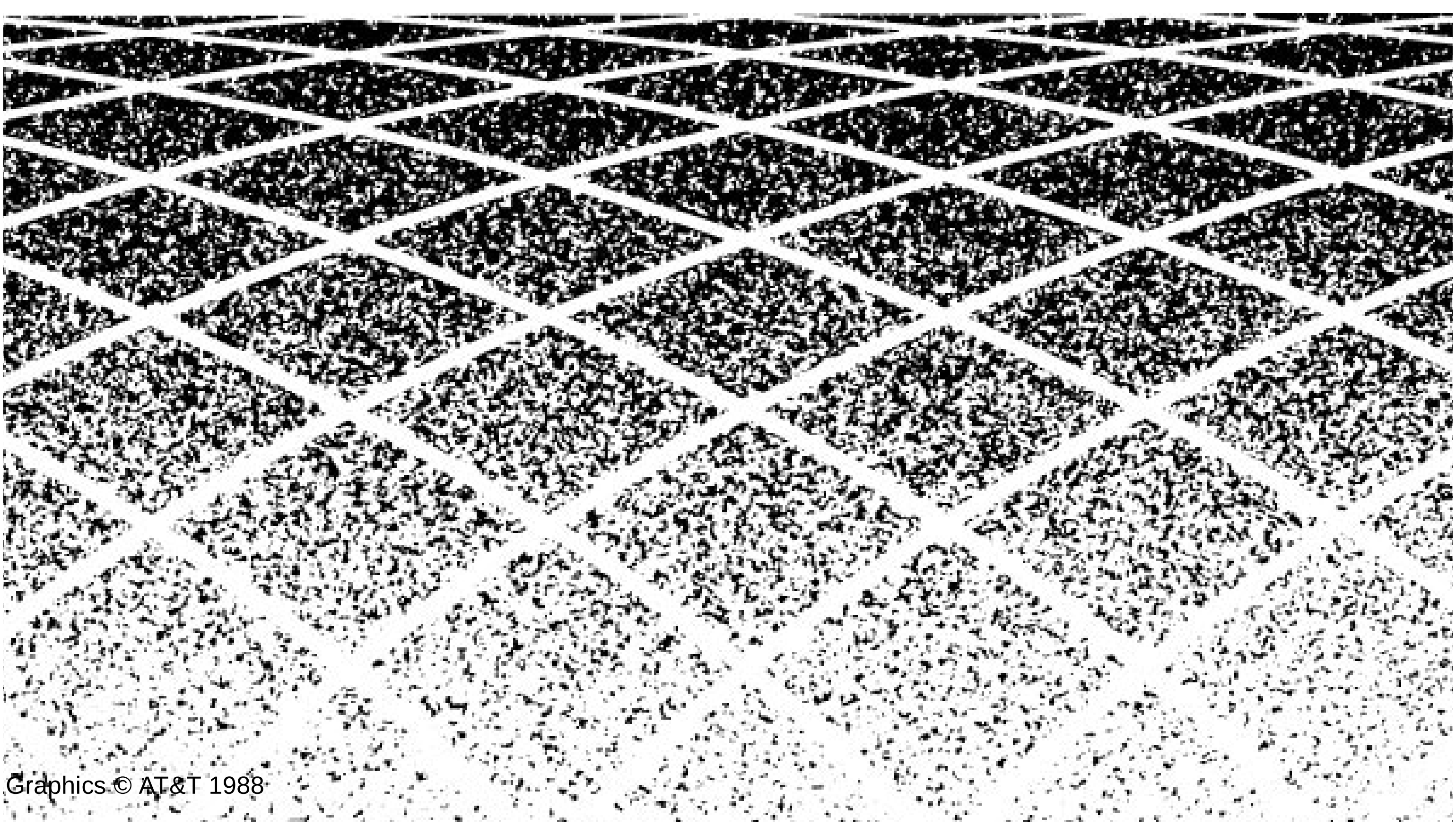
555-230-112
Issue 1
September 1996

DEFINITY Enterprise Communications Server Release 5 Installation and Test for Multi-Carrier Cabinets



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About This Document

This document provides procedures and information for installing and initially testing the DEFINITY® Enterprise Communications Server Multi-Carrier Cabinets. Also covered is the power and peripheral equipment that connects directly to the system.

The following conventions are used to describe the systems referred to in this document.

- The word *system*, is a general term and includes references to the DEFINITY Enterprise Communications Server
- DEFINITY Systems are called: G3V4, G3siV4+m, G3rV4, Release 5; Release 5si + memory, and Release 5r
- All occurrences of G3rV4 and Release 5r are called Release 5r unless a specific configuration is required to differentiate between product offerings
- All occurrences of G3siV4+m and Release 5si + memory are called Release 5si unless a specific configuration is required to differentiate between product offerings
- Information in this document is applicable for G3V4 through Release 5 unless otherwise specified
- DEFINITY Enterprise Communications Server is abbreviated DEFINITY ECS

NOTE:
This document is being modified for international translation. This means some illustrations contain numbers instead of descriptive text. In the future, all illustrations will contain numbers.

This document describes installation and wiring including:

1. Placing and interconnecting the various cabinets and adjuncts.
2. Power connections to the system and adjuncts.
3. Wiring from the telephone network interface to and including the 25-pair cables that connect directly to the system.
4. The main equipment room Main Distribution Frame (MDF) and the associated cabling to the system and/or 8-pin information outlets (modular wall jacks).
5. Testing of the completed installation.

This issue replaces all previous issues of *DEFINITY Communications System Generic 1 and Generic 3 Installation and Test,* 555-204-104.

Organization

This document contains the following chapters, appendices, glossary, and index:

Chapter 1, "Install and Connect Cabinets" — How to unpack the cabinets and inspect for damage. Also, how to install the cabinets, connect power, and connect the cabinets together.

Chapter 2, "Install Telecommunications Cabling" — How to install cabling between the system and the Main Distribution Frame.

Chapter 3, "Install Management Terminal and Activate System" — How to install the management terminal and how to activate and initialize the system.

Chapter 4, "Test the System" — How to initially test the system.

Chapter 5, "Install and Wire Telephones and Other Equipment"— How to install and wire telephones and other equipment to the system.

Chapter 6, "Test Telephones and Other Equipment" — How to test the equipment installed in Chapter 5.

Appendix A, "Option Switch Settings", Appendix B, "Cable Ductwork", Appendix C, "Connecting and Handling Fiber Optic Cables", and Appendix D, "Connector and Cable Diagrams"

Abbreviations — Alphabetic listing of abbreviations used in this document

Glossary — Alphabetic listing and definitions of terms used in this document

Index — Alphabetic listing of topics

Related Documents

The following documents are useful for system-related information:

- *DEFINITY Enterprise Communications Server Release 5 Feature Description*, 555-230-301
- *DEFINITY Enterprise Communications Server Release 5 System Description and Specifications*, 555-230-210
- *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5r,* 555-230-105
- *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5vs/si,* 555-204-105
- *AT&T Network and Data Connectivity Reference*, 555-025-201
- *GBCS Products Security Handbook*, 555-025-600
- *DEFINITY Wireless Business System Users Guide,* 555-232-105
- *DEFINITY Wireless Business System Installation and Test Guide,* 555-232-102
- *DEFINITY Wireless Business Systems System Interface*, 555-232-108
- *DEFINITY Enterprise Communications Server Release 5 Installation for Single-Carrier Cabinets,* 555-230-894
- *DEFINITY Enterprise Communications Server Release 5 Implementation,* 555-230-302
- *DEFINITY Enterprise Communications Server Release 5vs/s/i Upgrades and Additions,* 555-230-120
- *DEFINITY Enterprise Communications Server Release 5r Upgrades and Additions,* 555-230-121

Trademarks

This document contains references to the following Lucent Technologies trademarked products:

- ACCUNET®
- AUDIX®
- Callmaster™
- CallVisor™
- CONVERSANT®
- DEFINITY®
- FORUM™
- MEGACOM®

- SYSTIMAX™
- TELESEER®
- TRANSTALK™

The following products are trademarked by their appropriate vendor:

- Audichron® is a registered trademark of Audichron Company
- Music Mate® is a registered trademark of Harris Corporation
- PagePac® is a registered trademark of Harris Corporation, Dracon Division
- PORTA™ Systems is a trademark of PORTA Systems Corporation
- SHOCKWATCH® is a registered trademark of Media Recovery, Incorporated
- Styrofoam® is a registered trademark of Styrofoam Corporation
- TILTWATCH® is a registered trademark of Media Recovery, Incorporated
- VELCRO® is a registered trademark of VELCRO U.S.A. Incorporated
- Zone Mate® is a registered trademark of Harris Corporation

Standards Compliance

The equipment presented in this document complies with the following (as appropriate):

- ITO-T (Formerly CCITT)
- ECMA
- ETSI
- IPNS
- DPNS
- National ISDN-1
- National ISDN-2
- ISO-9000
- ANSI
- FCC Part 15 and Part 68
- EN55022
- EN50081
- EN50082
- CISPR22
- Australia AS3548 (AS/NZ3548)

- IEC950
- UL 1459
- UL1950
- CSA C222 Number 225
- TS001

The DEFINITY ECS may contain a Class 1 LASER device if single-mode fiber optic cable is connected to a remote Expansion Port Network (EPN). The LASER device operates within the following parameters:

Power Output: -5 dBm
Wavelength: 1310 nm
Mode Field Diameter: 8.8 microns

CAUTION:
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Contact your Lucent Technologies representative for more information.

Electromagnetic Compatibility Standards

This product complies with and conforms to the following:

- Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment, EN55022 (CISPR22), 1993
- EN50082-1, European Generic Immunity Standard
- FCC Parts 15 and 68
- Australia AS3548

NOTE:
The system conforms to Class A (industrial) equipment. Voice terminals meet Class B requirements.

- Electrostatic Discharge (ESD) IEC 1000-4-2
- Radiated radio frequency field IEC 1000-4-3
- Electrical Fast Transient IEC 1000-4-4
- Lightning effects IEC 1000-4-5
- Conducted radio frequency IEC 1000-4-6

- Mains frequency magnetic field IEC 1000-4-8
- Low frequency mains disturbance

The system conforms to the following:

- Electromagnetic compatibility General Immunity Standard, part 1; residential, commercial, light industry, EN50082-1, CENELEC, 1991
- Issue 1 (1984) and Issue 2 (1992), Electrostatic discharge immunity requirements (EN55024, Part 2) IEC 1000-4-2
- Radiated radio frequency field immunity requirements IEC 1000-4-3
- Electrical fast transient/burst immunity requirements IEC 1000-4-4

European Union Standards

Lucent Technologies Business Communications Systems declares that the DEFINITY equipment specified in this document bearing the “CE” mark conforms to the European Union Electromagnetic Compatibility Directives.

The “CE” (Conformité Europeénne) mark indicates conformance to the European Union Electromagnetic Compatibility Directive (89/336/EEC) Low Voltage Directive (73/23/EEC) and Telecommunication Terminal Equipment (TTE) Directive (91/263/EEC) and with i-CTR3 Basic Rate Interface (BRI) and i-CTR4 Primary Rate Interface (PRI) as applicable. The “CE” mark is applied to the following Release 5 products:

- Global AC powered Multi-Carrier Cabinet (MCC)
- DC powered Multi-Carrier Cabinet (MCC) with 25 Hz ring generator
- AC powered Single-Carrier Cabinet (SCC) with 25 Hz ring generator
- AC powered Compact Single-Carrier Cabinet (CSCC) with 25 Hz ring generator
- Enhanced DC Power System

Technical Support

To obtain technical support, refer to one of the following telephone numbers.

- Lucent Technologies Centers of Excellence
  - Asia/Pacific
    65-872-8686
  - Western Europe/Middle East/South Africa
    441-252-391-889
  - Central/Eastern Europe
    361-270-5160

- — Central/Latin America/Caribbean
  1-303-538-4666
- — North America
  1-800-248-1111

- DEFINITY Helpline
  1-800-225-7585
- Lucent Technologies Toll Fraud Intervention
  1-800-643-2353
- Lucent Technologies Technical Service Center
  1-800-242-2121
- Lucent Technologies Corporate Security
  1-800-822-9009

How to Order Documentation

In addition to this book, other description, installation and test, maintenance, and administration books are available. A complete list of DEFINITY books is provided in the *Business Communications System Publications Catalog*, 555-000-010.

This document and any other DEFINITY documentation can be ordered directly from the Lucent Technologies Business Communications System Publications Fulfillment Center at 1-317-361-5353 or toll free at 1-800-457-1235.

How to Comment on This Document

Lucent Technologies welcomes your feedback. Please fill out the reader comment card at the front of this manual and return it. Your comments are of great value and help improve our documentation.

If the reader comment card is missing, fax your comments to 1-303-538-1741 or to your Lucent Technologies representative, and mention this document's name and number, *DEFINITY Enterprise Communication Server Release 5 Installation and Test for Multi-Carrier Cabinets,* 555-230-112.

Install and Connect Cabinets

1

This chapter discusses installation of Multi-Carrier Cabinets only. For information on Single-Carrier Cabinets, refer to *DEFINITY Enterprise Communications Server Release 5 Installation and Test for Single-Carrier Cabinets*, 555-230-894.

Floor plans and equipment layouts for typical system installations are provided in *DEFINITY Enterprise Communications Server Release 5 System Description and Specifications*, 555-230-210.

The table of contents may be used as an “installation checklist” for this chapter.

Unpack and Inspect Cabinets z

A cabinet is shipped in a polyethylene bag packed in a cardboard container and is fastened to a pallet with four carriage bolts. The cardboard container is strapped to the pallet with two metal bands.

DANGER:
A cabinet may weigh as much as 800 pounds (363 kg) and may be top heavy. Use extreme caution.

1. Check the status of the SHOCKWATCH and/or TILTWATCH indicators on the container. If the container has been shaken or tilted beyond specifications, the indicators are red, indicating potential damage. Report any damage according to local shipping instructions.

DANGER:
Take care to avoid injury while cutting and removing the two metal bands.

2. Using tin snips, cut and remove the two metal bands.
3. Open the carton containing the “Ramp Enclosed” label.
4. Carefully cut the tape holding the container together.
5. Remove all cardboard, tape, and plastic from the outside of the cabinet.
6. To open the cabinet doors, use a #2 flat blade screwdriver to turn the screws located on the front and rear doors to release the door latches. Turn the screws clockwise to loosen.
7. Lift off the front and rear doors. Do not remove the screws from the door hinges.
8. Remove all packing material from inside the cabinet.
9. Inspect cabinet for any damage caused during shipping. Report any damages per local instructions.
10. Use an adjustable wrench to remove the carriage bolts located at each bottom corner of the cabinet. Drive the carriage bolts downward until they clear the cabinet.
11. Remove the ramp from the side of the cabinet carton. See Figure 1-1.
12. Remove the power cord stored under or inside the cabinet of AC-powered systems and lay it over the top of cabinet.
13. Remove the supporting block of wood by raising the rear corner of the cabinet using a pry bar (if necessary). Repeat for the other rear corner.
14. Screw the cabinet stabilizing bolts all the way up to provide clearance between the cabinet and the pallet when the cabinet is rolled down the ramp.
15. Place the ramp as shown in Figure 1-1. Bolt the ramp into position using the bolts provided in the plastic bag attached to the ramp.
16. Hold both sides of the rear of the cabinet. It is recommended that two people move the cabinet.
17. Roll the cabinet off the ramp, onto the floor, and into position at the designated location.
18. When all cabinets are in place, adjust the leveling legs until the cabinets are level.

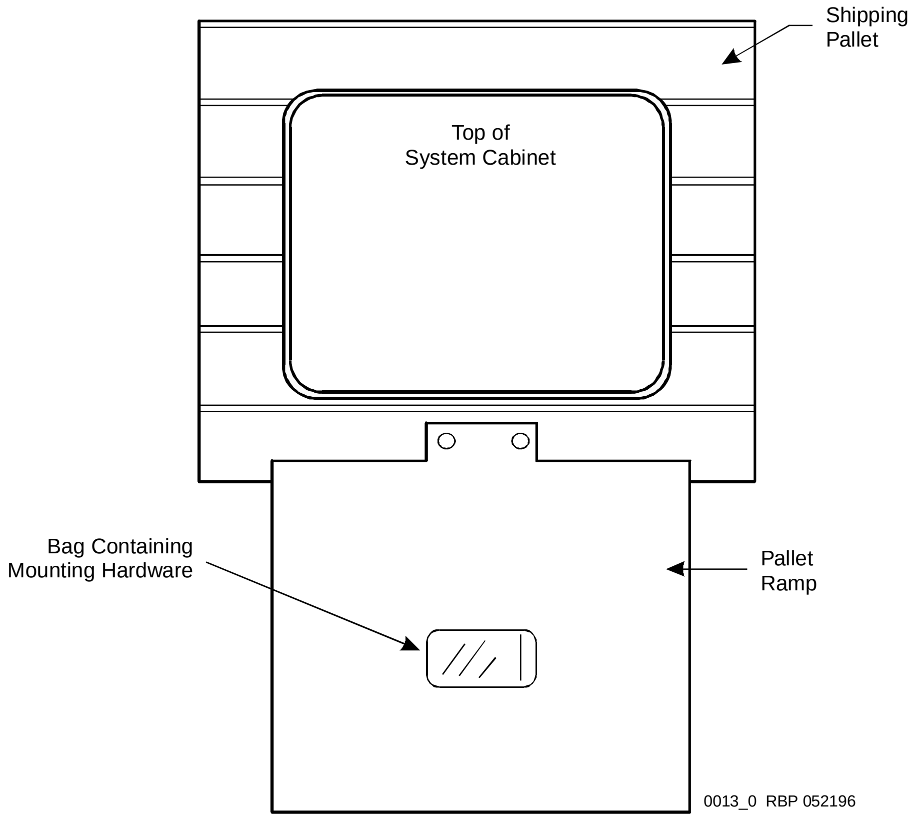

Figure 1-1. Ramps Installed on Pallet

Unpack and Inspect Auxiliary Cabinet

The Auxiliary cabinet is normally positioned adjacent to the PPN cabinet or the EPN cabinet, if provided. The cabinet is shipped in a polyethylene bag packed in a cardboard container. The cabinet is fastened to a pallet by four carriage bolts. The cardboard container is strapped to the pallet by two metal bands.

To unpack the cabinet, perform the steps as detailed in "Unpack and Inspect Cabinets z".

1. Remove the lower rear panel from the Auxiliary cabinet.
2. Roll the cabinet off the ramp, onto the floor, and into position at the designated location.
3. When the cabinet is in place, adjust the leveling legs until the cabinet is level.
4. Re-install the lower rear panel when the installation is completed.

Unpack and Inspect Stratum 3 Clock Cabinet

1. Check the status of the SHOCKWATCH and/or TILTWATCH indicators on the cardboard container. The indicators are normally white. If the container has been jarred or tilted beyond specifications, the indicators are red, indicating possible damage.
2. Remove the cabinet from the cardboard container.
3. Remove all cardboard, tape, and plastic.
4. Open and remove front door and rear screw-on panels from cabinet.
5. Remove all packing material from inside cabinet.
6. Inspect cabinet for damage. Report any damage per local instructions.
7. Position cabinet into the designated location and adjust the leveling legs until the cabinet is level.

Check Circuit Packs

Ensure all circuit packs are fully inserted into the proper slots according to the Customer Service Document (CSD). Report any discrepancies in circuit pack type or quantity to your Lucent Technologies representative. For detailed circuit pack descriptions, refer to *DEFINITY Enterprise Communications Server Release 5 System Description and Specifications*, 555-230-210.

Check Customer's Order

Check the customer's order and the shipping packing lists to confirm all equipment is present. If any equipment is missing, report the information to your Lucent Technologies representative. Check the system adjuncts for damage and report all damage according to local shipping instructions.

How to Correct Shipping Errors

For a new installation, defective equipment and over-shipped equipment must be red-tagged and returned per the nearest Material Stocking Location (MSL) instructions.

Short-shipped reports must also be directed to the nearest Material Stocking Location (MSL). Contact the appropriate location for specific instructions. For Streamlined Implementation in the United States, call 1-800-772-5409.

Install System Cabinets

Check the location of the AC power receptacle in the equipment room. The receptacle must be on a separately fused circuit not controlled by a wall switch. It must be located within 10 feet (3 m) of the cabinet and outside the Main Distribution Frame (MDF) area.

Multi-Carrier Cabinets offer a variety of configurations. Figure 1-2 shows four typical Processor Port Network (PPN) and Expansion Port Network (EPN) cabinets.

NOTE:
Several cabinet configurations are possible that are not shown in Figure 1-2. Other configurations are presented later in this chapter.

NOTE:
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Install Processor Port Network Cabinet

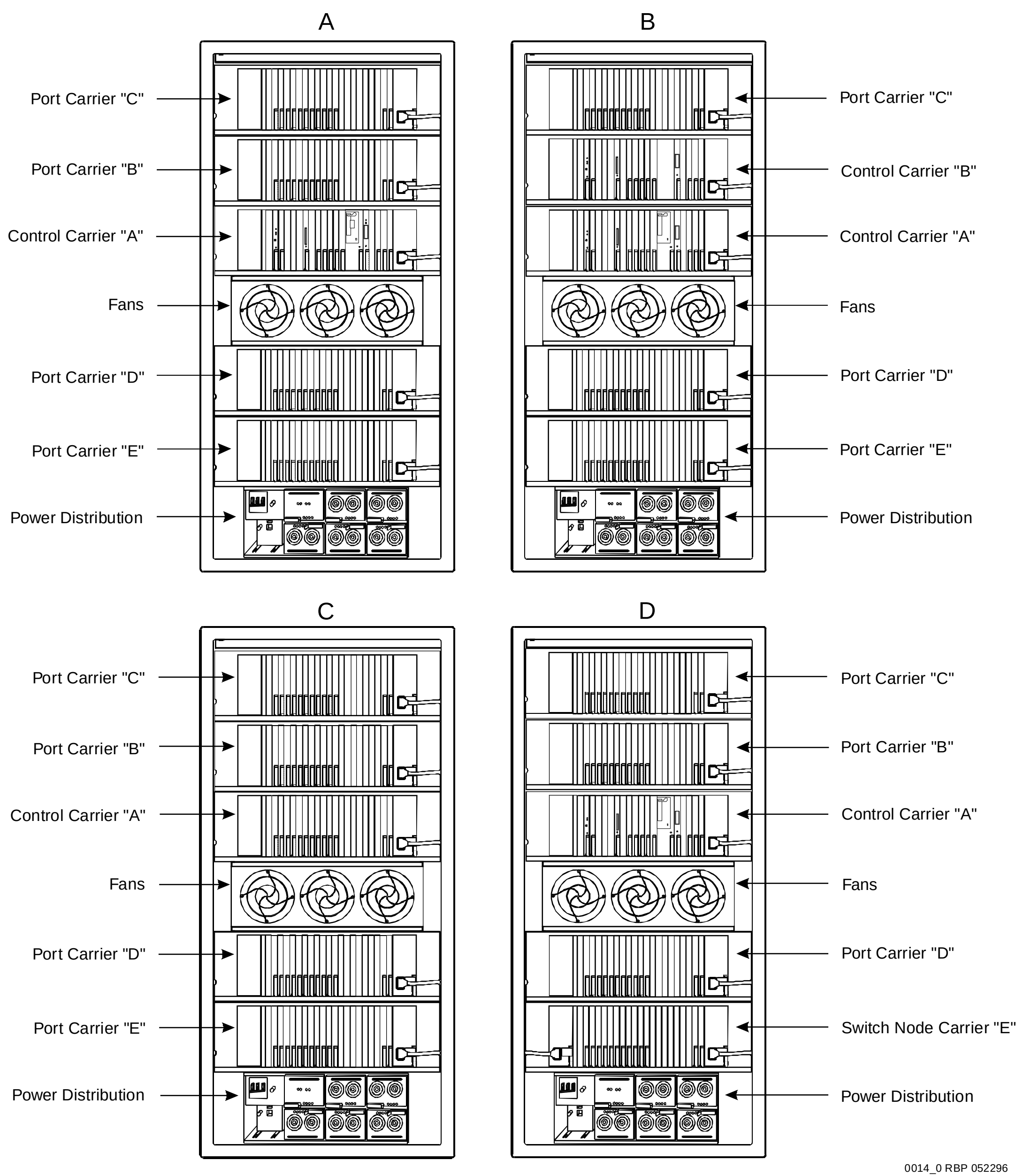


Figure 1-2. Typical Multi-Carrier Cabinet Configurations

Typical Configurations

The following cabinet configurations are shown in Figure 1-2.

- Cabinet “A” is a standard reliability PPN cabinet
- Cabinet “B” is a high or critical reliability PPN cabinet
- Cabinet “C” is an EPN (any reliability option) cabinet
- Cabinet “D” is a standard reliability PPN cabinet with a Switch Node carrier (Release 5r only)

Position the PPN Cabinet

If the system is supplied with cable ductwork, the cabinets must be spaced on 32 inch (81.3 cm) centers +-1/8 inch (0.3 cm), they must be level, and must be square with respect to each other.

If the system is supplied with Cable Slack Managers, the cabinets must be placed far enough from the connection field to lay down the 32 inch (81.3 cm) slack managers and to provide a little extra room for the cables to access the Cable Slack Managers.

1. If earthquake protection is required, refer to "Earthquake Protection Installation" on page 1-11.
2. After the cabinets are leveled, adjust and lock the cabinet stabilizing bolts to keep the cabinets from moving.
3. At the bottom of the cabinets, install hole plugs (provided with cabinet) in the holes previously occupied by the four carriage bolts.

Install and Position an EPN Cabinet

Each EPN cabinet is normally positioned adjacent to the PPN cabinet but may be located remotely in a different room or a different building.

1. The procedure for installing an EPN cabinet in a *new* installation is the same as for the PPN cabinet.
2. To install a new EPN cabinet in an *existing* system, skip to end of this chapter.

Install Auxiliary Cabinet (Optional)

The Auxiliary cabinet is normally positioned adjacent to the PPN cabinet or the EPN cabinet. The location of equipment inside the Auxiliary cabinet is specified in the Customer Service Document (CSD).

The Auxiliary cabinet is shipped in a polyethylene bag packed in a cardboard container. The cabinet is fastened to a pallet by four carriage bolts. The cardboard container is strapped to the pallet by two metal bands.

To install the Auxiliary cabinet, perform the steps as detailed in "Install Processor Port Network Cabinet". If earthquake protection is required, refer to "Earthquake Protection Installation" on page 1-11.

NOTE:
Check the location of the AC power receptacle. The receptacle must be on a separately fused circuit that is not controlled by a wall switch. It must be located within 10 feet (3 m) of the cabinet and should be located outside the Main Distribution Frame area.

Install Auxiliary Cabinet Equipment

The cabinet allows for carrier, 23 inch (58.4 cm) rack, or panel mounting of hardware. The following equipment is furnished with the cabinet. See Figure 1-3.

- Fuse panel — distributes -48 VDC power to fused cabinet circuits
- Power receptacle strip — provides switched and unswitched 120 VAC receptacles
- DC connector block — required when Auxiliary cabinet is powered by an external DC source
- AC to DC power supply — converts AC power provided by the AC power strip switched outlet to the required DC voltage

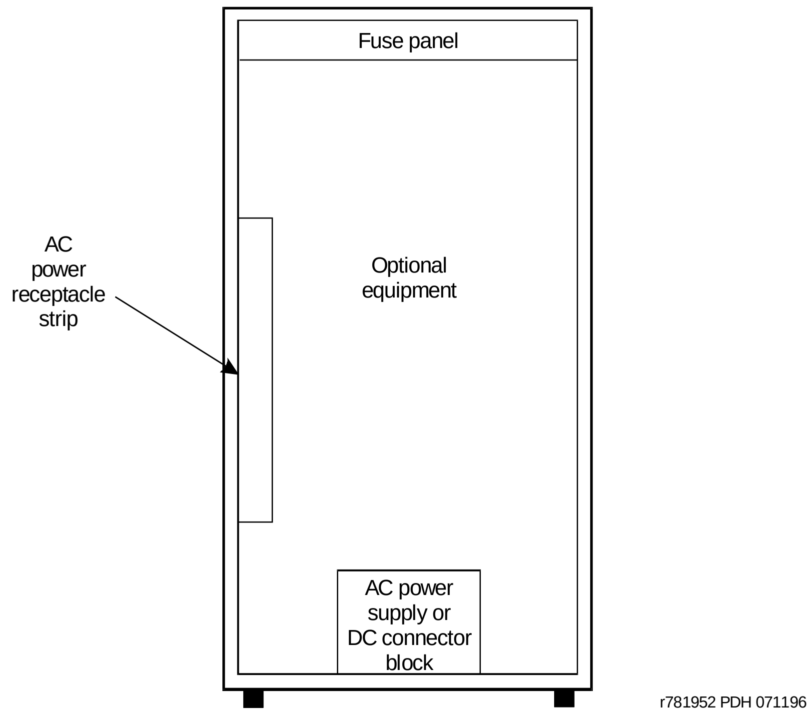


Figure 1-3. Auxiliary Cabinet

Install equipment inside the cabinet as specified in the CSD. The following optional equipment can be installed:

- Audichron H9040 Wake-Up Announcement System
- 909A/B Universal Coupler
- 7400 Series Data Modules
- Z77A Multiple Data Mounting
- Fan Assembly — requires 120 volt AC power
- COMSPHERE 3000
- Channel Service Unit (CSU) — one is required for each T1 carrier link

- PagePac Paging System — three models are available:
  - PagePac 20
  - PagePac VS
  - PagePac 50/100/200

  All PagePac models require 120 VAC power
- Model 15A Announcement System — See Table 1-1 for PEC codes.

Table 1-1. Model 15A Announcement Equipment

PEC Code	Description
PEC 63240	1 chassis and 1 BLD1 circuit pack
PEC 63241	1 BLD1 circuit pack
PEC 63242	1 chassis and 1 BLD2 circuit pack
PEC 63243	1 BLD2 circuit pack
PEC 63246	1 remote record module

The BLD1 circuit pack provides 8 channels with up to 20 seconds of recording time on each channel. The BLD2 circuit pack provides 8 channels with up to 40 seconds of recording time on each channel. Each chassis can be populated with any combination of two BLD circuit packs.

The Model 15A Announcement System is FCC registered and does not require a voice coupler.

Install and Position Stratum 3 Clock Cabinet

Position the cabinet into the designated location. Check the location of the AC power receptacle. The receptacle must be on a separately fused circuit that is not controlled by a wall switch. It must be located within 10 feet (3 m) of the cabinet and should be located outside the Main Distribution Frame area.

Earthquake Protection Installation

Install Concrete Floor Mounting

1. Position the cabinet in the exact position it is to occupy when the installation is complete.
2. Insert a pencil or marker through the holes previously occupied by the carriage bolts (front and rear) in the bottom of the cabinet and mark the floor directly beneath each hole.
3. Roll the cabinet out of the way and drill four 1/2-inch (1.27 cm) diameter holes about 1.5 inches (3.81 cm) deep at the locations marked in Step 2.
4. Insert concrete floor anchors (STARR part number 3425) into the holes.
5. Roll the cabinet back into place and align the cabinet holes over the concrete floor anchors.
6. Adjust the leveling legs until the cabinet is level. See Figure 1-4.

   NOTE:
   If the system is supplied with cable ductwork, the cabinets must be level from front to rear and from side to side. They must be square with respect to each other to within +-1/8-inch (0.3 cm).

7. Secure the cabinet to the floor with four supplied 3/8-16 x 4.5-inch bolts and four 3/8-inch flat washers.
8. Repeat this procedure for each cabinet to be installed.

Install Raised Computer Floor Mounting

1. Position the cabinet in the exact position it is to occupy when the installation is complete.
2. Insert a pencil or marker through the holes previously occupied by the carriage bolts (front and rear) in the bottom of the cabinets and mark the raised floor panels directly beneath each hole.
3. Roll the cabinet out of the way and drill four holes 5/8-inch (1.58 cm) in diameter through the raised floor panels marked in Step 2.

   CAUTION:
   Take care while drilling the holes through the raised floor that the drill bit does not penetrate any cables below the floor that could cause damage to the cable or injury to the installer.

4. Insert a long punch through the holes drilled in Step 3 and mark the concrete floor beneath the raised floor panels.

5. Remove the raised floor panels in which the holes were drilled.
6. Using 1/2-inch (1.27 cm) anchor bits, drill a hole at each of the locations marked in Step 4. Stop drilling when the mark on the side of the bit reaches the floor level.
7. Insert a concrete floor anchor (STARR part number 3425) into the hole until the mark on the bit reaches floor level again. Snap the top of the anchor bit off. Repeat for the remaining holes.

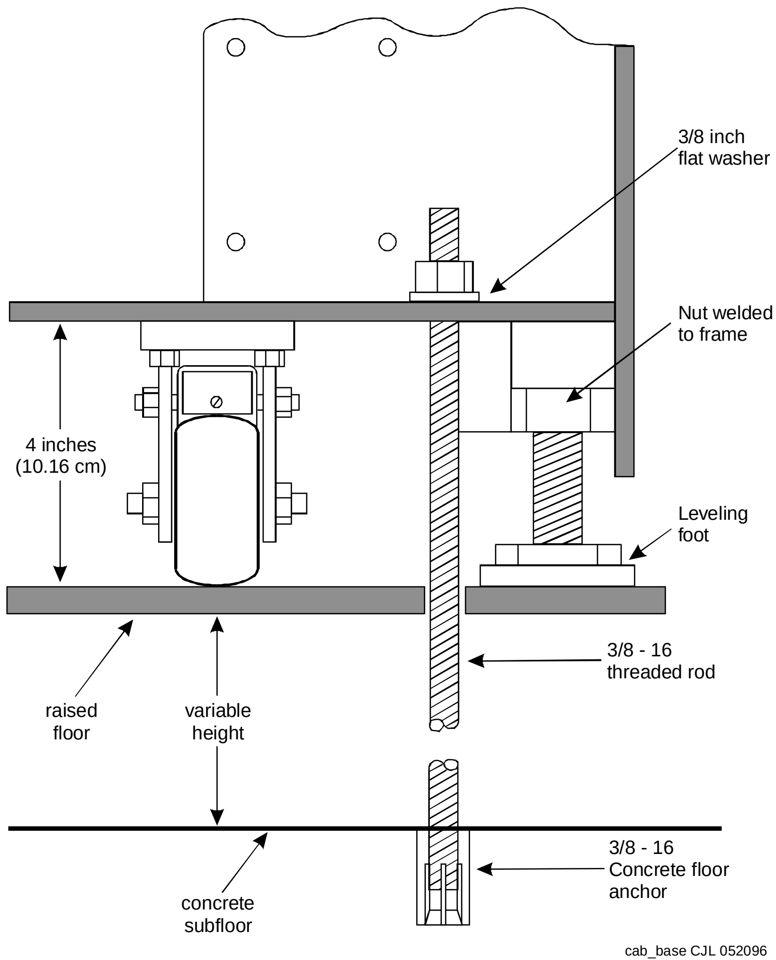


Figure 1-4. Earthquake Mounting — Raised Computer Floor

8. A 3/8-16 threaded rod (part number 845557073) is used to secure the cabinet to each concrete floor anchor. See Figure 1-4.

   Measure the distance from one of the anchors to the bottom of the cabinet. Add 1/2-inch (1.27 cm) to this measurement to allow the rod to be threaded into the floor anchor. Add an additional 1/2-inch (1.27 cm) to allow the rod to protrude up through the bottom of the cabinet. For example: if the distance from the floor anchor to the bottom of the cabinet is 10 inches (25.4 cm), cut the threaded rod 11 inches (27.9 cm) long.

9. When all four threaded rods are cut, replace the raised floor panels removed in Step 5.

10. Position the cabinet over the holes and adjust the leveling legs until the cabinet is level.

    NOTE:
    If the system is supplied with cable ductwork, the cabinets must be level from front to rear and from side to side. They must be square with respect to each other to within +-1/8-inch (0.3 cm).

11. Insert the threaded rods through the cabinet bottom and thread into the concrete floor anchors.

12. Place a 3/8-inch flat washer onto each rod. Thread a 3/8-16 hex nut onto each rod and tighten securely.

13. Repeat this procedure for each cabinet to be installed (including the Auxiliary Cabinet and the Stratum 3 Clock Cabinet).

Connect AC Power and Ground

J58890CE-1, J58890CE-2, and J58890CH-1

The following procedures apply to the AC-powered PPN and EPN cabinets. Either of the following power sources can supply 60 Hz power to the AC load in Release 5 systems and in later G3V4 systems:

- Single-phase, 4-wire, 120/240 VAC supplying 240 VAC. This source has three hot wires plus a ground wire (J58890CE)
- Three-phase, 4-wire, 120/208 VAC supplying 208 VAC. This source has two hot wires, one ground wire, and one neutral wire (J58890CE)
- Single-phase, 3-wire, 208 or 240 VAC. This source has two hot wires and one ground wire (J58890CH-1)

Either of the following power sources can supply 50 Hz power to the AC load in Release 5 systems:

- International 4-wire, Y, 220/380 VAC. This source has three hot wires, one neutral wire, and one ground wire.
- International Delta, 3-wire, 220 or 240 VAC. This source has three wires

Table 1-2 describes the power sources and required AC input power.

Table 1-2. AC Power Sources and Plug Type

Power Distribution Unit	Power Sources	Power Input
AC power distribution (J58890CE-1 and J58890CE-2) Multi-Carrier Cabinet	Single phase 120 VAC with neutral Single phase 240 VAC with neutral, or single phase of 3-phase, 208 VAC with neutral	120 VAC, 60 Hz NEMA 5-50R 208/240 VAC, 60 Hz NEMA L14-30R
AC power distribution (J58890CH-1) Multi-Carrier Cabinet	Single Phase 176-264 VAC	200-240 Volts, 50-60 Hz NEMA L6-30R. Installations outside the United States require a receptacle suitable for use in the country of installation.

NOTE:
The type of power required is shown on the cabinet’s rear door.

CAUTION:

The equipment room AC power and ground wiring must be performed by a qualified electrician. Refer to DEFINITY Enterprise Communications Server Release 5 System Description and Specifications, 555-230-210, for site requirement information.

CAUTION:

The power circuit must be dedicated to the system and must not be shared with other equipment and must not be controlled by a wall switch. The AC receptacle should not be located under the Main Distribution Frame.

CAUTION:

System grounding must comply with the general rules for grounding contained in Article 250 of the National Electrical Code (NEC), National Fire Protection Agency (NFPA) 70, or the applicable electric code in the country containing the equipment. See page 1-29 for information on approved grounds.

Connect Ground to AC-Powered System (J58890CE)

Grounding is relatively simple for an AC-powered system. Basically, the cabinets are connected to each other. Then, a single ground wire is connected from the PPN to the single-point ground terminal block at the AC load center (or optional AC protector cabinet). The ground terminal block is connected to an approved ground using a 6 AWG (#40) wire.

NOTE:

All approved grounds must be bonded together to form a single grounding electrode system.

1. At the lower right rear of the PPN cabinet, connect a 6 AWG (#40) ground wire to the cabinet ground terminal block. See Figure 1-5.
2. Route the ground wire to the single-point ground block at the AC load center. Connect the wire to the ground block.
3. At the first EPN cabinet (if provided), connect a 6 AWG (#40) ground wire to the cabinet ground terminal block.

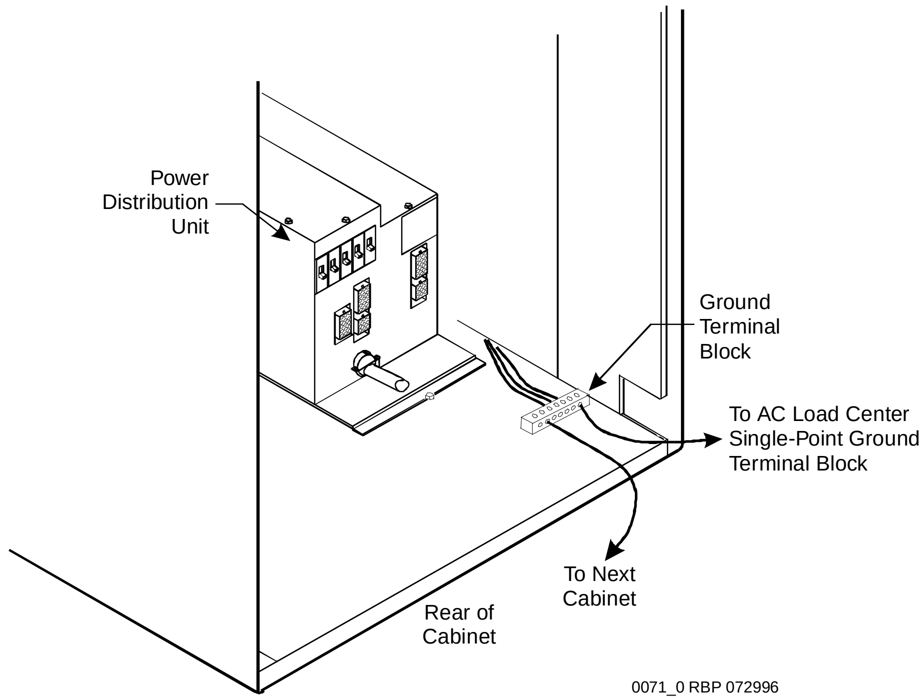


Figure 1-5. Typical Cabinet Ground Location

4. Route the ground wire to the PPN cabinet and connect it to the ground terminal block.

NOTE:
If the EPN cabinet is located remote from the PPN cabinet (in a separate room or building), route the EPN cabinet ground wire to an approved ground.

5. At the second EPN cabinet (if provided), connect a 6 AWG (#40) ground wire to the cabinet ground terminal block.
6. Route the ground wire to the first EPN cabinet and connect it to the ground terminal block. Repeat connecting each EPN cabinet to the next EPN cabinet in the system.
7. At the AC load center, connect a 10 AWG (#25) wire to the single-point ground terminal block. This ground wire will later be tie-wrapped to the trunk cables and connected to the CBC ground block at the MDF.

Connect Battery Leads (J58890CH-1)

Figure 1-6 shows a typical small battery holdover assembly. The battery connector is plugged into the -48 VDC Batteries connector on the rear of the J58890CH-1 Power Distribution Unit.

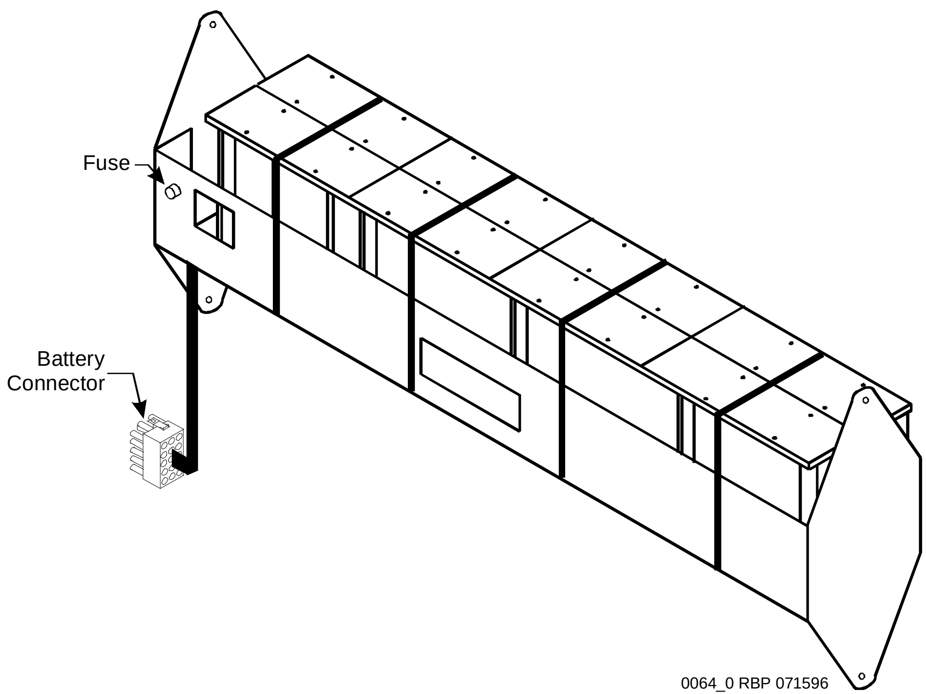


Figure 1-6. Typical Small Battery Assembly

Optional battery holdover assemblies may be shipped with the battery leads disconnected to prevent the batteries from discharging.

CAUTION:

Power is present in the cabinet even if the AC power cable is unplugged. Turn off the main circuit breaker on the front of the power distribution unit when procedures require ALL power to be removed from the cabinet.

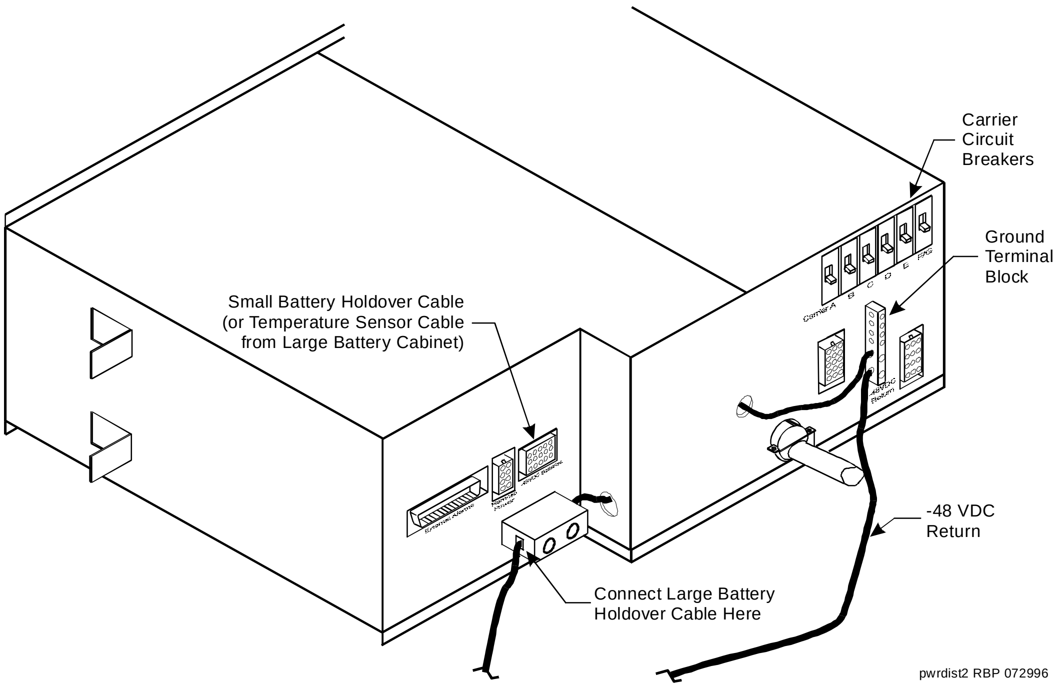


Figure 1-7. Power Distribution Unit (J58890CH-1)

1. Be sure the main power to the power distribution unit is OFF.
2. At the power distribution unit, set all carrier circuit breakers OFF.

Small Battery Holdover

1. Connect the cable to the small battery holdover connector as shown in Figure 1-7.

Large Battery Holdover

1. Connect the -48 VDC cable to the large battery connector as shown in Figure 1-7.
2. Connect the -48 VDC RETURN cable to the ground terminal block.
3. Connect the temperature sensor cable from the battery cabinet to the connector shown in Figure 1-7.

Connect Shorting Cable to J58890CE-2

Some cabinets may contain a J58890CE-2 AC Power Distribution Unit without an optional battery charger. The shorting cable is used only when the battery charger is *not* installed.

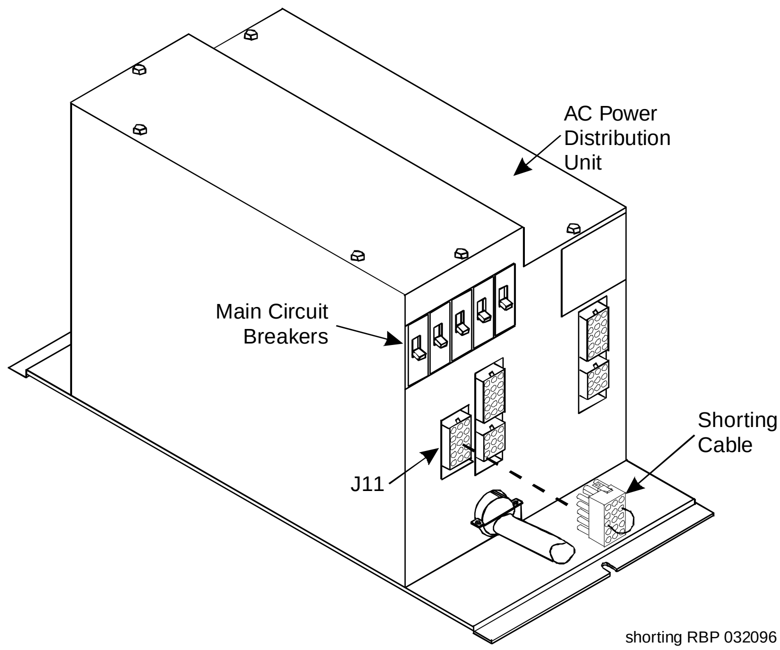


Figure 1-8. Shorting Cable Installation

1. Be sure the circuit breakers on the power distribution unit are OFF. See Figure 1-8.
2. From the rear of the cabinet, insert the shorting cable (H600-442-G1) into J11. The cable is keyed so it can fit only one way.

Connect AC Power

The main circuit breakers are located on the power distribution unit.

1. Verify the main circuit breakers are **OFF**.
2. Connect cabinet AC line cords to AC power receptacles.
3. Do not power up the system at this time.

Connect DC Power and Ground

Power Distribution Unit (J58890CH-1 Only)

Install Battery Interface Unit and Rectifier Modules

The Battery Interface Unit (BIU) controls the rectifier modules, manages the batteries, and reports the status of system power. The BIU provides the Remote Power Off (RPO) option and provides all battery alarm interfaces for internal and external alarms.

Each rectifier module is designed to operate as an integral part of a complete power system with battery backup. The modules operate in a redundant, high reliability mode to provide -48 VDC at 850 Watts to a common power bus.

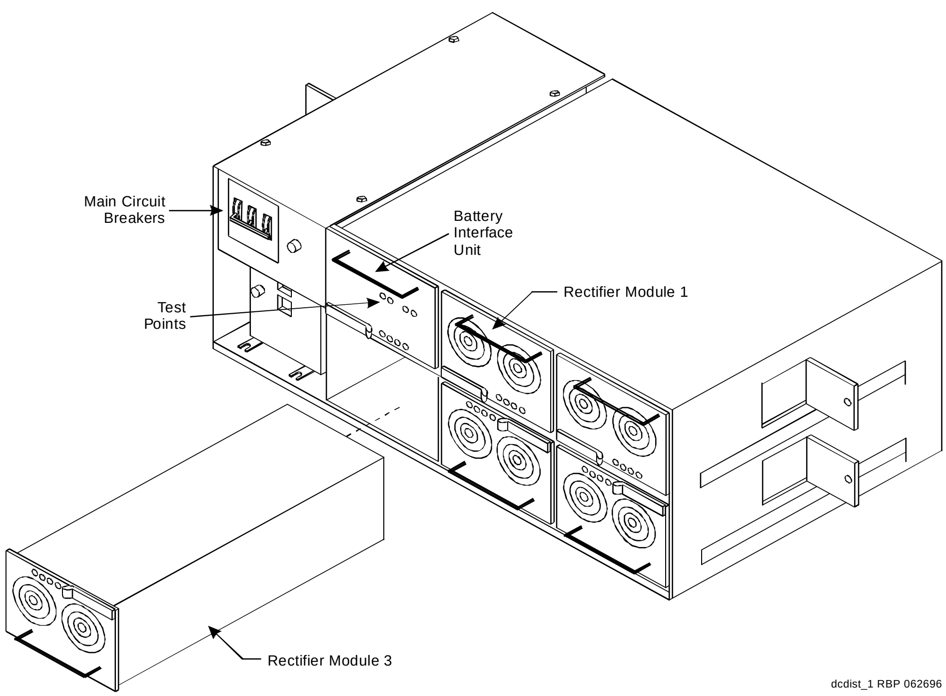


Figure 1-9. Rectifier Module Installation

1. The BU3200A Battery Interface Unit (comcode 107781502) or BU3200B Battery Interface Unit must be installed in the first slot of the J58890CH-1 Power Distribution Unit. See Figure 1-9.
2. The first two RM0850HA100 Rectifier Modules (comcode 107793796) must be installed in the second and third slots of the J58890CH-1 Power Distribution Unit.
3. For two to three carriers installed in the system, a third rectifier module is required (N+1).
4. For four to five carriers installed in the system, a fourth rectifier module is required.
5. The fifth rectifier module is designed for future growth.

NOTE:
The BIU and the rectifier modules are keyed and can only be installed one way.

Connect Power and Ground

1. Have a qualified electrician connect and route wires from the AC load center to the dedicated electrical outlet for the power distribution unit. Refer to the *DEFINITY Enterprise Communications Server Release 5 System Description and Specifications*, 555-230-210, for power requirements.
2. The power distribution unit is grounded to the cabinet by its mounting hardware. No additional grounding procedures are required.

DC Power and Ground (J58890CF Only)

Figure 1-10 shows a typical power and ground layout for a DC-powered cabinet. The size of the wire required for the -48 volt DC and -48 volt return must ensure the -48 volt DC supplied by the battery plant is maintained between -42.5 and -54.2 volts DC at all times for proper operation and to prevent hardware damage. This procedure applies to both PPN and EPN cabinets.

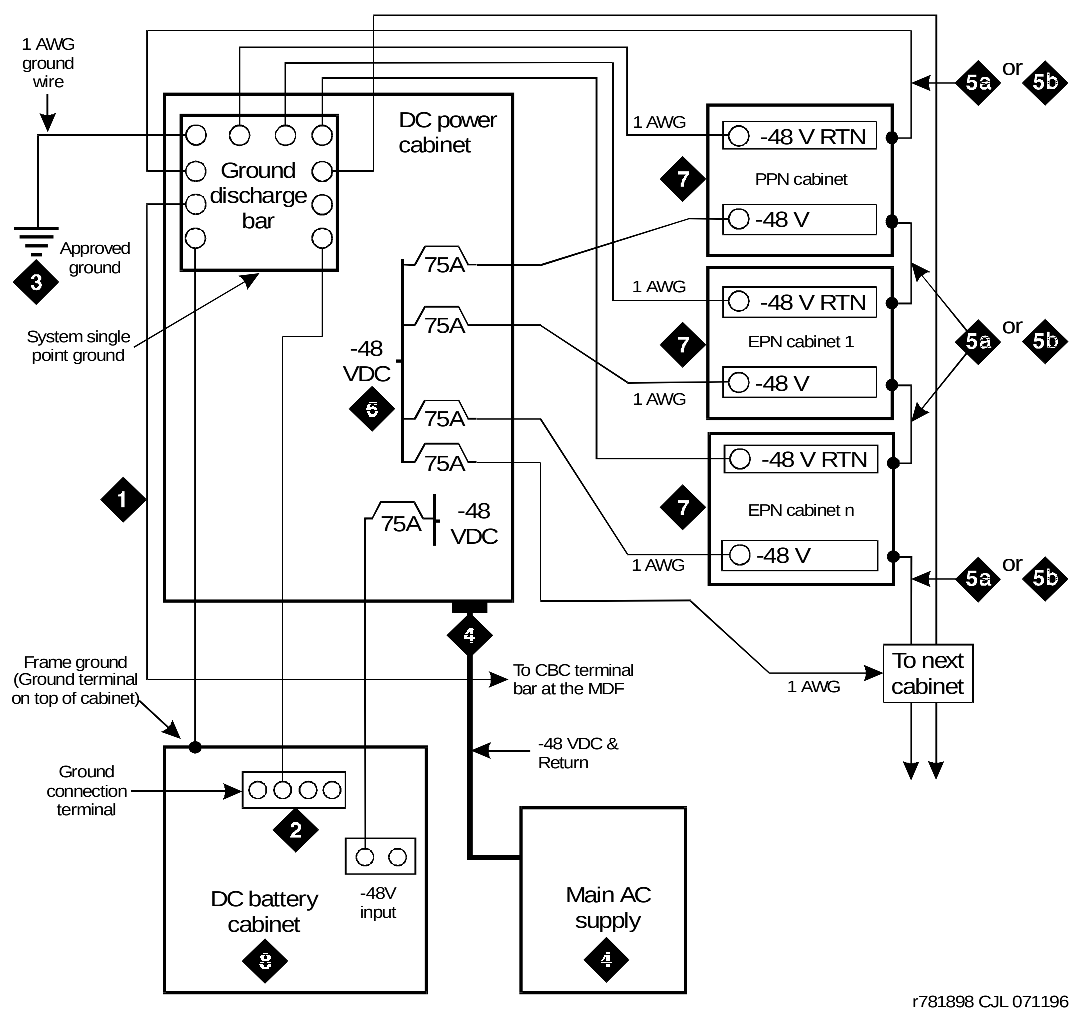


Figure 1-10. Typical Power and Ground for a DC-Powered Cabinet

Connect DC Power and Ground

The grounding methods for the DC-powered system are more complex than that of an AC-powered system. The following installation procedures refer to Figure 1-10. The numbers 1-8 in the illustration match the following subsections 1-8. Other figures may be referenced as required.

CAUTION:
Grounding of the system shall comply with the general rules for grounding contained in Article 250 of the National Electrical Code, NFPA 70. See page 1-29 for information on approved grounds.

1. Install Coupled Bonding Conductor Wires

This is a conductor that is connected to the single-point ground terminal bar and run adjacent to pairs in an associated cable. The mutual coupling between the CBC and the pairs reduces potential differences in terminating equipment. The conductor consists of a 10 AWG (#25) wire terminated at the CBC ground terminal bar at the Main Distribution Frame (MDF).

1. At the DC Power Cabinet, connect a 10 AWG (#25) ground wire to the Ground Discharge Bar. See Figure 1-10.
2. Route the 10 AWG (#25) ground wire to the CBC ground terminal bar at the MDF. Be sure a minimum of 12 inches (30.5 cm) spacing is maintained between the CBC and other power and ground leads.
3. Tie wrap the ground wire to the inside wiring cable.

NOTE:
The ground wires are connected to the CBC as instructed in Chapter 2, "Install Telecommunications Cabling".

2. Connect DC Battery and Power Cabinet Frame Grounds

1. Measure and cut a 6 AWG (#40) wire (comcode 846110971) long enough to reach between the Ground Connection Terminal in the DC Battery Cabinet and the Ground Discharge Bar in the DC Power Cabinet. See Figure 1-10.
2. Crimp terminal lugs on each end of the wire. Terminal lugs are furnished as part of D-181895, Kit of Parts (comcode 105434559). See the inset in Figure 1-11.
3. At the DC Power Cabinet, connect the wire to the Ground Discharge Bar.
4. Route the wire through one of the holes in the side of the cabinets and terminate it on the Ground Connection Terminal in the DC Battery Cabinet.

3. DC Power Cabinet Approved Ground

1. At the DC Power Cabinet, connect a 1 AWG (#70) ground wire to the Ground Discharge Bar. See Figure 1-10.
2. Route the ground wire out of the cabinet and terminate it on the approved ground. The approved ground must be identified with a grounding tag (FORM 15657NR or equivalent). See "Approved Grounds" on page 1-28.

4. Connect Main AC Supply to DC Power Cabinet

1. Have a qualified electrician connect AC power leads to the rectifiers in the DC Power Cabinet. Each rectifier should have its own branch circuit. Terminate the leads on the AC INPUT terminal block of each rectifier.
2. Ensure the associated circuit breakers at the AC power panel are in the OFF position.

5. Connect Ground Wires for DC-Powered Systems

Two approved methods of grounding the system cabinets are provided in the following subsections. The element common to both methods is the cabinets making up the system are wired in series from the most distant cabinet to the PPN cabinet.

Either wire the tops of the cabinets together or wire the cabinet's ground terminal blocks together. Determine which method the system has been engineered for and then follow the appropriate instructions below (5A or 5B).

5A. Connect Top-Mounted Cabinet Grounds

1. Measure and cut a 6 AWG (#40) wire long enough to reach from the ground discharge bar in the DC Power Cabinet to the top rear corner of the PPN cabinet. See Figure 1-11.
2. Route the wire out of DC Power Cabinet and up to the top rear corner of the PPN cabinet.
3. Crimp terminal lugs on each end of the wire. Terminal lugs are furnished as part of D-181895, Kit of Parts (comcode 105434559).
4. At the DC Power Cabinet, connect the wire to the ground discharge bar.
5. On the top of the PPN cabinet, terminate the 6 AWG (#40) ground wire as shown in Figure 1-11.
6. If the system is equipped with an EPN cabinet, cut a piece of 6 AWG (#40) wire long enough to reach between the PPN and EPN cabinet.

   NOTE:
   If the EPN cabinet is located remote from the PPN cabinet (in a separate room or building), route the EPN cabinet ground wire to an approved ground.

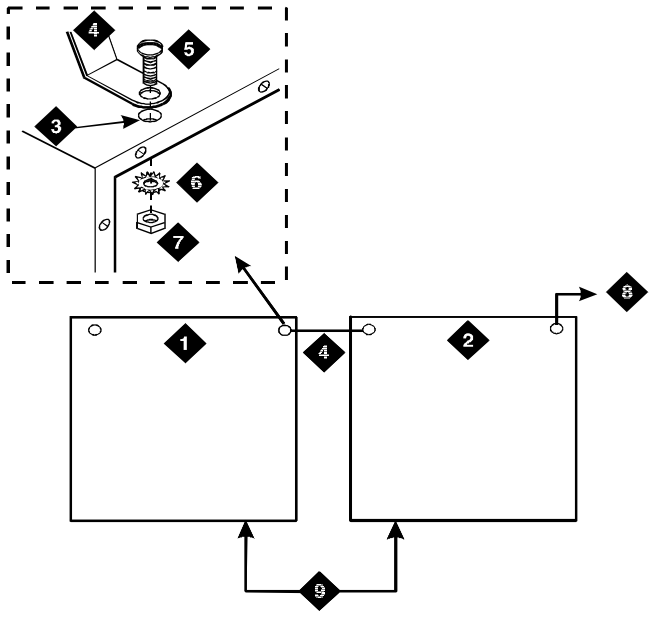


Figure Notes:

1. DC Power Cabinet
2. Top of Multi-Carrier Cabinet
3. Frame Ground Hole in Top of Cabinet
4. 6 AWG (#40) Wire with Ring Terminal Attached (Part of D-18195 Kit)
5. Pan Head Slotted Screw
6. Star Washer
7. Hex Nut
8. Ground Discharge Bar
9. To Auxiliary Cabinet (if Installed)
10. Front of Cabinets

Figure 1-11. Cabinet Frame Ground Connections

7. Crimp terminal lugs on each end of the wire.
8. Connect the wire to the top rear corner of PPN cabinet.
9. Terminate the other end of the wire at the top rear corner of EPN cabinet.
10. Repeat for each cabinet installed in the system.

5B. Cabinet Ground Blocks

1. At the bottom right rear of the PPN cabinet, connect a 6 AWG (#40) wire to the ground terminal block. See Figure 1-12.
2. If the system is equipped with EPN or Auxiliary cabinets, wire from the PPN's ground terminal block to the next cabinet's ground terminal block.

   NOTE:
   If the EPN or Auxiliary cabinet is located remote from the PPN cabinet (in a separate room or building), connect the EPN cabinet ground wire to an approved ground.

3. Continue to wire serially from ground terminal block to ground terminal block until all the cabinets are connected to the PPN cabinet.

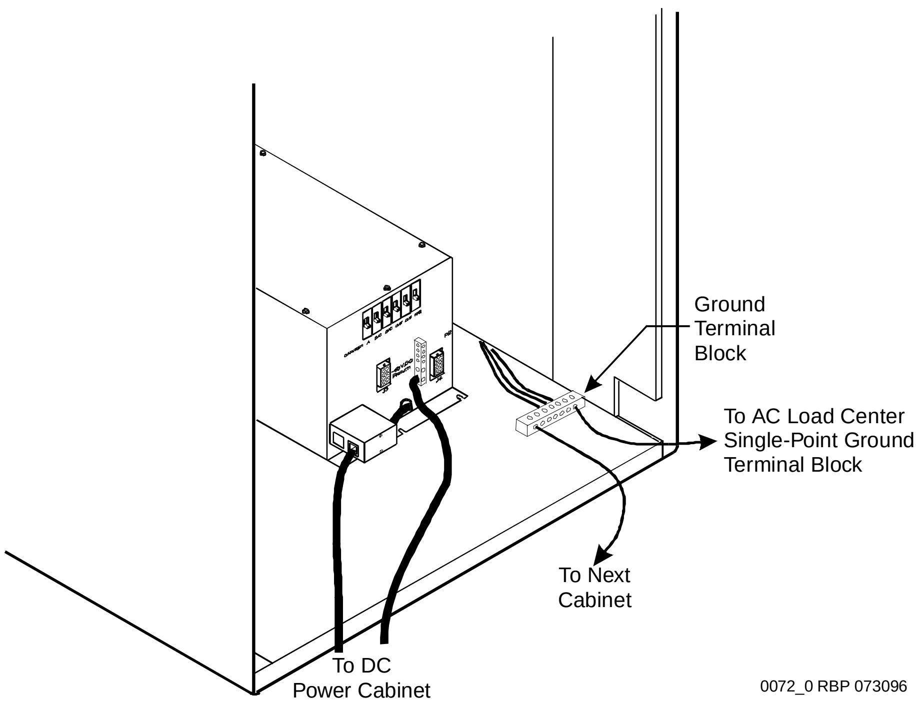


Figure 1-12. Power and Ground Connections

4. At the AC load center, connect a 10 AWG (#25) wire to the single-point ground terminal bar.
5. Route the 10 AWG (#25) ground wire to the CBC ground terminal bar at the MDF. Be sure a minimum of 12 inches (30.5 cm) spacing is maintained between the CBC and other power and ground leads.
6. Tie wrap the ground wire to the inside wiring cable.

6. Turn Circuit Breakers Off

The main circuit breaker on a DC-powered PPN/EPN cabinet is located on the front of the power distribution unit. The circuit breakers on the rear of the power distribution unit control the individual carriers. See Figure 1-7 on page 1-18 for the location of the carrier breakers.

1. Set the main circuit breaker to OFF.
2. Set the carrier circuit breakers to OFF.

7. Connect DC Power to PPN and EPN Cabinets

1. Be sure the main circuit breaker is OFF.
2. Measure and cut a piece of 6 AWG (#40) wire long enough to reach from the DC Power Cabinet to the PPN cabinet.
3. At the DC Power Cabinet, connect the -48 volt DC wire to the DC OUTPUT circuit breaker. See Figure 1-10. Connect the -48 volt RTN (return) wire to the Ground Discharge Bar.
4. Route the wires out of the cabinet, through the hole in the lower rear cover, and to the PPN cabinet.
5. Connect the -48 volt DC wire to the **-48VDC** terminal on the J58890CF Power Distribution Unit.
6. Connect the -48 volt RTN wire to the **-48RTN** terminal on the J58890CF Power Distribution Unit terminal block.
7. Repeat Steps 2 through 6 for each EPN and Auxiliary cabinet in the system.

8. Connect DC Battery Cabinet to DC Power Cabinet

1. Set the main circuit breaker on the DC Battery Cabinet and the DC Power Cabinet to OFF.
2. Measure and cut a 6 AWG (#40) wire long enough to reach from the DC Battery Cabinet's -48 Volt DC terminal to a DC OUTPUT circuit breaker on the DC Power Cabinet.
3. At the DC Battery Cabinet, connect the -48 volt DC wire to the -48 VDC connector. Connect the -48 volt RTN wire to the Ground Connection Terminal.
4. Route the wires out of the cabinet through the hole in the lower rear cover and to the DC Power Cabinet.
5. At the DC Power Cabinet, terminate the -48 volt DC wire on a DC OUTPUT circuit breaker. Terminate the -48 volt RTN (return) wire on the Ground Discharge Bar.

Mixed AC/DC Power and Ground

Figure 1-13 shows a power and ground layout for a mixed AC/DC-powered cabinet configuration in the same equipment room with the PPN being DC powered and the EPN being AC powered. If a second EPN is part of the system, the same basic connections shown below should be used.

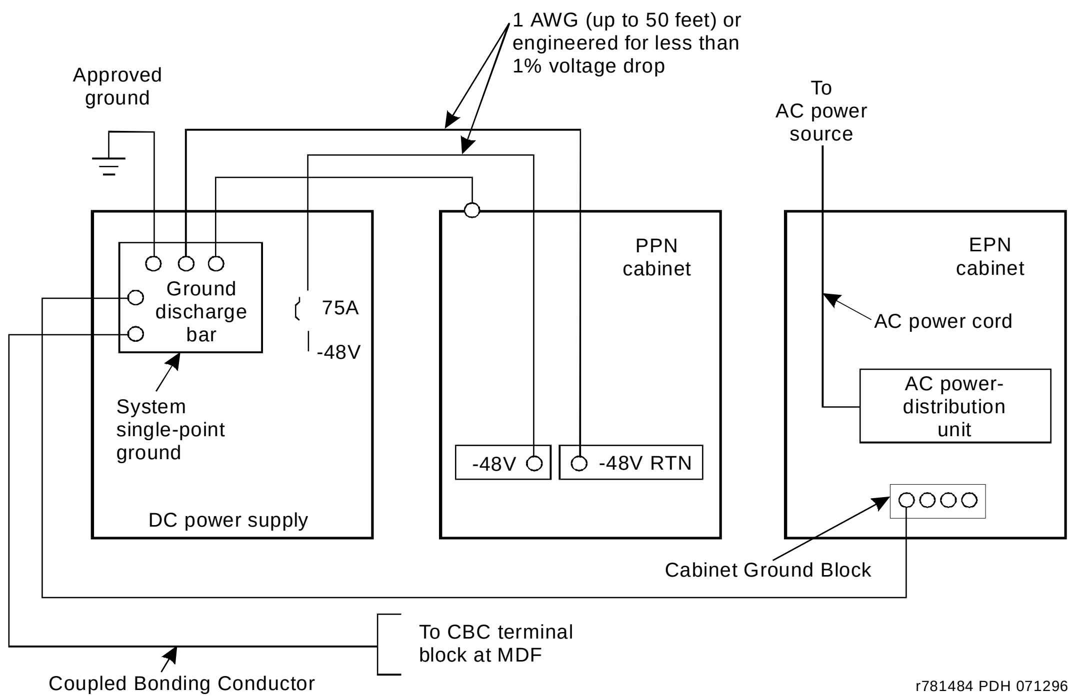


Figure 1-13. Typical Power and Ground for a Mixed AC/DC-Powered Cabinet

Approved Grounds

An approved ground is the closest acceptable medium for grounding the building entrance protector, entrance cable shield, or single-point ground of electronic telephony equipment. If more than one type of approved ground is available on the premises, the grounds must be bonded together as required in Section 250-81 of the National Electrical Code.

Grounded Building Steel — The metal frame of the building where it is effectively grounded by one of the following grounds: acceptable metallic water pipe, concrete encased ground, or a ground ring.

Acceptable Water Pipe — A metal underground water pipe, at least 1/2-inch (1.27 cm) in diameter, in direct contact with the earth for at least 10 feet (3 m). The pipe must be electrically continuous (or made electrically continuous by bonding around insulated joints, plastic pipe, or plastic water meters) to the point where the protector ground wire is connected. A metallic underground water pipe must be supplemented by the metal frame of the building, a concrete encased ground, or a ground ring. If these grounds are not available, the water pipe ground can be supplemented by one of the following types of grounds:

- Other local metal underground systems or structures — Local underground structures such as tanks and piping systems
- Rod and pipe electrodes — A 5/8-inch (1.58 cm) solid rod or 3/4-inch (1.9 cm) conduit or pipe electrode driven to a minimum depth of eight feet (2.43 m)
- Plate electrodes — Must have a minimum of 2 square feet (0.6 square m) of metallic surface exposed to the exterior soil

Concrete Encased Ground — An electrode encased by at least 2 inches (5.08 cm) of concrete and located within and near the bottom of a concrete foundation or footing in direct contact with the earth. The electrode must be at least 20 feet (6.1 m) of one or more steel reinforcing bars or rods 1/2-inch (1.27 cm) in diameter, or at least 20 feet (6.1 m) of bare, solid copper, No. 4 AWG wire.

Ground Ring — A buried ground that encircles a building or structure at a depth of at least 2.5 feet (0.76 m) below the earth's surface. The ground ring must be at least 20 feet (6.1 m) of 2 AWG, bare, copper wire.

Approved Floor Grounds

Approved floor grounds are those grounds on each floor of a high-rise building suitable for connection to the ground terminal in the riser closet and to the cabinet equipment single-point ground terminal. Approved floor grounds may include the following:

- Building steel
- The grounding conductor for the secondary side of the power transformer feeding the floor
- Metallic water pipes
- Power feed metallic conduit supplying panel boards on the floor
- A grounding point specifically provided in the building for the purpose

WARNING:

If the approved ground or approved floor ground can only be accessed inside a dedicated power equipment room, then connections to this ground should be made by a licensed electrician.

Connect Remote Power Off Cable and External Alarm Cable

Figure 1-14 shows the location of the Remote Power Off (RPO) cable. The opposite end of the cable is connected to the Emergency Power Off (EPO) switch located outside the equipment room.

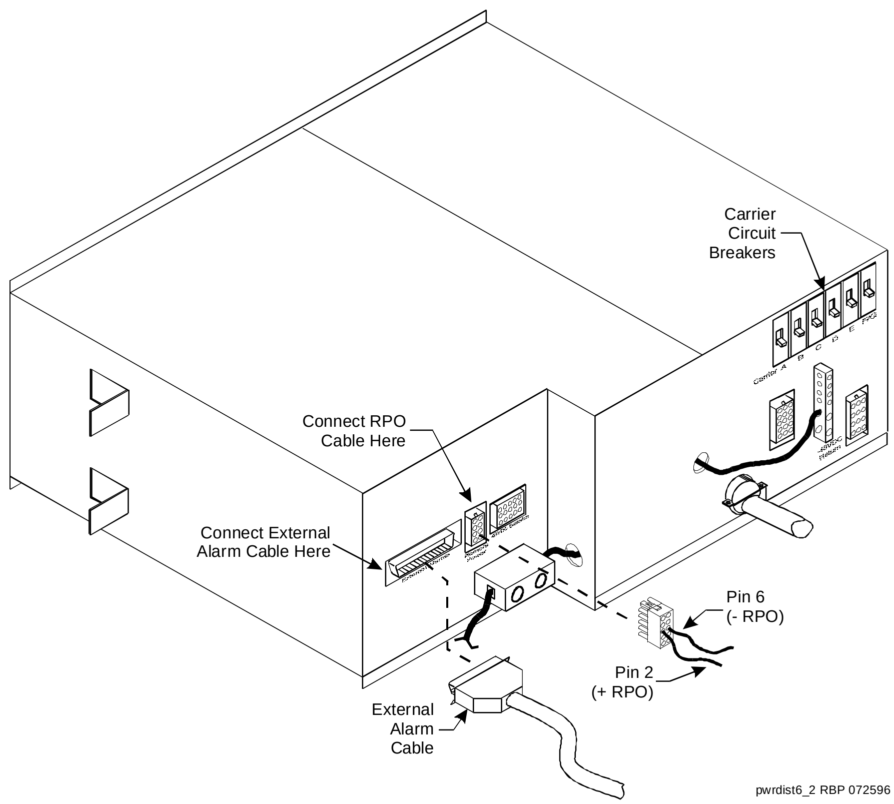


Figure 1-14. Remote Power Off Cable Connections — Part 1

Even though the equipment room EPO switch disconnects main AC power to the equipment room, it cannot disconnect the battery power from the J58890CH. An auxiliary set of contacts inside the EPO are used for this feature.

1. Plug the RPO cable into the connector shown in Figure 1-14.
2. Route the opposite end of the wires to the EPO switch. The opposite end of the RPO cable is connected to the internal relay on the next page.

NOTE:
The EPO switch and the auxiliary contacts (inside the EPO switch assembly) are customer-provided.

CAUTION:

*The auxiliary contacts inside the EPO switch assembly must **close** when the switch is pressed. This contact closure energizes the relay inside the power distribution unit, causing the connection to the battery holdover assembly to open.*

Figure 1-15 shows the cabling from the auxiliary contacts inside the EPO switch assembly and how they connect to the internal relay.

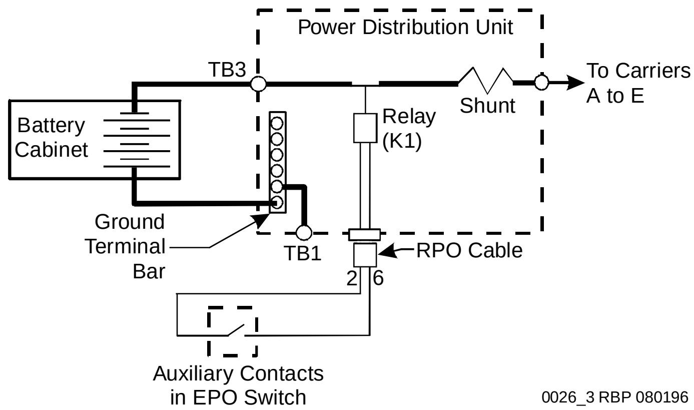


Figure 1-15. Remote Power Off Cable Connections — Part 2

1. Connect the RPO wires to the auxiliary contacts on the EPO switch. See Figure 1-15.

NOTE:
The EPO switch and the auxiliary contacts for the RPO connection are customer-supplied.

Connect External Alarm Cable

1. Plug the external alarm cable into the connector shown in Figure 1-14.
2. Route the opposite end of the cable to the MDF. The cable is connected to the MDF as instructed in Chapter 5, "Install and Wire Telephones and Other Equipment".

Connect AC Power to Stratum 3 Clock Cabinet

The clock cabinet requires a 120 VAC, 15 Amp receptacle. The green wire ground provided by the receptacle is sufficient. The clock cabinet does not require a ground connection back to the single-point ground.

Check Commercial Power and Connect AC Power

Before powering up the system, check the AC power using a KS-20599 digital voltmeter (DVM) (or equivalent).

1. Set the DVM to the 250 volt range.
2. Carefully measure the voltage between the hot and neutral side of the receptacle. The neutral wire is white, the hot wire is black.
3. Verify the meter reads 106 to 128 VAC. If not, have a qualified electrician correct the problem.
4. Measure the voltage between the neutral and ground side of the receptacle. The ground wire is green.
5. Verify the meter reads 0 VAC. If not, have a qualified electrician correct the problem.
6. Set all cabinet power modules OFF. Plug the AC power cable into the receptacle.

Connect DC Power and Ground to Stratum 3 Clock Cabinet

The clock cabinet should be powered from the same DC Power Plant as the DEFINITY System. The clock cabinet must be grounded to the DC Power Plant.

Connect Clock Cabinet Grounding

1. Measure and cut a 6 AWG (#40) wire long enough to reach from the clock cabinet to the ground discharge bar in the DC Power Plant.
2. Insert one end of the wire into the ground lug on the clock cabinet and tighten the screw.
3. Attach the lug to the receptacle cover. Be sure the lug and cabinet ground wires are connected to separate screws on the receptacle cover.
4. Route the ground wire to the DC Power Plant and connect to **DISCH GRD** in the cabinet.

Connect Stratum 3 Clock DC Power

1. Set the clock cabinet circuit breaker at the DC Power Plant OFF.
2. At the clock cabinet, connect a 6 AWG (#40) ground wire to the **-48V** terminal on the terminal strip.
3. At the clock cabinet, connect a 6 AWG (#40) wire to the **-48VRTN** terminal on the terminal strip.
4. Route the wires out of the cabinet and to the DC Power Plant.
5. At the DC Power Plant, connect the -48V wire to the **DC OUTPUT** circuit breaker.
6. At the DC Power Plant, connect the -48VRTN wire to the **DISCH GRD** bar.

Interconnect Cabling

The fiber optic cables are connected to the MDF in Chapter 2, "Install Telecommunications Cabling". Refer to Appendix C, "Connecting and Handling Fiber Optic Cables" for information about connecting to optical cross-connect hardware and routing through lightguide equipment.

The DEFINITY ECS may contain a Class 1 LASER device if single-mode fiber optic cable is connected to a remote Expansion Port Network (EPN).

CAUTION:
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

If the cabinets are close together, the signal may go through a single, directly-connected fiber optic cable. If the cabinets are far apart, it may be convenient to connect the cabinets through the fiber optic cross-connect field.

Connect Fiber Optic Cables

The following procedure is a typical example of how a system should be wired. For each fiber indicated in the Fiber Optic Cable Running List:

1. Install a lightwave transceiver on the cabinet connector at the position in the FROM column in the running list.
2. Select a cable indicated by the CABLE CODE and LENGTH in the running list. Connect one of the fibers to each connector on the lightwave transceivers just installed. The fiber is numbered 1 or 2. The connector on the transceiver is labeled TX or RX. Keep track of which fiber is connected to which transceiver connector. Label both ends of these cables.

3. Route the fiber optic cables from the transceiver out of the cabinet. Secure the cables to the cable-tie rack. Keep the fiber optic cables clear of the heavier B25A cables.
4. If the cabinet in the TO column in the running list is located remotely from the FROM cabinet, connect to the TO cabinet by way of the fiber optic cross-connect field.
5. Install a lightwave transceiver on the cabinet connector at the position in the TO column in the running list.
6. Route the cables from the FROM cabinet down into the cable trays of each EPN cabinet. Connect the cables to the lightwave transceiver just installed on the TO cabinet.
7. Connect the fiber that comes from the TX connector of the FROM transceiver to the RX connector of the TO transceiver and vice versa.
8. Route the cables through the cabinet and through cable organizers and cross-connects as provided. Secure the cables to the cable-tie rack.

Release 5r CSS-Connected Systems

In all cases, use the running list to determine actual cable connections.

Standard-Reliability

Figure 1-16 shows a typical example of fiber optic cabling between cabinets in standard reliability CSS-connected systems with one Switch Node carrier. Included in Figure 1-16 are carrier positions, types of carriers, and Expansion Interface (EI) circuit packs and Switch Node Interface (SNI) port slots. The cable between the EI and SNI on the PPN cabinet is a pre-installed metallic cable (H600-278).

1. If a running list is not provided, use the outer slots first in alternating order. For example, the first two SNI slots to be connected should be 3 and 20 (the leftmost and rightmost of the unused slots). Next, use 4 and 19, and so forth.
2. Add links to the EPNs in alternating order. For example: 20, 3, 19, 4, 18, 5, and so forth.

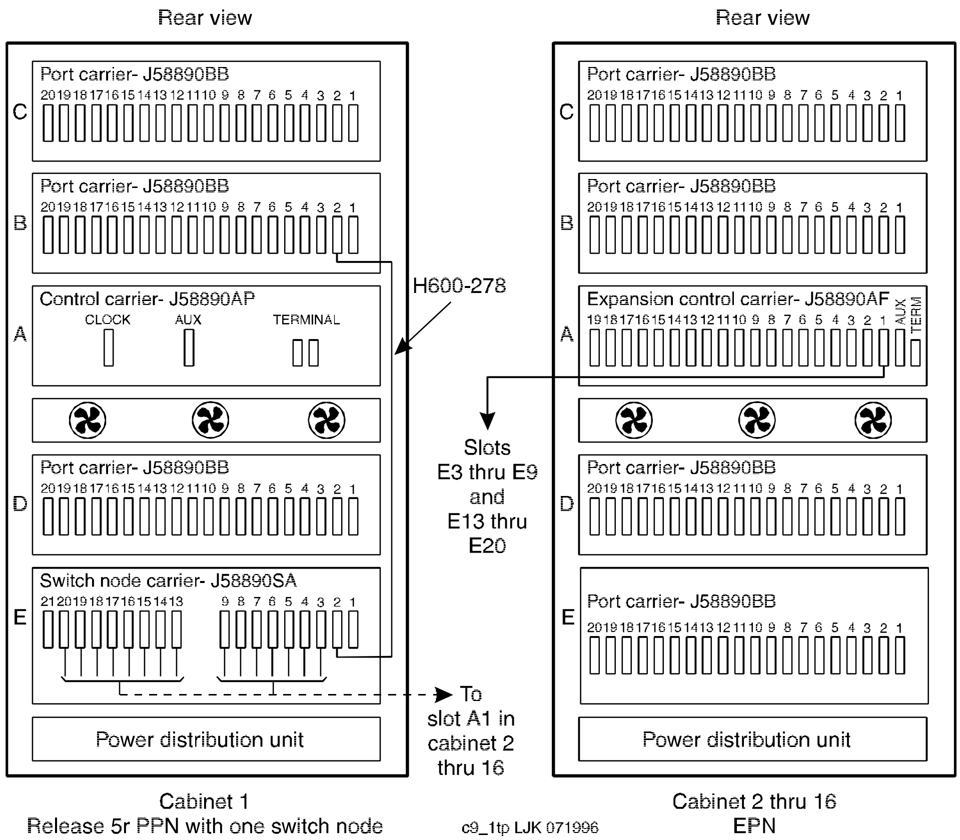


Figure 1-16. Standard Reliability CSS-Connected with One Switch Node

High-Reliability, CSS-Connected, with One Switch Node

Figure 1-17 shows typical fiber optic cabling between cabinets in high-reliability CSS-connected systems with one Switch Node carrier. Included in Figure 1-17 are carrier positions, types of carriers, and Expansion Interface (EI) circuit packs and Switch Node Interface (SNI) port slots. The cable between the EI and SNI on the PPN cabinet is a pre-installed metallic cable (H600-278).

The cables are connected between the PPN cabinet and each EPN cabinet in an alternating port slot order: 3, 19; 4, 18; 5, 17; and so forth. Cabinet 1 is a Release 5r PPN with one Switch Node.

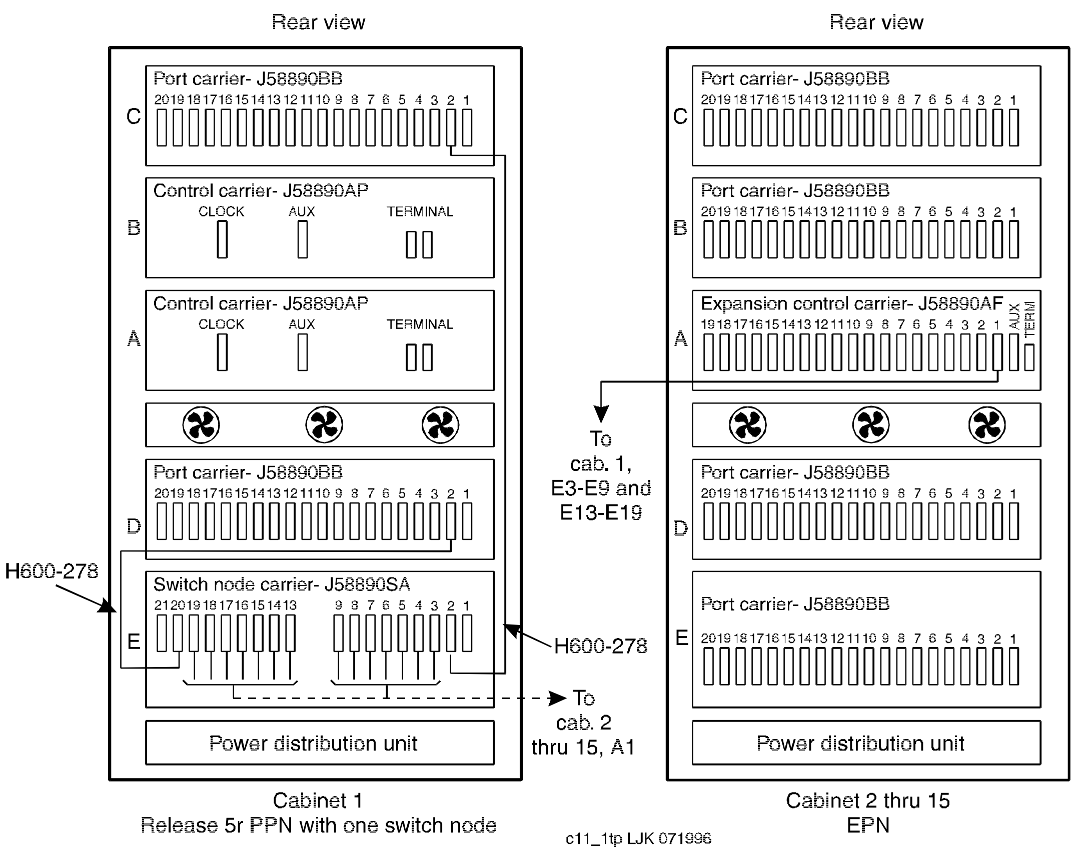


Figure 1-17. High-Reliability CSS-Connected with One Switch Node

Critical Reliability, CSS-Connected, with One Switch Node

Figure 1-18 shows fiber optic cabling between cabinets in critical-reliability CSS-connected systems with one Switch Node carrier. The cable shown between port slots 1 and 2 on each Switch Node carrier is shielded metallic cable (H600-278). Also shown are carrier positions, types of carriers, and Expansion Interface (EI) circuit packs and Switch Node Interface (SNI) port slots.

The two groups of 1 to 15 cables are connected between the PPN cabinet and each EPN cabinet in an alternating port slot order: 20, 3; 19, 4; 18, 5; and so forth.

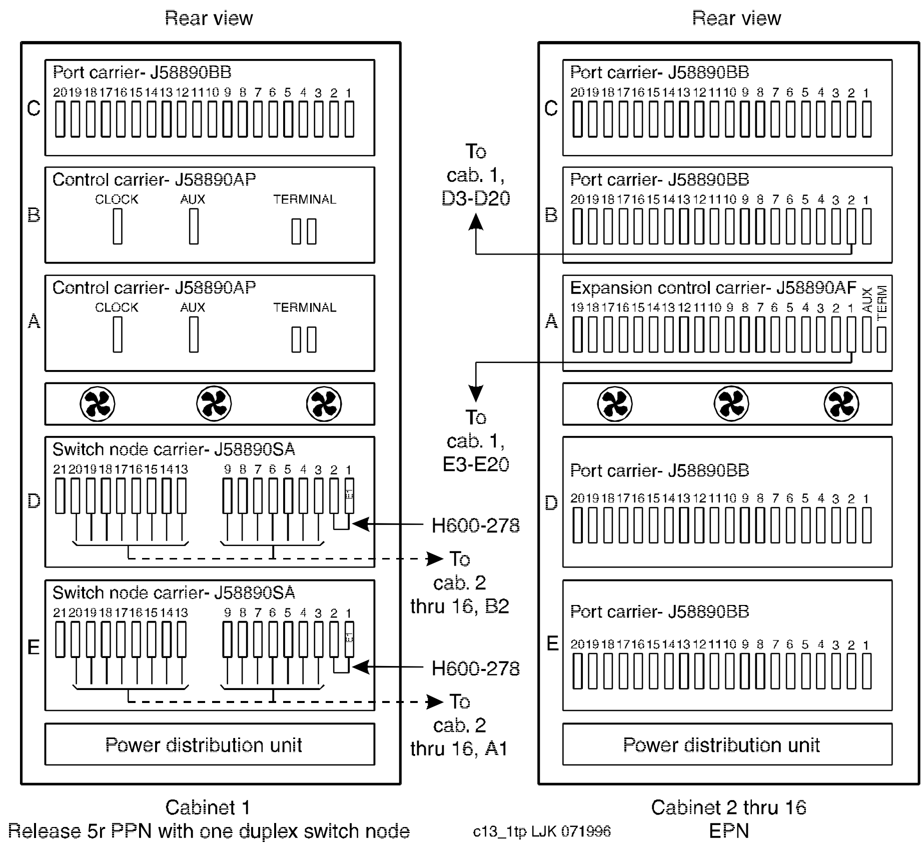


Figure 1-18. Critical-Reliability CSS-Connected with One Switch Node

Cabinet 1 is a Release 5r PPN with one duplex Switch Node.

Both connections from each EPN must go to the same slot number. For example: EPN cabinet 2, 2A1 to 1E3 and cabinet 2, 2B2 to 1D3.

Install a New EPN Cabinet in an Existing System

Figure 1-19 shows a typical Multi-Carrier EPN cabinet. Each EPN cabinet is normally positioned adjacent to the PPN cabinet but may be located remotely in a different room or a different building.

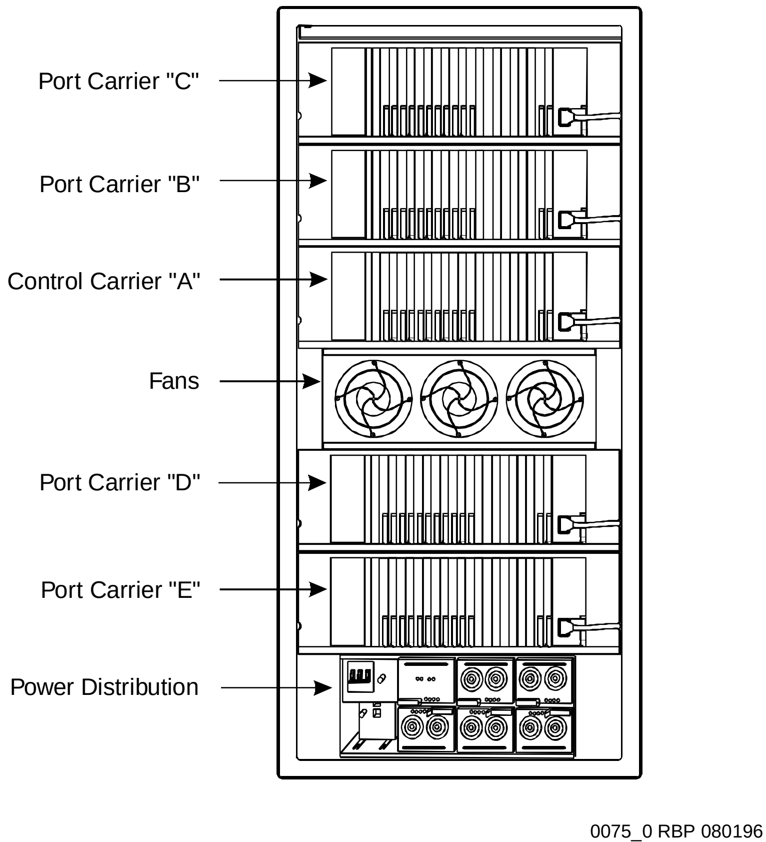


Figure 1-19. Typical Multi-Carrier EPN Cabinet

1. Uncrate and position the cabinet as instructed on page 1-1 to page 1-7.
2. Install earthquake protection as instructed on page 1-11.

Connect Power

1. For an AC-powered system, connect AC power and ground to the cabinet as instructed on page 1-14 to page 1-19.
2. For a DC-powered system, connect DC power and ground as instructed on page 1-20 to page 1-32.

NOTE:
Do not power up the system until all installation procedures are completed.

Interconnect Cabling Release 5si + Memory

For fiber optic cabling information, refer to Appendix C, “Connecting and Handling Fiber Optic Cables”. The fiber connections installed in this section are later administered using *DEFINITY Enterprise Communications Server Release 5 Implementation,* 555-230-302.

Direct-Connect New EPN to Existing PPN (Standard Reliability)

For a standard reliability Release 5si + Memory, perform the following:

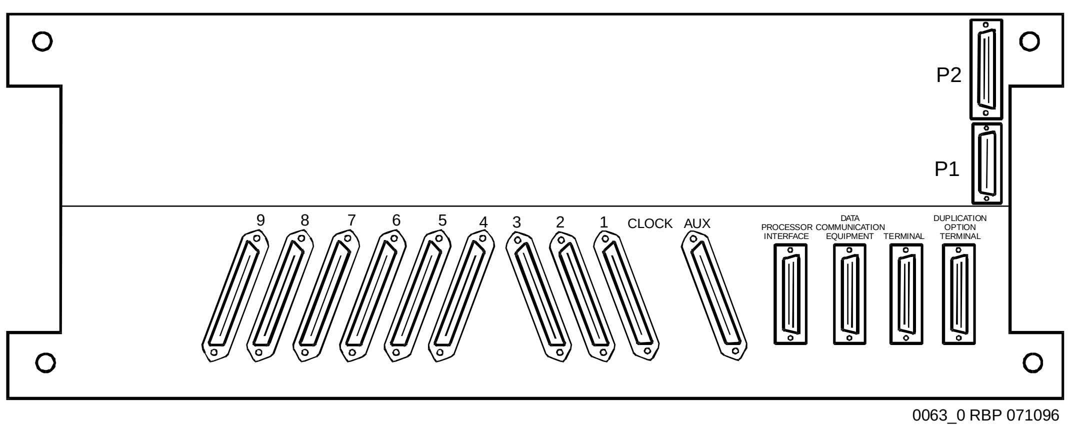


Figure 1-20. Rear of J58890AH Control Carrier (PPN)

1. Install a 9823A lightwave transceiver on to Slot 1 on the rear of the PPN Control Carrier. See Figure 1-20.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to the EPN cabinet easier. Refer to Appendix C, “Connecting and Handling Fiber Optic Cables” for more information.

3. Route the fiber cable to the J58890AF Expansion Control Carrier in the EPN cabinet.
4. On the rear of the EPN Expansion Control Carrier, install a 9823A lightwave transceiver onto Slot 2. See Figure 1-21.

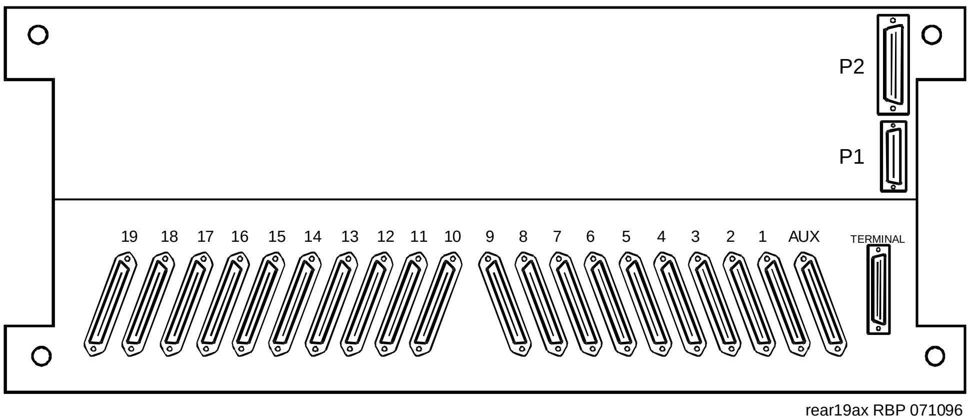


Figure 1-21. Rear of J58890AF Expansion Control Carrier (EPN)

5. Connect the 20 foot fiber optic cable from the PPN Control Carrier to the TX and RX connectors on the transceiver on the EPN Expansion Control Carrier. Be sure the cable connected to the TX connector on the PPN transceiver is connected to the RX connector on the EPN transceiver and vice versa.

Direct-Connect New EPN to Existing PPN (High or Critical Reliability)

For a high or critical reliability Release 5si + Memory, perform the following:

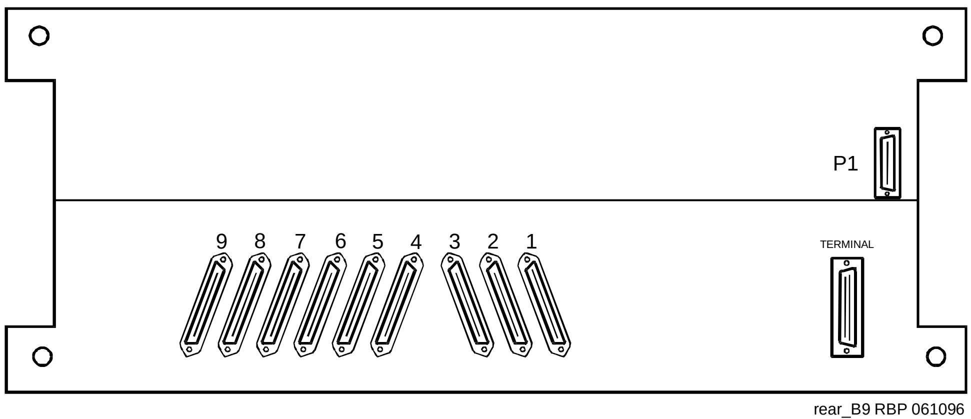


Figure 1-22. J58890AJ Duplicated Control Carrier (PPN)

1. On the rear of the Duplicated Control Carrier, install a 9823A lightwave transceiver onto Slot 1. See Figure 1-22.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to the EPN cabinet easier. Refer to Appendix C, “Connecting and Handling Fiber Optic Cables” for more information.
3. Route the fiber cable to the J58890BB Port Carrier in position C in the EPN cabinet.

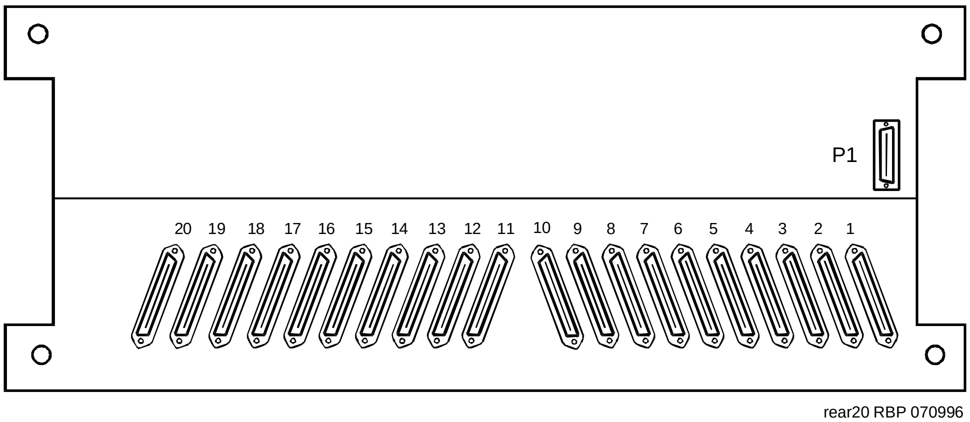


Figure 1-23. Typical J58890BB Port Carrier (EPN)

4. On the rear of the Port Carrier, install a 9823A lightwave transceiver onto Slot 2. See Figure 1-23.
5. Connect the 20 foot fiber optic cable from the PPN Duplicated Control Carrier to the TX and RX connectors on the transceiver on the EPN Port Carrier. Be sure the cable connected to the TX connector on the PPN transceiver is connected to the RX connector on the EPN transceiver and vice versa.

Direct-Connect New EPN to Existing PPN and EPN (Standard Reliability)

For a standard reliability Release 5si + Memory, perform the following. For the following connection example, the PPN cabinet is called Cabinet 1, the first EPN cabinet (next to the PPN cabinet) is called Cabinet 2, and the last EPN cabinet is called Cabinet 3.

1. At the rear of the Port Carrier in position C in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to Cabinet 3 easier.
3. Route the fiber cable to the Expansion Control Carrier in Cabinet 3.
4. At the rear of the Expansion Control Carrier in Cabinet 3, install a 9823A lightwave transceiver onto Slot 1.
5. Connect the 20 foot fiber optic cable from the Port Carrier in Cabinet 1 to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 3. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
6. At the rear of the Expansion Control Carrier in Cabinet 3, install a 9823A lightwave transceiver onto Slot 2.
7. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
8. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 2.
9. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 3. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
10. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 1.
11. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 2.
12. Route the fiber cable to the Port Carrier in position B in Cabinet 1.
13. Install a 9823A lightwave transceiver onto Slot 2 on the Port Carrier in position D in Cabinet 1.
14. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Port Carrier in Cabinet 1. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.

Direct-Connect New EPN to Existing PPN and EPN (High or Critical Reliability)

For a high or critical reliability Release 5si + Memory, perform the following. For the following connection example, the PPN cabinet is called Cabinet 1, the first EPN cabinet (next to the PPN cabinet) is called Cabinet 2, and the last EPN cabinet is called Cabinet 3.

1. At the rear of the Port Carrier in position C in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to Cabinet 2 easier.
3. Route the fiber cable to the Expansion Control Carrier in Cabinet 2.
4. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 1.
5. Connect the 20 foot fiber optic cable from the Port Carrier in Cabinet 1 to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 2. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
6. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 2.
7. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
8. At the rear of the Expansion Control Carrier in Cabinet 3, install a 9823A lightwave transceiver onto Slot 2.
9. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 3. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
10. At the rear of the Expansion Control Carrier in Cabinet 3, install a 9823A lightwave transceiver onto Slot 1.
11. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver on the Expansion Control Carrier in Cabinet 3.
12. Route the fiber cable to the Port Carrier in position D in Cabinet 1.
13. At the rear of the Port Carrier in position D in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.
14. Connect the 20 foot fiber optic cable from Cabinet 3 to the TX and RX connectors on the transceiver on the Port Carrier in Cabinet 1. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.

Interconnect Cabling Release 5r

For more fiber optic cabling information, refer to Appendix C, “Connecting and Handling Fiber Optic Cables”.

Switch-Connect New EPN to Existing PPN and EPN (Standard Reliability)

For a standard reliability Release 5r with the Switch Node Carrier in the EPN, perform the following. For the following connection example, the PPN cabinet is called Cabinet 1, the first EPN cabinet is called Cabinet 2, and the EPN cabinet containing the Switch Node Carrier is called Cabinet 4.

1. At the rear of the Port Carrier in position B in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to Cabinet 4 easier.
3. Route the fiber cable to the Port Carrier in position E in Cabinet 4. See Figure 1-24.
4. At the rear of the Port Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 20.
5. Connect the 20 foot fiber optic cable from the Port Carrier in Cabinet 1 to the TX and RX connectors on the transceiver on the Port Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
6. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 1.
7. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
8. At the rear of the Switch Node Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 3.
9. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
10. Connect an H600-278 Inter-cabinet Cable from Slot 1 in the Expansion Control Carrier in Cabinet 4 to Slot 2 on the Switch Node Carrier in position E in Cabinet 4.

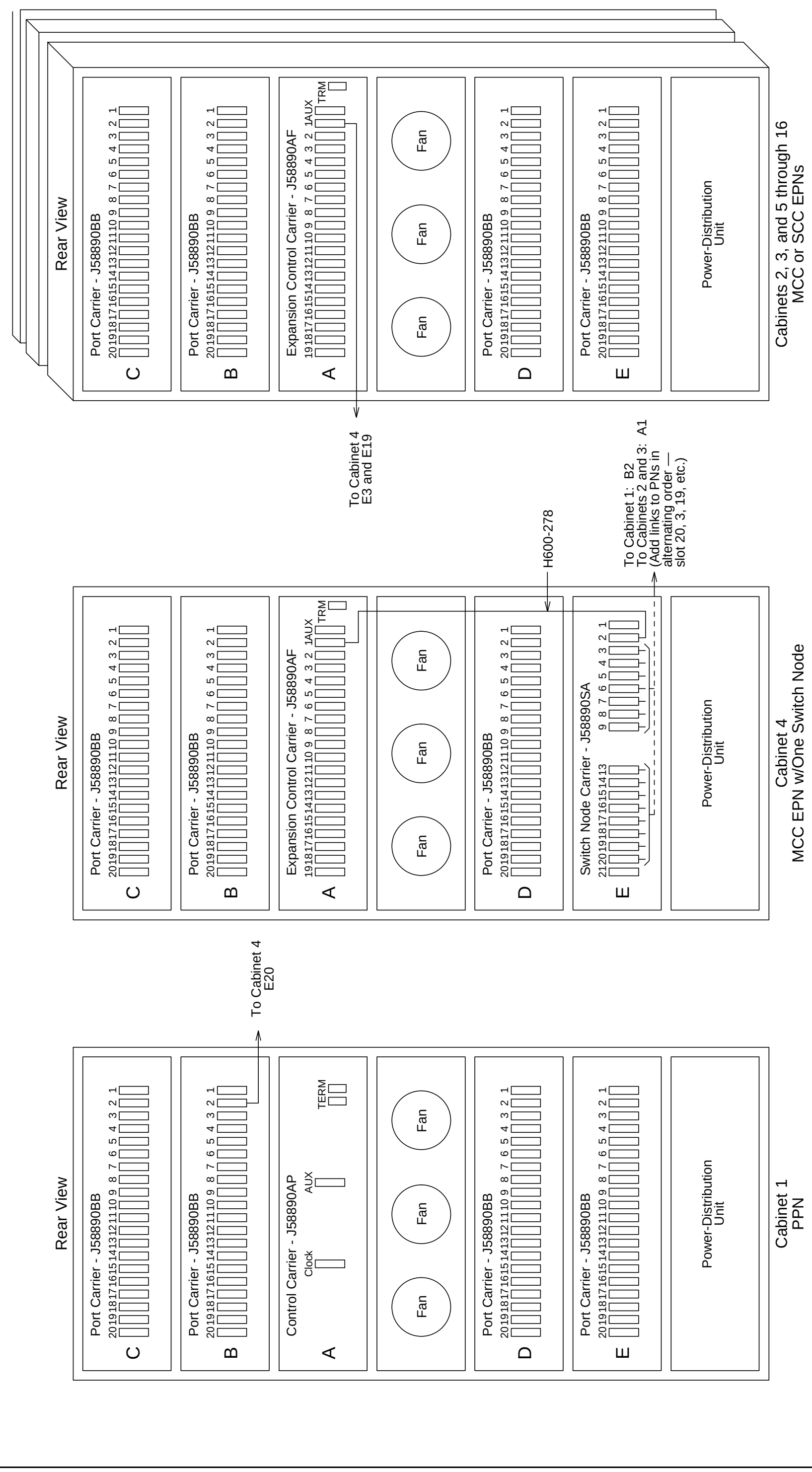


Figure 1-24. Switch-Connected Release 5r with SNC in EPN

Switch-Connect New EPN to Existing PPN and EPN (High Reliability)

For a high reliability Release 5r with the Switch Node Carrier in the EPN, perform the following. For the following connection example, the PPN cabinet is called Cabinet 1, the first EPN cabinet is called Cabinet 2, and the EPN cabinet containing the Switch Node Carrier is called Cabinet 4.

1. At the rear of the Port Carrier in position B in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2. See Figure 1-25.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to Cabinet 4 easier.
3. Route the fiber cable to the Port Carrier in position E in Cabinet 4.
4. At the rear of the Port Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 20.
5. Connect the 20 foot fiber optic cable from the Port Carrier in Cabinet 1 to the TX and RX connectors on the transceiver on the Port Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
6. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 1.
7. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
8. At the rear of the Switch Node Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 19.
9. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
10. At the rear of the Port Carrier in position D in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.
11. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
12. Route the fiber cable to Switch Node Carrier in position E in Cabinet 4.
13. Connect the 20 foot fiber optic cable from Cabinet 1 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
14. Connect an H600-278 Inter-cabinet Cable from Slot 1 in the Expansion Control Carrier in Cabinet 4 to Slot 2 on the Switch Node Carrier in position E in Cabinet 4.

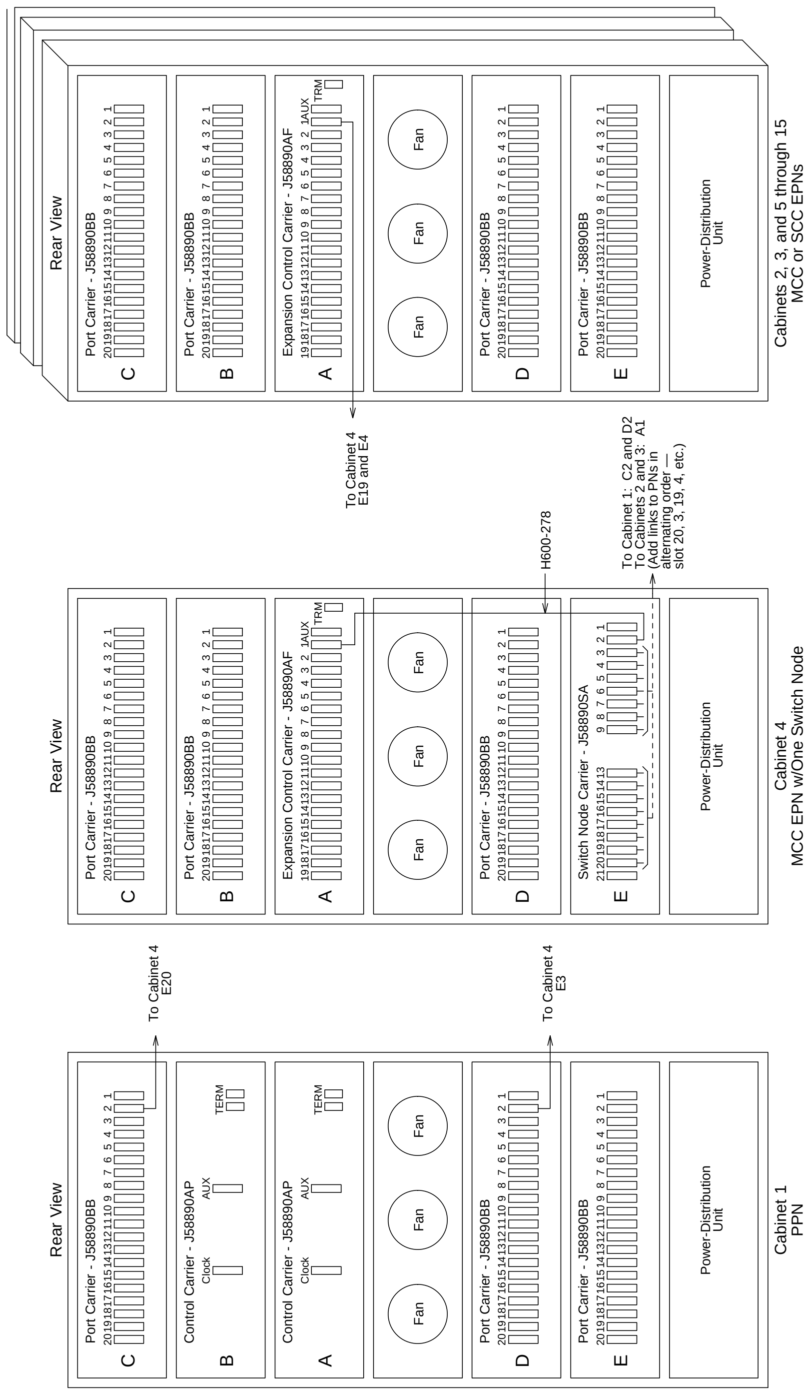


Figure 1-25. Switch-Connected Release 5r with SNC in EPN

Switch-Connect New EPN to Existing PPN and EPN (Critical Reliability)

For a critical reliability Release 5r with the Switch Node Carrier in the EPN, perform the following. For the following connection example, the PPN cabinet is called Cabinet 1, the first EPN cabinet is called Cabinet 2, and the EPN cabinet containing the Switch Node Carrier is called Cabinet 4.

1. At the rear of the Port Carrier in position C in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2. See Figure 1-26.
2. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Label the cable to make the connections to Cabinet 4 easier.
3. Route the fiber cable to the Port Carrier in position D in Cabinet 4.
4. At the rear of the Port Carrier in position D in Cabinet 4, install a 9823A lightwave transceiver onto Slot 20.
5. Connect the 20 foot fiber optic cable from the Port Carrier in Cabinet 1 to the TX and RX connectors on the transceiver on the Port Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
6. At the rear of the Expansion Control Carrier in Cabinet 2, install a 9823A lightwave transceiver onto Slot 1.
7. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
8. At the rear of the Switch Node Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 3.
9. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
10. At the rear of the Port Carrier in position B in Cabinet 2, install a 9823A lightwave transceiver onto Slot 2.
11. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
12. At the rear of the Switch Node Carrier in position D in Cabinet 4, install a 9823A lightwave transceiver onto Slot 3.
13. Connect the 20 foot fiber optic cable from Cabinet 2 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
14. At the rear of the Port Carrier in position D in Cabinet 1, install a 9823A lightwave transceiver onto Slot 2.

15. Connect a 20 foot fiber optic cable (comcode 407439975) to the TX and RX connectors on the transceiver. Be sure to label the cable.
16. Route the fiber cable to Switch Node Carrier in position E in Cabinet 4.
17. At the rear of the Switch Node Carrier in position E in Cabinet 4, install a 9823A lightwave transceiver onto Slot 20.
18. Connect the 20 foot fiber optic cable from Cabinet 1 to the TX and RX connectors on the transceiver on the Switch Node Carrier in Cabinet 4. Be sure the cable connected to the TX connector on one transceiver is connected to the RX connector on the other transceiver and vice versa.
19. Connect an H600-278 Inter-cabinet Cable from Slot 1 in the Expansion Control Carrier in Cabinet 4 to Slot 2 on the Switch Node Carrier in position E in Cabinet 4.
20. Connect an H600-278 Inter-cabinet Cable from Slot 2 in the Port Carrier in position B in Cabinet 4 to Slot 2 on the Switch Node Carrier in position Din Cabinet 4.

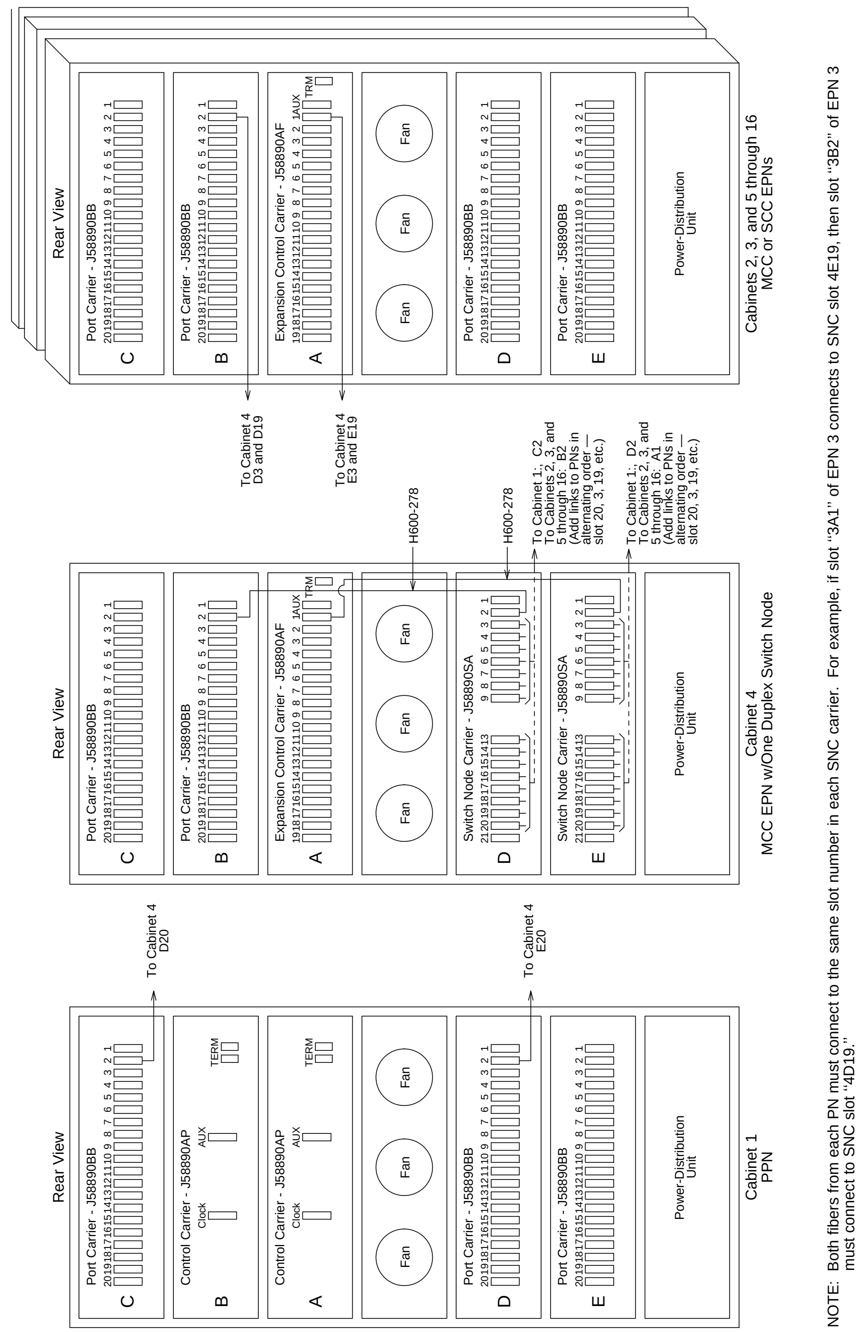


Figure 1-26. Switch-Connected Release 5r with SNC in EPN

Install Telecommunications Cabling

2

Equipment Room Hardware

SYSTIMAX 110-type hardware is used for the Main Distribution Frame (MDF). 110-type hardware is available in two basic types: the 110A and 110P. The 110A requires less wall space than the 110P. The 110P includes horizontal and vertical cable troughs for managing cross-connect cables. The system is connected to the MDF with the supplied B25A male to female 25-pair cables. The cables are provided in 10-foot (3 m) and 15-foot (4.5 m) lengths.

Refer to *DEFINITY Communications System Generic 1 and Generic 3 Main Distribution Field Design*, 555-230-630, for more information.

Figure 2-1 shows a detailed example of cables connecting system cabinets and satellite closets to the MDF. Figure 2-1 shows the cross-connections for one example station circuit.

NOTE:
This document is being modified for international translation. This means some illustrations contain numbers instead of descriptive text. In the future, all illustrations will contain numbers.

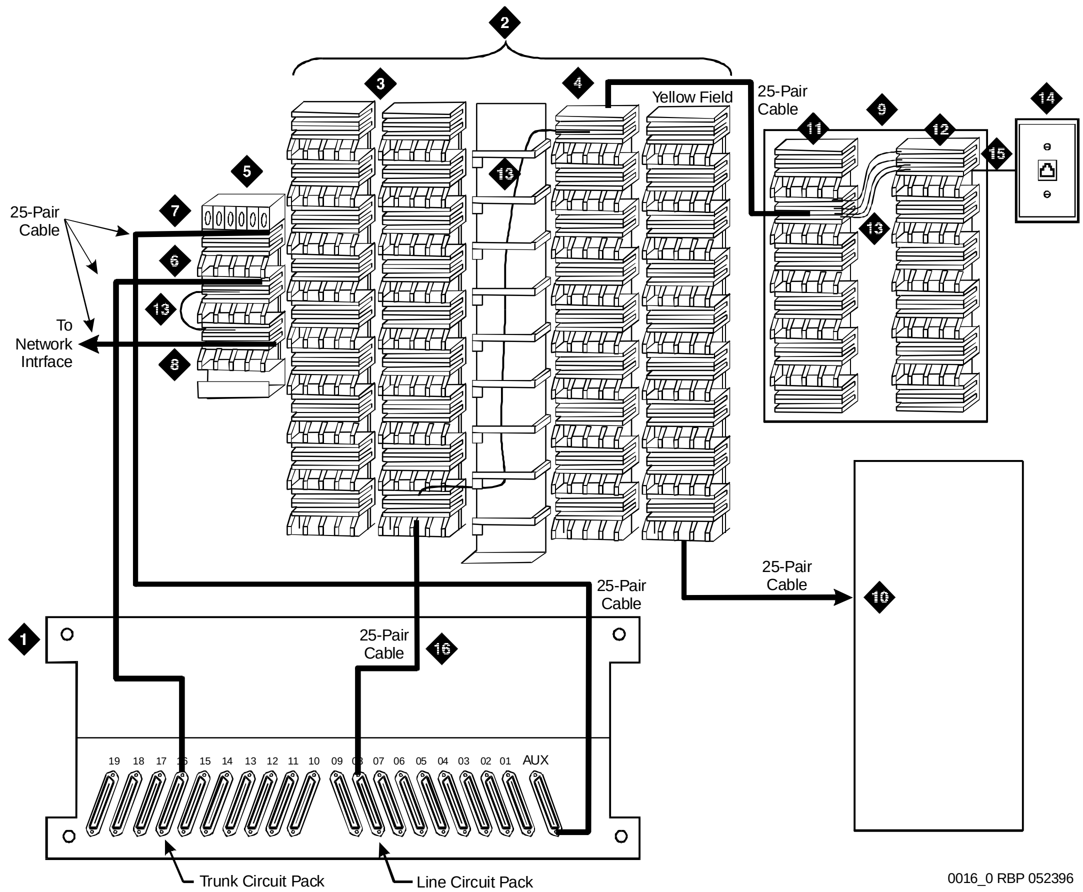


Figure Notes:

1. Rear of Port Carrier
2. Main Distribution Frame (MDF)
3. Port Distribution Field (Purple Field)
4. Station Distribution Field (White Field)
5. Trunk/Auxiliary Field
6. Purple Field (To Trunk Circuit Pack)
7. Yellow Field
8. Green Field
9. Satellite Closet
10. Auxiliary Cabinet (To Yellow Field)
11. White Field
12. Blue Field
13. Cross-Connect Jumpers
14. 103A or Modular Wall Jack
15. 4-Pair Line Cord
16. To Line Circuit Pack

Figure 2-1. Example MDF Connections

Cross-Connect Fields

Each MDF contains a trunk/auxiliary field and a distribution field. The trunk/auxiliary field contains three cross-connect areas:

1. *The green field* terminates the network interface leads from the Central Office (CO) and provides the terminals to cross-connect the leads to the purple or yellow fields as required. A single row of the 110-type terminal block can terminate twenty-four 1-pair, eight 3-pair, or twelve 2-pair trunks.
2. *The purple field* terminates the trunk circuits from the system with WP-90929, List 1 or 3 concentrator cables. Also, 25-pair cables can be used to terminate trunk circuits from the system with each trunk circuit pack connecting to one 25-pair row of the 110-type terminal block. Each terminal block row can terminate twenty-four 1-pair, eight 3-pair, or twelve 2-pair trunks.
3. *The yellow field* provides cross-connect terminals for all miscellaneous leads from the system, such as alarm monitors, emergency transfer relay power, and attendant console power. This field is used for emergency transfer wiring, paging equipment, music sources, and so forth.

The distribution field contains four cross-connect areas:

1. *The purple field* (port field) terminates 25-pair cables from the system. Each line circuit pack connects to one 25-pair row of the 110-type terminal block. One 25-pair cable is required for each line circuit pack.

   NOTE:
   This is the case except for the 16 port analog circuit pack and the MET circuit pack. The 16-port analog line circuit pack requires an adapter cable to connect from one connector on the system to two 25-pair connectors on a 110-type terminal block. Two MET circuit packs require a concentrator cable to connect from two connectors on the system to one 25-pair connector on a 110-type terminal block.

2. *The yellow field* (auxiliary field) terminates all 25-pair cables from the auxiliary cabinet and adjunct equipment cabinets. The yellow field is located in the lower right-hand corner of the distribution field.
3. *The white field* (station field) terminates the station wiring. The white field indicates 3-pair station circuits (eight circuits per 25-pair cable) routed through a satellite closet.
4. *The blue field* (station field) also terminates station wiring. The blue field indicates 3- and/or 4-pair station circuits (eight or six circuits, respectively, per 25-pair cable). The fourth pair, of the 4-pair station circuit provides adjunct power from the cross-connect field on an as-needed basis to terminals within 250 feet (wire length) of the MDF.

Main Distribution Frame

The MDF is located directly behind the system cabinet. Figure 2-2 shows a typical installation using 900-pair 110P-type terminal blocks.

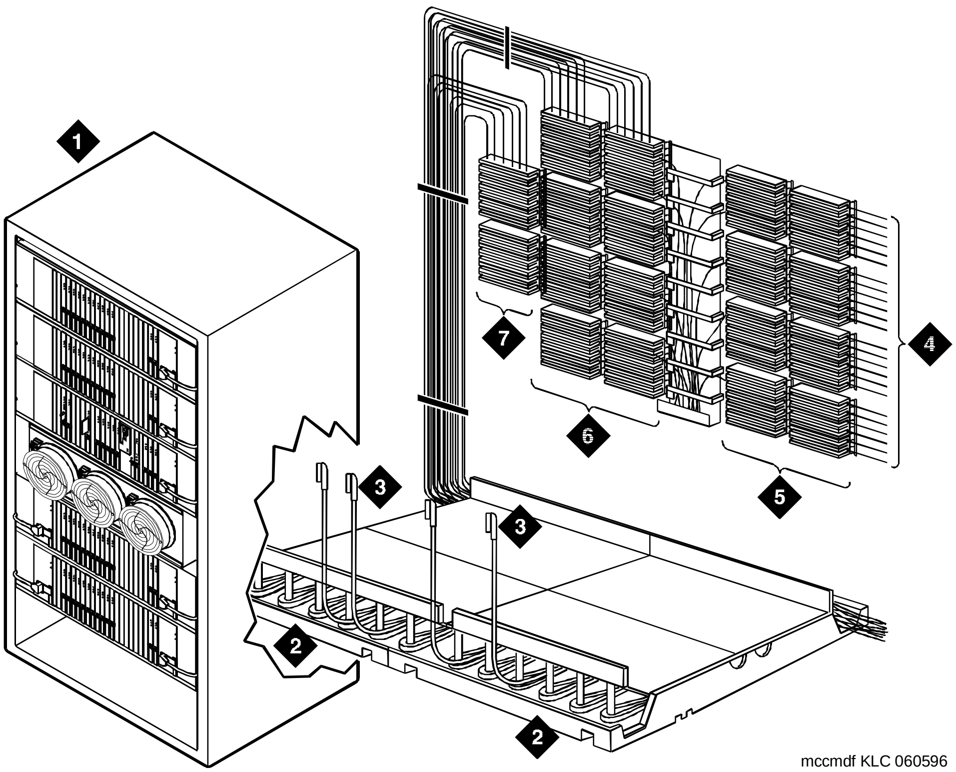


Figure Notes:

1. Multi-Carrier Cabinet
2. Z113A Cable Slack Manager
3. 25-Pair Cable to System Cabinet
4. Station Cables
5. Station Distribution Field
6. Port Distribution Field
7. Trunk/Auxiliary Field

Figure 2-2. Typical 110A-Type Terminal Blocks

Installation Requirements

Sneak Fuse Panels and Emergency Transfer Units

Approximately eight inches (20 cm) of horizontal wall space is required for each column of sneak fuse panels. Up to 25 connector pairs can be protected by each panel. Horizontal wall space must also be provided for emergency transfer units.

110-Type Hardware

The trunk/auxiliary field and the distribution field are mounted on the same wall. Each 110P-type terminal block is 8.5 inches (21.6 cm) wide. Vertical patch cord troughs are 5.31 inches (13.4 cm) wide and horizontal patch cord troughs are 23 inches (58.4 cm) wide.

Each 110A-type terminal block is 10.81 inches (27.4 cm) wide; however, no horizontal patch cord troughs are used and the blocks are shorter than 110P-type terminal blocks. This allows the 110A-type terminal blocks to be stacked. Therefore, the 110A-type hardware requires less space than the 110P-type hardware on a per-station basis.

Cable Slack Manager

A Cable Slack Manager is 32 inches (81.3 cm) wide. Slack managers are commonly used in installations consisting of cabinet stacks. The quantity of slack managers is determined by dividing the total length of the MDF in inches (cm) by 32. A partial number of 0.4 or less should be rounded down, and a partial number of 0.5 or more should be rounded up (for example: 2.4 = 2 Cable Slack Managers and 2.5 = 3 Cable Slack Managers).

NOTE:
Cable clamps are required in installations with Cable Slack Managers. At the rear of the cabinets, on each rear ground plate, install two cable clamps using the screws provided. These clamps hold the 25-pair input/output or MDF cables in place.

Install Equipment and Cables

Hardware Installation

The following procedures assume one system technician is performing the installation. Procedures are provided for installing the following:

- Main Distribution Frame (MDF)
- Cable Slack Managers
- Sneak Fuse Panels
- Labels for the Main Distribution Frame

Install the Main Distribution Frame

The preferred MDF location is directly behind the system cabinets.

Wall Mounting 110A-Type Terminal Blocks

The 110A-type hardware can be stacked in almost any arrangement at any height or location on the wall. One arrangement is shown in Figure 2-3. The distance between the mounting screw holes on the terminal blocks is 10.81 inches (27.4 cm). If a vertical patch cord trough is to used, the distance between the mounting screw holes is 5.31 inches (13.3 cm).

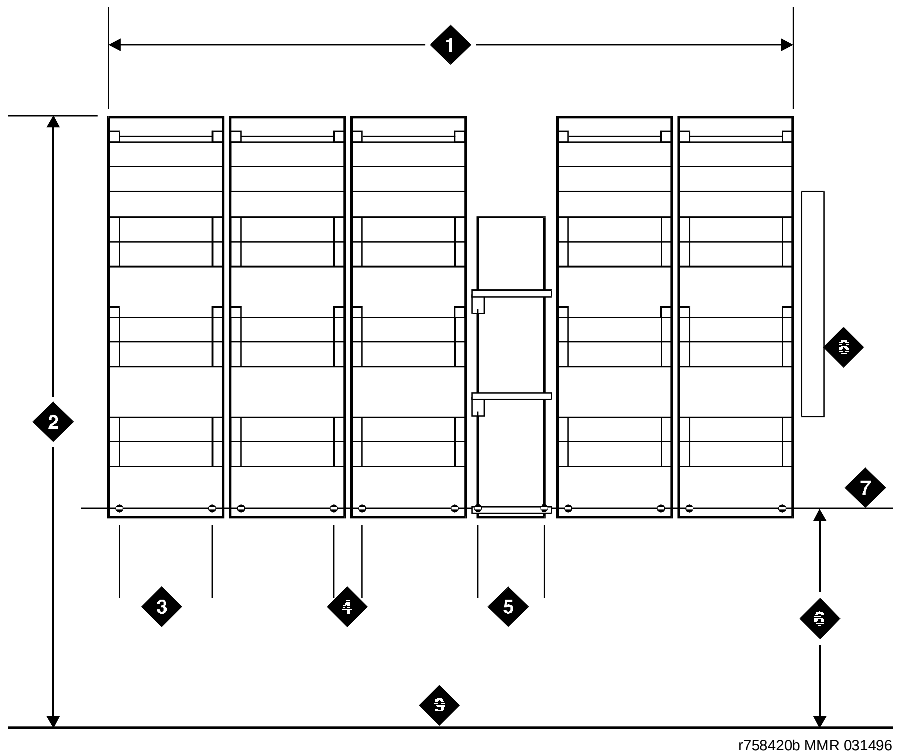


Figure Notes:

1. 4 Feet (1.22 m)
2. 6.6 Feet (2 m)
3. 7.68 Inches (19.5 cm)
4. 7/8-Inch (2.22 cm)
5. 5.31 Inches (13.5 cm)
6. 47.5 Inches (120.6 cm)
7. Horizontal Line
8. AC Power Strip
9. Floor Line

Figure 2-3. 110A-Type Terminal Blocks (300-Pair)

Wall Mounting 110P-Type Terminal Blocks

The first terminal block of the trunk/auxiliary field is aligned with the left side of the system cabinet. See Figure 2-4. This arrangement allows for growth on the right side of the MDF.

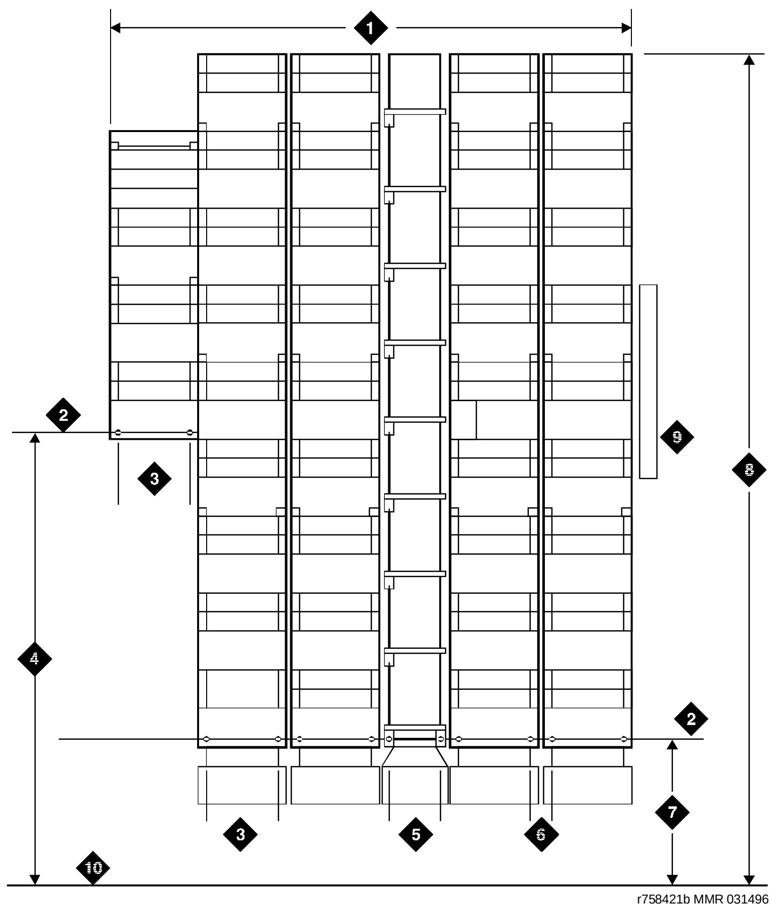


Figure Notes:

1. 4 Feet (1.22 m)
2. Horizontal Line
3. 7.68 Inches (19.5 cm)
4. 47.5 Inches (120.6 cm)
5. 5.31 Inches (13.5 cm)
6. 7/8-Inch (2.22 cm)
7. 23 Inches (58.4 cm)
8. 8 Feet (2.43 m)
9. AC Power Strip
10. Floor Line

Figure 2-4. 110P-Type Terminal Blocks (900-Pair)

1. If 300-pair terminal blocks are to be installed, draw a level horizontal line on the wall 47.5 inches (1.2 m) above the floor. See Figure 2-3.

   If 900-pair terminal blocks are to be installed, draw a level horizontal line on the wall 23 inches (58.4 cm) above the floor. See Figure 2-4.
2. To mount the first trunk/auxiliary field terminal block, partially install two 3/4-inch #12 wood screws, 7.68 inches (19.5 cm) apart on the left side of the horizontal line on the wall.
3. Slide the bottom terminal block feet onto the mounting screws and mark the upper mounting screw locations.
4. Remove the terminal block and partially install the upper mounting screws.
5. Place the terminal block on the mounting screws and tighten the screws.
6. If a vertical patch cord trough is to be installed, partially install the first screw for the patch cord trough, on the line, 7/8-inch (2.2 cm) to the right of the previous screw. Partially install the second mounting screw 5.31 inches (13.5 cm) to the right of the screw just installed. Repeat Steps 3, 4, and 5.
7. If another trunk/auxiliary field terminal block is to be installed, partially install the first screw for the terminal block, on the line, 7/8-inch (2.2 cm) to the right of the previous screw. Partially install the second mounting screw 7.68 inches (19.5 cm) to the right of the screw just installed. Repeat Steps 3, 4, and 5.
8. If a horizontal patch cord trough is to be installed, install it, on the line, between the trunk/auxiliary field and the distribution field.
9. To install the first distribution field terminal block, partially install two 3/4-inch, #12 wood screws, 7.68 inches (19.5 cm) apart on the line, to the right of the vertical patch cord trough. Repeat Steps 3, 4, and 5.
10. If another distribution field terminal block is to be installed, partially install the first screw for the terminal block, on the line, 7/8-inch (2.2 cm) to the right of the previous screw. Partially install the second mounting screw 7.68 inches (19.5 cm) to right of the screw just installed. Repeat Steps 3, 4, and 5.
11. If a vertical patch cord trough is to be installed in the distribution field, repeat Step 6.
12. Repeat Steps 10 and 11 until all the terminal blocks and vertical patch cord troughs in the distribution field are installed.

Frame Mounting 110P-Type Terminal Blocks

The 900-pair 110P-type terminal blocks and the associated patch cord troughs can also be mounted on a free-standing, floor-mounted 1110A2 Apparatus Mounting Frame. See Figure 2-5.

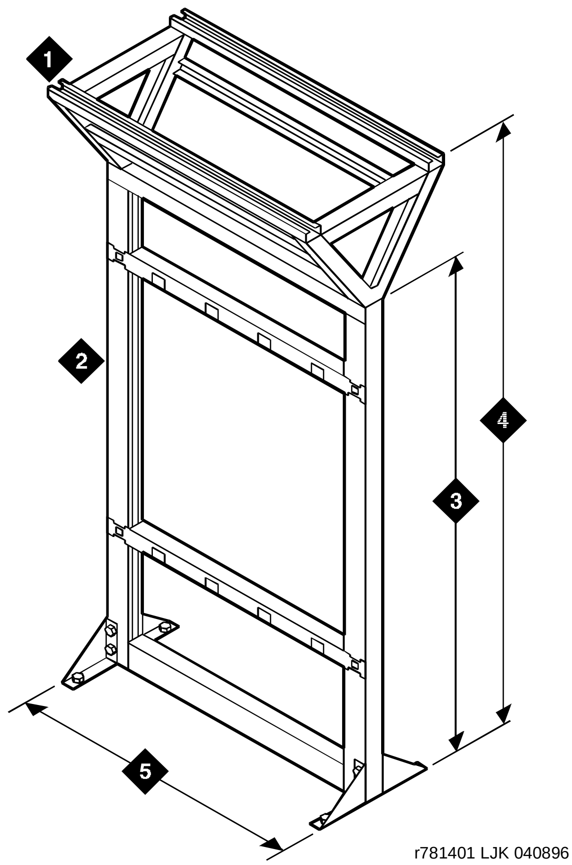


Figure Notes:

1. 1110C1 Apparatus Mounting
2. 1110A2 Apparatus Mounting
3. 76 Inches (193 cm)
4. 88.5 Inches (225 cm)
5. 43.5 Inches (110.5 cm)

Figure 2-5. 1110A2 and 1110C1 Apparatus Mountings

Each 1110A2 provides the space to mount five terminal blocks/patch cord troughs on each side of the frame. A cable support structure, apparatus mounting 1110C1, mounts directly on top of the 1110A2 and provides support for all cables routed to and from the frame.

Apparatus Mounting Frame Ordering Information

Code Number	Description	Comcode
1110A2	Apparatus Mounting Frame	104032495
1110C1	Cable Support Assembly	104175120
1110A1	End Dress Panel	104176268
2110A1	Top Dress Panel	104176276
2110B1	Bottom Dress Panel	104176284

Install Cable Slack Managers

1. Place the Z113A Cable Slack Manager against the wall under the MDF. See Figure 2-6. Align the left side of the Cable Slack Manager with the first terminal block of the trunk/auxiliary field.
2. Place the next Cable Slack Manager beside the previously installed unit. Align the tabs and interlocks and snap the units together.
3. Repeat Step 2 until all Cable Slack Managers are installed.

NOTE:
Nine 1/4-inch holes (0.63 cm) are provided in a Cable Slack Manager base if earthquake mounting is required. If a base is mounted on an uneven floor, shims may be required for leveling and to assure proper fit of the covers.

Holes are provided in the sides of the base for bolting Cable Slack Managers together. Bolts and shims must be obtained locally.

Figure 2-6 shows a completed installation. Place the Cable Slack Managers so the cables are routed neatly down the rear of the cabinets. The cables will also be routed through the Cable Slack Manager as shown. Complete cable routing is covered later in this chapter.

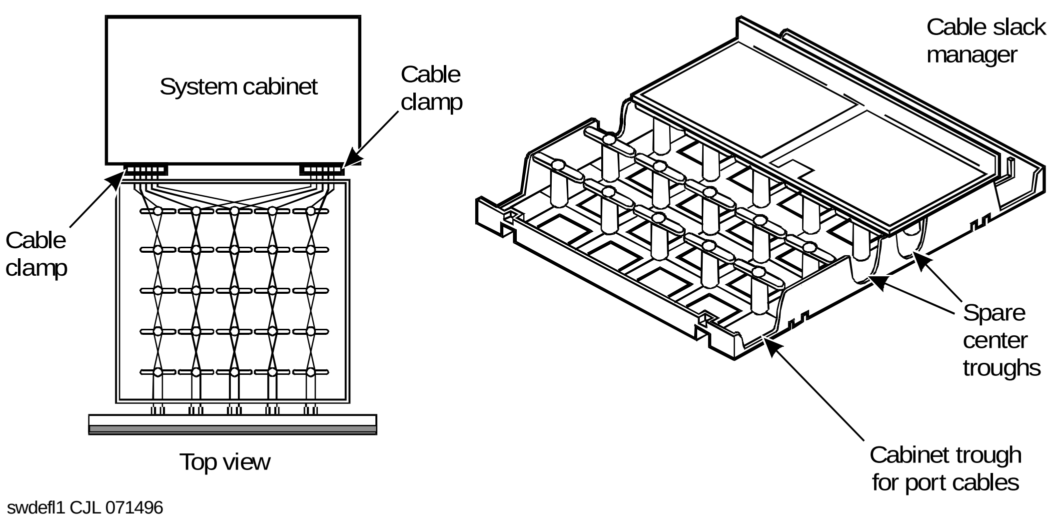


Figure 2-6. Cable Routing Through Cable Slack Manager

Cable clamps are required in installations with Cable Slack Managers. At the rear of the cabinets, install two cable clamps using the screws provided. These clamps hold the 25-pair input/output or MDF cables in place. Figure 2-6 shows cable clamp placement and cable routing.

Install Sneak Fuse Panels

Sneak current protection is required between the incoming RJ21X or RJ2GX network interface and the system for both trunk and off-premise circuit packs.

The Model 507B sneak current fuse panel, or equivalent, is recommended for sneak current protection. See Figure 2-7. The panel contains two 25-pair connectors, fuse removal tool, and fifty 220029 Sneak Fuses (and two spares).

Connector cables (B25A male to female) connect the network interface to the sneak fuse panel. Also, 157B connecting blocks equipped with SCP-110 protectors can be used for sneak current protection.

Table 2-1. Sneak Fuse Panel Ordering Information

Description	Comcode
157B Connecting Block	403613003
SCP-110 Protector	406948976
507B Sneak Current Fuse Panel	107435091
220029 Sneak Current Fuse	407216316

NOTE:
Sneak current protectors with a rating of 350 mA at 600 volts must be UL listed for domestic installation and CSA certified for Canadian installation.

The 507B includes 52 sneak fuses and two cables and can be ordered using PEC code 63210.

The SCP-110 protectors are used with 110-type hardware and on the 507B Sneak Fuse Panel. The SCP-110 Protectors can be ordered separately and installed on the 157B connecting block. Fifty protectors are required per block.

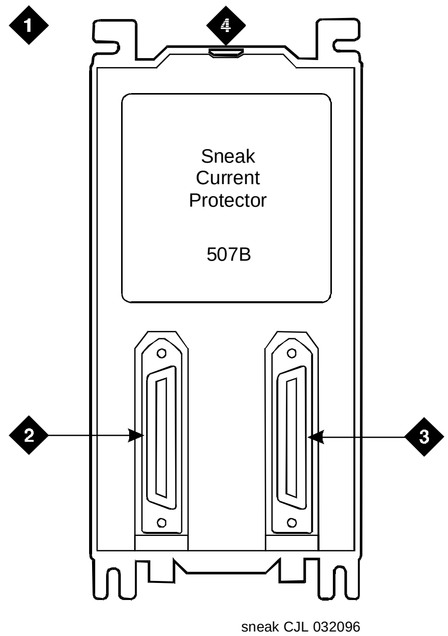


Figure Notes:

1. Sneak Fuse Panel
2. 25-Pair Male Connector (In)
3. 25-Pair Female Connector (Out)
4. 220029 Fuses (Inside Panel). Use Small Screwdriver to Pry Top Cover Off

Figure 2-7. Model 507B Sneak Fuse Panel

1. Locate the 507B near the network interface or the MDF.
2. Hold the panel against the mounting surface and mark the mounting screw locations. Drill pilot holes at the marked locations and partially install a locally obtained #12 x 3/4-inch screw into the two bottom mounting slots.
3. Slide the sneak fuse panel onto the mounting screws and tighten the screws securely.
4. Install a locally obtained #12 x 3/4-inch screw into the top two mounting slots and tighten securely.
5. Repeat the procedure for each sneak fuse panel.

Table 2-2 is a pinout of the cable wiring and associated fuse numbers.

Table 2-2. Sneak Fuse Connector Pinout

Connector Pin Numbers	Pair/Fuse Number
26/1	1
27/2	2
28/3	3
29/4	4
30/5	5
31/6	6
32/7	7
33/8	8
34/9	9
35/10	10
36/11	11
37/12	12
38/13	13
39/14	14
40/15	15
41/16	16
42/17	17
43/18	18
44/19	19
45/20	20
46/21	21
47/22	22
48/23	23
49/34	24
50/25	25

6. Secure the top of each B25A Cable with the captive screw on the connector.
7. Secure the bottom of each cable with a supplied cable tie wrap.

Cable Installation

Labels

The purple port label shown in Figure 2-8 is installed on both ends of the 25-pair cables connecting to the trunk/auxiliary field and/or distribution field.

The top blue/yellow building and floor labels are for cables connecting from the equipment room to a site/satellite location on another floor or in another building. The yellow label is for auxiliary circuits connecting to the trunk/auxiliary field. The bottom blue/yellow label is for 25-pair cables connecting to site/satellite closets.

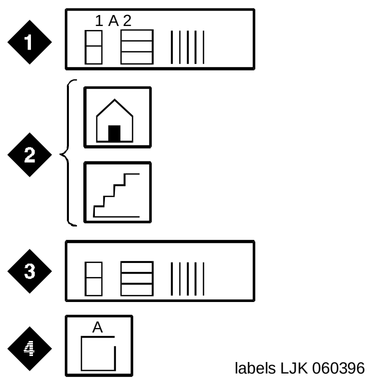


Figure Notes:

1. Purple Label (Port Cable)
2. Blue/Yellow Label (Building and Floor)
3. Yellow Label (Auxiliary)
4. Blue/Yellow Label (Site or Satellite)

Figure 2-8. Equipment Room Cabling Labels

Table 2-3 details the label name and range of each label.

Table 2-3. Equipment Room Labels

Label Name	Range
Port Cable	1A1-1A20, 1B1-1B20, 1C1-1C20, 1D1-1D20, 1E1-1E20
Building	Field Identified
Floor	Field Identified
Auxiliary Cable	Field Identified
Site or Satellite	A-F and/or Field Identified

Cable/Connector/Building Label Ordering Information

Description	Quantity	Comcode
201A Labels	34 Sheets	103969994

Figure 2-9 shows the proper way to install a label on a 25-pair cable connector. The label should be installed near the rear of the connector so it is not obscured by the cabinet connector retainers. Also, it can be installed on the skin of the cable near the connector.

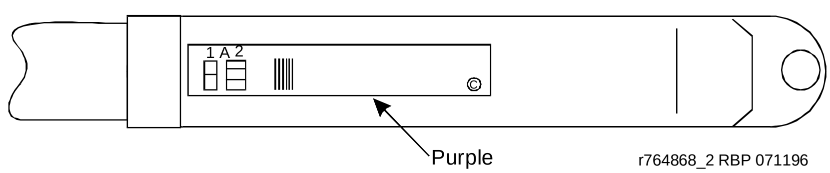


Figure 2-9. Self-Stick Label on 25-Pair Cable Connector

Cable Routing Guidelines

General

The following guidelines should be used when installing the equipment room cabling. Following these guidelines will maximize use of the Cable Slack Managers and make future cabling additions and changes easier.

Figure 2-10 and Figure 2-11 show typical cable routing from the cabinet to the top and bottom of the MDF, respectively.

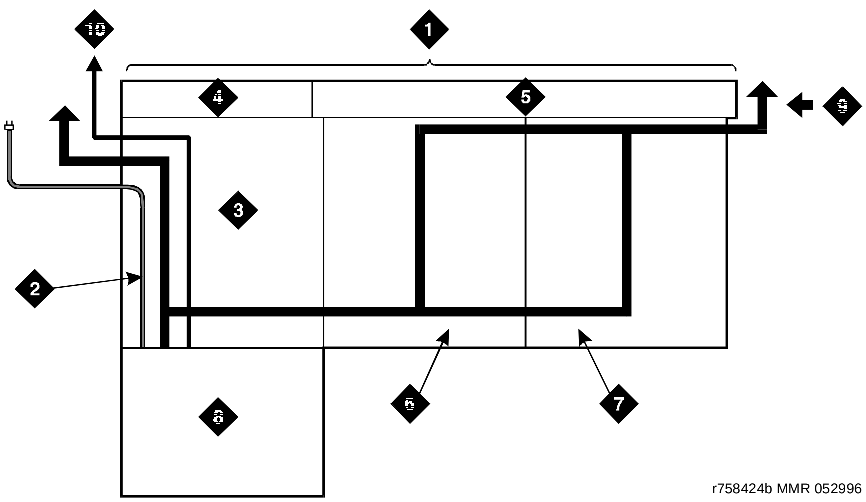


Figure Notes:

1. Main Distribution Frame
2. AC Power Cord (AC-Powered Cabinets Only)
3. Cable Slack Manager Number 1
4. Trunk/Auxiliary Field
5. Station Distribution Field
6. Cable Slack Manager Number 2
7. Cable Slack Manager Number 3
8. System Cabinet(s)
9. To Building Cables
10. 10 AWG (#25) Wire to Coupled Bonding Conductor

Figure 2-10. Cable Routing to Top Terminal Blocks

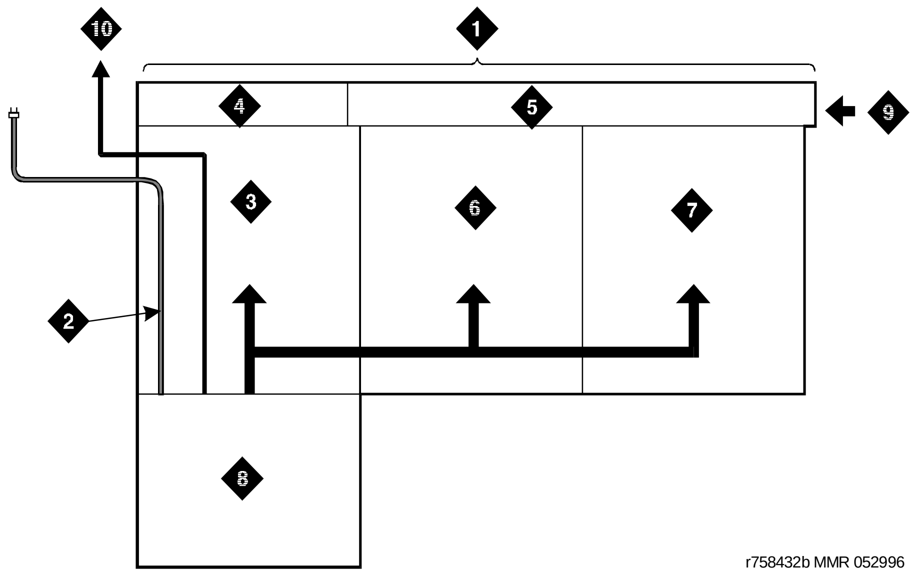


Figure Notes:

1. Main Distribution Frame
2. AC Power Cord (AC-Powered Cabinets Only)
3. Cable Slack Manager Number 1
4. Trunk/Auxiliary Field
5. Station Distribution Field
6. Cable Slack Manager Number 2
7. Cable Slack Manager Number 3
8. System Cabinet(s)
9. Building Cables (Through Cable Trough)
10. 10 AWG (#25) Wire to Coupled Bonding Conductor

Figure 2-11. Cable Routing to Bottom Terminal Blocks

Route Cables to Main Distribution Frame

The following guidelines should be followed when routing cables from the cabinet to the MDF.

- Each port cable is connected at the cabinet and then routed along the front trough of the Cable Slack Manager to the connecting/terminal block where the cable is to be terminated.
- Enough slack must be left at the cabinet end of the cable to allow for proper dressing of the cables.
- Route the cable from the cabinet to the wall. Place the cable beside one of the rows of columns in the Cable Slack Manager.

  NOTE:
  Retainers mounted on the columns keep the cable from protruding above the top of the base of the Cable Slack Manager.

- Determine the length of the cable required to reach from the Cable Slack Manager to the assigned connecting/terminal block.
- The cable must be supported on the wall using “D” rings.
- Cable slack is stored by coiling the cable around the columns in the Cable Slack Manager. The first run should always go across the full length of the five columns in the Cable Slack Manager.
- Connect the cable to the assigned connecting/terminal block.
- Avoid placing copper cables where they may bend or strain fiber optic cables.

Install Control Carrier Outputs Cable

A connector on the rear of the Control Carrier is labeled AUX. A 25-pair cable connects the AUX connector to a 110-type terminal block in the yellow field of the trunk/auxiliary field. The AUX connector outputs include the following:

- Alarm monitoring for the processor interface
- Seven DC power (-48 VDC) sources for emergency transfer units
- Three DC power (-48 VDC) sources for remotely powering a total of three attendant consoles or executive voice terminal adjuncts
- The remote maintenance internal modem connection location
- Access to a relay contact is available to actuate a light, bell, or similar type customer-supplied device. The relay can be administered to make contact when a major, minor, or warning alarm condition occurs in the system

Label Control Carrier Cable

Place the appropriate AUX connector label on the assigned 110-type terminal block row. On the control carrier cable, place a yellow auxiliary label on the connectors at each end of the cable. Write “AUX” on each label.

Connect Control Carrier Outputs Cable

Plug the connector cable in the AUX connector on the rear of the Control Carrier. Route the connector cable through the Cable Slack Manager to the assigned 110-type terminal block in the yellow field of the trunk/auxiliary field.

Install Trunk Cables Among Network Interface, Sneak Fuse Panel, and Cabinet

The 1-pair of Central Office (CO) trunks are installed by the network provider in the green field. Up to 24 pairs may be terminated on each row of the 110-type terminal block. Tie trunks also appear in the green field with up to eight 3-pair trunks terminated on each row of the 110-type terminal block.

Select Concentrator Cables

WP-90929, List 1 and 3 concentrator cables can be used to connect the cabinet to the 110-type terminal blocks in the purple field. The 1-pair patch cords/jumper wires are then run from the purple terminal block rows to the green terminal block rows in order to establish the correct 3-pair modularity.

Connect Trunk Pairs Using Concentrator Cables

Figure 2-12 shows trunk pairs connected to the cabinet with concentrator cables. To install the cables:

1. Connect B25A (male to female) cables between the network interface and sneak fuse panels.
2. Connect A25D (male to male) cables from the sneak fuse panels to the 110-type terminal block connectors in the green field.
3. Connect patch cords/jumper wires from the terminal block in the green field to the associated terminal block in the purple field.
4. Connect the single-fingered end of the concentrator cables to the 110-type terminal block connectors in the purple field in Step 3.
5. Connect the other end (2/3-fingered end) of the concentrator cables to the appropriate carrier slots. Equipped carrier slots are identified on the CSD. Mark the nomenclature strips above the carriers to identify the slots.

6. Label connectors on each end of the cables that connect to the cabinet.
7. Route the cables down the sides of the cabinet and store the excess cable slack in the Cable Slack Manager as previously described.

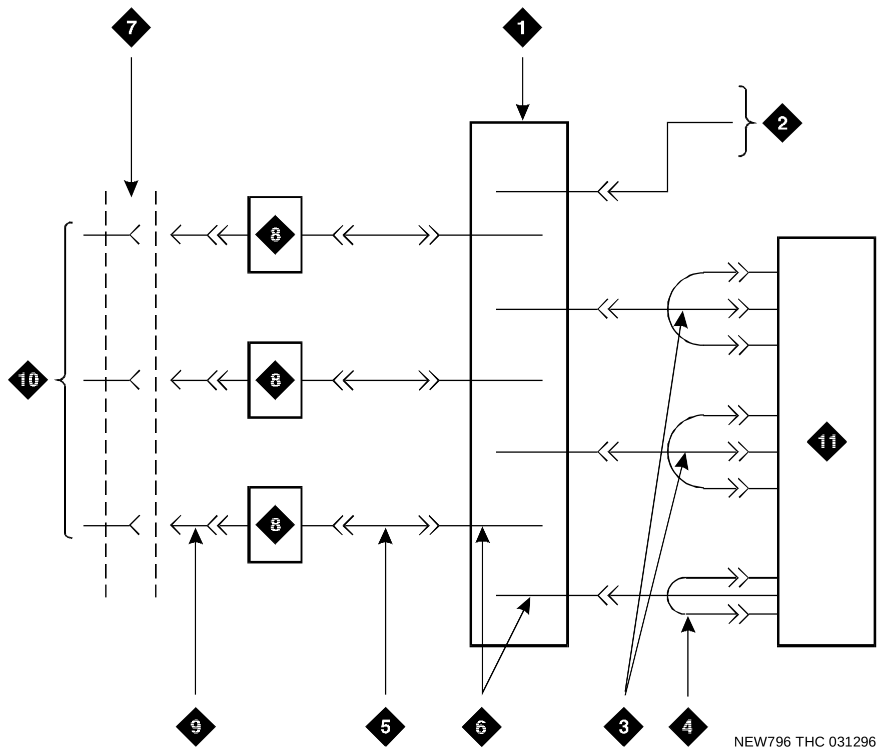


Figure Notes:

1. Trunk/Auxiliary Field
2. To Control Carrier AUX Connector
3. Concentrator Cable (WP90929, List 1)
4. Concentrator Cable (WP90929, List 3)
5. A25D (Male-to-Male) Cable
6. Alternate Block/Rows
7. RJ21X/RJ2GX Network Interface
8. Sneak Fuse Panel
9. B25A (Male-to-Female) Cable
10. Central Office Trunks
11. System Cabinet

Figure 2-12. Connect Trunk Pairs Using Concentrator Cables

Connect Trunk Pairs to Cabinet Using Jumper Wires To Establish 3-Pair Modularity

Figure 2-13 on page 2-23 and Figure 2-14 on page 2-24 show trunk pairs connected to the cabinet with jumper wires to establish 3-pair modularity.

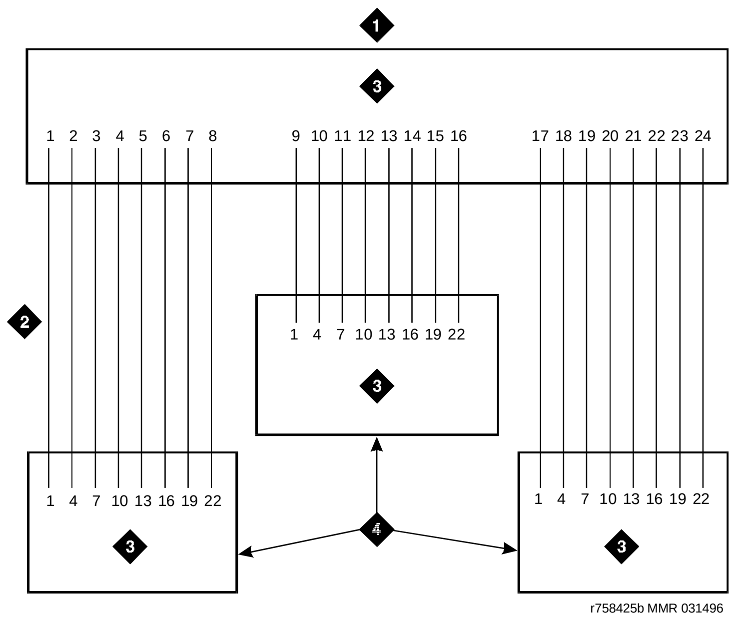


Figure Notes:

1. Green Field
2. 1-Pair Jumpers
3. Pairs
4. Purple Field

Figure 2-13. 3-Pair Modularity for Trunk Pairs for 1-Pair Trunks

To connect the trunk pairs to the purple field:

1. Connect B25A cables between the network interface and the sneak fuse panels. See Figure 2-13.
2. Connect A25D/B25A cables from the sneak fuse panels to the 110-type terminal block-type connecting block connectors in the green field.
3. Connect 1-pair patch cords/jumper wires from each 110-type terminal block row in the green field to the 110-type terminal block rows in the purple field for 1-pair Central Office (CO) trunks or in Figure 2-14 on page 2-24 for 3-pair tie trunks.

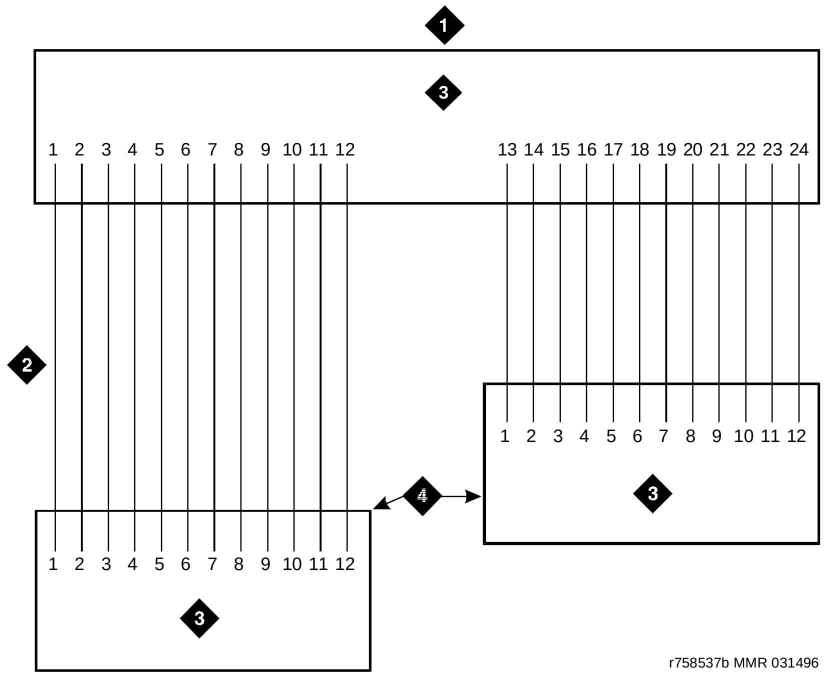


Figure Notes:

1. Green Field
2. 1-Pair Jumpers
3. Pairs
4. Purple Field

Figure 2-14. 3-Pair Modularity for Trunk Pairs for 3-Pair Tie Trunks

Install Connector Cables Between Cabinet and MDF

1. Install "D" rings on the wall between the Cable Slack Manager and the terminal/connecting blocks mounted on the MDF.
2. Install a self-adhesive port label on the back of each connector on the connector cable. Labels should be positioned so they are not covered by the cabinet connector retainers.
3. At the rear of the cabinet, connect one end of the connector cable to the assigned connector.
4. Route the cable down the rear of the cabinet, through the Cable Slack Manager, and to the MDF.
5. At the MDF, connect the other end of the cable to the assigned terminal/connecting block connector.

6. Store the cable slack in the Cable Slack Manager.
7. Repeat Steps 2 through 6 until all cables are installed.

Install Connector Cables Between Auxiliary Cabinet and MDF

Auxiliary equipment that connects to the MDF can be mounted inside the Auxiliary cabinet. The equipment connects to an ED-1E1443-10 (Group 1) intraconnection panel mounted in the cabinet. This intraconnection panel consists of a 110-type 100-pair wiring block. Auxiliary equipment is connected to the 110-type wiring block. The wiring block is pre-wired to four 25-pair female connectors mounted on the outside rear of the cabinet.

1. Install "D" rings on the wall between the Cable Slack Manager and the terminal/connecting blocks mounted on the MDF.
2. Install a self-sticking port label on the rear of each connector on the B25A connector cable. See Figure 2-9 on page 2-17.

   NOTE:
   Labels should be positioned so they will not be obscured by the cabinet connector retainers.

3. At the rear of the Auxiliary cabinet, connect one end of the connector cable to the assigned connector.
4. Route the cable down the rear of the cabinet and through the Cable Slack Manager to the MDF.
5. At the MDF, connect the other end of the cable to the assigned terminal/connecting block connector.
6. Store the excess cable in the Cable Slack Manager.
7. Repeat Steps 2 through 6 until all cables are installed.

Install Coupled Bonding Conductor

The Coupled Bonding Conductor (CBC) connects to the single-point ground block and runs adjacent to pairs in an associated telecommunications cable. See Figure 2-15 on page 2-27. The mutual coupling between the bonding conductor and the pairs reduces potential differences in terminating equipment.

The conductor consists of a 10 AWG (#25) wire tie-wrapped to the inside wiring cable and terminated at the CBC terminal bar at the MDF. A minimum of 12 inches (30.48 cm) spacing must be maintained between the CBC and other power and ground leads.

The 10 AWG (#25) wire must be long enough to reach the telecommunications cables at the rear of the system cabinets, follow these cables to the MDF, and to terminate at the CBC.

1. Cut a 10 AWG (#25) wire long enough to reach from the system's single-point ground block or DC power cabinet Ground Discharge Bar to the MDF CBC block.
2. Connect one end of the 10 AWG (#25) wire to the single-point ground block (or Ground Discharge Bar).
3. Route the wire next to the 25-pair cables connecting to the trunk/auxiliary (purple) field.
4. Tie wrap the 10 AWG (#25) wire to the 25-pair cables.
5. Connect the 10 AWG (#25) wire to the MDF CBC ground block.
6. Repeat the above steps for each CBC ground wire installed.

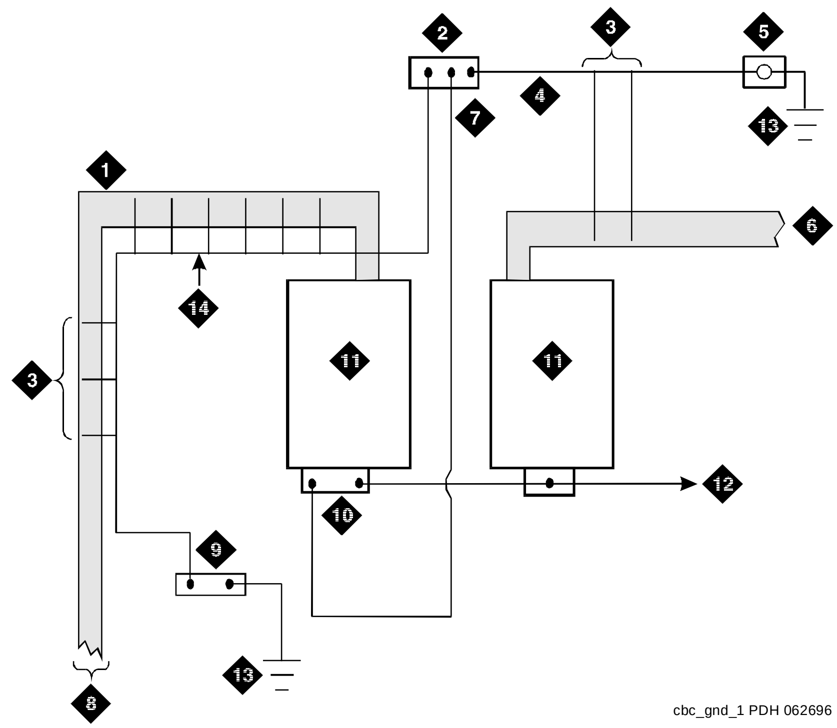


Figure Notes

1. 25-Pair Tip & Ring Cables to Cabinets
2. Coupled Bonding Conductor (CBC) Terminal Block
3. Tie Wraps
4. Cable Shield or Six Spare Pairs
5. Ground on Carbon Block Protector or Equivalent
6. Trunk Cable to Network Interface
7. 10 AWG (#25) Wire
8. To Network Cabinets
9. Battery Plant Ground Discharge Bar for Single-Point Ground
10. Cross-Connect Ground Block
11. Main Distribution Frame (MDF)
12. To Other Cross-Connect Ground Blocks
13. Approved Ground
14. Coupled Bonding Conductor (CBC)

Figure 2-15. Coupled Bonding Conductor

Station Wiring Design

The following hardware and cabling is used:

- Information outlets (modular wall jacks)
- Station Cables
- Closets
  - — Site locations
  - — Satellite locations
- Adapters
- Labels

A brief description of each of the above listed items follows. Ordering information is not provided for station cables and information outlets. This information is available in the *Premises Distribution System Equipment and Supplies Catalog*.

Information Outlets

Information outlets are 8-pin modular wall jacks. Most of the outlets are wired with push-on connections. Information outlets are also available that connect to a double modular plug-ended 4-pair station cable routed from the MDF, a site/satellite location, or an adapter.

Station Cables

For clarity, a station cable is either a 25-pair cable, multiple 25-pair cable, or 4-pair D-inside wire (DIW) run from the equipment room, site/satellite location, or adapter to the information outlets. The following station cables are available. See Figure 2-16 on page 2-30.

25-pair station cable — Use between the equipment room and site/ satellite locations or adapters. Use an A25D cable (male to male) between the equipment room and satellite closet. Use a B25A cable (male to female) between the equipment room and site closet or adapter.

Multiple 25-pair station cable — Use between the equipment room and site/satellite locations or adapters. This cable consists of individually sheathed 25-pair cables with a factory-installed 25-pair connector on each end. Use a male to female cable to connect between the equipment room and site location or adapter. Use a male to male cable to connect between the equipment room and satellite location. Staggered-finger cables are recommended for all multiple 25-pair station cables and are available in both double-ended and single-ended types.

Single modular plug-ended 4-pair station cable — Use this cable between adapters and information outlets that require push-on connections. It can also be used when 4-pair station cables are field- terminated on the 110-type terminal blocks in the equipment room or satellite closet and modularly connected to information outlets. The station cables are available in the following lengths:

- 10 feet (3.05 m)
- 25 feet (7.62 m)
- 50 feet (15.24 m)
- 75 feet (22.86 m)
- 100 feet (30.5 m)
- 150 feet (45.72 m)
- 200 feet (61 m)

NOTE:
If more than 200 feet (61 m) of 4-pair station cable is required, a 451A in-line adapter (double-ended modular female connector) is attached to the cable and a second 4-pair cable of the required length is plugged into the adapter. See Figure 2-16.

Double modular plug-ended 4-pair station cable — Use this cable to provide nonstandard length runs between adapters and information outlets with push-on connections. It can also be used between adapters and modularly connected information outlets. It is available in the same lengths as the single modular plug-ended cable.

Bulk Cable — Same as the 25-pair cable or multiple 25-pair cable; however, the bulk cable is not equipped with connectors. Use this cable between the equipment room and satellite closets when both are equipped with punch-down type terminal/connecting blocks.

4-pair station cable — Use this cable when 4-pair station cables are to be field-terminated on the 110-type terminal blocks in the equipment room or satellite closet and the information outlets require push-on connections.

451A Adapter Ordering Information

Color	Comcode
Gray	103942272
Ivory	103786240

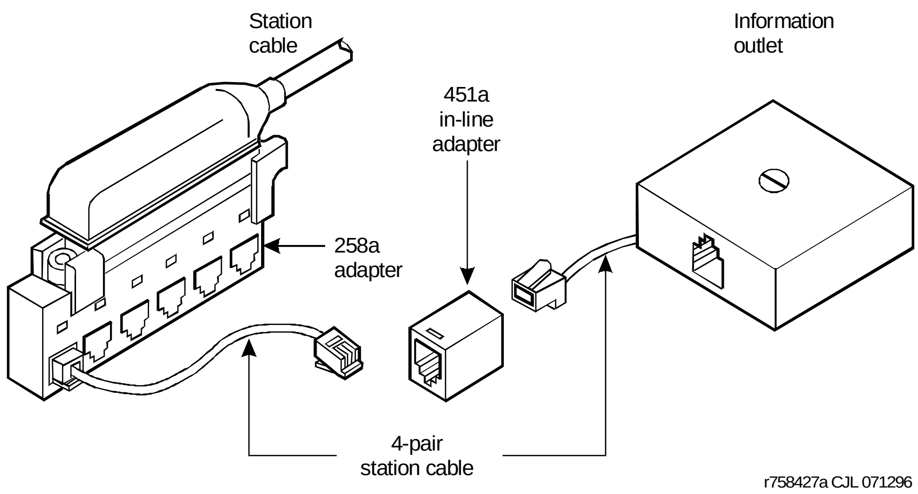


Figure 2-16. Example of Extending 4-Pair Station Cables

Closets

Site Locations

Site locations are closets that provide a point in the station wiring for the administration of remote powering. Adapters are used at site locations to terminate the 25-pair station cables and provide connection points (modular jacks) for power adapters and 4-pair station cables.

The 258A and BR2580A adapters plug into a 25-pair female cable connector. These adapters divide the 25-pair cable into six 4-pair (modular jack) circuits. See Figure 2-17.

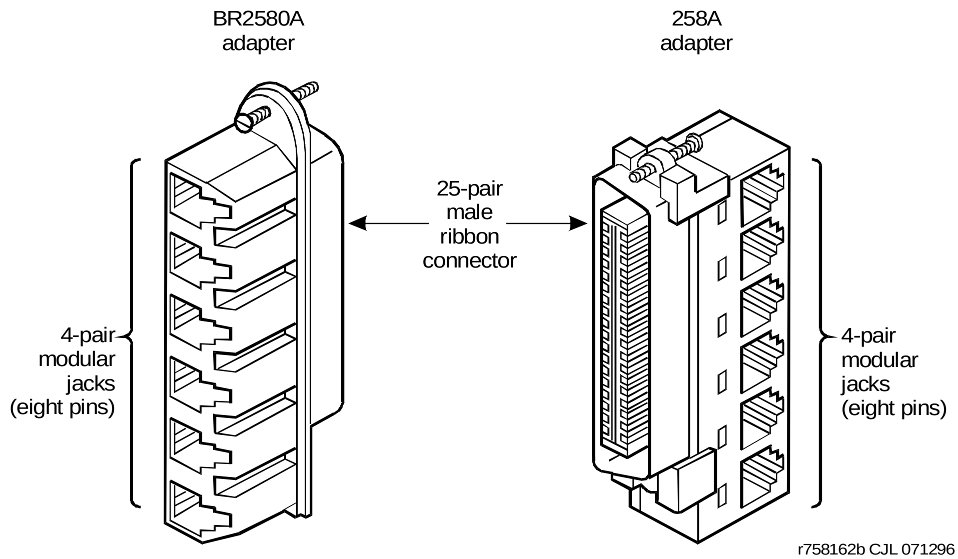


Figure 2-17. 258A and BR2580A Adapters

The 356A adapter plugs into a 25-pair female cable connector. See Figure 2-18. The 356A adapter divides the 25-pair cable into eight 3-pair circuits. Although the circuits are 3-pair, the adapters modular jacks will accept the 8-wide modular plug used on the 4-pair station cable.

CAUTION:

Adapters wired similarly to the 356A should not be used. Their jacks will not accept 4-pair plugs.

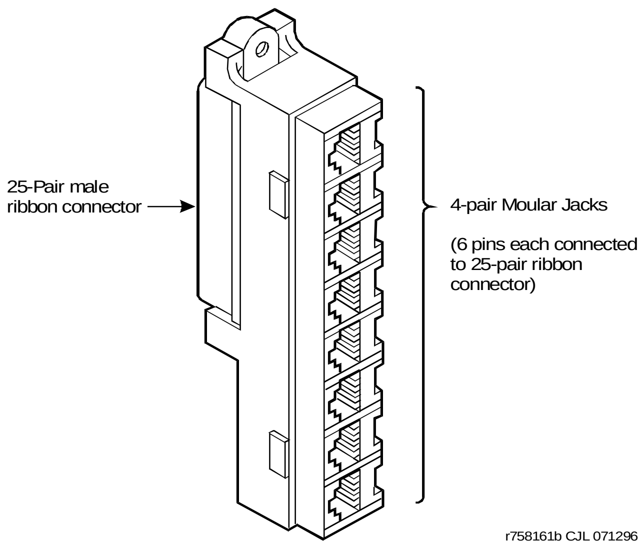


Figure 2-18. 356A Adapter

Use the ZD8AJ adapter to connect a Multi-Button Electronic Telephone (MET) line cord to an information outlet. The adapter interchanges pairs 3 and 4 to correspond with the pair assignments for the telephone. The line cord plugs into the adapter, and then the adapter is plugged into an information outlet.

Adapter Ordering Information

Description	Comcode
258A Adapter	102605136
BR2580A Adapter	403384720
356A Adapter	104158829
400B Adapter	103848859
400B2 Adapter	104152558
ZD8AJ Adapter	103881421

Satellite Locations

Satellite locations are closets that provide an administration point (using cross-connect equipment) for station cables and where adjunct power may be applied. The station cable circuits from the equipment room MDF are 3-pair. At the satellite location, 4-pair circuits run to the information outlets. The hardware used is 110-type terminal blocks.

Satellite Locations Using 110-Type Hardware

Each terminal block has a 3-pair (white field) and a 4-pair (blue field) located on the same terminal block.

The 110A-type terminal block that can be used is the 110AE1-75FT. It must be field-terminated to both the white and blue fields.

The 300-pair 110P-type terminal blocks that can be used are:

- 110PE1-300CT/FT — 25-pair connector on the white field and field-terminated on the blue field
- 110PE1-300FT — Field-terminated on both the white and blue fields

The 900-pair 110P-type terminal blocks that can be used are:

- 110PE1-900CT/FT — 25-pair connector on the white field and field-terminated on the blue field
- 110PE1-900FT — Field-terminated on both the white and blue fields

Station Circuit Distribution from Equipment Room

This section explains the station circuit distribution from the equipment room to the information outlets for new wiring installations. Example connection diagrams are provided to show the options for running and connecting the station cables.

If most of the telephones/voice terminals that require remote powering are within 250 feet (76.2 m) of the equipment room, 4-pair station circuits are run from the equipment room to the information outlets. If this is not the case, or if the customer requires 2-point administration, 3-pair station circuits are run from the equipment room to satellite locations. Then, the 4-pair station circuits are run from the satellite locations to the information outlets.

A list of voice and data terminals that can be connected to the system is provided in Table 2-4 on page 2-42. A list of administration terminals that can be connected to the system is provided in Table 2-5 on page 2-43.

4-Pair Station Circuits

Four-pair circuits can be run directly from an equipment room MDF to a 258A or BR2580A adapter as shown in Figure 2-19. The 4-pair station cables connect the adapter to the information outlets.

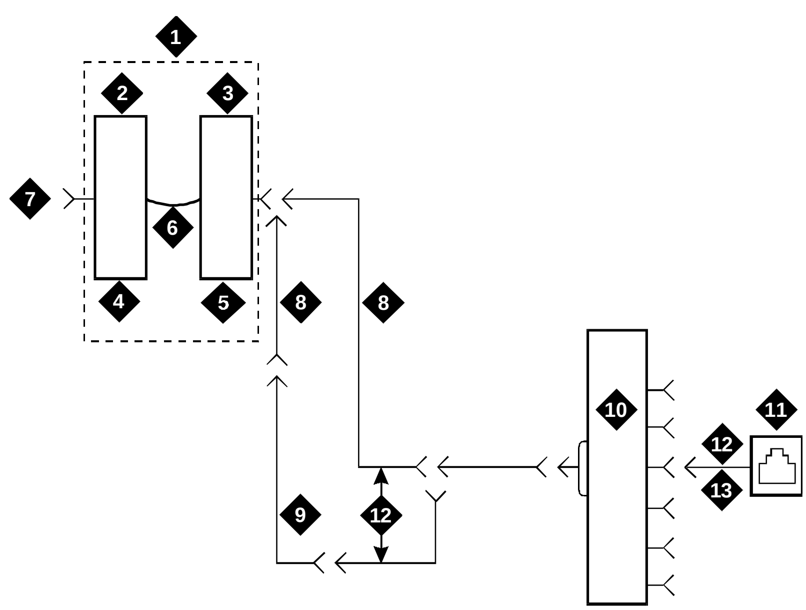


Figure Notes:

1. Part of Main Distribution Frame (MDF)
2. 3-Pair Connecting Blocks
3. 4-Pair Connecting Blocks
4. Purple Field
5. Blue Field
6. Patch Cord or Cross-Connect Jumpers
7. To System Cabinet (Three-Pair Modularity)
8. B25A Cable
9. Connectorized (Staggered Finger) Multiple 25-Pair Cable
10. 258A or BR2580A Adapter
11. Information Outlet
12. 4-Pair Circuit
13. DIW Station Cable (D-Inside Wire)

Figure 2-19. 4-Pair Circuit Distribution and Connectivity

The 4-pair station cables can be run directly from the equipment room to the information outlets if 4-pair terminal blocks are used in the distribution field. See Figure 2-20. The station cables must be field-terminated on the 110-type terminal blocks.

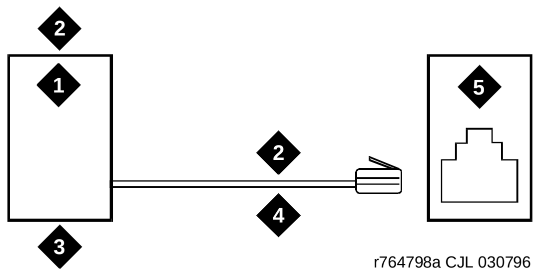


Figure Notes:

1. Station Side of Main Distribution Frame (MDF) or Satellite Location
2. 4-Pair Circuit
3. Blue Field
4. DIW Station Cable (D-Inside Wire)
5. Information Outlet

Figure 2-20. 4-Pair Run to Equipment Room or Satellite Location

If 110-type terminal blocks are used with a modular plug-ended station cable, an adapter can be connected directly to the 110-type terminal block connectors. See Figure 2-21.

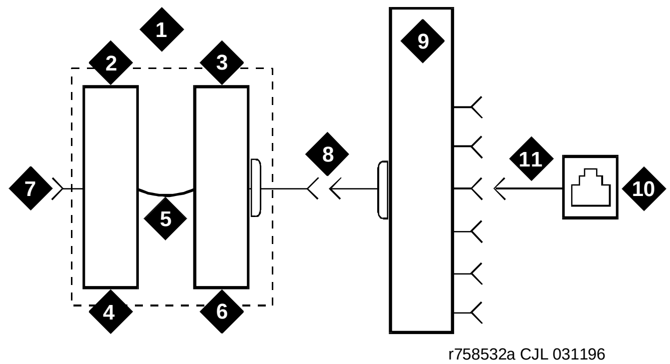


Figure Notes:

1. Part of Main Distribution Frame (MDF)
2. 3-Pair Connecting Blocks
3. 4-Pair Connecting Blocks
4. Purple Field
5. Patch Cord or Cross-Connect Jumpers
6. Blue Field
7. To System Cabinet (Three Pair Modularity)
8. A25D Cable (Male to Male)
9. 258A or BR2580A Adapter
10. Information Outlet
11. 4-Pair Circuit (DIW Station Cable (D-Inside Wire))

Figure 2-21. 4-Pair Run to Equipment Room or Satellite Location

3-Pair to 4-Pair Station Circuit Distribution

Figure 2-22 shows the 3-pair circuit distribution from an equipment room MDF to a satellite location using 110-type hardware. Four-pair circuits are distributed from the satellite location to the information outlets.

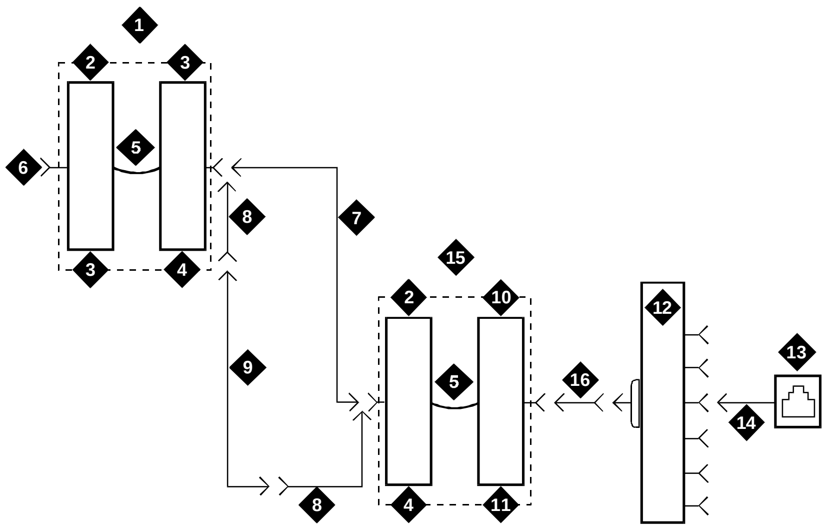


Figure Notes:

1. Part of Main Distribution Frame (MDF)
2. 3-Pair Connecting Blocks
3. Purple Field
4. White Field
5. Patch Cord or Cross-Connect Jumpers
6. To System Cabinet (Three Pair Modularity)
7. A25D Cable (3-Pair Circuits)
8. B25A Cable
9. Connectorized (Staggered Finger) Multiple 25-Pair Cable
10. 4-Pair Connecting Blocks
11. Blue Field
12. 258A or BR2580A Adapter
13. Information Outlet
14. 4-Pair Circuit (DIW Station Cable (D-Inside Wire))
15. Part of Satellite Location
16. 4-Pair Circuits (B25A Cable)

Figure 2-22. 3-Pair to 4-Pair Satellite Location Connectivity

Three-pair circuits can also be run directly from the equipment room MDF to a 356A adapter as shown in Figure 2-23. Four-pair station cables connect the adapter to the information outlets. Four-pair station cables can be run directly from a satellite location to the information outlets as previously described.

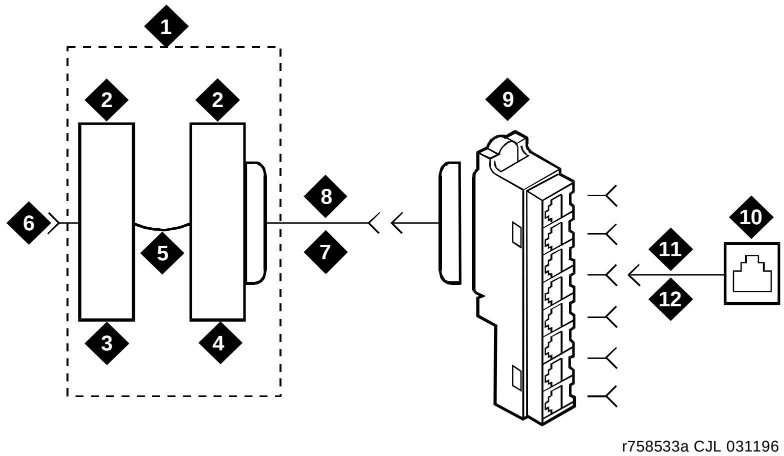


Figure Notes:

1. Part of Main Distribution Frame (MDF)
2. 3-Pair Connecting Blocks
3. Purple Field
4. Blue Field
5. Patch Cord or Cross-Connect Jumpers
6. To System Cabinet (3-Pair Modularity)
7. B25A Cable (Male to Female)
8. 3-Pair Circuits
9. 356A Adapter
10. Information Outlet
11. 3-Pair Circuit in 4-Pair Wire
12. DIW Station Cable (D-Inside Wire)

Figure 2-23. 3-Pair to 4-Pair Circuit Distribution and Connectivity

NOTE:
Bridged taps must not be allowed on any part of the station wiring.

Layout

Locate Information Outlets

The customer or marketing representative must provide floor plans showing the information outlet locations and types (flush- or surface-mounted) required. The floor plans must also show a complete overview of all conduit and cabling facilities in the building.

Locate Satellites and Sites

Use the following information when determining site, satellite, or adapter locations.

a. Keep the number of locations to a minimum.

b. To minimize the station wiring distances, centrally locate the sites/satellites, or adapters among the information outlets.

c. Site/satellite locations must be easily accessible and contain AC-powered receptacles.

Adapter Requirements

One 258A/BR2580A adapter is required for each 25-pair station cable containing 4-pair station circuits. One 356A adapter is required for each 25-pair station cable containing 3-pair station circuits.

Hardware Requirements

Hardware requirements are the same as for the equipment room.

Sizing 4-Pair Station Cables

Use the scale of the floor plan to determine the approximate length of the station cables required per the standard SYSTIMAX wiring concepts.

Sizing 25-Pair and Multiple 25-Pair Station Cables

Use the scale of the floor plan to determine the approximate length of each 25-pair station cable. The cables must be selected and properly sized to make maximum use of the hardware at the equipment room or satellite location.

Use 25-pair B25A cables (male to female) to connect adapters directly to the MDF or satellite location. Staggered-finger cables, equipped with factory-installed 25-pair connectors at both ends (male to female), should be used when multiple 25-pair cables are used between the equipment room or satellite location and the adapters. B25A cables are required at the equipment room or satellite location to connect the staggered-finger cables to the 110-type terminal blocks.

Use the following information to determine the cable size (cable pairs) required for either 3-pair or 4-pair circuits. Note the length and size on the floor plan to aid in the ordering and installation of the station cables.

3-Pair Station Cable Circuits

To determine the size of station cables containing 3-pair circuits, multiply the number of 3-pair circuits required at the satellite location by 3.5. Then, using the minimum size cable requirement, round up the cable size requirement to the next highest available cable bundle size. This will provide additional pairs for growth and compensate for every twenty-fifth pair in a cable that is not used.

4-Pair Station Cable Circuits

To determine the size of station cables containing 4-pair circuits, find out how many information outlets are served by the equipment room MDF or satellite location MDF. Multiply the number of information outlets by 4. Then, using the minimum size cable requirement, round up the cable size requirement to the next highest available cable bundle size.

NOTE:
This formula may not compensate for the unused twenty-fifth pair in all cases. If not, it must be allowed for.

Terminals

The system can be connected to all DTE terminals and have RS-232 (or EIA-232) or DCP interfaces.

Voice and Data Terminals

Table 2-4 lists some of the voice and data terminals that can be connected to the system. Contact your Lucent Technologies representative for more information.

Table 2-4. Voice and Data Terminals

Terminal	Type
Multi-button Electronic Telephone (MET) sets: 10, 20, 30 Button	Voice
Analog: 500, 2500/2554, 2500 DMGC, 2500YMGK, S203A Speakerphone	Analog voice
71XXX series: 7101A, 7102A, 7103A, 7104A	Analog voice
73XXX series: 7302H, 7303H, 7303S, 7305S, 7305H	Hybrid voice
74XXD series: 7401D, 7403D, 7404D, 7405D, 7406D, 7407D, 7410D, 7434D, 7444	Digital voice
81XX series: 8102, 8110 91XX series: 9101, 9103, 9110	Analog voice
84XX series: 8403B, 8410B/D/B+/D+, 8411B/D, 8412, 8434, 8435 94XX series: 9403, 9410, 9434	Digital voice
Basic Rate Interface (BRI) (75XX series): 7505-VOM/T, 7506-VOM/T, 7507-VOM/T 85XX series: 8503, 8510, 8520	BRI voice
Workstation series Business Communications Terminals (BCTs) and Business Communications Systems (BCS): 510D BCT, 513 BCT, 515 BCT, 615 BCT, 715 BCT, 715 BCS PC/PBX platform (digital): PC/ISDN platform (BRI)	Data
Consoles: 301A Attendant Console 302A1 Enhanced Generic 1 Console 602A1 ACD Console (CallMaster®digital communications terminal)	Data and voice

Continued on next page

Table 2-4. Voice and Data Terminals — *Continued*

Terminal	Type
ZE01A Expansion Module for 8434DX	Voice and Features
DCP Data interface: Constellation Automatic Call Distribution (ACD) data terminal	Data and voice
Cordless Hybrid: MDW 9000 (TransTalk 9000) MDC 9000	Voice
PassageWay interface: Consoles: 302B1, 302C1 Attendant Console 603A/D Automatic Call Distribution (ACD) Console (CallMaster digital console) 603E Automatic Call Distribution (ACD) Console (CallMaster digital console)	Data and voice

Administration Terminals

Table 2-5 lists the administration terminals that can be connected to the system.

Table 2-5. Administration Terminals

Administration Terminal	Application
510D	Remote administration
610D, 513, 610, 615, 715[1] Business Communications Terminal (BCT), 4410, 4425, and VT220	Management Terminal: administration and general purpose
515 Business Communications Terminal (BCT)	Remote administration, general purpose
615 Management Terminal	Management Terminal system administration and maintenance terminal
715 BCS, 2900/715 BCS, and 715 BCS-2 Management Terminal	Management Terminal system administration and maintenance terminal

1. The keyboards and terminals are interchangeable when an adapter cable is used.

NOTE:
The 715 BCS (406803148 and 406803155), has a 6-pin mini-DIN keyboard connector. The 2900/715 BCS (4073113881 and 407313899), has a 6-pin RJ-11 keyboard jack located on the side of the terminal.

Label the Main Distribution Frame

Figure 2-24 shows the graphic symbols used on labels for the system, cross-connections, information outlets, and cables. The labels are color-coded to identify system wiring:

- Green — To Central Office (CO)
- Purple — To system ports
- Yellow — To auxiliary equipment and miscellaneous system leads
- Blue — To information outlets
- White — From Main Distribution Frame to satellite locations (3-pair)

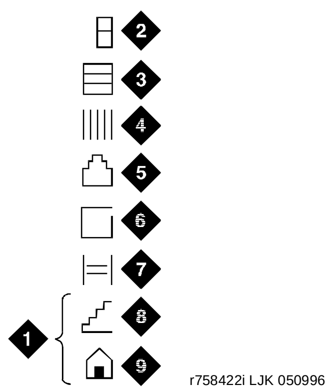


Figure Notes:

1. Write Floor or Building Identification on Label as Required
2. Cabinet
3. Carrier
4. Slot
5. Information Outlet
6. Site/Satellite Closet
7. Tie Circuit
8. Floor
9. Building

Figure 2-24. Label Graphic Symbols and Nomenclature

Each 110-type label identifies 2 rows on the 110-type terminal block. The upper half identifies the row above it and the lower half identifies the row below it. The labels are inserted into the clear plastic designation strips furnished with the 110-type terminal blocks. The strip is snapped in place between the terminal block rows. Label code number 220A (comcode 103970000) contains all of the 110-type labels.

Patch Cord/Jumper Installation and Administration

Before starting the patch cord installation, obtain a copy of the Port Assignment Record forms from the customer or marketing representative. See Figure 2-25. These forms contain the port assignments and identify the extension numbers (**Terminal No.**) of the telephones/voice terminals. Enter the jack assignments at the equipment room and indicate if adjunct power is required and where it is provided (MDF, site/satellite closet, or information outlet).

CARRIER ________ PORT ASSIGNMENT RECORD Page ________

Slot	Port	Jack*	Extension Number		Bldg Flr Rm	Voice Terminal		Voice Terminal Adjunct	Module	Power*		User Name/Use
			Old	New		Type	Color					
	01											
	02											
	03											
	04											
	05											
	06											
	07											
	08											
	09											
	10											
____	11											
Slot	12											
	13											
______	14											
CKT PK	15											
Type	16											
	17											
	18											
	19											
	20											
	21											
	22											
	23											
	24											

* To be completed by installation technician

r764787 PDH 071596

Figure 2-25. Port Assignment Record Form

When satellite locations are provided, enter the satellite letter designation (A through F) and the jack appearance in the equipment room on the form. Also, enter the floor designation and/or building designation if appropriate. For 1-point administration, this entry is all that is required.

Labeling

Figure 2-26 shows an example labeling scheme from the white field at the equipment room to the information outlet. In the example shown, the white label identifying the terminal block row associated with circuits 17 to 24 is connected to an identically labeled terminal block row at the satellite closet. This is always the case for either 1-point or 2-point administration.

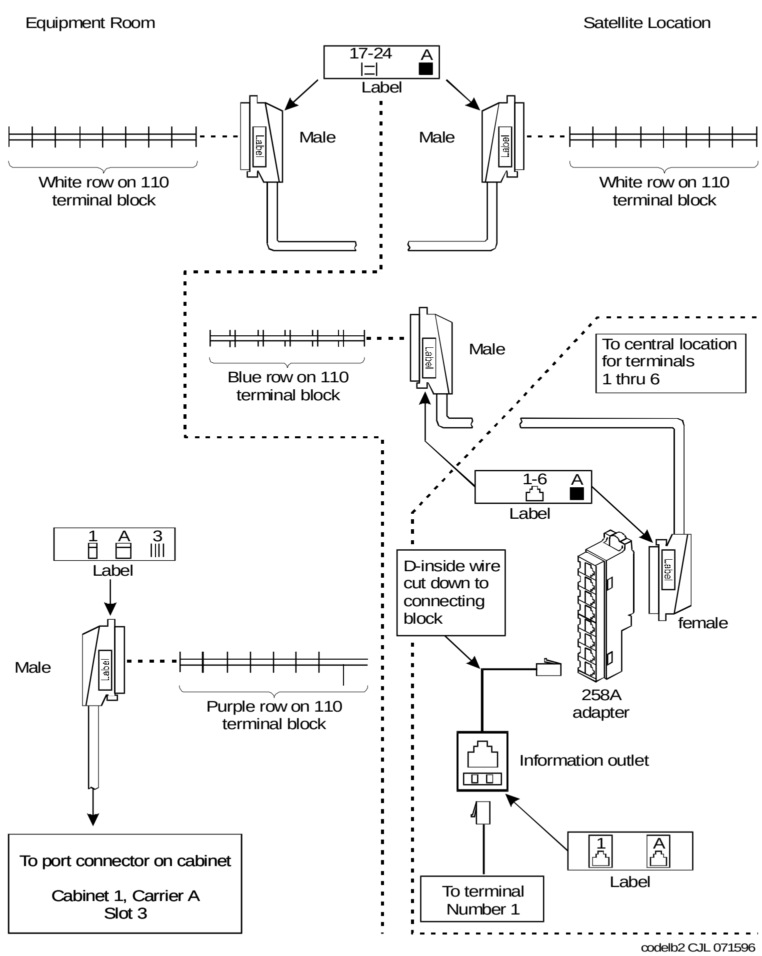


Figure 2-26. Example 3-Pair Labeling to Information Outlet

The satellite symbol must be installed at all connection points between the blue field and the information outlet. It must also be installed at the information outlet itself.

Figure 2-27 shows an example labeling scheme for 4-pair circuits from the equipment room to the information outlets. The labeling scheme for 3-pair circuits from the MDF to a satellite location.

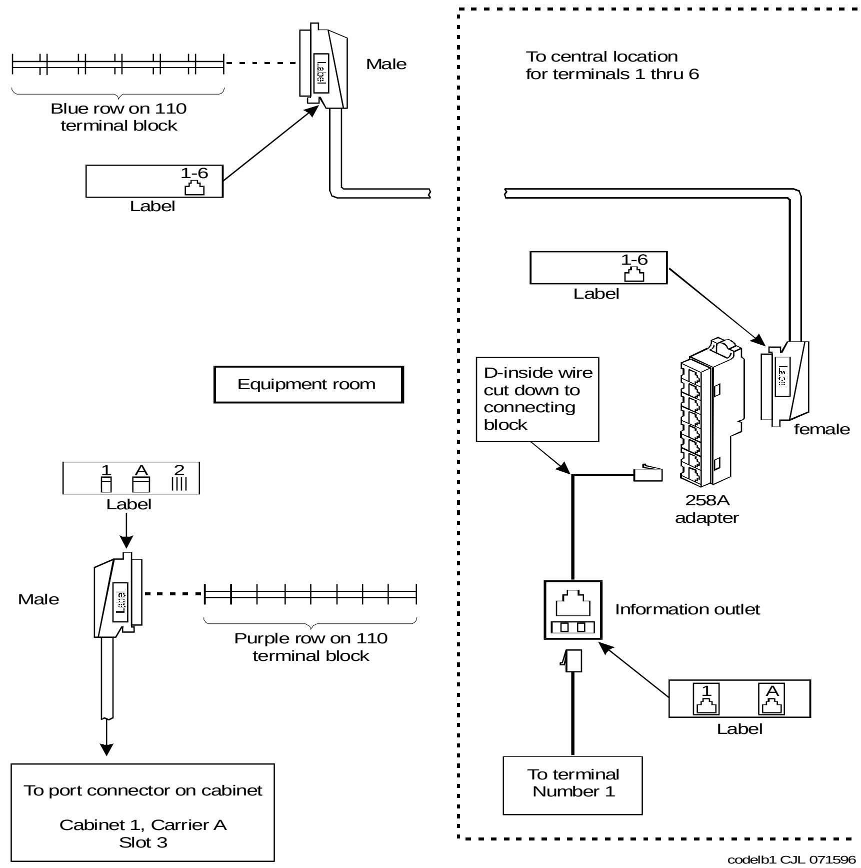


Figure 2-27. Example 4-Pair Labeling to Information Outlet

Create a Provisioning Plan

Determine an appropriate available port circuit on the system for each telephone, trunk, and peripheral connection needed, and, in addition, plan for auxiliary power for Basic Rate Interface (BRI) and certain display sets.

Create a Port Assignment Record to include the following (see Figure 2-25):

- Station or trunk type or feature/service
- Building location (floor/room/desk/information outlet)
- Extension number or trunk group and member number
- Port circuit location on the system for each endpoint (cabinet/carrier/slot/circuit)
- Route from equipment room through equipment closets to each endpoint
- Auxiliary power supply, if required

Install Management Terminal and Activate System

3

This chapter contains procedures for installing the management terminal and bringing the system up to a “no red LEDs” state. This chapter details how to:

- Install Management Terminal
- Activate the System
- Power Up the System
- Screens and Commands
- Log in to the System
- Set Country Options
- Change Craft Password
- Set Date and Time
- Administer System Cabinet Configurations (Release 5r)
- Administer Fiber Link Configurations (Release 5r)
- Set System Maintenance Parameters
- Save Translations
- Initiate DEFINITY AUDIX System Power Procedures

⚠ CAUTION:

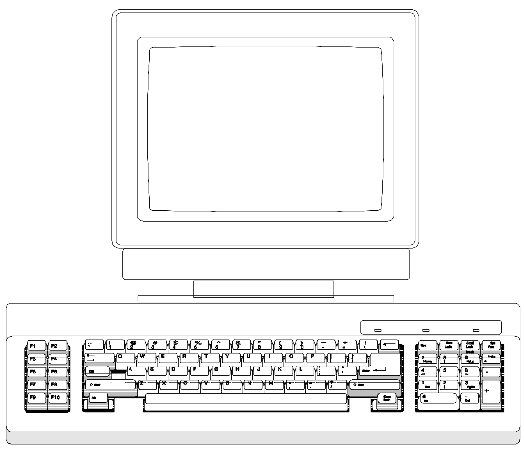
To prevent unnecessary trouble tickets, do not enable the system alarms (Alarm Origination feature) until all installation and administration procedures are completed. This chapter describes basic system startup procedures only and is not intended to identify all system alarms or error conditions.

Install Management Terminal

The management terminal must be located within 50 feet (15.2 m) of the system. It may be necessary to reduce the maximum distance limitation if higher gauge wire is used or if the capacitive load on the line is increased.

In general, the terminal must be connected directly to the system with the shortest possible cable. For maintenance purposes, the terminal must be located in the same equipment room as the system or in sight of the system.

NOTE:
The management terminal in Figure 3-1 is shown for illustration purposes only and does not represent a specific terminal type.



r773185 RBP 032696

Figure 3-1. Typical Management Terminal

The following types of terminals can be connected to a system:

— 715 BCS

— 2900/715 BCS

— 715 BCS-2

The following notes apply:

- This chapter emphasizes terminal installation in Release 5 and later systems.
- If the terminal is installed to support a DC-powered system, a 116A Isolator (comcode 106005242) must be installed.
- An optional printer may be connected using a locally obtained Electronic Industries Association (EIA) cord.
- See Appendix A, "Option Switch Settings" for printer option switch settings.

Unpack and Inspect

1. Unpack the terminal and inspect for damage. Report all damage according to local requirements.
2. Remove and retain the installation and usage instructions from the carton. These instructions are needed to set up the terminal after it is installed.
3. Set the terminal, keyboard, and all cables onto the equipment room table.

Install a 715 BCS Terminal

1. Plug the keyboard cable into the 6-pin mini-DIN jack on the rear of the terminal. See Callout 2 in Figure 3-2 on page 3-4.
2. Plug the supplied 25-pin Data Terminal Equipment (DTE) cable into the P2 port (center connector) on the rear of the terminal.

Install a 2900/715 BCS Terminal

1. Plug the keyboard cable into the 6-pin RJ-11 jack on the left side of the terminal. An adapter cable is available to convert a 6-pin mini DIN jack to an RJ-11 jack to allow a 715 BCS keyboard to be used (comcode 847489895 or 847489903).
2. Plug the supplied 25-pin Data Terminal Equipment (DTE) cable into the P2 port (right side connector). See Callout 4 in Figure 3-2 on page 3-4.

Install a 715 BCS-2 Terminal

1. Plug the keyboard cable into the modular keyboard jack on the rear of the terminal. See Callout 5 in Figure 3-2. This is a unique cable and must be connected to the 715 BCS-2 only.
2. Plug the supplied 25-pin Data Terminal Equipment (DTE) cable (H600-426) into the COM1 port (right side connector).

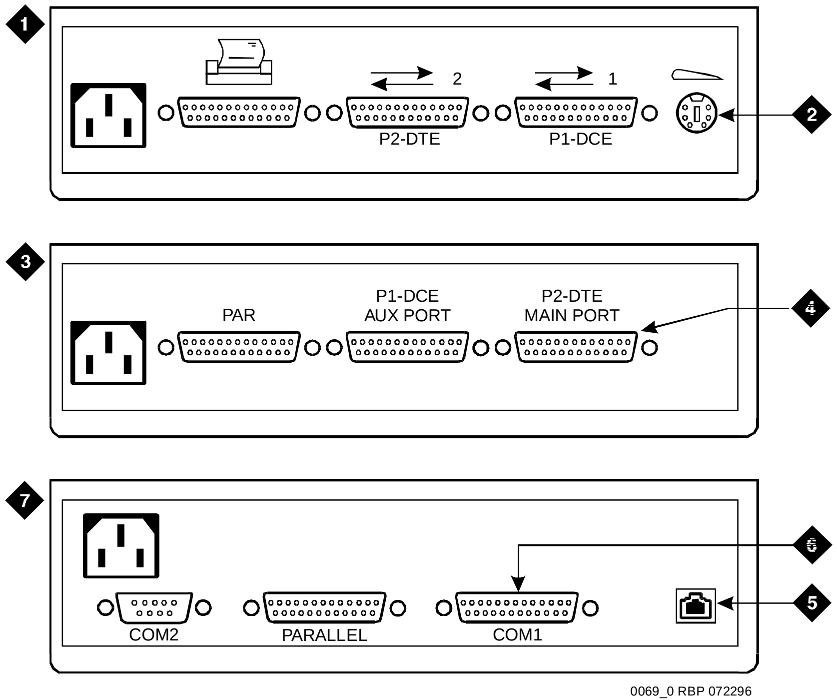


Figure Notes:

1. Rear Panel of 715 BCS Terminal
2. 6-Pin Mini DIN Connector
3. Rear Panel of 2900/715 BCS Terminal
4. P2-DTE Port
5. Modular Keyboard Jack
6. COM 1 Port
7. Rear Panel of 715 BCS-2 Terminal

Figure 3-2. Rear Panels on Management Terminals

Connect to the System

1. Route the 25-pin DTE cable from the terminal to the rear of the system.
2. For Release 5si, connect the cable to the **TERM** connector. See Figure 3-3. For Release 5r, connect the cable to the **Terminal Active** connector. See Figure 3-4.
3. Plug the AC power cord into the AC receptacle on the terminal. Plug the opposite end of the power cord to the AC receptacle located at the bottom rear of the cabinet, or into the selected AC receptacle.
4. Set the terminal power switch **ON**.

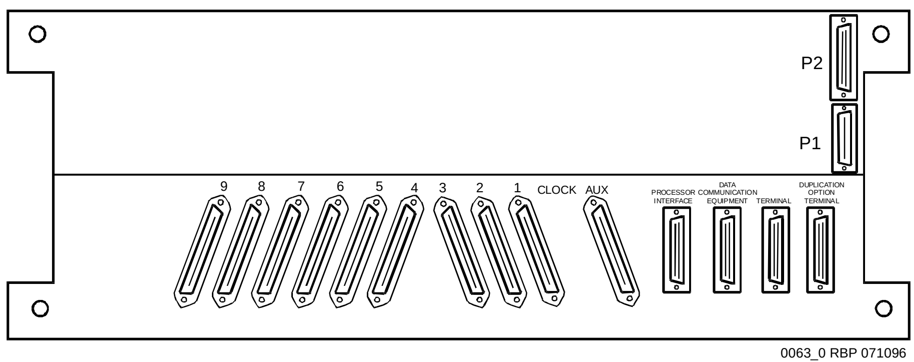


Figure 3-3. Management Terminal Connections for Release 5si

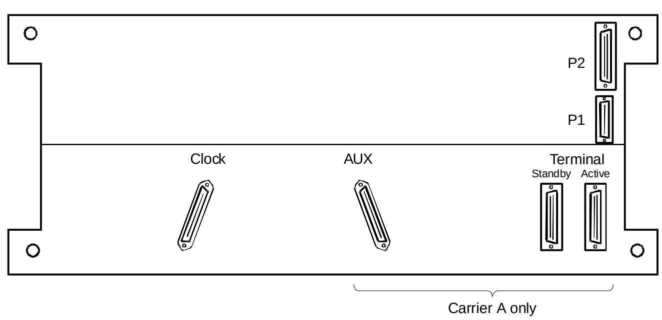


Figure 3-4. Management Terminal Connections for Release 5r

- If the system is DC-powered, install an EIA 116A Isolator (comcode 106005242) in series between the DTE cable and the **TERM** or **Terminal Active** connector.

Remotely Connect Terminal

A management terminal can be installed at some distance from the system. Typical remote connections are shown in Figure 3-5.

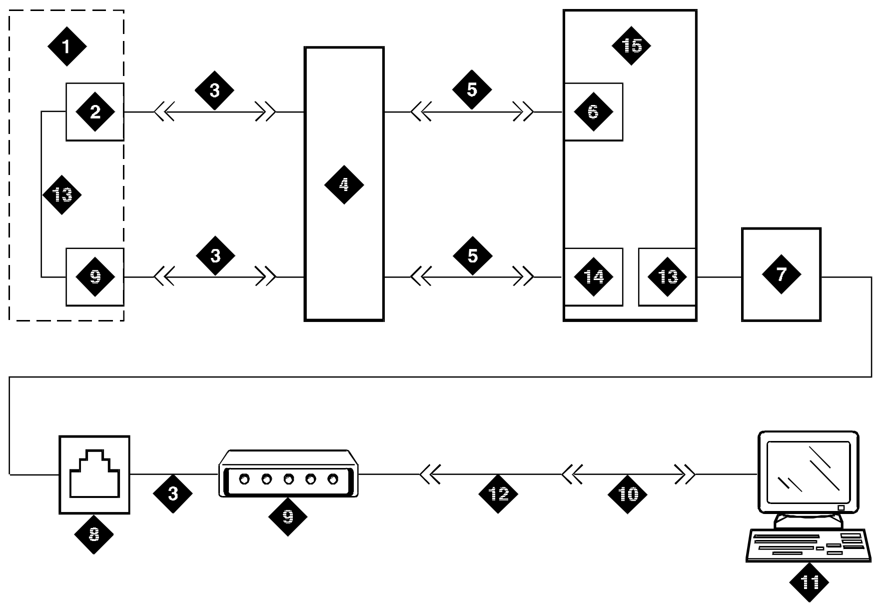


Figure Notes:

1. External Modem Pool
2. 7400A Data Module
3. Line Cord
4. Main Distribution Frame (MDF)
5. B25A Cable (Male to Female)
6. TN754 Digital Line 4-Wire Circuit Pack
7. Public Switched Telephone Network
8. 103A or Modular Wall Jack
9. Modem
10. A DB9 to DB25 Converter (ED3-1-70, G115) May Be Required on a PC
11. Remote Management Terminal or Other Remote Device (Call Detail Recording Utility, CAS+, Property Management System, Basic Call Management System, System Journal Printers, Cost Allocator)
12. M25A Cable
13. Can Be Any of the Following Trunk Circuit Packs: TN747, TN753, TN760, TN767, TN464, TN2147, TN465, and so forth.
14. Can Be Any Analog Line Circuit Pack
15. Multi-Carrier Cabinet System

Figure 3-5. Typical Connections to Remote Devices

1. Use Z3A2 ADUs and M25A cables on CDRU/CAS+, PMS, SAT PC, BCMS terminal, and Remote SAT.
2. Use Z3A1 ADUs and M25B cables (25-pin RS-232) on System/Journal printers.
3. If a DB-9 cable is used to connect to a PC, use the ED3P001-70, G115 converter to adapt the DB-9 to a DB-25.
4. A TN556 ISDN BRI circuit pack is used with the 7500 Data Module.

Set Up Management Terminal

Each management terminal requires a different setup procedure. Refer to the installation and usage instructions packed with the management terminal.

Install Management Applications

The PC-based Management Applications are installed according to the complete installation instructions provided in *Management Applications Operations*, 585-229-202.

Activate the System

Instructions are provided to activate Release 5 and later systems. To activate a G3V4 and earlier system, refer to *DEFINITY Communications System Generic 3 Installation and Test*, 555-230-104.

NOTE:
To prevent unnecessary trouble tickets, do not enable the system alarms (Alarm Origination feature) until all installation and administration procedures are completed.

CAUTION:
It may be necessary to reseat circuit packs. To prevent damage from static electricity, always wear an Electromagnetic Compatibility (EMC) wrist strap (comcode 900698226) when handling all system components.

Install Translation Flash Memory Card (Release 5si)

If a Release 5r system is installed, skip this section.

1. Verify the write switch on the Translation Flash-Memory Card (Translation Card) is positioned down so the card can be written to. See Figure 3-6.
2. Insert the Translation Card into the TN777B Network Control circuit pack in the direction indicated by the arrow on the label.

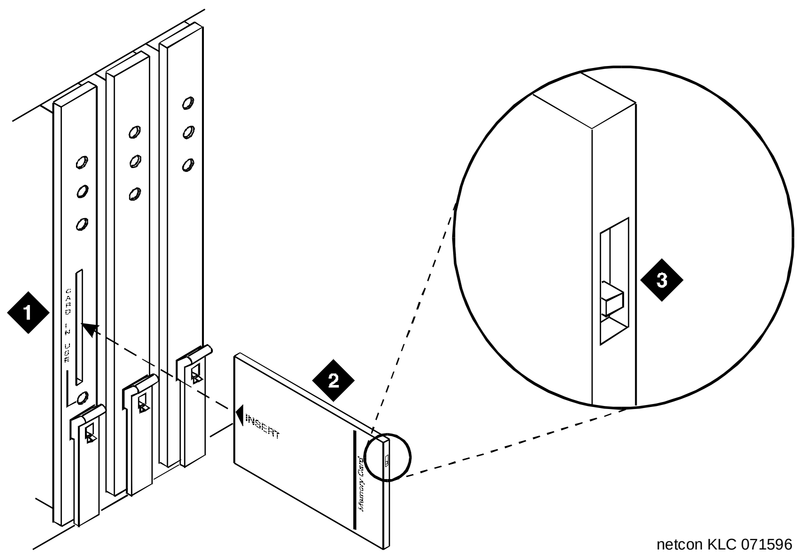


Figure Notes

1. Slot in TN777B Network Control Circuit Pack
2. Insert Card in Direction of Arrow
3. Write Switch Positioned Down

Figure 3-6. Write Switch on Translation Card

Power Up AC-Powered System

1. Set the associated circuit breakers on the AC power panel **ON**.

NOTE:
If the system is high or critical reliability, power-up the EPN cabinet first, then the PPN cabinet. *Always* power up the Control Cabinet *last*.

2. At the rear of each cabinet, set the circuit breaker to **ON**. Skip to "Verify Messages on Terminal".

This starts the system initialization and test. All red lights on the circuit packs go on and then off.

Power Up DC-Powered System

1. At the DC Battery Cabinet (if installed), set the circuit breaker to **ON**.
2. At the DC Power Cabinet, set the circuit breaker(s) on the associated rectifiers **ON**.

This starts the system initialization and test. Some red lights may be on but are turned off by other procedures in this chapter.

If the system is high or critical reliability, power-up the Expansion Port Network (EPN) first, then the Processor Port Network (PPN). *Always* power up the control cabinet *last*.

Verify Messages on Terminal

1. After several minutes, verify all tests pass. Screen 3-1 displays the screen contents of a typical Release 5r system with three memory circuit packs. The Release 5si + memory system screen will be similar.

If any of the terminal messages indicate a test has failed or if the message "`spe down mode`" is displayed, refer to *DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5r,* 555-230-105 or *DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5vs/si,* 555-204-105 to clear the trouble.

```
INTERNAL REGISTER TEST                 PASSED
LOOP DATA TEST                         PASSED
DUART TEST                             PASSED
ROM CHECKSUM TEST                      PASSED
CONTROL STATUS TEST                    PASSED
DCACHE TEST                            PASSED
ICACHE TEST                            PASSED
WRITE BUFFER TEST                      PASSED
BTO TEST                               PASSED
MEM CONFIG TEST                        PASSED
MEMORY FUNCTIONAL TEST                 PASSED
MEMORY MODULE A STUCK BIT TEST         PASSED
MEMORY MODULE A PARITY TEST            PASSED
MEMORY MODULE A BURST TEST             PASSED
MEMORY MODULE B STUCK BIT TEST         PASSED
MEMORY MODULE B PARITY TEST            PASSED
MEMORY MODULE B BURST TEST             PASSED
MEMORY MODULE C STUCK BIT TEST         PASSED
MEMORY MODULE C PARITY TEST            PASSED
MEMORY MODULE C BURST TEST             PASSED
VIRTUAL MEMORY TEST                    PASSED
EXCEPTION TEST                         PASSED
TIMER TEST                             PASSED
MTP TEST                               PASSED
SANITY TIMER TEST                      PASSED
ADDRESS MATCHER TEST                   PASSED
FLASH TEXT CHECKSUM TEST               PASSED
RAM DATA CHECKSUM TEST                 PASSED
RESET 4 (REBOOT PERFORMED)
```

Screen 3-1. Typical Startup Messages (Release 5r)

2. About two minutes after `REBOOT PERFORMED` is displayed, verify the screen displays:

   `Login:`

Screens and Commands

Screens

The system is administered using screens displayed on the terminal. The screens are used to add, change, display, list data, and to remove system and telephone features. To access a screen, enter a valid system command in response to the `command:` prompt.

Commands

System commands are standard words and phrases instructing the system to perform a specific function. The commands are arranged in a hierarchy of keywords; that is, enter one command to go to a different level. The commands contain three parts: ACTION, OBJECT, and QUALIFIER.

- ACTION is the first part of the command. When `command:` appears on the screen. The ACTION specifies the operation desired. Examples include **add, duplicate, change, remove, display, list,** and **save.**
- OBJECT is the second part of the command and specifies the particular object to be administered. Typical entries are **hunt-group, coverage path,** and **station.**
- QUALIFIER is the last part of the command. It is one or more words or digits used to further identify or complete the OBJECT. For example, *hunt group 15* or *station 3600*, where *15* and *3600* are qualifiers.

An example of the command line required to add a station with extension number *1234* is **add station 1234**. In this example, **add** is the ACTION, **station** is the OBJECT, and **1234** is the QUALIFIER. In the command line, spaces are required between the ACTION, OBJECT, and QUALIFIER.

To save time, enter enough letters for each part of the command to make it unique. For example, if you want to enter the command **change system-parameters country-options**, typing **cha sys coun** is acceptable. However, typing the entire command is always best.

NOTE:
The craft login may not be allowed to perform some of the steps needed to initialize the system. If access is denied to some of these procedures, contact your Lucent Technologies representative for assistance.

Getting Help

Use the HELP key for a list of options and the CANCEL key to back out of any command. Refer to *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, for detailed procedures.

Log in to the System

1. Verify the screen displays: `Login:`
2. Type **craft** and press ENTER.
3. Verify the screen displays: `password`:
4. Type **crftpw** and press ENTER. For security reasons, the password is not displayed as it is typed. The system verifies a valid login and password name were entered. If an invalid login or password name was entered, the screen displays:

   `login incorrect:`

   In this case, repeat the procedure using the correct login and matching password.

   If the system recognizes the login and password name, the screen displays the software version.
5. Verify the screen display is similar to:

   `Terminal Type (513, 715, 4410, 4425, VT220): [715]`
6. Type the number of the management terminal and press ENTER.
7. Verify the screen displays: `command`:

NOTE:
The following sections describe some of the procedures used to access and change certain options. These sections are not intended to replace or modify the instructions provided in *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Set Country Options

Certain country options need to be set to turn red failure indication LEDs off.

1. Verify the screen displays: `command:`
2. Type **change system-parameters country options** and press ENTER.

   A screen similar to Screen 3-2 is displayed on the terminal. The cursor is set on the `Companding Mode` line.

```
change system parameters country-options            Page   1  of  21
                   SYSTEM-PARAMETERS COUNTRY-OPTIONS

         Companding Mode: Mu-Law           Base Tone Generator Set: 1
     440Hz PBX-dial Tone? n              440Hz Secondary-dial Tone? n
       Digital Loss Plan: 1
  Analog Ringing Cadence: 1     Set Layer 1 timer T1 to 30 seconds? n
Analog Line Transmission: 1    Enhanced 84xx Display Character Set? n

TONE DETECTION PARAMETERS
         Tone Detection Mode: 5  Dial Tone Validation Timer (msec): 600
            Interdigit Pause: short
```

Screen 3-2. Typical System Parameters Country-Options Screen

3. The default companding mode is Mu-Law. If the country uses A-Law companding, type A-Law.
4. Press ENTER when this information is correct.

   Other items eventually need to be entered on this screen, but this is all that must be done to turn the red alarm LEDs off. Refer to Table 3-1 for a list of the country codes.

Table 3-1. Country Codes

Country	Code	Country	Code
USA	1	France	12
Australia	2	Germany	13
Japan	3	Czechoslovakia	14
Italy	4	Russia	15
The Netherlands	5	Argentina	16
Singapore	6	Greece	17
Mexico	7	China	18
Belgium	8	Hong Kong	19
Saudi Arabia	9	Thailand	20
United Kingdom	10	Macedonia	21
Spain	11		

5. If all red LEDs do not go off, reseat (unplug and reinsert) any *purple*-labeled circuit packs displaying red LEDs.

   CAUTION:
   *To avoid a disk crash, **never** reseat the DEFINITY AUDIX System without first shutting it down. Shut down the DEFINITY AUDIX System (and allow the disk to completely spin down) before unplugging the assembly. See "DEFINITY AUDIX System Power Procedures" on page 3-26 for the proper procedures.*

6. If the red LEDs still do not go off, refer to *DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5r,* 555-230-105 or *DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5vs/si,* 555-204-105.

   NOTE:
   Ignore the red alarm indication LED on the TN767 or TN464 DS1 circuit pack until after the DS1 circuit pack is administered. Alarms will appear in the Alarm Log when power is applied to the system before all equipment connecting to port circuit packs is installed. Normally, some alarms will be logged when power is applied to the system, but should be resolved quickly. If no equipment is connected to the port circuit packs, alarms associated with these ports can take up to four hours to log, but will clear automatically after all equipment is installed and operating correctly.

Change Craft Password

The password for the craft login *must be changed* by the installing technician to prevent unauthorized administration changes.

CAUTION:
After the password is changed, the new password must be safeguarded so no unauthorized administration changes can be made. This password MUST NOT BE REVEALED to the customer or to any unauthorized person.

Passwords are changed using the Change Password Screen. See Screen 3-3. To change the "craft" password, perform the following.

1. Verify the screen displays: `command:`
2. Type **change password craft.** Press ENTER.

.

```
change password craft                                           Page 1 of 1
                             PASSWORD ADMINISTRATION

   Password For Login Making Change:


   LOGIN BEING CHANGED
                       Login Name: craft
   LOGIN'S PASSWORD INFORMATION
                  Login's Password:
                  Reenter Login's Password:
```

Screen 3-3. Typical Change Password Screen

3. Verify the screen displays the Change Password Screen. The cursor is positioned on "`Password for Login Making Change:`"
4. Type the password assigned to the craft login (assigned as *crftpw* when system is shipped) and press ENTER. The cursor is positioned on "`Login's Password`:".
5. Enter new password. Valid passwords consist of a combination of from four to eleven alpha or numeric characters. At least one letter and one number must be used in each password.

6. Press ENTER. The cursor is positioned on "`Reenter Login's Password:`".
7. Type new password again and press ENTER.
8. Verify the screen displays:

   `command successfully completed`

   `command:`

Set Date and Time

1. Verify the screen displays `command:`
2. Type **set time** and press ENTER.
3. Verify the screen displays Set Date and Time Screen.

   The cursor is positioned on `Day of the Week:` field.

   .

```
set time                                                Page 1 of 1

                  DATE AND TIME

DATE

  Day of the Week: _________     Month: __________
  Day of the Month: __             Year: ____

TIME

              Hour: __           Second: xx
            Minute: __
```

Screen 3-4. Typical Date and Time Screen

4. Type the day of the week in English (Sunday through Saturday) and press TAB to move to next field. See Table 3-2 for English day of the week names.

Table 3-2. English Day of the Week Names

Day Number	Day Name
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

5. The cursor is positioned on the `Month:` field. Type the current month in English (January through December). See Table 3-3 for English month names. After the month is entered, press TAB to move to next field.

Table 3-3. English Month Names

Month Number	Month Name
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November
12	December

6. The cursor is positioned on the `Day of the Month:` field. Type the day of month (1 through 31) and press TAB to move to the next field.
7. The cursor is positioned on the `Year:` field. Type the current year and press TAB to move to the next field.

8. The cursor is positioned on the `Hour:` field. Type the current hour for a 24-hour clock. See Table 3-4. Press TAB to move to the next field.
9. The cursor is positioned on the `Minute:` field. Type current minute (0 through 59). Seconds cannot be set.
10. Press ENTER when the information is correct.

Table 3-4. Conversion to 24-Hour Clock

Standard Time		Standard Time	
12-Hour	**24-Hour**	**12-Hour**	**24-Hour**
12:00 midnight	0000	12:00 noon	1200
1:00 am	0100	1:00 pm	1300
2:00 am	0200	2:00 pm	1400
3:00 am	0300	3:00 pm	1500
4:00 am	0400	4:00 pm	1600
5:00 am	0500	5:00 pm	1700
6:00 am	0600	6:00 pm	1800
7:00 am	0700	7:00 pm	1900
8:00 am	0800	8:00 pm	2000
9:00 am	0900	9:00 pm	2100
10:00 am	1000	10:00 pm	2200
11:00 am	1100	11:00 pm	2300

11. Verify the screen displays:

    ```
    command successfully completed
    command:
    ```

12. Type **display time**, and press ENTER to verify date/time data.

Set System Maintenance Parameters

If the system does not contain a TN778 Packet Control circuit pack, skip this section and proceed to "Administer System Cabinet Configurations (Release 5r)".

1. Verify the terminal screen displays: `command:`
2. Type **change system-parameters maintenance** and press ENTER. Verify the screen displayed is similar to Screen 3-5. The screen shows default values and the cursor is positioned on `Product Identification:` line.

.

```
change system-parameters maintenance                 Page   1  of   2
                MAINTENANCE-RELATED SYSTEM PARAMETERS

OPERATIONS SUPPORT PARAMETERS
            Product Identification: 1000000000
        First OSS Telephone Number:                Abbrev Alarm Report? y
       Second OSS Telephone Number:                Abbrev Alarm Report? n
  Alarm Origination to OSS Numbers: neither
        Cleared Alarm Notification? n
              Restart Notification? n
           Test Remote Access Port? n
      CPE Alarm Notification Level: none

     Customer Access to INADS Port? n
       Repeat Dial Interval (mins): 7

  SCHEDULED MAINTENANCE
                       Start Time: 01 : 00              Stop Time: 06 : 00
                Daily Maintenance: daily         Save Translation: daily
  Control Channel Interchange: no        System Clocks Interchange: no
                  SPE Interchange: no
```

Screen 3-5. Typical Display System-Parameters Maintenance Screen (Page 1)

> **CAUTION:**
> *To prevent unnecessary trouble tickets, do not enable the system alarms (Alarm Origination feature) until all installation and administration procedures are completed.*

3. Move the cursor by pressing TAB to move down the screen from field to field and enter **y** in the `Packet Bus Activated?` field to indicate a TN778 circuit pack is installed. This is the only field needing change on this screen to turn the red LEDs off.
4. Press ENTER when the information is correct.

Administer System Cabinet Configurations (Release 5r)

If a Release 5si + memory is installed, skip to “Save Translations” on page 3-24.

Change Customer Options

The following features are part of the basic software package and do not need to be activated. They default to y (yes) on the Optional Features Form.

- Automatic Route Selection/Automatic Alternate Routing Partitioning
- Emergency Access to the Attendant
- Hospitality
- Service Observing

Use the following procedure to change the customer’s optional features.

1. At the `Command:` prompt, enter the **change system-parameters customer-options** command. A display similar to Screen 3-6 appears.

```
 change system-parameters customer-options                  Page   1 of   4
                                OPTIONAL FEATURES

              G3 Version: V5                 Maximum Ports:   14000

    Abbreviated Dialing Enhanced List? n                           CAS Main? y
 A/D Grp/Sys List Dialing Start at 01? n   Cvg Of Calls Redirected Off-net? n
Answer Supervision by Call Classifier? n                       DCS (Basic)? y
                                  ARS? y                  DCS Call Coverage? n
                    ARS/AAR Partitioning? n    Emergency Access to Attendant? y
                         ASAI Interface? n          Extended Cvg/Fwd Admin? n
       ASAI Proprietary Adjuncts Links? n       External Device Alarm Admin? n
                                  ATMS? n                  Flexible Billing? n
                 Audible Message Waiting? n    Forced Entry of Account Codes? n
                     Authorization Codes? n              Hospitality (Basic)? n
                             CAS Branch? n  Hopitality (G3V3 Enhancements)? n
                                            Hopitality Parameter Reduction? n


      (NOTE: You must logoff & login to effect the permission changes.)
```

Screen 3-6. Typical Customer-Options Form: Page 1 of 4

2. Find the *Customer Order* and enable the optional features purchased by the customer (as shown by PEC codes on the Customer Order).

   In Release 5 systems, a separate screen offers ASAI capability groups for selection in cases where the ASAI interface has been enabled. Change this screen in the same manner as Page 1 of the customer-options form.

Change and Logoff Critical Reliability System

If a critical reliability system is installed (one with both processor and PNC duplicated), follow these steps. Otherwise, continue to ‘‘Change Site-Data’’.

NOTE:
Be sure `PNC Duplication` was set to y in the customer-options form.

1. Issue the logoff command.
2. At the `login:` prompt, login in to the system as *craft*.

Change Site-Data

This form initializes the building, floor, and color data to make them available later in help messages that refer to site information.

1. At the `Command:` prompt, enter the **change site-data** command.

   The first of three pages of site data appears: See Screen 3-7.

```
display site-data                                                Page  1 of  3
                         SITE DATA USER DEFINITION
                          VALID BUILDING FIELDS

Denver
Middletown
Building30
Building22
Command abortedfully completed
Command:  ch cab 1
```

Screen 3-7. Typical Display Site-Data Form

2. Enter names for the buildings served by the system. The example shows buildings *Denver, Middletown, Building 30*, and *Building 22*.
3. Access the remaining site-data pages and fill them in appropriately.

Change Cabinet 1

1. Enter **change cabinet 1** at the `command:` prompt. A screen similar to Screen 3-8 appears.
2. Fill in the blanks as required by the location and nature of the cabinet. If the system is critical reliability, verify the `B` field is set to the processor option, the `D` field is set to the dup-sw-node option, and the `E` field is set to the switch-node option.

```
change cabinet 1                                          Page   1  of   1
                                   CABINET


CABINET DESCRIPTION
                    Cabinet: 1
             Cabinet Layout: five-carrier
               Cabinet Type: processor
     Number of Portnetworks: 1
                       Room:
                      Floor:
                   Building:

CARRIER  DESCRIPTION
   Carrier       Carrier Type        Number

     C           port                PN 01
     B           port                PN 01
     A           processor           PN 01
     X           fan
     D           port                PN 01
     E           switch-node         PN 01

not-used        port        switch-node
```

Screen 3-8. Typical Change Cabinet 1 Form

Add Cabinet 2 through N (Release 5r)

1. Enter **add cabinet 2** at the `command:` prompt. See Screen 3-9.
2. Fill in the blanks as required by the location and nature of the cabinet.

```
add cabinet 2                                                Page   1  of   1
                                  CABINET

CABINET DESCRIPTION
                 Cabinet: 2
          Cabinet Layout: five-carrier
            Cabinet Type: expansion-portnetwork
  Number of Portnetworks: 1
                    Room:
                   Floor:
                Building:

CARRIER  DESCRIPTION
  Carrier       Carrier Type       Number
     C          port
     B          port
     A          expansion-control
     X          fan
     D          not-used
     E          not-used

five-carrier
command:  add cab 2
```

Screen 3-9. Typical Add Cabinet 2 Form

Administer Fiber Link Configurations (Release 5r)

Administer system fiber link configurations to match the hardware installed according to the Running List. Refer to *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Reboot High Reliability System

1. Enter **reset system 4** at the `command:` prompt.
2. When the `login:` prompt appears, login as *craft*.
3. About eight minutes after booting and at the `command:` prompt, enter the **status spe** command.
4. Verify that `handshake`, `shadowing`, and `refreshed` are all shown to be either `yes` or `on`.

Enable Duplication and Boot Critical Reliability System (Release 5r)

1. Enter **change system-parameters duplication** at the `command:` prompt.
2. Make sure duplication of both SPE and PNC are enabled on the screen that follows the command. Confirm that a `y` is contained in both fields.
3. Enter **save translations** at the `command:` prompt.
4. Enter **reset system 4** at the `command:` prompt to reboot the system.
5. When `login:` appears on the screen, login as *craft*.
6. About eight minutes after booting the system and at the `command:` prompt, enter the **status spe** command.
7. Verify that `handshake, shadowing,` and `refreshed` are all shown to be either `yes` or `on`.

Save Translations

Save Translations (Release 5si)

The **save translation** command copies the current system translations onto the translation card. For standard reliability systems, one translation card plus one backup is required. For high or critical reliability systems, two translation cards plus two backups are required.

CAUTION:
Do not attempt to save translations on the orange-labeled, 10 MB memory card. Use the white translation card.

Use the following procedure to save system translations on the original card and to make a backup card:

1. At the `command:` prompt, enter **save translation** and press ENTER.
2. After several minutes, the SAVE TRANSLATION screen appears.
3. Verify a **0** is displayed in the Error Code column for each SPE. A **0** indicates the save translation was successfully completed. If not, the save translation did not complete. Record the "error code number" and the "error message" and notify your Lucent Technologies representative.
4. Remove the original card from the TN777B and replace with backup card.
5. Repeat Steps 1 through 4 for the backup card(s).
6. Remove the backup card and replace with the original card.
7. Label the backup card with the date and time of the backup and store in a secure place.

Save Translations (Release 5r)

The **save translation** command copies the current system translations onto both disks.

1. Enter the **save translation** command at the `command:` prompt.
2. Verify the save completes to both disks and returns a result code of 0 (zero).

Add Translations

1. Refer to *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, to add new terminals to the system.
2. Enter the **save translation** command at the `command:` prompt to merge these translations with the contents of disk or flash memory.
3. If a standard-reliability Release 5r system is installed, enter the backup disk `incremental` command. If a high or critical reliability Release 5r system is installed, enter the backup disk `incremental both` command at the `command:` prompt.

Installation Completion

After the system is activated, it must be tested for proper operation. See Chapter 4, "Test the System".

After completion of the system tests, the telephones and other equipment must be installed. See Chapter 5, "Install and Wire Telephones and Other Equipment".

The system is then administered by adding the customer data to match the wiring, telephones, and other equipment. See *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

After the system is administered , the telephones and other equipment are tested. See Chapter 6, "Test Telephones and Other Equipment". The Alarm Origination feature is then activated and tested.

Logoff the System

Log off the system to prevent unauthorized changes to data. To log off:

1. Enter **logoff** at the `command:` prompt.
2. The `login:` prompt appears on the screen.

DEFINITY AUDIX System Power Procedures

Manually Power Down AUDIX System

A yellow caution sticker on the system's power unit notifies technicians to shut down the DEFINITY AUDIX System prior to powering down the system.

1. Using a pointed object, such as a paper clip or pen (do not use a pencil), press the Boot/Shutdown button. The button is located at the top right portion of the front panel.
2. Hold the Boot/Shutdown button in until the LCD display flashes the message `MSHUT`.
3. Release Boot/Shutdown button.

NOTE:
The DEFINITY AUDIX System takes about five minutes to shut down. The "heartbeat" indication on the display continues to flash.

Manually Power Up AUDIX System

1. Using a pointed object such as a paper clip or a pen (do not use a pencil), press the Boot/Shutdown button.
2. Hold the Boot/Shutdown button in until the display indicates the message, `BTEST`, steady on.
3. Release the Boot/Shutdown button. The DEFINITY AUDIX System takes approximately five minutes to power up.
   - The display has the following sequence of steady on messages:
     - `OSINIT`
     - `OS`
     - `AINIT`
     - `ADX`
   - The DEFINITY AUDIX System is now powered up. When the system is in the active state, the display indicates `ADX`, and the red LED is off.

NOTE:
Upon the system powering up, the DEFINITY AUDIX System automatically reboots. This sequence may show an `MD` or `MJ ADX` alarm in the display until the system has powered up. When the system has completed its power up sequence, the DEFINITY AUDIX System display reads: `ADX`.

Test the System

4

The following tests provide verification of the TDM bus cables and terminators, and fiber optic inter-cabinet cables (ICC). If a FAIL result code is seen or other problems are indicated, check these cables. If problems continue, refer to *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5r,* 555-230-105 or *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5vs/si,* 555-204-105.

NOTE:
Refer to "LED Indicators" on page 4-17 for information regarding the LED status indicators for the different circuit packs.

1. The status of the system should be reviewed first.
2. Test the tone-clock, TDM bus, and duplication link in the Processor Port Network (PPN).
3. Test the Switch Node carrier (Release 5r only).
4. Test Expansion Interface circuit packs, tone-clock circuit packs, TDM buses, and duplication in the Expansion Port Networks (EPNs).

Circuit pack positions are usually given by cabinet, carrier, and slot. They may also be given by port.

The term "*cabinet*" refers to one Multi-Carrier Cabinet making up one port network. A port network is defined as a group of cabinets connected together with one TDM bus.

Check System Status for Each Cabinet

1. Verify the terminal screen displays: `command:`
2. Type **status system all-cabinets** and press ENTER.
3. Verify the screen displays system status screens similar to Screen 4-1.

```
status system all-cabinets                               Page   1 of   3   SPE A
                            SYSTEM STATUS CABINET 1

                            SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
 SPE  MODE                  SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
 1A   active                 auto     1    0       1A     in     standby standby
 1B   maint/init             auto     1    0       1B     in     active  active

     SERVICE   CONTROL  DEDICATED         SERVICE  BUS ALARMS    BUS   OPEN BUS
 TDM  STATE    CHANNEL    TONES      PKT   STATE  MAJOR MINOR   FAULTS  LEADS
 1A    in         y         n        1
 1B    in         n         y

 EMERGENCY     SELECT                    SERVICE              CABINET
 TRANSFER      SWITCH      EXP-LINK      STATE     MODE       TYPE
 1A            auto-on     01A01-02A01    in       standby    MCC
 1B            auto-on     01B01-02B02    in       active
```

Screen 4-1. Example System Status Screen for Cabinet 1

The following notes pertain to Screen 4-1, Screen 4-2, and Screen 4-3.

NOTE:
In the first section of the report, all Tone-Clocks should report a `SERVICE STATE` of `in`.

In the second section of the report, all TDM buses should report a `SERVICE STATE` of `in`.

In the third section of the report, all expansion links should report a `SERVICE STATE` of `in`, and, under `EXP-LINK`, the cabinet/carrier/slot numbers for the fiber optic cables are listed. For example, `01A01` in Screen 4-1 refers to cabinet 01, carrier A, and slot 01.

Refer to *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5r,* 555-230-105 for a detailed interpretation of this screen.

```
status system all-cabinets                               Page   2 of   3   SPE A
                            SYSTEM STATUS CABINET 2

                            SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
SPE  MODE                   SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
1A   active                  auto     1    0       2A     in     active  active
1B   maint/init              auto     1    0       2B     in     standby standby

    SERVICE   CONTROL  DEDICATED         SERVICE  BUS ALARMS    BUS   OPEN BUS
TDM  STATE    CHANNEL    TONES      PKT   STATE  MAJOR MINOR   FAULTS  LEADS
2A    in        y          n        2
2B    in        n          y

EMERGENCY     SELECT                   SERVICE                CABINET
TRANSFER      SWITCH      EXP-LINK     STATE     MODE         TYPE
2A            auto-on     01A01-02A01   in       standby      MCC
                          01B01-02B02   in       active
```

Screen 4-2. Example System Status Screen for Cabinet 2

NOTE:
See the notes associated with Screen 4-1 on the previous page.

```
status system all-cabinets                                Page   3 of   3   SPE A
SYSTEM STATUS CABINET 3

                           SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
SPE  MODE                  SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
1A   active                 auto     1    0       3A
1B   maint/init             auto     1    0       3B

    SERVICE   CONTROL  DEDICATED         SERVICE  BUS ALARMS    BUS   OPEN BUS
TDM  STATE    CHANNEL    TONES      PKT   STATE  MAJOR MINOR   FAULTS  LEADS
3A
3B

EMERGENCY     SELECT                      SERVICE              CABINET
TRANSFER      SWITCH      EXP-LINK       STATE     MODE       TYPE
3A                             -
```

Screen 4-3. Example System Status Screen for Cabinet 3

NOTE:
In the example of Screen 4-3, cabinet 3 (the second EPN) is not connected to the system.

Check Circuit Pack Configuration

1. Verify the screen displays: `command:`
2. Type **list configuration all** and press ENTER.
3. Verify the screen displays list configuration screens similar to the example shown below. Check the report on the screen with the equipment installed and make sure the software is communicating with each circuit pack (except power supply circuit packs). Wait until after the diagnostic tests later in this chapter before attempting to correct any problems.
4. Note any circuit packs in the `VINTAGE` column stating: `BOARD NOT PRESENT` or `CONFLICT`.

.

```
list configuration all                                          Page   1   SPE B

                              SYSTEM CONFIGURATION

Board                                                      Assigned Ports
Number   Board Type              Code     Vintage    u=unassigned t=tti

01A01    EXPANSION INTRFC         TN570B  000001
01A03    DID TRUNK                TN459   000004     u  u  u  u  u  u  u  u
01A04    DID TRUNK                TN436   000004     u  u  u  u  u  u  u  u
01A07    TIE TRUNK                TN439   000004     u  u  u  u
01A09    ANNOUNCEMENT             TN750   000007     01 02 03 04 05 06 07 08
                                                     09 10 11 12 13 14 15 16
01B01    EXPANSION INTRFC         TN570   000009
01B02    TONE DETECTOR            TN748D  000002     01 02 03    05 06 07
01B03    DATA LINE                TN726   000012     u  u  u  u  u  u  u  u
01B08    BRI LINE                 TN556B  000003     u  u  u  u  u  u  u  u
                                                     u  u  u  u  u  u  u  u
                                                     u  u  u  u  u  u  u  u
01C01    ANALOG LINE              TN746B  000006     u  u  u  u  u  u  u  u
                                                     u  u  u  u  u  u  u  u

                press CANCEL to quit --  press NEXT PAGE to continue
```

Screen 4-4. Example System Configuration Screen — Page 1

NOTE:
Under `Assigned Ports`, a “u” indicates unassigned ports and a number indicates the port has been translated.

Test TDM Bus in PPN

1. Verify the screen displays: `command:`
2. Type **test tdm port-network 1** and press ENTER.
3. Verify the screen displays the results similar to Screen 4-5.

```
test tdm port-network 1                                                  SPE B

                                  TEST RESULTS

   Port      Maintenance Name  Alt. Name Test No. Result            Error Code

   PN 01A    TDM-BUS                     294      PASS
   PN 01A    TDM-BUS                     296      PASS
   PN 01A    TDM-BUS                     297      ABORT             1005
   PN 01B    TDM-BUS                     294      PASS
   PN 01B    TDM-BUS                     296      ABORT             1005
   PN 01B    TDM-BUS                     297      PASS

 Command successfully completed

 Command:
```

Screen 4-5. Example Test Results for TDM Port Network 1

4. If the result is `FAIL` for any test, check the connectors of the TDM bus cables in PPN 1.

Test Tone-Clock Circuit Packs

This test also detects problems with the TDM bus cables.

1. Verify the screen displays: `command:`
2. Type **test tone-clock 1a** and press ENTER.
3. Verify the screen displays test results similar to Screen 4-6.

```
test tone-clock 1a                                                          SPE A

                                  TEST RESULTS

   Port      Maintenance Name  Alt. Name Test No. Result            Error Code

   01A       TONE-BD                     46       PASS
   01A       TONE-BD                     52       PASS
   01AXX01   ETR-PT                      42       PASS
   01AXX01   ETR-PT                      43       PASS
   01AXX02   ETR-PT                      42       PASS
   01AXX02   ETR-PT                      43       PASS
   01AXX03   ETR-PT                      42       PASS
   01AXX03   ETR-PT                      43       PASS
   01AXX04   ETR-PT                      42       PASS
   01AXX04   ETR-PT                      43       PASS
   01AXX05   ETR-PT                      42       PASS
   01AXX05   ETR-PT                      43       PASS
   01AXX06   ETR-PT                      42       PASS
   01AXX06   ETR-PT                      43       PASS

 Command successfully completed

 Command:
```

Screen 4-6. Example Test Results for Tone-Clock 1A

Test Switch Processing Element Duplication Memory Shadowing Link

For high and critical reliability systems only.

1. Verify the screen displays: `command:`
2. Type **test shadow-link** and press ENTER.
3. Verify the screen displays test results similar to Screen 4-7.

```
                              TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result            Error Code

            SHDW-LNK                    318      PASS

Command successfully completed
```

Screen 4-7. Example Test Results for Switch Processing Element Duplication Memory Shadowing Link

4. If result is `FAIL` for any test, check the Inter-Cabinet Cables (ICC) in the PPN.

Test Duplicated Switch Processing Element Interchange

For high and critical reliability systems only.

1. Verify the screen displays: `command:`
2. Type **status system all-cabinets** and press ENTER.
3. Verify the screen displays test results similar to Screen 4-8.

```
status system all-cabinets                                                      SPE A
                           SYSTEM STATUS CABINET 1

                           SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
SPE  MODE                  SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
1A   active                 auto     1    0       1A     in     standby standby
1B   maint/init             auto     1    0       1B     in     active  active

    SERVICE   CONTROL  DEDICATED         SERVICE  BUS ALARMS    BUS   OPEN BUS
TDM  STATE    CHANNEL    TONES      PKT   STATE  MAJOR MINOR   FAULTS  LEADS
1A    in         y          n       1
1B    in         n          y

EMERGENCY     SELECT                    SERVICE              CABINET
TRANSFER      SWITCH      EXP-LINK      STATE     MODE       TYPE
1A            auto-on     01A01-02A01    in       standby    MCC
1B            auto-on     01B01-02B02    in       active
                               -
                               -

Command successfully completed

Command:
```

Screen 4-8. Example System Status Report for All Cabinets

4. Note the `MODE` of `SPE 1A` and `1B`.
5. Type **refresh spe** and press ENTER.

   `Command successfully completed` should be displayed.
6. Type **reset system interchange** and press ENTER. This causes the terminal to log off.
7. Log in as *craft* again. Remember to use the new password established for craft.
8. Type **status system cabinets-all** and press ENTER.
9. A screen similar to Screen 4-9 should be displayed.

```
- status system all-cabinets                                                    SPE B
                           SYSTEM STATUS CABINET 1

                           SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
SPE  MODE                  SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
1A   standby                auto     1    0       1A     in     standby standby
1B   active                 auto     1    0       1B     in     active  active

    SERVICE   CONTROL  DEDICATED         SERVICE  BUS ALARMS    BUS   OPEN BUS
TDM  STATE    CHANNEL    TONES      PKT   STATE  MAJOR MINOR   FAULTS  LEADS
1A    in         y          n        1
1B    in         n          y

EMERGENCY     SELECT                     SERVICE              CABINET
TRANSFER      SWITCH      EXP-LINK       STATE     MODE       TYPE
1A            unavail     01A01-02A01     in       standby    MCC
1B            auto-on     01B01-02B02     in       active

                            -
```

Screen 4-9. Example System Status Report for All Cabinets after Reset

10. Note the `MODE` for `SPE 1A` and `1B` should have changed from that noted in Step 4.

Test Expansion Interface Circuit Packs

1. Verify the screen displays: `command:`
2. Type **test board xxx** where **xxx** is the cabinet, carrier, and slot for an expansion interface board in the system, and press ENTER. Labels on the port network and carrier containing the board and the label on the strip under the board contain this information.

   NOTE:
   Circuit pack positions are usually given by cabinet, carrier (within cabinet), and slot (within carrier). They may also be given by port (within slot). The term “cabinet” refers to one Multi-Carrier Cabinet making up one port network. A port network is defined as a group of cabinets connected together with one Time Division Multiplexing (TDM) bus.

3. Verify the screen displays test results similar to Screen 4-10. This example is for board 2a01.

```
                              TEST RESULTS

Port      Maintenance Name  Alt. Name Test No. Result            Error Code

02A01     EXP-INTF                    237      PASS
02A01     EXP-INTF                    238      PASS
02A01     EXP-INTF                    240      PASS
02A01     EXP-INTF                    241      PASS
02A01     EXP-INTF                    244      PASS
02A01     EXP-INTF                    316      PASS
```

Screen 4-10. Example Test Results for Expansion Interface Board 2A01

4. If any result is FAIL, check the connections for the associated fiber optic link.
5. Repeat Steps 2 and 3 for each Expansion Interface circuit pack in the system.

Test TDM for each EPN

1. Verify the screen displays: `command:`
2. Type **test tdm port-network 2** and press ENTER.
3. Verify a test results screen similar to Screen 4-11 is displayed.

```
test tdm port-network 2                                                       SPE B

                                  TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result            Error Code

  PN 02A    TDM-BUS                     294      PASS
  PN 02A    TDM-BUS                     296      PASS
  PN 02A    TDM-BUS                     297      ABORT             1005
  PN 02B    TDM-BUS                     294      PASS
  PN 02B    TDM-BUS                     296      ABORT             1005
  PN 02B    TDM-BUS                     297      PASS

 Command successfully completed

 Command:
```

Screen 4-11. Example Test Results for TDM Port Network 2

4. If result is `FAIL` for any test, check the connectors of the TDM bus cables in PPN 2.
5. Repeat these steps for each EPN to check the TDM bus cables.

Test Tone-Clock for each EPN

1. Verify the screen displays: `command:`
2. Type **test tone-clock 2A** where **2A** is the cabinet and carrier number for one of the Tone-Clocks installed, and press ENTER.

   NOTE:
   Circuit pack positions are usually given by cabinet, carrier, and slot. They may also be given by port. The term “cabinet” refers to one Multi-Carrier Cabinet making up one Port Network. A Port Network is defined as a group of cabinets connected together with one Time Division Multiplexing (TDM) bus.

   If any result is `FAIL`, check the associated TDM bus cables and intercabinet cables in the Expansion Port Network.
3. Repeat Step 2 for each installed Tone-Clock circuit pack.

Test Tone-Clock Interchange for each EPN

Critical reliability only.

1. Verify the screen displays: `command:`
2. Type **status system all-cabinets** and press ENTER. This displays the location of the Standby Tone-Clock.
3. Type **set tone-clock xx** where **xx** is the Port Network/carrier for the Standby Tone-Clock. Press enter.
4. Type **status system all-cabinets** and press ENTER.
5. Verify the duplicated Tone-Clock is active using the information displayed on the screen.

   If any problems are indicated, check the TDM cables in the associated EPN.

Test Expansion Interface Exchange for Each EPN

Critical reliability only.

1. Verify the screen displays: `command:`
2. Type **status system all-cabinets** and press ENTER. This displays the standby expansion link (before changes are made). See Screen 4-12.

```
status system all-cabinets                                                  SPE B
                          SYSTEM STATUS CABINET 1

EMERGENCY     SELECT                    SERVICE                CABINET
TRANSFER      SWITCH      EXP-LINK      STATE     MODE         TYPE
1A            unavail     01A01-02A01    in       standby      MCC
1B            auto-on     01B01-02B02    in       active
                               -
                               -
Command successfully completed

Command:
```

Screen 4-12. Example of System Status Before Expansion Link is Set

3. Type **set expansion-link xxxx** where **xxxx** is the either one of the cabinet, carrier, and port locations of the standby expansion link.
4. Verify the screen displays:

   `Command successfully completed`

   `Command:`
5. Type **status system all-cabinets** and press ENTER. See Screen 4-13.

```
status system all-cabinets                                                   SPE B
                               SYSTEM STATUS CABINET 1

 EMERGENCY     SELECT                        SERVICE                CABINET
 TRANSFER      SWITCH      EXP-LINK          STATE     MODE         TYPE
 1A            auto-on     01A01-02A01        in       active       MCC
 1B            auto-on     01B01-02B02        in       standby
```

Screen 4-13. Example of System Status after Expansion Link is Set

6. Verify the `MODE`s of the expansion links have changed.
7. If any problems are indicated, check the TDM cables and the Inter-Cabinet Cables (ICC) in the associated EPN.

Check Circuit Pack Configuration Again

1. Verify the screen displays: `command:`
2. Type **list configuration all** and press ENTER.
3. Verify all circuit packs installed in the system are listed in the reports. Refer to *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5r,* 555-230-105, to resolve any discrepancies.

System Test Completion

Save Translations

If any administration changes have been made, save and make a back up copy of the translations.

Next Steps

After the basic hardware is installed and tested, three more steps must be completed:

1. Install the telephones and other equipment. See Chapter 5, "Install and Wire Telephones and Other Equipment".
2. Administer the features, telephones, and other equipment according to customer data on the provisioning plan. The data for system and telephone features can be administered using *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.
3. After the system is administered, test the telephones and other equipment using the procedures in Chapter 6, "Test Telephones and Other Equipment".

NOTE:
It may be more efficient to install each hardware component, administer it, and test it before going on to install another component. As an example, install the attendant console using the procedures in Chapter 5, "Install and Wire Telephones and Other Equipment", administer it using the procedures in *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, and test it using the procedures in Chapter 6, "Test Telephones and Other Equipment".

LED Indicators

If a maintenance object begins to fail some periodic tests, the system generates an alarm. The system identifies three levels of alarms:

- Major Alarms — Failures that cause critical degradation of service and require immediate attention.
- Minor Alarms — Failures that cause some degradation of service, but do not cause a critical portion of the system to be inoperable. This condition requires action, but its consequences are not immediate. Problems might be impaired service to a few trunks or stations or interfering with one feature across the entire system.
- Warning Alarms — Failures that cause no significant degradation of service or failures in equipment external to the system. Warning alarms are not reported to the attendant console or INADS.

Alarms are communicated to the system users and technicians by entries in the alarm log and the lighting of LEDs located on the attendant console, on all circuit packs, and, optionally, on customer-designated voice terminals.

Attendant Console LEDs

The console has two red LEDs, labeled "ALM" and "ACK". The ALM LED lights steadily when there is a major or minor alarm at the system cabinet. The ACK LED lights steadily if the alarm has been successfully reported to INADS. If the system is unable to report the alarm to INADS, the LED flashes; this signals the attendant to call INADS and report the alarm.

Tone-Clock Circuit Pack LEDs

The Tone-Clock circuit packs have the standard red, green and yellow LEDs. The red LED indicates an alarm condition. The yellow and green LEDs flash in specific patterns to indicate the status of the circuit pack.

The standby status applies only to systems with a duplication option, (High Reliability and Critical Reliability).

Terminal Alarm Notification

Terminal Alarm Notification is an optional feature that displays several types of alarms on voice terminals with administered feature buttons or the attendant console. A maximum of ten digital and/or hybrid voice terminals may be used.

When an alarm occurs, the green status LED associated with the assigned button is in a steady state. The LED may be turned off by pressing the button associated with the LED. If the LED is off and the alarm has not been resolved by the time maintenance reschedules testing, the green status LED resumes its steady state. See Table 4-1.

Table 4-1. Terminal Alarm Notifications LEDs

Alarm Name	Description
ac-alarm	Administered Connection alarm: a locally administered connection has a major, minor, or warning alarm active.
pr-awu-alm	Auto Wakeup Journal Printer alarm: the automatic wakeup journal printer has a major, minor, or warning alarm active.
ds1-alarm	DS1 Facility alarm: a DS1-BD has an off-board major, minor, or warning alarm active.
trk-ac-alm	Facility Access alarm: The facility access trunk test feature is activated.
major-alrm	The system has logged a major alarm.
mj/mn-alrm	The system has logged a major or minor alarm.
pr-pms-alm	The Property Management System printer has a major, minor, or warning alarm active.
rs-alert	Reset-Alert: **reset system 2** or **3** has been performed.
cdr1-alrm	Call Detail Recording alarm: The primary CDR link has a major, minor, or warning alarm active.
cdr2-alrm	Call Detail Recording alarm: The secondary link has a major, minor, or warning alarm active.
pr-sys-alm	The System Printer (SYS-PRNT) has a major, minor, or warning alarm active.
pms-alarm	The Property Management System has a major, minor or warning alarm active.

Circuit Pack LEDs

Typically, each circuit pack has three LEDs on the front panel. Table 4-2 describes the red, green, and yellow LEDs and their meaning. Exceptions are explained in subsequent sections. Also see Figure 4-1.

Table 4-2. Circuit Pack LEDs

LED Color	Status	Description
Red	Alarm	The system has detected a fault in this circuit pack. The alarm log should contain an on-board alarm or one of the maintenance objects associated with it. The red LED is also lit briefly when a circuit pack is inserted or reset. If the circuit pack passes its initialization tests, the LED goes out. If a fault is detected, it remains lit.
Green	Testing	The system is currently running tests on this circuit pack as part of background maintenance or demand testing. This LED is also lit briefly during initialization tests when a circuit pack is inserted or reset.
Yellow	Busy	The circuit pack is currently in use by the system.

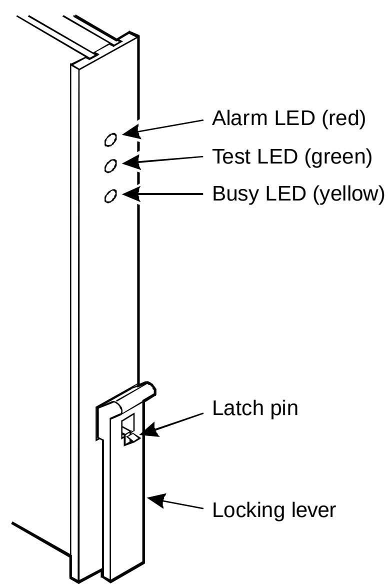


Figure 4-1. Circuit Pack LEDs

LED Alarms without Alarm Log Entry or with Error Type 1

When the system or a part of the system is reset, all affected circuit packs briefly light the red and green LEDs as they are initialized. Upon power-up of a newly installed system, several alarm indicators may remain lit until the circuit packs are administered. Ignore these alarms until administration is completed.

During routine or demand testing of Mass Storage System components, the red, green and yellow LEDs on the MSSNET, TAPE, and DISK circuit packs all light temporarily. This is normal and does not indicate a problem.

After a circuit pack has been initialized, a lit red LED should be accompanied by an alarm in the alarm log. A single fault can sometimes light alarm LEDs on several circuit packs, as in the following examples:

- A TDM bus problem may cause several port circuit packs to display red LEDs.
- An EPN Maintenance circuit pack can prevent an Expansion Interface circuit pack from initializing.
- Extensive interactions in the Center Stage Switch can cause multiple alarms from single faults in DS1 Converter, SNI and SNC circuit packs and fiber links.
- Tone/clock problems may cause other circuit packs to report alarms.
- Misconnected optical fiber cables may cause several circuit packs to alarm.
- Packet bus faults can cause several port circuit packs to display red LEDs.
- Inspect the backplane connectors for bent pins.
- If the system seems to be functioning correctly, but the circuit pack in question is not communicating with the system, replace the circuit pack.

Expansion Interface Circuit Pack LEDs

The TN570 Expansion Interface (EI) circuit pack has the standard red, green and yellow LEDs. The red LED indicates an alarm condition and the green LED indicates testing in progress.

The yellow LED displays various flashing patterns to provide status information useful in isolating faults in the fiber link and other components connected to the fiber link. Table 4-3 describes the EI yellow LED states.

Table 4-3. Expansion Interface Yellow LED Flashing Codes

LED on	LED off	Condition
0.1 second	0.1 second	Fiber Out-of-Frame: may be caused by absence of the opposite end EI or SNI, a defective or missing fiber, or defective lightwave transceiver on either endpoint.
0.5 second	0.5 second	In Frame — No Neighbor: usually due to a failure of this EI, or of the EI or SNI at the other end of the fiber.
2 second	0.2 second	Expansion Interface active: this is the normal state of an active EI that is an archangel of an EPN.
solid on		Expansion Interface active: this is the normal state for an active EI that is not an EPN archangel. These include EPN EIs connected to other EPN EIs in direct connect configurations, and EIs located in the PPN.
	solid off	Expansion Interface standby: this is the normal state for a standby EI in systems with a duplication option.

Maintenance Circuit Pack LEDs

TN1648 System Access-Maintenance (SYSAM) and TN775 EPN Maintenance circuit packs have seven LEDs on the front panels. The top three LEDs are the standard group of red, green and yellow, and indicate the status of the circuit pack. The green LED on the TN775 blinks faintly once per second, indicating continual self-testing.

The second group of three LEDs, labeled "ALARMS", reflect maintenance conditions throughout the system, and indicate alarms reported against other components. On systems with duplicated SPEs, disregard the major, minor, and warning alarm LEDs on the standby SYSAM circuit pack. Only those on the active SYSAM are updated with the current system status. The yellow LED that is third from the top indicates which SYSAM is active. See Table 4-4 on page 4-22 and Figure 4-2 on page 4-22.

Table 4-4. Maintenance Circuit Pack LEDs

Alarm	Description
Major (red) flashing	Major alarm against a component in the same cabinet, (PPN for SYSAM, and EPN for MAINT)
Major (red) solid	Major alarm against a component in another cabinet in the system
Minor (red) flashing	Minor alarm against a component in the same cabinet
Minor (red) solid	Minor alarm against a component in another cabinet
Wrng (yellow) flashing	Warning alarm against a component in the same cabinet
Wrng (yellow) solid	Warning alarm against a component in another cabinet
ACK (green) on	Acknowledged; alarm has been reported to INADS
EMERGENCY TRANSFER (red) on	Emergency transfer has been invoked. This occurs upon power-up as well as during disabling failures

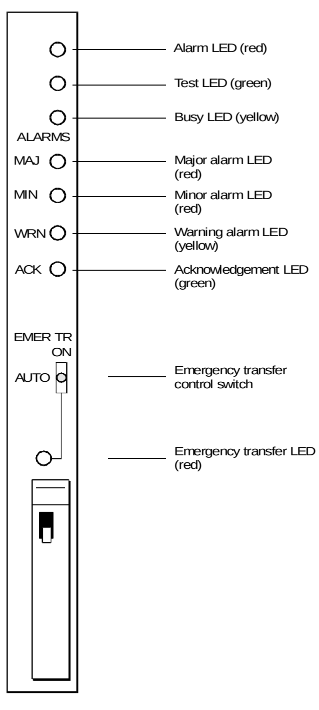


Figure 4-2. SYSAM and EPN Maintenance Circuit Pack LEDs

Duplication Interface Circuit Pack LEDs

In systems with duplicated SPEs, (High Reliability and Critical Reliability), there are two UN330B Duplication Interface circuit packs. One is located in carrier A and one in carrier B of the PPN. Each circuit pack has four LEDs. The top three have the traditional function of indicating the status of the circuit pack.

The LED located at the bottom of the faceplate directly beneath the SPE Select switch is labeled OVERRIDE. Under normal operating conditions, this switch is in the AUTO (center) position, and the OVERRIDE LED remains off. This means the system controls which SPE is active. System selection of the active SPE can be manually overridden by moving the SPE Select switches to either the "A" position or the "B" position on both Duplication Interface circuit packs. The red OVERRIDE LEDs on both Duplication Interface circuit packs light steadily to indicate one SPE is locked Active and the system is not duplicated. If both SPE Select switches are not in the same position, the system software retains control of Active SPE selection, and the OVERRIDE LED remains off. When control of the SPE selection is returned to the system by returning the SPE Select switches on both Duplication Interface circuit packs to the AUTO position, the OVERRIDE LED goes off. Forced SPE selection should be undertaken only after consulting *DEFINITY Enterprise Communications Server Release 5 Maintenance for R5r,* 555-230-105.

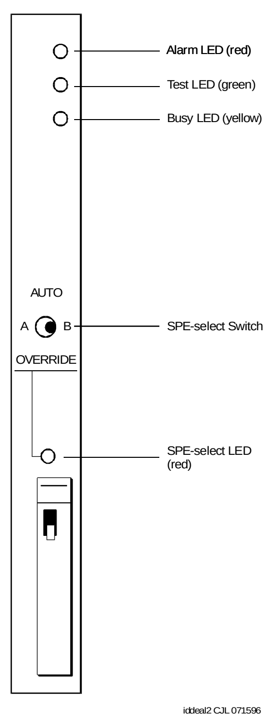


Figure 4-3. Duplication Interface Circuit Pack LEDs

Switch Node Interface LEDs

The TN573 Switch Node Interface (SNI) circuit pack has the standard red, green and yellow LEDs. The red LED indicates an alarm condition and the green LED indicates testing in progress.

The yellow LED displays various flashing patterns to provide status information useful in isolating faults in the fiber link and other components connected to the fiber link. Table 4-5 describes the SNI yellow LED states.

Table 4-5. Switch Node Interface Yellow LED Flashing States

LED on	LED off	Condition
0.1 second	0.1 second	Fiber Out-of-Frame: may be caused by absence of the opposite end EI or SNI, a broken or missing fiber, or a missing lightwave transceiver on either endpoint.
0.5 second	0.5 second	In Frame — No Neighbor: usually due to a failure of this SNI, or the EI or SNI at the opposite of the fiber. This condition may also be due to a faulty Switch Node clock.
solid on		SNI Active This is the normal state for an active SNI.
	solid off	SNI Standby This is the normal state for a standby SNI in systems with a duplication option.

DS1 Converter Circuit Pack LEDs

Eleven LEDs provide an indication of the state of the TN1654 DS1 Converter circuit pack and the T1/E1 facilities. The top group has the standard red, green and yellow LEDs. The red LED indicates an alarm condition and the green LED indicates testing in progress. The four SPAN LEDs indicate the status of the T1/E1 facilities. The four STATUS LEDs are currently unused and remain off.

The yellow LED is used to indicate the state of the fiber interface, the fiber channel, and the control channel, and the communications link to the SPE in the following manner and order of priority. See Table 4-6.

Table 4-6. DS1 Converter Yellow LED Flashing States

LED on	LED off	Condition
0.1 second	0.1 second	Fiber out-of-frame or fiber loss of signal
0.5 second	0.5 second	In frame, fiber channel down. The fiber channel communicating between the DS1 Converter and the other fiber endpoint (EI or SNI) is down.
1 second	1 second	In frame, control channel down. The control channel between the two DS1 Converters in the DS1 Converter complex is down.
2 second	0.2 second	No response from SPE. The SPE is not acknowledging messages from the DS1 Converter or the communications link to the SPE is down.
solid on		DS1 Converter active. This is the normal state for an active DS1 Converter.
	solid off	DS1 Converter standby. This is the normal state for a standby DS1 Converter in critical reliability systems (duplicated PNC).

SPAN LEDs

The four SPAN LEDs indicate the status of the four T1/E1 facilities. A SPAN LED is in one of the following states:

1. Solid on yellow: Facility is operational and alarm free.
2. Blinking yellow for 2 seconds, off 0.1 seconds: Facility is operational and alarm free AND is carrying the control channel (facility A or B only).
3. Solid on red: Facility is alarmed.
4. Solid off: Facility is not administered or has been busied out.

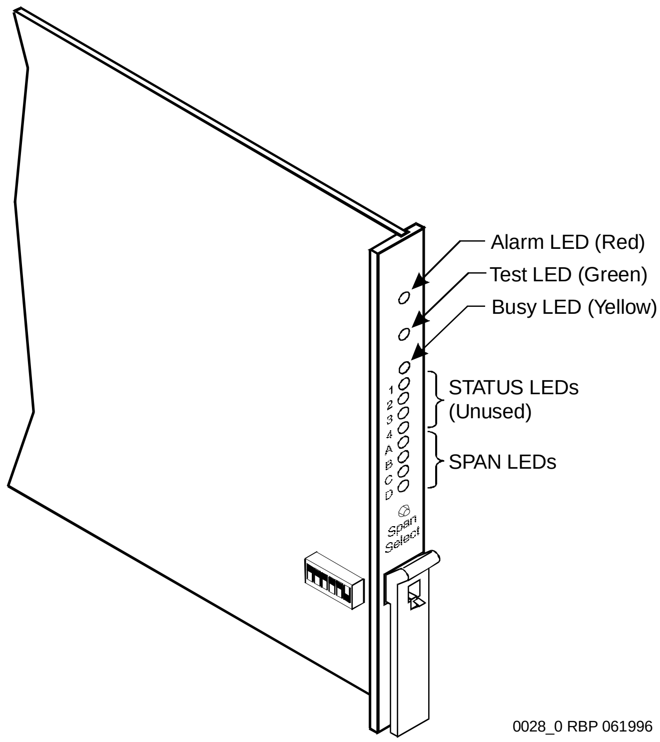


Figure 4-4. TN1654 DS1 Converter Circuit Pack LEDs

Maintenance/Test Circuit Pack LEDs

The TN771D Maintenance/Test circuit pack has the standard red, green, and yellow LEDs. The red LED indicates an alarm condition and the green LED indicates testing in progress.

The yellow LED can be off, on continuously, or flashing depending on the mode of operation and whether it has detected errors. The yellow LED is on steady when the TN771's analog test port or digital test ports are being used to test trunks or line circuits. The yellow LED is also used to indicate packet bus status. Table 4-7 describes the yellow LED states as they apply to packet bus activity.

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Table 4-7. TN771 Maintenance/Test Yellow LED States

LED State	Mode	Condition
Solid off	Normal	The circuit pack detects no packet bus faults.
Solid on[1]	Normal	The Packet bus port has successfully reconfigured the packet bus around a fault.
Flashing (1 Hz)	Normal	The packet bus port is unable to reconfigure the packet bus around a fault.
Solid off	Stand-alone[2]	The circuit pack detects no packet bus faults.
Flashing (1 Hz)	Stand-alone	The packet bus port detects a packet bus fault.

1. Because the yellow LED on the Maintenance/Test circuit pack can also be on steady when the digital and analog test ports on the circuit pack are in use, exact interpretation of the yellow LED may require the analog and digital test ports to be busied out or the error and alarm logs for PKT-BUS errors and alarms should be examined.
2. Refers to the TN771's ability to operate alone as a troubleshooting aid.

LEDs on Standby Components

In high and critical reliability systems, duplicated components on standby usually have the yellow LEDs off, with the following exceptions:

- The major, minor and warning alarm LEDs on the SYSAM circuit pack on the standby SPE do not give reliable indications. Note only LEDs on the active SYSAM circuit pack.
- The yellow LED blinks on and off when the standby processor circuit pack is up and standby maintenance is running.
- In high reliability systems with a Center Stage Switch, (duplicated SPE, simplex PNC), the standby Switch Node clock's yellow LED is off. In critical reliability systems, the standby SNC is located on a separate carrier and normally remains lit.
- Yellow LEDs on power units on standby carriers normally remain lit.

Install and Wire Telephones and Other Equipment

5

The wiring procedures are the same for most telephones and other equipment. This chapter provides wiring examples of these similar installation procedures. These are examples only and actual wiring procedures may differ at each site. Wiring pinouts for circuit packs mentioned in this chapter can be found in Table 5-31 on page 5-149 and Table 5-32 on page 5-150.

After the hardware is installed, the data for the system and telephone features is administered. These procedures are provided in *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

NOTE:
This document is being modified for international translation. Some illustrations contain numbers instead of descriptive text. In the future, all illustrations will contain numbers.

Telephone Connection Example

The 302C1 Attendant Console used in this section describes a typical telephone connection. This connection information is typical of the 603E, 84xx (4-wire), and 94xx telephones. The attendant console always requires auxiliary (adjunct) power (-48 VDC). Power is connected to the console through Pins 7 and 8 of the information outlet as shown in Figure 5-2 on page 5-4. Only three consoles can be powered by the cabinet through the AUX connector. When possible, the primary console should be powered from the system cabinet so it has the same power failure backup as the system.

The maximum cabling distance for the console powered from the cabinet is 350 feet (100 meters) using 24 AWG (#5) wire.

The general steps to connect a telephone are:

1. Choose a device to connect such as a 302C1 Attendant Console.
2. Choose the port circuit pack (from Table 5-3 on page 5-13) and its carrier and slot number. Such as: TN754B, Cabinet 1, Carrier C, Slot 02.
3. Choose a port circuit on the port circuit pack. Such as Port 05.
4. Install cross-connect jumpers to wire the named pins on the terminal to the appropriate pins on the port circuit pack. See Figure 5-1. This pinout information is for the TN754B Digital Line circuit pack.

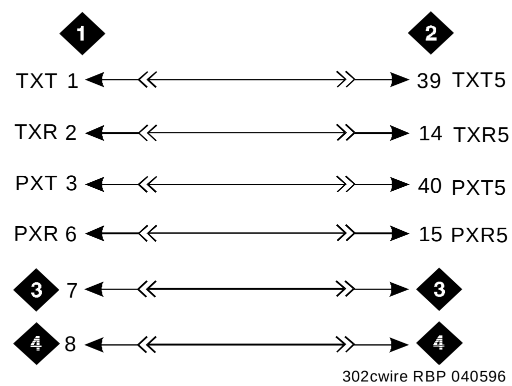


Figure Notes

1. 302C1 Attendant Console
2. TN754B Digital Line Circuit Pack (Position 1C02)
3. -48 VDC (From Adjunct Power)
4. Ground (From Adjunct Power)

Figure 5-1. 302C1 to TN754B Wiring

5. For terminals needing adjunct power (such as an attendant console), wire -48 VDC and ground to appropriate pins on the terminal. See Figure 5-2.

CAUTION:

The 329A power unit must not be used as the power source for the attendant console. Use an 1151A, 1145A, or MSP-1 power unit.

6. Refer to "Three-Pair and Four-Pair Modularity" on page 5-14 and to "Adjunct Power Connections" on page 5-15.

Connect Adjunct Power

The 400B2 adapter is convenient for connecting local -48 VDC power to a modular plug. See Figure 5-2.

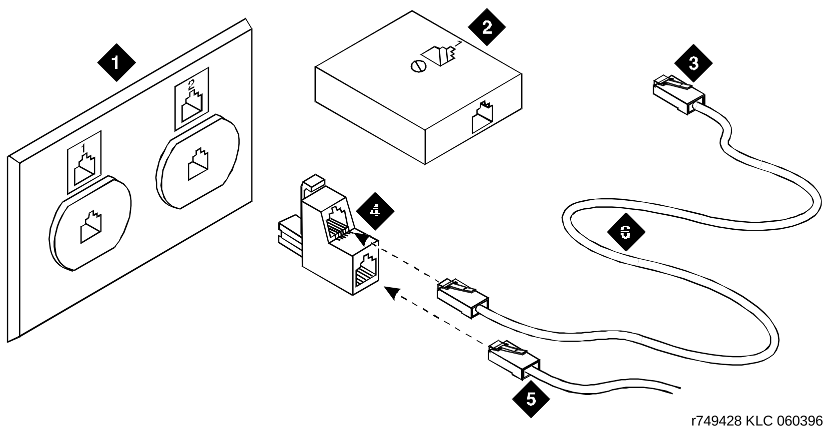


Figure Notes

1. Flush-Mounted Information Outlet
2. Surface-Mounted Information Outlet
3. To Individual Power Unit
4. 400B2 Adapter
5. To Telephone
6. Destination Service Access Point (DSAP) Power Cord

Figure 5-2. 400B2 Adapter Connecting to a Modular Plug

Adjunct power can be provided from the equipment room or equipment closet with 1145B power unit. See "Install the 1145B Power Supply" on page 5-44 for more information.

Each system port network can provide power for up to three attendant consoles. This source of power is preferred for the attendant consoles because it has the same battery backup as the system. See the Auxiliary Power pinout information in Table 5-2 on page 5-11.

Adjunct power can be provided locally at the telephone or console by the 1151A Power Supply. See "Install the 1151A Power Supply" on page 5-53 for more information. *Do not use the 329A power unit*.

Analog Station or 2-Wire Digital Station Example

This example is typical of the 2-wire digital stations (603E, 84xx, 94xx, 302C1), 2-wire analog stations (500, 2500, 71xx), analog Central Office (CO) trunks, Direct Inward Dial (DID) trunks, and external alarms.

The wiring designations for this example are shown in Figure 5-3.

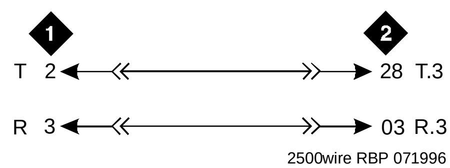


Figure Notes

1. 2500-Type Analog Station
2. TN2183 Analog Line Circuit Pack (Position 1C01)

Figure 5-3. 2500-Type Analog Telephone Wiring

1. Choose a peripheral to connect (such as an analog station or 2-wire digital station).
2. Choose the port circuit pack to use and its carrier and slot number (from Table 5-3 on page 5-13). For example TN2183 Analog Line, Cabinet 1, Carrier C, Slot 1.
3. Choose a port circuit on the port circuit pack, for example Port 3.
4. Install cross-connect jumpers to connect the named pins from the analog station or 2-wire digital station to the appropriate pins on the port circuit pack. This pinout information is for the TN2183 Analog Line circuit pack.
5. Administer on the management terminal. See *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, for more details.

Analog Tie Trunk Example

This example shows how to connect analog tie trunk wiring from one DEFINITY System to another DEFINITY System.

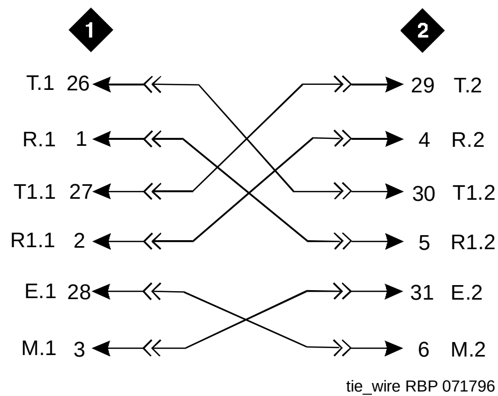


Figure Notes

1. External Trunk or Adapter
2. TN760 Tie Trunk Circuit Pack (Position 1C05)

Figure 5-4. Analog Tie Trunk Wiring

1. Set the option switches on the port circuit pack (TN760) as described in Appendix A, "Option Switch Settings".
2. Install cross-connect jumpers to connect the named pins from the tie trunk circuit pack to the appropriate leads on the external tie trunk. Names of the tie trunk leads must be determined from the manufacturer or supplier of the external trunk circuit. The example in Figure 5-4 shows a DEFINITY System tie trunk connected to a DEFINITY System tie trunk.
3. Administer on the Trunk Group Screen of the management terminal. See *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, for more details.

Digital Tie Trunk Example

This example shows how to connect digital tie trunk wiring from one DEFINITY System to another DEFINITY System. See Figure 5-5.

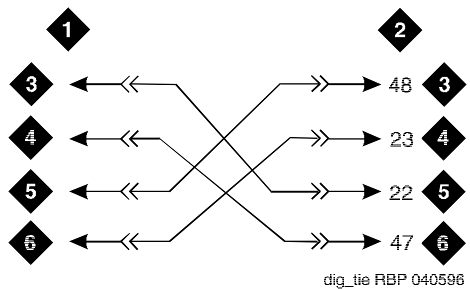


Figure Notes

1. External Trunk
2. TN464F Digital Trunk Circuit Pack (Position 1C06)
3. LO
4. LO (Balanced Output Pair)
5. LI
6. LI (Balanced Input Pair)

Figure 5-5. Digital Tie Trunk Wiring

1. Install cross-connect jumpers to connect the named pins from the digital trunk circuit pack to appropriate pins on the manufacturer's or supplier's external digital trunk.
2. Set option switches on the port circuit pack (TN464F Digital Trunk) according to Appendix A, "Option Switch Settings".
3. Administer on the DS1 and Trunk Group Screens of the management terminal. See *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, for more details.

DS1 Tie Trunk Example

Digital Signal Level 1 (DS1) tie trunks provide a 1.544 Mbps digital data service between two collocated systems or between the system and a data network using T1 carrier facilities. DS1 tie trunk circuit packs provide connection capability to the DS1 facility.

The following cables can be used to connect DS1 tie trunk circuit packs to DS1 digital facilities:

- C6C connector cable (comcode 104307327) — 50-foot (15.24 m) shielded cable equipped with a 50-pin male connector on one end and a 15-pin male connector on the other end. Use this cable to connect a DS1 tie trunk circuit pack to a Channel Service Unit (CSU).
- C6D connector cable (comcode 104307376) — 50-foot (15.24 m) shielded cable equipped with a 50-pin male connector on each end. Use this cable to connect a DS1 tie trunks in collocated Single-Carrier Cabinets.
- C6E connector cable (comcode 104307434) — 100-foot (30.48 m) shielded cable equipped with a 50-pin male connector on one end and a 50-pin female connector on the other end. Use this cable as an “extension” cable between the DS1 tie trunk circuit pack and other connector cables.
- C6F connector cable (comcode 104307475) — 50-foot (15.24 m) shielded cable equipped with a 50-pin male connector on one end and a three inch (7.62 cm) stub on the other end. Use this cable to connect the DS1 tie trunk circuit pack to channel multiplexers requiring hardwired connections. See Table 5-1 for a pinout of the C6F cable.

Table 5-1. Pinout of C6F Cable

Wire Color	Lead Designation	Pin Number
White/Green	LI (High Side)	47
Green	LI	22
White/Brown	LO	48
Brown	LO (High Side)	23
White/Slate	LBACK2	49
Slate	LBACK1	24

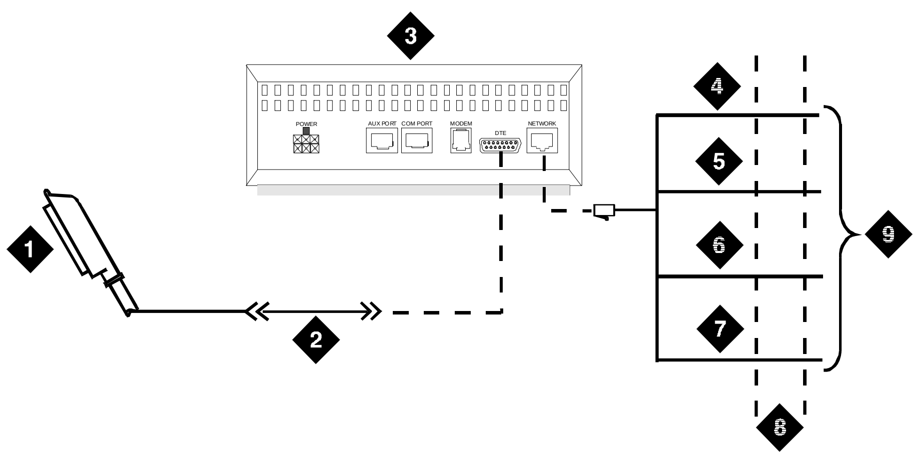
Collocated DS1 Tie Trunks

Connection to two TN722B DS1 Tie Trunk circuit packs in collocated systems can include a C6D cable for distances up to 50 feet (15.24 m). For distances over 50 feet (15.24 m) and up to 1310 Feet (399.3 m) maximum, use C6E cable(s).

DS1 Tie Trunks Using Channel Service Unit

Figure 5-6 shows an example of the connections required to connect a DS1 tie trunk to a T1 Channel Service Unit (CSU). The Channel Service (CSU) is used to interface the DS1 tie trunks with the 1.544 Mbps digital facility.

Contact your Lucent Technologies representative for maximum cabling distances.



0012_1 RBP 062696

Figure Notes

1. To TN722B DS1 Tie Trunk Circuit Pack
2. C6C Cable (For Distances Over 50 Feet (15.24 m), Use C6E Cables)
3. T1 Channel Service Unit (CSU)
4. T (Tip)
5. R (Ring)
6. T1 (Tip 1)
7. R1 (Ring 1)
8. 1.544 Mbps Digital Service Interface
9. To T1 Carrier

Figure 5-6. Typical Connections to Channel Service Unit

Auxiliary Connector Outputs

The Control Carrier outputs cable pinouts are shown in Table 5-2. The Control Carrier AUX connector outputs include the following:

- Alarm monitoring for the auxiliary cabinet.
- Seven -48 VDC power sources for emergency transfer units.
- Three -48 VDC power sources for remotely powering three attendant consoles or telephone adjuncts.
- The remote system management terminal interface trunk connection location.
- Access to a relay contact is available to actuate a customer-supplied light, bell, or similar alarm device. The relay can be administered to make contact when a major, minor or warning alarm condition occurs in the system. The circuitry required for this feature must be provided by the customer. The device connected to the alarm leads must not exceed a rating of 100 volts at 3/4 amps. The pinouts for an external alarm are shown in Table 5-2 on page 5-11.

A connector labeled AUX is provided on the rear of the Control Carrier. Connect a 25-pair cable to this connector.

Route the cable to a connecting block on the trunk/auxiliary field.

Table 5-2. Auxiliary Lead Appearances at AUX Connector

Color [1,2]	Pin Number	AUX Connector Outputs	
W-BL BL-W	26 1	Major[3]	
W-O O-W	27 2	Minor[3]	
W-G G-W	28 3	 GRD	
W-BR BR-W	29 4	 GRD	
W-S S-W	30 5	 GRD	
R-BL BL-R	31 6	 GRD	
R-O O-R	32 7	 GRD	
R-G G-R	33 8	Not Connected	
R-BR BR-R	34 9	Not Connected	
R-S S-R	35 10	Not Connected	
BK-BL BL-BK	36 11	-48 GND	Emergency Transfer Relay Power ↓
BK-O O-BK	37 12	-48 GND	
BK-G G-BK	38 13	-48 GND	
BK-BR BR-BK	39 14	-48 GND	
BK-S S-BK	40 15	-48 GND	
Y-BL BL-Y	41 16	-48 GND	
Y-O O-Y	42 17	-48 GND	
Y-G G-Y	43 18	Not Connected	

Table 5-2. Auxiliary Lead Appearances at AUX Connector — *Continued*

Color [1,2]	Pin Number	AUX Connector Outputs	
Y-BR BR-Y	44 19	GND -48	Aux Power ↓
Y-S S-Y	45 20	GND -48	
V-BL BL-V	46 21	GND -48	
V-O O-V	47 22	Not Connected	
V-G G-V	48 23	Ext Alarm A[3] Ext Alarm Return	
V-BR BR-V	49 24	Not Connected	
V-S S-V	50 25	INADS Tip INADS Ring	

1. Color designation is AA-BB. AA is the main wire color and BB is the color of the stripe.
2. The following wire colors apply in Table 5-2:

W	White
BL	Blue
O	Orange
G	Green
BR	Brown
S	Slate (Grey)
R	Red
BK	Black
Y	Yellow
V	Violet

3. External alarm with signal incoming to system.

Table 5-3 provides port circuit pack and telephone pin designations.

Table 5-3. Port Circuit Pack and Telephone Pin Designations

Pin on Modular plug	**4-wire; 302C1, 8403, 8410, 8411B/D, 8434, 603E, 9403, 9434**	**2-wire; 302C1, 8403, 8410, 8411B/D, 8434, 603E, 9403, 9410, 9434**	**8510T Basic Rate Interface (BRI) (with adjunct speaker phone)**	**Analog Station, Modem**	**NT1**	**Z3A1 & Z3A2 Asynchronous Data Units (ADU), Data Modules**
1	TXT					TXT
2	TXR			T		TXR
3	PXT		TXT	R		PXT
4		T	PXR		T	
5		R	PXT	No Connection (4-pin modular jack)	R	
6	PXR		TXR			PXR
7	-48VDC	(-48VDC)	(-48VDC)		-48VDC	
8	GRD	GRD	GRD		GRD	
Circuit Pack	**TN754 4-wire digital (8 port)**	**TN2181 2-wire digital (16 port) TN2224 2-wire digital (24 port)**	**TN556, ISDN-BRI Line**	**TN2183 Analog line (16 port)**	**TN2198 2-wire Basic Rate Interface line**	**TN726 Data Line**

PX private branch exchange transmit T Tip (A)
TX Terminal transmit R Ring (B)

Three-Pair and Four-Pair Modularity

Figure 5-7 shows 3-pair and 4-pair modularity from the port circuit pack to the terminal pins at the information outlet (modular jack). Most terminals are connected to an information outlet installed at the work location.

Make the connections from the port circuit pack to the modular jacks as shown in Figure 5-7. Then, plug the terminal into the modular jack.

Figure 5-8 shows three methods of connecting adjunct power.

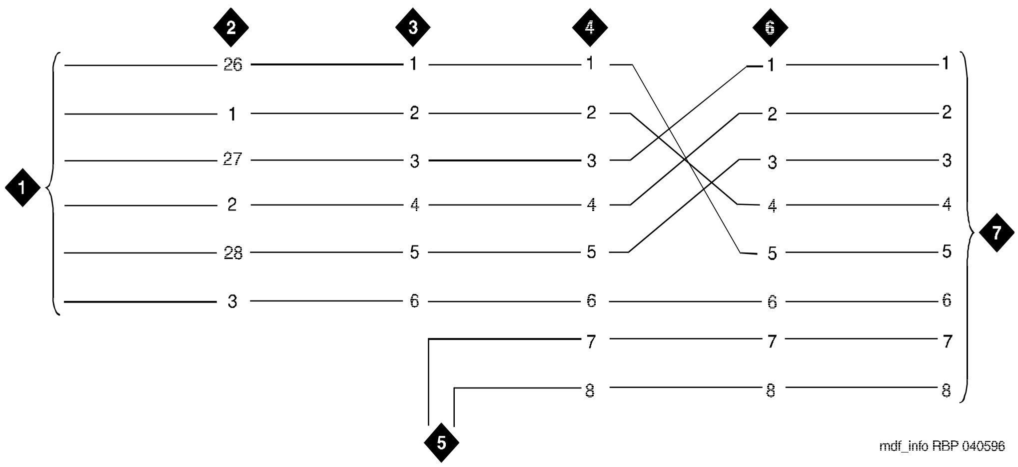


Figure Notes

1. Port Circuit Pack
2. System Cabinet Connector Pins (3-Pair Modularity)
3. Main Distribution Frame (MDF) Pins (3-Pair Modularity)
4. Input to Information Outlet (4-Pair Modularity)
5. Adjunct Power
6. Output From Information Outlet (4-Pair Modularity)
7. Voice Terminal

Figure 5-7. 3-Pair and 4-Pair Modularity

Adjunct Power Connections

Figure 5-8 shows typical connection locations for adjunct power. Adjunct power for station equipment may be supplied from the equipment room, satellite location, or the work location.

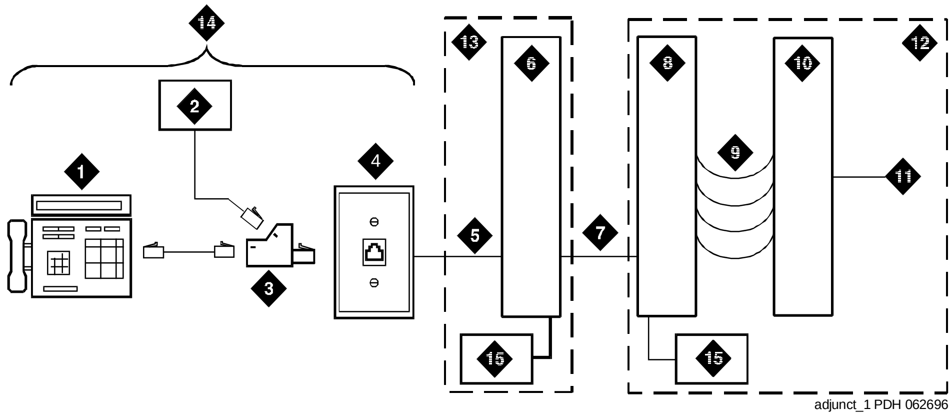


Figure Notes

1. Typical Display Telephone
2. Adjunct Power Supply (Such as 1151A)
3. 400B2 Adapter
4. Information Outlet
5. 4-Pair D-Inside Wire (DIW) Cable
6. Satellite Site or Adapter Location
7. 25-Pair D-Inside Wire (DIW) Cable
8. Station Side of Main Distribution Frame
9. 100P6A Patch Cord or Jumpers
10. System Side of Main Distribution Frame
11. 25-Pair Cable to System Cabinet Analog Line Circuit Pack
12. Equipment Room
13. Satellite Location
14. Work Location
15. Power From Bulk Power Source (Such as 1145B)

Figure 5-8. Example Adjunct Power Connections

For Figure 5-8, the following example is used:

a. If 25 telephones are connected to the system and all 25 telephones need adjunct power, install the adjunct power supply in the equipment room.

b. If only ten of the telephones need adjunct power, install the adjunct power supply at the satellite location.

c. If only one telephone needs adjunct power, install the adjunct power supply at the work location.

Install 26B1 Selector Console

1. Connect the supplied 3-foot (0.9 m) D8AC cable to the modular jack on the bottom of the 26B1 Selector Console. Route the cable to the attendant console and connect to the DXS/BLF jack.
2. Attach labels according to the Attendant Console form.
3. Administer the console using *DEFINITY Enterprise Communications Server Release 5 Implementation,* 555-230-302.

Connect External Alarm Indicators

The system provides access to a relay contact that can be used to operate a customer-supplied alarm, such as a light or bell. The circuitry and power source are customer-provided. The device connected to the alarm leads must not exceed a rating of more than 100 volts at 0.75 Amp.

1. Route one major and one minor alarm pair to the trunk/auxiliary field for each carrier AUX connector. These pairs are designated *1M* (major) and *1m* (minor) in Table 5-4. Also refer to Table 5-31 on page 5-149 and Table 5-32 on page 5-150 for connector pin numbers to wiring block terminals.

Table 5-4. External Alarm Leads at Main Distribution Frame

Color	110-Type Wiring Block Terminal	Cabinet AUX Connector Outputs
White-Blue	01	1M (Pin 26)
Blue-White	02	Ground (Pin 1)
White-Orange	03	1m (Pin 27)
Orange-White	04	Ground (Pin 2)

Alarms can be generated on adjunct equipment, sent to the DEFINITY System, and recorded and reported as “External Alarms.” A typical major alarm input is from pins 14 and 15 of J2 on an Uninterruptible Power Supply (UPS).

2. Connect external alarm inputs from the adjunct equipment through pins 45 and 20 of the wiring block associated with the AUX connector.
3. The connection is completed through the 25-pair cable to pins 48 and 23 of the AUX connector.
4. Note which device is connected to which alarm and give this information to your Lucent Technologies representative for future troubleshooting purposes.

Connect Power Distribution Unit External Alarm Wires

The external alarm plug was already connected to the J58890CH-1 Power Distribution Unit. The pinout for the connector is shown in Table 5-5.

Table 5-5. External Alarm Connector Pinout

Pin	Designation	Definition
26	Not Used	
1	Not Used	
27	Not Used	
2	Not Used	
28	Not Used	
3	Not Used	
29	Not Used	
4	Not Used	
30	Not Used	
5	Not Used	
31	Not Used	
6	Not Used	
32	Not Used	
7	Not Used	
33	RFA2 +	Rectifier Failure (positive)
8	RFA2 -	Rectifier Failure (negative)
34	ACF2 +	AC Failure (positive)
9	ACF2 -	AC Failure (negative)
35	BIF2 +	Battery Interface Failure (positive)
10	BIF2 -	Battery Interface Failure (negative)
36	BOD2 +	Battery On Discharge (positive)
11	BOD2 -	Battery On Discharge (negative)
37	Not Used	
12	RXD	Receive Data
38	TXD	Transmit Data

Continued on next page

Table 5-5. External Alarm Connector Pinout — *Continued*

Pin	Designation	Definition
13	DTR	Data Terminal Ready
39	RS-232 GRD	RS-232 Ground
14	DSR	Data Set Ready
40	RTS	Request To Send
15	Not Used	
41	Not Used	
16	Not Used	
42	Not Used	
17	Not Used	
43	Not Used	
18	Not Used	
44	Not Used	
19	Not Used	
45	Not Used	
20	Not Used	
46	Not Used	
21	Not Used	
47	Not Used	
22	Not Used	
48	Not Used	
23	Not Used	
49	Not Used	
24	Not Used	
50	Not Used	
25	Not Used	

NOTE:
RS-232 alarms (RXD, DTR, DSR, TXD, RS-232 GRD, and RTS) are not supported on the BU3200A Battery Interface Unit.

1. Choose an alarm to connect (such as Battery Interface Failure).
2. Choose the port circuit pack to use and its carrier and slot number (from Table 5-3 on page 5-13). For example TN2183 Analog Line, Cabinet 1, Carrier C, Slot 1.
3. Choose a port circuit on the port circuit pack, for example Port 3.
4. Install cross-connect jumpers to connect the named pins from the alarm wires to the appropriate pins on the port circuit pack.

   NOTE:
   It is recommended that the RFA, ACF, and BIF alarm leads be connected to the major alarm device and the BOD alarm leads be connected to the minor alarm device.

5. Connect the major and minor alarm devices to the appropriate cross-connect pins on the MDF.
6. Administer the alarms using *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install Remote Network Interface

The Remote Network Interface (formerly Initialization and Administration System (INADS)) provides a 1200 bps modem connection for the remote management terminal. The network interface trunk should appear on the twenty-fifth pair of a RJ21X network interface jack. The trunk is a two-way, rotary dial, loop start trunk that connects to a TN731 Maintenance circuit pack, the processor circuit pack, or the TN1648 Sysam circuit pack through the network interface terminals at the trunk/auxiliary Main Distribution Frame (MDF). Figure 5-9 shows a typical network interface trunk installation.

1. Determine the network interface trunk appearance at the green trunk/auxiliary field of the Main Distribution Frame (MDF).
2. Label the terminals for the trunk appearance.
3. Install jumpers between the trunk appearance on the green field and the Remote Network Interface terminals on the purple field.

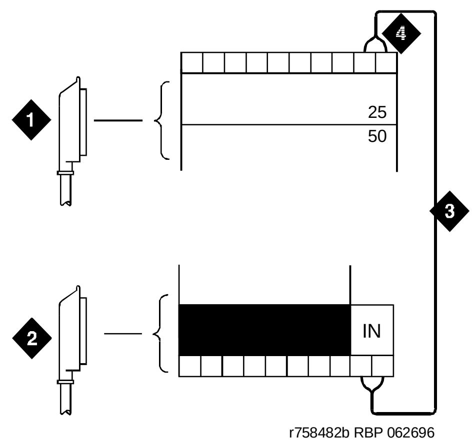


Figure Notes

1. To Network Interface Facility
2. To Control Carrier Auxiliary Connector
3. One Pair of Wires
4. Twenty-fifth Pair of RJ21X Network Interface Jack

Figure 5-9. Connections at Trunk/Auxiliary Field

Install TN1654 DS1 Converter (Release 5r Only)

Set Circuit Pack Switches

The configuration switches on the TN1654 must be set before the circuit pack is installed. The TN1654 can be configured for either T1 or E1 operation. All four facilities on the circuit pack are configured as a group. It is not possible to have T1 and E1 facilities supported on the same circuit pack at the same time.

E1 facility line termination impedances of 120 Ohms for twisted-pair and 75 Ohms for coax wiring are supported. The T1 line impedance is fixed at 100 Ohms and the T1 framing is selectable for ESF (Extended Super Frame) or D4 for each facility.

Figure 5-10 shows the location of the switches. Table 5-6 shows the switch setting positions and functions.

Table 5-6. TN1654 DS1 Converter Configuration Switches

Switch	Function	Up	Down
1	Type of Facility	T1	E1
2	Span A Line Impedance (E1 Only) Span A Framing (T1 Only)	120 Ohm ESF	75 Ohm D4
3	Span B Line Impedance (E1 Only) Span B Framing (T1 Only)	120 Ohm ESF	75 Ohm D4
4	Span C Line Impedance (E1 Only) Span C Framing (T1 Only)	120 Ohm ESF	75 Ohm D4
5	Span D Line Impedance (E1 Only) Span D Framing (T1 Only)	120 Ohm ESF	75 Ohm D4
6	Force Fiber Data-Stream Scrambling	Enabled	Disabled

1. Set the configuration switches on the TN1654 as required per site.
2. Set Switch 6 down (disabled).

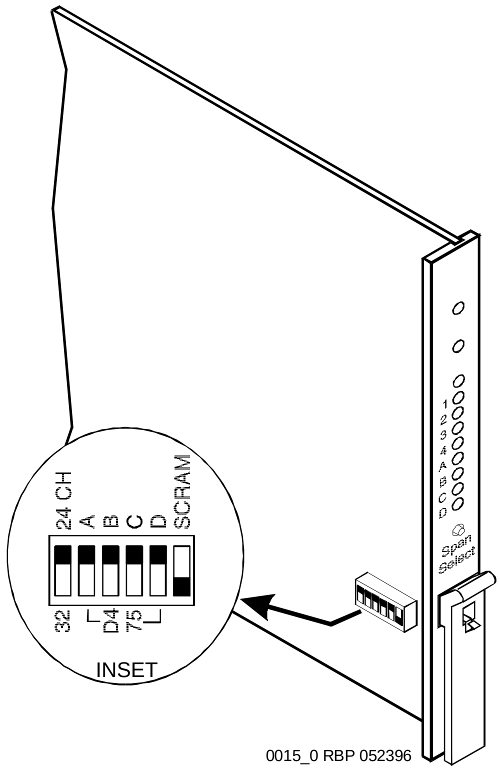


Figure 5-10. TN1654 DS1 Converter Circuit Pack Switches

If Switch 1 is down, E1 facilities are selected. All subsequent facility switch settings (Switches 2-5) reflect E1 impedance on each of the four facilities. For example: If Switch 1 is down and Switch 2 is up, Span A Line Impedance of 120 Ohms is selected. If Switch 1 is down and Switch 2 is down, Span A Line Impedance of 75 Ohms is selected.

If Switch 1 is up, T1 facilities are selected. All subsequent facility switch settings (Switches 2-5) reflect T1 framing on each of the four facilities. For example: If Switch 1 is up and Switch 2 is up, ESF framing is selected. If Switch 1 is up and Switch 2 is down, D4 framing is selected.

Switch 6 must be set to the down (disabled) position. Switch 6 may not be present (or active) on all TN1654 DS1 Converter circuit packs.

Install the Circuit Pack and Cabling (T1 Only)

The following installation instructions are provided as examples only.

Be sure to label the cables as they are installed.

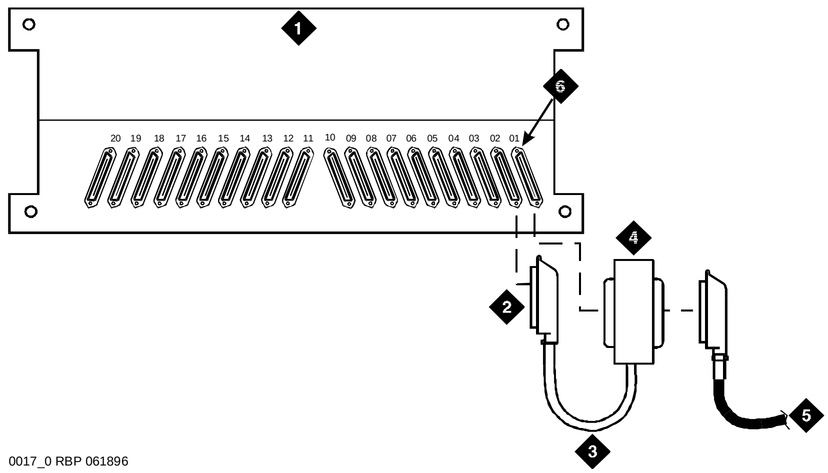


Figure Notes

1. Port Cabinet
2. 50-Pair Female Connector to Expansion Interface Connector
3. 14-Inch (35.56 cm) “Y” Cable
4. 50-Pin Male/50-Pin Female Double- Headed Connector
5. Quad Cable (With 50-Pin Male Connector) Connects to Channel Service Unit
6. DS1 Converter Connector

Figure 5-11. DS1 Converter Connections — Part 1

Port Carrier

1. Install the TN1654 in any slot in a Port Carrier, next to a TN570C Expansion Interface circuit pack.
2. On the backplane, connect a 14-inch (35.56 cm) “Y” cable from the TN1654 to the Expansion Interface circuit pack. See Figure 5-11.

   CAUTION:
   The “Y” cable used with the TN1654 is different than the “Y” cable used with the TN574. These cables are NOT interchangeable.

3. Connect an H600-348 Quad cable to the remaining end of the “Y” cable.
4. Skip to "Channel Service Unit Cabling".

Switch Node Carrier

Up to two TN1654 circuit packs can be installed in a Switch Node Carrier.

1. Install the TN1654 in any slot in the Switch Node Carrier, next to a TN573B Switch Node Interface circuit pack.
2. On the backplane, connect a 14-inch (35.56 cm) “Y” cable from the TN1654 to the Switch Node Interface circuit pack. See Figure 5-11.

   CAUTION:
   The “Y” cable used with the TN1654 is different than the “Y” cable used with the TN574. These cables are NOT interchangeable.

3. Connect an H600-348 Quad cable to the remaining end of the “Y” cable.
4. Skip to "Channel Service Unit Cabling".

Port Carrier to Switch Node Carrier

When the TN1654 is located in the Port Carrier and the Switch Node Interface circuit pack is located in the Switch Node Carrier, connect a 70” (177.8 cm) “Y” Cable between the two circuit packs.

CAUTION:
The “Y” cable used with the TN1654 is different than the “Y” cable used with the TN574. These cables are NOT interchangeable.

1. Connect an H600-348 Quad cable to the remaining end of the “Y” cable.

Channel Service Unit Cabling

Figure 5-12 shows a typical connection from the H600-348 Quad Cable to the CSU, through the H600-307 Network Cable, and to the network interface through the Smart Jacks. The double-headed cable is plugged into the DS1 converter slot. The quad cable provides up to four DS1 connections using a 15-pin connector that plugs into the DTE jack on each CSU. An adapter may be required to connect the H600-348 and H600-307 cables to the CSU.

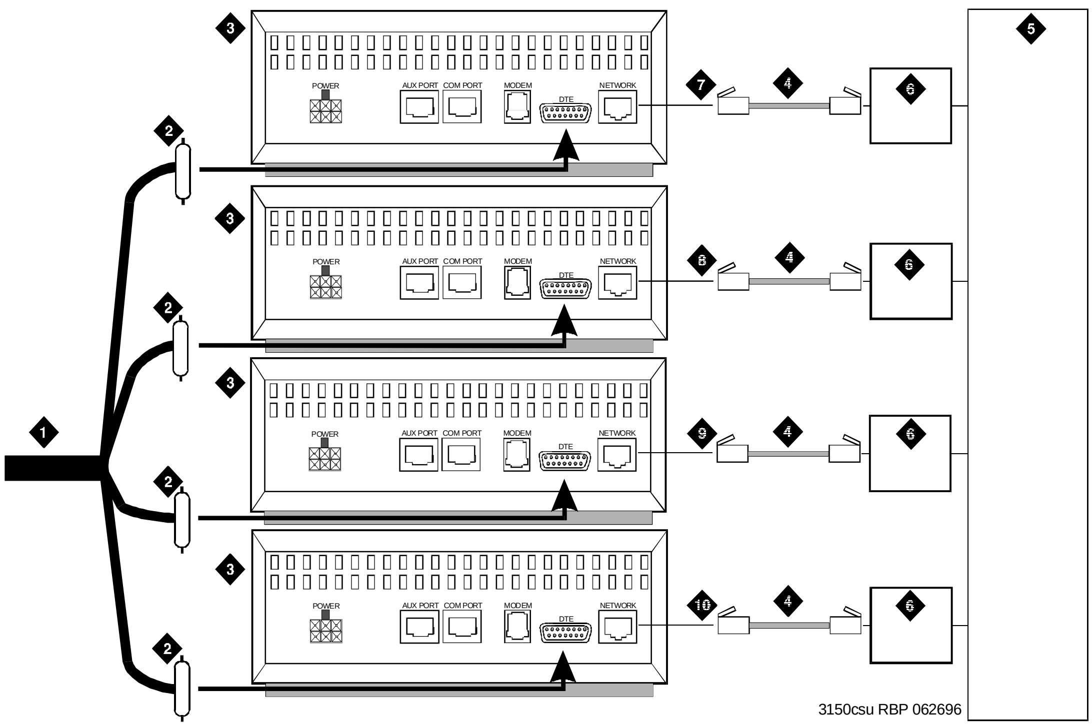


Figure Notes

1. H600-348 Quad Cable
2. 15-Pin Male "D" Connectors (to DTE Jacks on CSU)
3. Channel Service Unit (CSU)
4. H600-307 Cable (RJ-48C to RJ-48C)
5. Network Interface
6. Smart Jack
7. Cable "A"
8. Cable "B"
9. Cable "C"
10. Cable "D"

Figure 5-12. DS1 Converter Connections — Part 2

1. Connection to the remote-located system is the same as that shown in Figure 5-11 and Figure 5-12.

Table 5-7 shows the “Y” cable lengths and associated comcode numbers.

Table 5-7. “Y” Cable Lengths

Length	Description	Comcode
14 Inches (35.5 cm)	TN1654 to adjacent Expansion Interface circuit pack or TN573B Switch Node Interface circuit pack in same carrier	847245750
70 Inches (177.8 cm)	TN1654 to Expansion Interface circuit pack or Switch Node Interface in another carrier	847245768
14 Inches (35.5 cm)	TN1654 to fiber optic transceiver (DC-powered cabinets only). This cable is for intercabinet cabling only.	847245776
14 Inches (35.5 cm)	TN1654 to adjacent TN570C Expansion Interface circuit pack	847746641

NOTE:
The distinction between facility types is important when using TN1654 circuit packs. The facility used to carry control channel messages between the pair of DS1 converter circuit packs and all packet traffic is known as the primary facility. The facility used to backup and takeover for the primary facility in the event of primary facility failure is known as the secondary facility. The TN1654 allows either facility, A or B, to be a primary channel. The control channel is restricted to only the A or B facilities. This permits full 24-channel access (T1) or 31-channel access (E1) for facilities C and D to support user traffic.

Install the Circuit Pack and Cabling (E1 Only)

The E1 installation is similar to the T1 installation except the H600-348 Quad Cable and the Channel Service Unit are not used.

NOTE:
The H600-348 Quad Cable can be used on E1, 120 Ohm installations.

1. Install a “Y” cable between the DS1 Converter connector and the Expansion Interface connector. See Figure 5-11 on page 5-23. Also refer to Table 5-7 for the “Y” cable lengths and associated comcode numbers.
2. Be sure to label the cables as they are installed.

E1 Interface Cabling

Figure 5-13 shows typical E1 cabling to the network interface via the coaxial adapter cable. The actual adapter may be different in appearance.

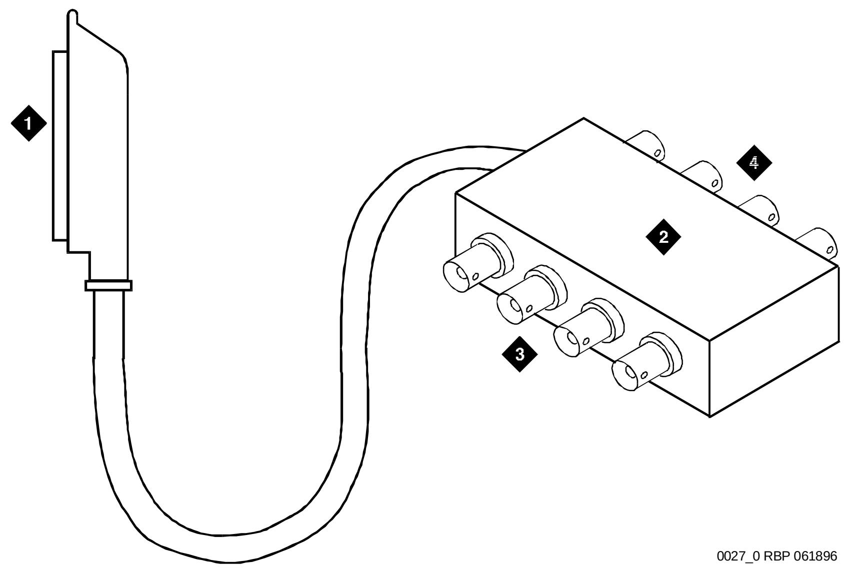


Figure Notes

1. 50-Pin Male Connector on Coaxial Adapter Cable
2. Coaxial Adapter Cable (With 8 BNC Connectors)
3. Connect to Quad Cable
4. Connect to E1 Network

Figure 5-13. DS1 Converter Connections — E1 Only

1. Connect a coaxial adapter cable to the remaining end of the “Y” cable. The opposite end of this cable is wired to a coaxial adapter assembly.
2. Plug a customer-provided quad cable onto the four BNC connectors provided on the coaxial adapter.
3. Connect the opposite end of the quad cable to the network interface.

Install Off-Premises Station Wiring

The cabling outside the building for off-premises stations is provided by the local telephone company. The off-premises stations can appear on any of the RJ21X network interfaces provided for the Central Office (CO) trunks.

CAUTION:
Only an FCC-approved (or equivalent) analog type telephone, for example, a 2500-type, can be used as an off-premises station. The TN746B and TN2183 Analog Line circuit packs can be used for off-premises stations.

1. Install a A25D cable between the RJ21X network interface and a sneak fuse panel. See "Install Sneak Fuse Panels" on page 2-13.
2. At the Main Distribution Frame (MDF), connect jumper wires between one row/connecting block in the green field and up to three rows/connecting blocks in the purple field to concentrate the analog line pairs.
3. Connect an A25D cable between the sneak fuse panel and the 110-type terminal block connector associated with the green row in Step 2.
4. Install a green label on the 110-type terminal block to identify the remote location.
5. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install Off-Premises or Out-of-Building Stations

Out-of-building campus stations are those telephones/voice terminals not physically located in the same building as the equipment room but are located on the same property.

Analog Off-Premises Stations

Figure 5-14 shows the connections for one to eight off-premises analog telephones. Only analog telephones connected to TN742, TN746B, TN2183, or TN769 Analog Line circuit packs can be installed out-of-building.

The maximum distance from the system cabinet to the out-of-building voice terminal is 6000 feet (1828.8 meters) using 24 AWG wire.

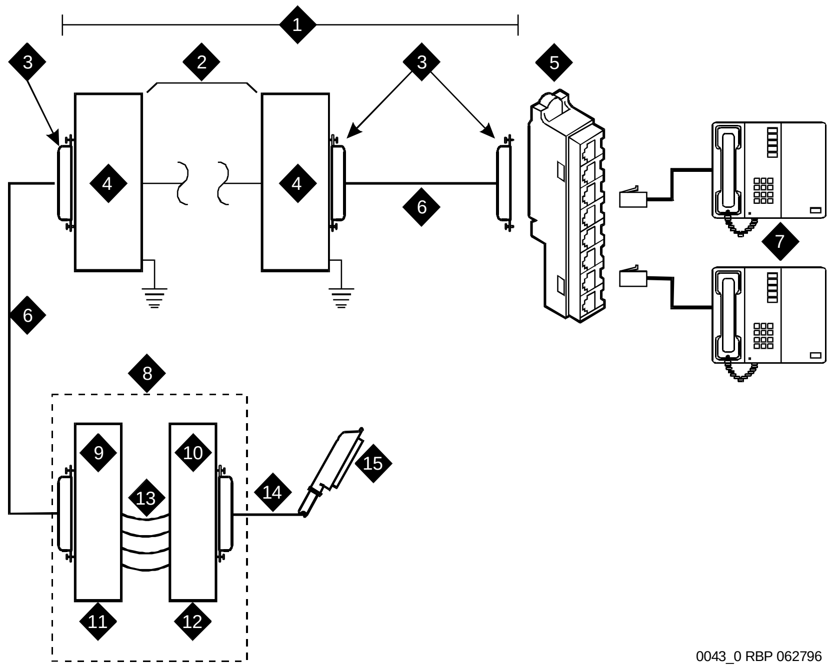


Figure Notes

1. Locally Engineered Cables and Equipment
2. Out-of-Building Wiring
3. 25-Pair Connector
4. Multi-Pair Protector Units (Primary Protectors with Heat Coils or Equivalent with Sneak Current Protection)
5. 356A Adapter
6. B25A Cable (Male to Female)
7. Out-Of-Building Analog Telephones
8. Part of Main Distribution Frame (MDF)
9. Station Side
10. System Side
11. White Field
12. Purple Field
13. Cross-Connect Jumpers
14. Tip and Ring Wires
15. To TN2183, TN769, TN742, TN746B, or Analog Line Circuit Pack

Figure 5-14. Connections for Up to Eight Out-of-Building Analog Telephones

Figure 5-15 shows the connections for up to 24 off-premises analog telephones. Concentrations of analog line pairs are used at both buildings to minimize the off-premises wiring required. At the Main Distribution Frame (MDF), jumpers must be connected between one row/connecting block in the white field and up to three rows/connecting blocks in the purple field. At the station location, a WP-90929, List 1 Concentrator Cable is used. There are eight station appearances on each of the three fingers of the concentrator cable.

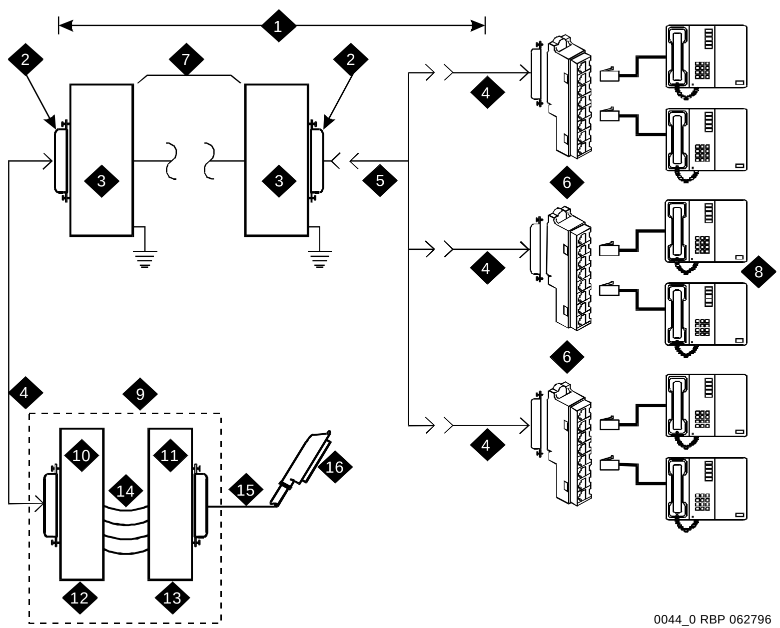


Figure Notes

1. Locally Engineered Cables and Equipment
2. 25-Pair Connector
3. Multi-Pair Protector Units (Primary Protectors with Heat Coils or Equivalent with Sneak Current Protection)
4. B25A Cable (Male to Female)
5. Concentrator Cable (WP90929 List 1)
6. 356A Adapter
7. Out-of-Building Wiring
8. Out-Of-Building Analog Telephones
9. Part of Main Distribution Frame (MDF)
10. Station Side
11. System Side
12. White Field
13. Purple Field
14. Cross-Connect Jumpers
15. Tip and Ring Wires
16. To TN742, TN769, TN746B, or TN2183 Analog Line Circuit Pack

Figure 5-15. Connections to 24 Out-of-Building Telephones

Carbon block, or equivalent protection is required at both building entrances. Also sneak current protection is required. Protection can be provided by a 4-type protector or a 3-type protector plus a separate sneak current protector. The 4-type protector is equipped with a heat coil.

The 4-type protector is the preferred device. For installations not using primary protection, 4-type protectors should always be used. When the 3-type protector is already installed, a separate sneak current protector is required. The multi-pair protector units and the off-premises cabling must be locally engineered. Connectorized multi-pair protector units (female 25-pair connector) are recommended. The protector units can be ordered from the *Premises Distribution Systems Equipment and Supplies Catalog*. Table 5-8 shows the recommended protectors.

Table 5-8. Analog Line Circuit Protectors

Protectors		
Primary[1]	Primary (with heat coil)	Sneak Current Protectors[2]
3B1A (carbon)	4B1C (carbon)	220029 Fuse
3B1E-W (wide gap gas tube)	4B1E-W (wide gap gas tube)	SCP-1
3C1S (solid state)	4C1S (solid state)	

1. The 3-type protectors should only be used if they are already part of the existing protection system. A sneak current protector is always required when a 3-type primary protector is used.
2. The 3-type protectors should only be used if they are already part of the existing protection system. A sneak current protector is always required when a 3-type primary protector is used.

The maximum range of out-of-building analog telephones (500-, 2500-, or 7100-types) connected to an analog line circuit pack should be such that the maximum loop resistance does not exceed 1300 ohms.

The following voice terminals/telephones cannot be installed in an exposed environment:

- 7300-type voice terminals connected to TN762 Hybrid Line circuit packs
- Multi-button Electronic Telephone (MET) sets connected to TN735 MET Line circuit packs
- Analog telephones connected TN746 Analog Line circuit packs

Protector Ordering Information

Description	Comcode
3B1A (Carbon Block)	102381779
3B1E-W (Wide Gap Gas Tube)	104410147
3C1S (Solid State)	105514756
4B1C (Carbon Block with Heat Coil)	102904893
4B1E-W (Wide Gap Gas Tube w/Heat Coil)	104401856
4C1S (Solid State with Heat Coil)	104386545
SCP-110 Sneak Current Protector	406948976
220029 Fuse (sneak current protector)	407216316

Digital Out-of-Building Voice Terminals

Protection is required at both building entrances for digital out-of-building voice terminals. There are two different types of protectors that can be used to protect digital voice terminals and digital line circuit packs in an out-of-building environment. The two enhanced protectors to use are the 4C3S-75 and the ITW Linx. These units provide primary and sneak current protection. For sneak current protection, the 4C3S-75 is equipped with a heat coil and the ITW Linx is equipped with replaceable fuses.

The 4C3S-75 may only be used with Vintage 14 or newer TN754 circuit packs. The 4C3S-75 can be used on all vintages of the TN754B circuit packs. The ITW Linx may be used on all vintages of the TN754 and TN754B circuit packs. Table 5-9 lists the approved protectors.

Table 5-9. Digital Voice Circuit Protectors

Circuit Pack	Enhanced Primary Protector (With Sneak Current Protection)
TN754 V13 or earlier	ITW Linx Only
TN754 V14 or later	4C3S-75 or ITW Linx
TN754B all vintages	4C3S-75 or ITW Linx

When possible, all new and reused wiring installations should use blocks that accept the standard 5-pin plug-in 4C3S-75 protector. However, there are reused wiring installations where this may not be cost effective. For these installations, the ITW Linx protector may be installed. An example of this is where screw-type carbon block protectors (or other non plug-compatible types) are in place and it is too costly to re-terminate the outside plant cable on a 5-pin mounting block for only a few out-of-building terminals.

The ITW Linx Enhanced Protector may be installed in series with existing primary protection. The 4C3S-75 protector cannot be installed in series with other types of primary protection. It must be installed as the only protection on the line entering the building. For the 4C3S-75 protector there are a variety of 25-, 50-, and 100-pair protector panels equipped with 110-type connecting blocks and/or RJ21X connectors. The ITW Linx Enhanced Protector mounts directly on connecting blocks and requires a separate ground bar.

The maximum range for out-of-building digital voice terminals is 3400 feet when using 24 AWG wire and 2200 feet when using 26 AWG wire. The range can be extended to 5000 feet (24 AWG wire) or 4000 feet (26 AWG wire) with the use of a Data Link Protector (DLP). The DLP is an isolating transformer used to remove phantom power on the system side and re-introduce it on the terminal side. When a protector is used, the voice terminal must be locally powered by an external power supply or through the AC power cord provided with some of the 7400-type voice terminals. The protector is installed on the equipment side of the protection in both buildings.

Protector and Data Link Protector Ordering Information

Description	Comcode
4C3S-75 (Solid State with Heat Coil)	105581086
ITW LINX (Gas Tube, Avalanche Suppress)	406144907
ITW Linx Ground Bar (used with above)	901007120
ITW Linx Replacement Fuse	406304816
Data Link Protector (one circuit)	103972758
Data Link Protector (eight circuits)	103972733

Install Emergency Transfer Units and Associated Telephones

Emergency transfer capability is provided by a transfer unit mounted next to the trunk/auxiliary field. Analog telephones connected to the transfer panel can be used. The 500-and 2500-type telephones can also be used as normal extensions. Emergency transfer capability may be provided on analog Central Office (CO) and Wide Area Telecommunications Service (WATS) trunks.

The 808A Emergency Transfer Panel provides emergency trunk bypass or power-fail transfer for up to five incoming Central Office (CO) trunk loops to five selected station sets. The 808A equipment's Ringer Equivalency Number (REN) is 1.0 Amp.

At the Main Distribution Frame (MDF), the unit is controlled by a connection to a yellow terminal row/connecting block in the trunk/auxiliary field. The unit is controlled by -48 VDC from the **EM TRANS RELAY PWR** terminals. There are seven **EM TRANS RELAY PWR** terminal pairs that allow powering of up to seven transfer units.

Should power be restored to the relays while a call connected through the 808A is in progress, the 808A maintains the connection until the user goes on-hook. Each 808A can handle up to five Central Office (CO) trunks.

Install the 808A Emergency Transfer Panel

Figure 5-16 shows a typical 808A Emergency Transfer Panel. The 808A is connected to the Main Distribution Frame (MDF) with B25A or A25B cable.

The following procedures are provided as a typical installation example.

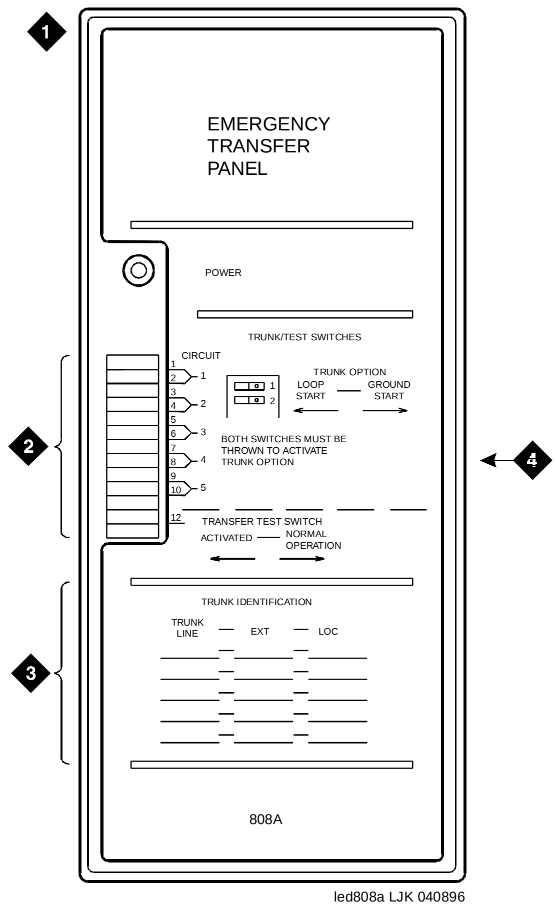


Figure Notes

1. 808A Emergency Transfer Panel
2. Circuit Start Selection Switches
3. Trunk Identification Label
4. 25-Pair Male Connector

Figure 5-16. 808A Emergency Transfer Panel

The panel can be installed on any mounting frame in either a vertical or horizontal position. The housing has ears for screw-mounting and cutouts for snap-mounting the unit in an 89-type mounting bracket. See Figure 5-17.

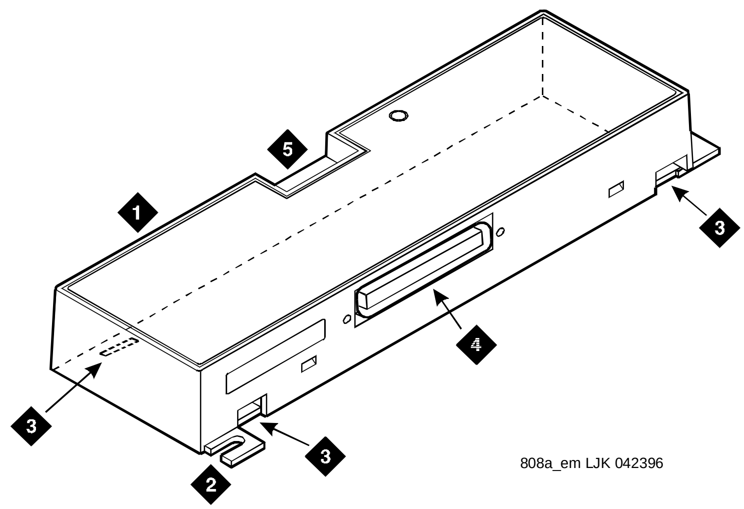


Figure Notes

1. 808A Emergency Transfer Panel
2. Ear for Screw Mount
3. Cut-Out for Snap Mount
4. 25-Pair Male Connector
5. Switches

Figure 5-17. 808A Emergency Transfer Panel Mounting

NOTE:
The 808A must be installed in a location that can be accessed only by authorized personnel. In addition the location must meet standard environmental considerations such as temperature, humidity, and so forth.

1. Verify dial tone is present at each trunk circuit.
2. Locate the circuit start selection switches (see Figure 5-16). These are the first 10 two-position switches on the left side of the Emergency Transfer Panel. They are used to set each of the five incoming trunk lines to either loop start or ground start. Two switches are used for each circuit; switches 1 and 2 are used for circuit 1, switches 3 and 4 are used for circuit 2, and so forth. See Table 5-10. For loop start, set the switches to the **left**. For ground start, set the switches to the **right.**

.

Table 5-10. Trunk/Test Switches

Switch Number	Circuit Number
1	1
2	1
3	2
4	2
5	3
6	3
7	4
8	4
9	5
10	5
11	Not Used
12	Test Switch

3. Connect a 25-pair cable between the male RJ21 25-pair connector on the Emergency Transfer Panel and the yellow field of the MDF. See Figure 5-18 on page 5-40. Table 5-11 shows the pin assignments.
4. Make cross-connections for each emergency trunk/emergency station pair. See Figure 5-19 on page 5-41 and Table 5-11.

Table 5-11. Pin Assignments for 25-Pair Connector

Pin	Color	Designation	Connector/Description
26	W-BL	TTC1	Tip-PBX Trunk Circuit 1
1	BL-W	RTC1	Ring-PBX Trunk Circuit 1
27	W-O	TTK1	Tip-CO Trunk Circuit 1
2	O-W	RTK1	Ring-CO Trunk Circuit 1
28	W-G	TLC1	Tip-PBX Line Port 1
3	G-W	RLC1	Ring-PBX Line Port 1
29	W-BR	TST1	Tip-Emergency Terminal 1
4	BR-W	RST1	Ring-Emergency Terminal 1
30	W-S	TTC2	Tip-PBX Trunk Circuit 2
5	S-W	RTC2	Ring-PBX Trunk Circuit 2
31	R-BL	TTK2	Tip-CO Trunk Circuit 2
6	BL-R	RTK2	Ring-CO Trunk Circuit 2
32	R-O	TLC2	Tip-PBX Line Port 2
7	O-R	RLC2	Ring-PBX Line Port 2
33	R-G	TST2	Tip-Emergency Terminal 2
8	G-R	RST2	Ring-Emergency Terminal 2
34	R-BR	TTC3	Tip-PBX Trunk Circuit 3
9	BR-R	RTC3	Ring-PBX Trunk Circuit 3
35	R-S	TTK3	Tip-CO Trunk Circuit 3
10	S-R	RTK3	Ring-CO Line Port 3
36	BK-BL	TLC3	Tip-PBX Line Port 3
11	BL-BK	RLC3	Ring-PBX Line Port 3
37	BK-O	TST3	Tip-Emergency Terminal 3
12	O-BK	RST3	Ring-Emergency Terminal 3
38	BK-G	TTC4	Tip-PBX Trunk Circuit 4
13	G-BK	RTC4	Ring-PBX Trunk Circuit 4
39	BK-BR	TTK4	Tip-CO Trunk Circuit 4
14	BR-BK	RTK4	Ring-CO Trunk Circuit 4
40	BK-S	TLC4	Tip-PBX Line Port 4
15	S-BK	RLC4	Ring-PBX Line Port 4

Continued on next page

Table 5-11. Pin Assignments for 25-Pair Connector — *Continued*

Pin	Color	Designation	Connector/Description
41	Y-BL	TST4	Tip-Emergency Terminal 4
16	BL-Y	RST5	Ring-Emergency Terminal 4
42	Y-O	TTC5	Tip-PBX Trunk Circuit 5
17	O-Y	RTC5	Ring-PBX Trunk Circuit 5
43	Y-G	TTK5	Tip-CO Trunk Circuit 5
18	G-Y	RTK5	Ring-CO Trunk Circuit 5
44	Y-BR	TLC5	Tip-PBX Line Port 5
19	BR-Y	RLC5	Ring-PBX Line Port 5
45	Y-S	TST5	Tip-Emergency Terminal 5
20	S-Y	RST5	Ring-Emergency Terminal 5
46	V-BL	COM1	Common 1 Relay Contact
21	BL-V	NO1	Normally Open 1 Contact
47	V-O	NC2	Normally Closed 2 Contact
22	O-V	NC1	Normally Closed 1 Contact
48	V-G	COM2	Common 2 Relay Contact
23	G-V	NO2	Normally Open 2 Contact
49	V-BR		
24	BR-V		
50	V-S	GRD	Ground From PBX
25	S-V	-48PX	-48V from Alm Panel

5. On the trunk identification label at the bottom of the panel, record the trunk line, extension, and location for each circuit.
6. Attach a label identifying each voice terminal designated as an emergency terminal. The labels are provided with the unit.
7. Check the system for normal operation:
   - — Set the test switch (switch 12) to NORMAL OPERATION.
   - — Ensure the power supply is providing -48 VDC at 80 mA maximum.
   - — The power LED should be ON.
   - — Verify there is dial tone on all emergency transfer sets.

If all of the above conditions are not met, remove the panel from service and replace it with a new panel.

8. Check the system for transfer operation as follows:
   - — Place the test switch (switch 12) in the ACTIVATED position.
   - — The power LED should be OFF.
   - — Verify there is dial tone on all emergency transfer sets.

   If all of the above conditions are not met, remove the panel from service and replace it with a new panel.

The 808A is connected to the MDF by a B25A cable. Figure 5-18 shows the connections at the trunk/auxiliary field for a telephone used only for emergency transfer.

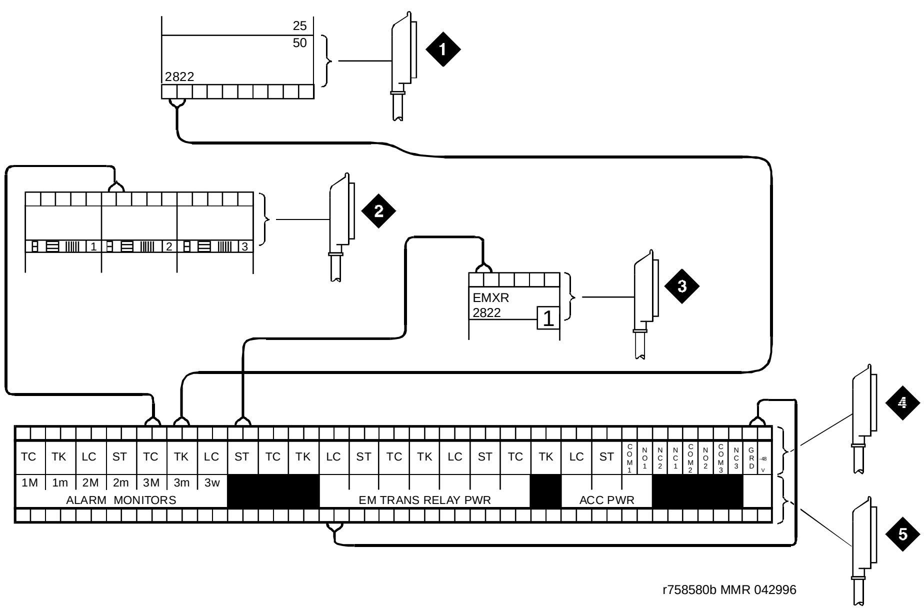


Figure Notes

1. To Network Interface Circuitry
2. To TN747 (or Equivalent) Central Office Trunk Circuit Pack
3. To Blue or White Station Distribution Field
4. To Power Transfer Unit
5. To Control Carrier AUX Connector

Figure 5-18. Connections for Telephone Used for Emergency Transfer

Figure 5-19 shows the connections at the trunk/auxiliary field for a telephone used for emergency transfer as well as a normal extension.

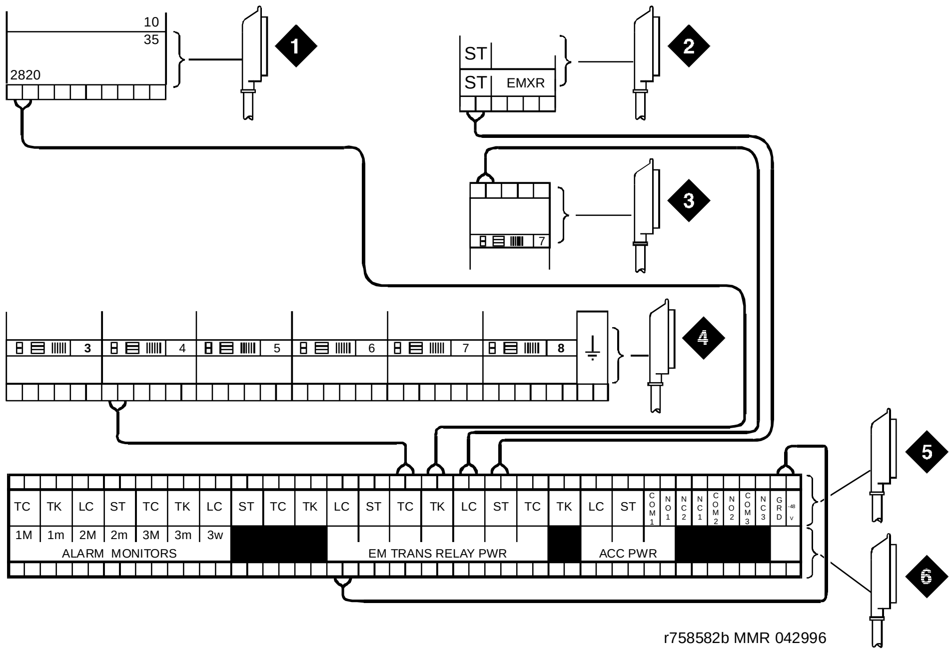


Figure Notes

1. To Network Interface Facility
2. To Blue or White Station Distribution Field
3. To TN742, TN746B, or TN769 (or Equivalent) Analog Line Circuit Pack
4. To TN747 (or Equivalent) Central Office Trunk Circuit Pack
5. To Power Transfer Unit
6. To Control Carrier AUX Connector

Figure 5-19. Connections for Telephone Used for Emergency Transfer and as Normal Extension

Install Telephone for Power Transfer Unit

Trunk/Auxiliary Field: Telephone Used Only for Emergency Transfer

1. Connect a pair of wires between the **-48V** and **GRD** terminals on the yellow emergency transfer row/connecting block and the **EM TRANS RELAY PWR** terminal. See Figure 5-18 on page 5-40.
2. Connect Central Office (CO) trunk leads from the purple field to **TC** terminals on the yellow emergency transfer row/connecting block for each trunk.
3. Connect CO trunk leads from the green field to **TK** terminals on the yellow emergency transfer row/connecting block for each trunk.
4. Connect **ST** leads on the yellow emergency transfer row/connecting block for each emergency transfer telephone to the **ST** terminal appearance in the yellow trunk/auxiliary field. The **ST** terminal leads should be terminated on the following pairs: 1, 4, 7, 10, 13, 16, 19, or 22 (the first pair of any 3-pair group).
5. Connect the **ST** leads from the terminal in Step 4 to the assigned terminal in the blue or white station distribution field.

Trunk/Auxiliary Field: Telephone Used for Emergency Transfer and as Normal Extension

1. Connect a pair of wires between the **-48V** and **GRD** terminals on the yellow emergency transfer row/connecting block to the **EM TRANS RELAY PWR** terminal. See Figure 5-19 on page 5-41.
2. Connect CO trunk leads from the purple field to **TC** terminals on the yellow emergency transfer row/connecting block for each trunk.
3. Connect CO trunk leads from the green field to **TK** terminals on the yellow emergency transfer row/connecting block for each trunk.
4. Connect telephone leads from the purple analog line board row/ connecting block to the **LC** terminals on the yellow emergency transfer row/connecting block for each telephone.
5. Connect **ST** leads on the yellow emergency transfer row/connecting block for each emergency transfer telephone to the **ST** terminal appearance in the purple trunk/auxiliary field.
6. Connect the **ST** leads from the terminal in Step 4 to the assigned terminal in the blue or white station distribution field.

Telephone Installation

Install telephone assigned to emergency transfer as follows:

1. Connect telephone to the information outlet.
2. Install patch cords/jumper wires between the system side and the station side of the station distribution field on the Main Distribution Frame (MDF).

Install External Ringing

Connections for external ringing provided by a device, such as a gong, chime, or bell, are at an information outlet. The system side of the MDF is connected to a TN2183 or equivalent analog line circuit pack located in a port carrier. The circuit packs contain 16 ports each.

NOTE:
A maximum of three devices can be connected to one TN2183 circuit pack port.

1. Wire the ringing device to the information outlet as shown in Figure 5-7 on page 5-14 and Figure 5-8 on page 5-15.
2. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install Queue Warning Indicator

The connections for the queue warning indicator are the same as external ringing. An AC indicator (lamp) such as a 21C49 can be used in a Uniform Call Distribution/Direct Departmental Calling (UCD/DDC) queue.

The lamp is connected to an information outlet. The system side of the Main Distribution Frame (MDF) is connected to an analog line circuit pack in a port carrier.

1. Wire the queue warning indicator to the information outlet as shown in Figure 5-7 on page 5-14 and Figure 5-8 on page 5-15.
2. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install the 1145B Power Supply

The 1145B closet power arrangement provides an uninterruptible -48 VDC power source with battery and 1145B distribution unit for ISDN/DCP, terminal equipment, adjuncts, and other customer-supplied equipment. During AC power interruptions, batteries automatically provide power to the load.

A manual switch on the distribution unit allows the user to redirect reserve power to outputs 1 through 32 so all outputs are provided battery reserve power.

NOTE:
The switch must be set to the 1-32 position.

The 1145B/1146B is a -48V power supply with 200 watts total output. Each output circuit is current limited by a thermistor that limits the maximum output to 12 watts. Each 1145B output has an LED to indicate the status of the thermistor. If the LED is on, the thermistor has a short on that power pair.

Not all outputs can simultaneously provide 12 watts. The average power per output cannot exceed 6.25 watts (200/32 = 6.25). The 1145B is designed to power one ISDN terminal or DCP adjunct per output. The maximum number of terminals or adjuncts is 32. The 1145B is required for installations outside the United States.

Auxiliary power (local or bulk) is always required for the following:

- Attendant Console 302C1
- Any 8520 terminal
- Any 7500- or 8500-series terminal with an asynchronous data module
- Any 7500-series terminal whether in passive bus, or point to point (one per BRI port)
- Any 8510 terminal in passive bus or with an asynchronous data module (unless the 8510 will not be used to support data or video)
- PassageWay adapter interface
- Any 8400-series terminal
- Any 7400-series terminal

Figure 5-20 on page 5-46 shows how the standard power supply and wall-mounting plates fit together. Figure 5-21 on page 5-49 shows the expanded power supply components (power distribution unit and “T” cable).

Wall-Mounting Plates

The top plate is used for mounting the back-up battery. The bottom plate is used to mount the power supply and distribution units. The plates can be rack-mounted using standard rack-mounting brackets.

1. Locate one plate directly below the other one such that the AC power cord (6.5 feet or 2 meters) reaches the electrical outlet from a power supply mounted on the bottom plate. Both plates should be located so the raised letters are right side up.

   NOTE:
   A maximum of four power supplies can be powered from one dedicated 110 VAC, 20 amp (or 230 VAC, 15 amp) feeder. Use only unswitched receptacles (receptacles not connected to a wall switch).

2. Secure the wall mounting plates to a standard 3/4 inch (2 cm) thick plywood mounting board. Each mounting plate comes with four #10 x 1/2-inch wood screws.
3. The 1145B Power Supply is snap-fit onto the bottom wall mounting plate without tools.
4. An installer-provided insulated ground wire, 16 AWG or greater, is required to connect the power supply frame ground lug to an approved ground. The frame ground screw is located next to the AC receptacle, to the left of the unit.
5. Mark the Unit Number and Connectivity information on the front label next to the LEDs.

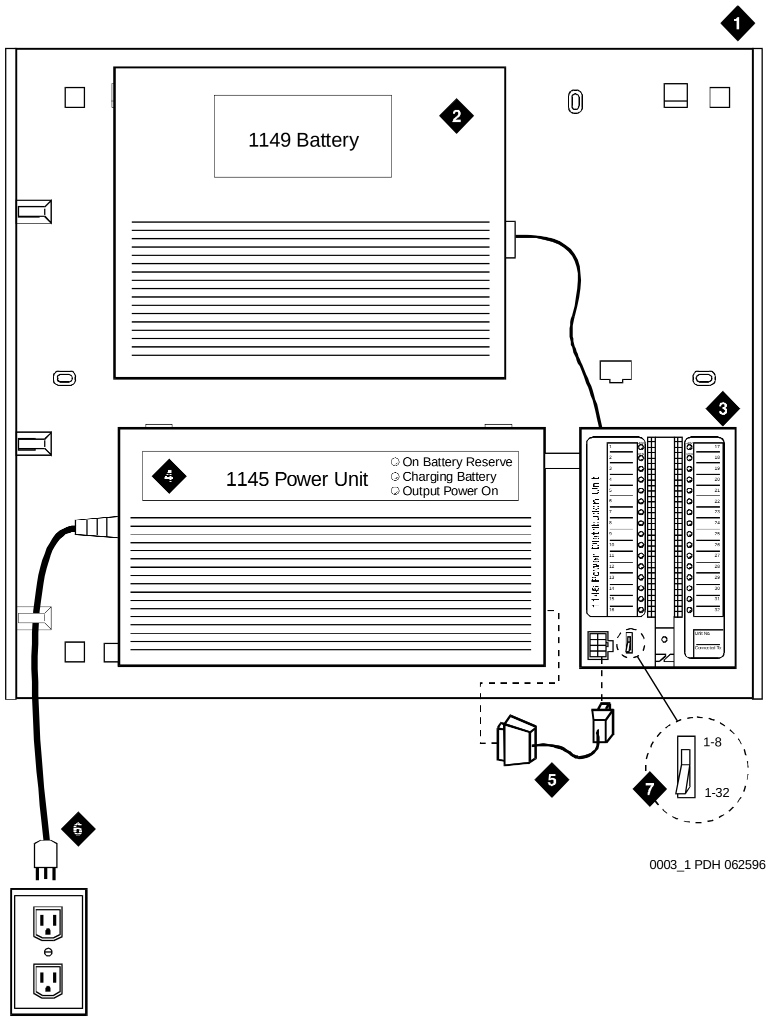


Figure Notes

1. Wall Mounting Plate
2. Battery (1149B Shown)
3. 1146B Power Distribution Unit
4. 1145B Power Unit
5. Power Cable
6. Unswitched Outlet (120 VAC, 20 Amp or 230 VAC, 15 Amp)
7. Battery Backup Switch Setting

Figure 5-20. 1145B/1146B Mounting Arrangement

Mount the 1146B Power Distribution Unit

1. Insert and securely tighten the two supplied #8-32 x 1/2-inch shoulder screws (they have an unthreaded section at the top) into the top holes designated for 1146B Power Distribution Unit on the bottom plate. Mount the unit on these two shoulder screws, using the key holes on the back of the unit.
2. Secure the unit by inserting the #8-32 x 1 inch screw through the bottom of the unit (just above the wire clips) into the plate and tighten.
3. Set the battery back-up switch option to the 1-32 (down) position to provide battery back-up to all outputs.
4. Connect the power distribution unit to the power supply with the power cable. Refer to the power supply's right-hand label to locate the output power connection.

Battery Mounting/Wiring

Three types of back-up batteries are used; the 1148B, the 1149B, and the 1147B. Table 5-12 provides the rating and PEC code of each battery.

Table 5-12. Back-Up Battery PEC Codes

Battery	Rating	PEC Code
1148B	2.5 Amp Hour (AH)	24700
1149B	5 Amp Hour (AH)	24701
1147B	8 Amp Hour (AH)	24703

1. Loosely thread two #10-32 x 1/2-inch shoulder screws into the top designated battery holes on the wall mounting plate.
2. Place the keyhole slots in the battery bracket on these two screws. The battery cord exits from the right of the bracket. Make sure the label on the battery is visible. Tighten the screws securely.
3. Plug the battery cord into the power supply's right rear receptacle. The rear receptacle is indicated on the right label.

Install the Expanded Power Distribution Unit

A second power distribution unit can be installed to provide power to additional 8400-series and 8500-series terminals.

⚠ CAUTION:

Total power cannot exceed 200 Watts. The maximum ISDN terminal mixture is twenty four 7500-series and twenty four 8500-series terminals.

The maximum DCP terminal mixture is twenty four 7400-series and twenty four 8400-series or sixty four 8400-series terminals.

The following items are supplied with each expanded power distribution unit kit:

— One 1146B Power Distribution Unit (comcode 107250995)

— One “T” Cable (comcode 847529872)

— Two #8-32 x 1/2-inch Shoulder Screws

— One #8-32 x 1 inch Screw

— One Spacer Bracket (comcode 847554441)

Refer to Figure 5-21 while installing the power distribution unit.

1. Set the spacer bracket onto the mounting plate and secure with the #8-32 x 1/2-inch shoulder screws. The spacer bracket is not shown in the figure but is installed behind the top power distribution unit.
2. Slide the keyhole slots in the power distribution unit over the shoulder screws.
3. Insert the #8-32 x 1 inch screw through the distribution unit, through the spacer bracket, and into the plate. The mounting hole is located just above the wire clip. Tighten the screw securely.
4. Set the battery back-up switch to the 1-32 (down) position.
5. Power-down the 1145B unit as described on the label on the side of the unit.
6. Remove the output power cable between the 1145B and the 1146B units. The cable will not be reused.
7. Connect the P1 connector end of the “T” cable to the bottom power distribution unit. Connect the P2 connector to the top distribution unit. Connect the P3 connector to the 1145B.
8. Power-up the 1145B as described on the label on the side of the unit.

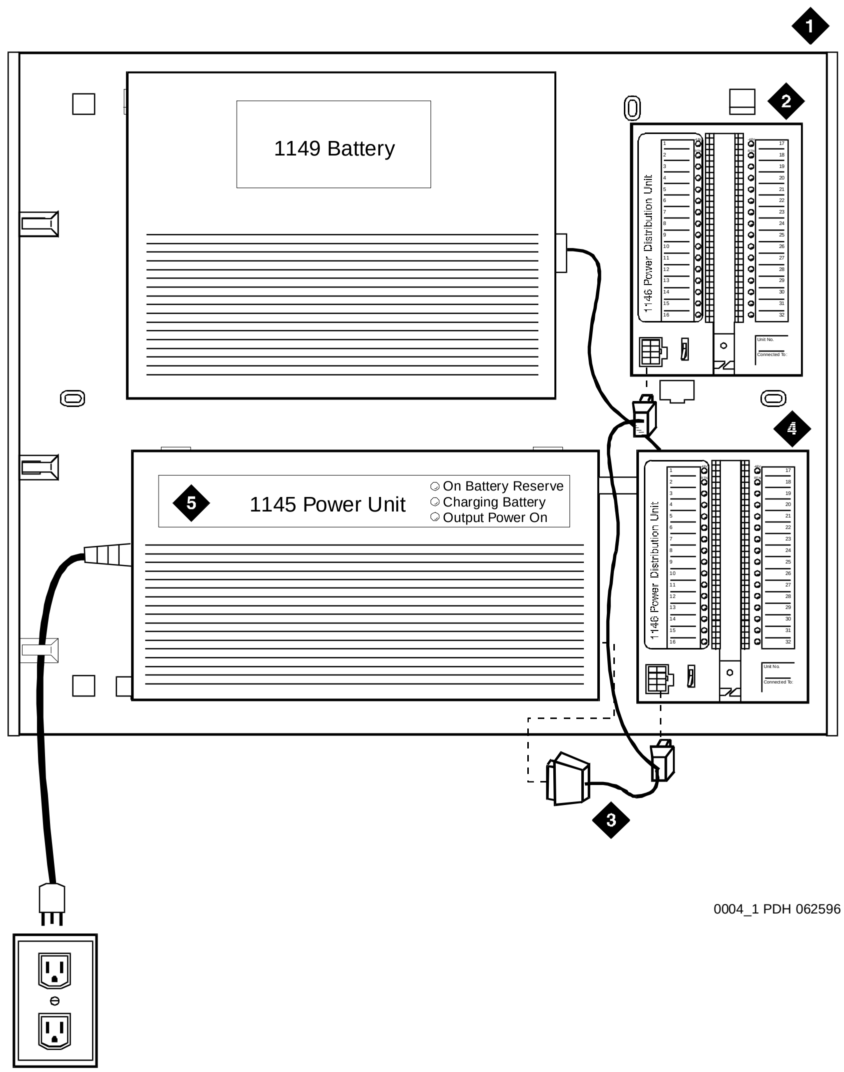


Figure Notes

1. Wall-Mounting Plate
2. Second 1146B Power Distribution Unit
3. “T” Cable (H600-347-G7)
4. First 1146B Power Distribution Unit
5. 1145B Power Unit

Figure 5-21. Expanded Power Distribution Unit

Power Up and Test

1. Connect the AC power cord to the power supply and route the cord to an appropriate AC outlet using the clips provided on the unit.

   NOTE:
   A maximum of four power supplies can be powered from one dedicated 110 VAC, 20 amp feeder. Use only unswitched receptacles.

2. Plug the cord into the outlet. This powers up the power supply.
3. Check AC operation of the 1145B Power Supply by monitoring the LEDs:

   PASS: Green and yellow LEDs at front of the unit should be lit together. Green means the power supply is providing power. Yellow means the battery is being charged. After the battery reaches full charge (maximum of twenty hours), the yellow LED should go out.

   FAIL: If either green or yellow LED is not lit after powering up, check the connections. Test the AC outlet. If power is available and the AC power cord and connections are good, replace the power unit.

4. Disconnect the AC plug on the power supply, this activates the DC supply.
5. Check DC (battery back-up) operation of the 1145B Power Supply by monitoring the LEDs:

   PASS: The red and green LEDs should be lit together. Red means the power supply is on battery back-up.

   FAIL: If either green or red LED is not lit after disconnecting AC power, check the connections. If the connections are good, replace the power unit or batteries.

6. Reconnect AC power to the power supply.

Wire the 1146B Power Distribution Unit

Wire endpoints to the 1146B while power from the 1145B is on. A red LED lights if its associated circuit is connected to shorted wiring or to a shorted terminal.

1. Install cross-connect jumpers to wire from the unit (the label shows polarity) to pins 7 and 8 of the appropriate information outlet. Route the wires through the clip provided on the unit. If a red LED is on, see "Reset LEDs on Power Distribution Unit".
2. Mark lead destinations on the label next to each connector. Also mark the Unit Number and Connectivity information on the label.

Reset LEDs on Power Distribution Unit

A red LED next to any of the 32 power output connectors indicates a short circuit in the building wiring or the terminal equipment. To reset the LED:

1. Disconnect the terminal equipment from the wall jack.
2. If the LED goes off, the terminal equipment is faulty and must be replaced. If the LED is still lit, find and repair the short circuit in the building wiring.
3. Reconnect the terminal equipment to the wall jack and re-test terminal equipment operation.

WARNING:
Important Safety Instructions follow.

When operating this equipment, basic safety precautions must be followed to reduce the risk of fire, electric shock and personal injury, including the following:

- Read and understand all instructions.
- Do not attach the power supply cord to building surfaces.
- For continued back-up protection and battery reliability, replace batteries every four years.
- Follow all warnings and instructions marked on the products.
- Clean products only with a dry rag.
- Do not use this product near water.
- For mounting security, follow all installation instructions when mounting product.
- Openings on top and bottom of power unit are provided for ventilation. Do not block or cover these openings. Do not exceed recommended environmental temperatures.
- Operate these products only from the type of power source indicated on the product labels.

- The power unit is equipped with a three wire grounding type plug; a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the grounding type plug.
- Do not allow anything to rest on or spill into the products.
- To reduce risk of fire and electrical shock, do not overload power outlets.
- Never push objects of any kind through the power supply or distribution unit slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.
- To reduce risk of electric shock, do not disassemble these products. Return them for repair when needed. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the products are subsequently used.
- Power down the power unit (see label on power unit on how to do this) and refer servicing under the following conditions:
  - If liquid has been spilled into any of the products.
  - If any of the products have been exposed to water.
  - If any of the products do not operate normally.
  - If any of the products have been dropped or damaged.
  - If any of the products exhibits a change in performance.
- Do not attempt to recharge batteries on your own. The batteries may leak corrosive electrolyte or explode. The 1145B power unit recharges the batteries safely.
- Remove the batteries if the power unit will not be used for a long period of time (several months or more) since during this time the battery may leak.
- Discard discharged batteries as soon as possible. Discharged batteries are more likely to leak.
- Do not store batteries in high temperature areas. Batteries stored in a cold environment should be protected from condensation during storage and warming. Batteries should be stabilized at room temperature prior to use after cold storage. Do not install batteries if the manufacturing date on the label indicates that the batteries are more than six months old.

Install the 1151A Power Supply

The 1151A Power Supply complies with the UL Standard UL 1459, second edition. Safety instructions follow the table of certifications.

Complies	UL 1459
Certified	CSA 22.2
Approved	EN6950
Approved	CE

Important Safety Instructions

Please read the following helpful tips. Retain these tips for later use.

When using this power supply, the following safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons.

- Read and understand all instructions.
- Follow all warnings and instructions marked on this power supply.
- This product can be hazardous if immersed in water. To avoid the possibility of electrical shock, do not use it near water.
- To reduce the risk of electric shock, do not disassemble this product except to replace battery.
- This product should be operated only from the type of AC power source indicated on the label. If you are not sure of the type of AC power being provided, contact a qualified service person.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- Do not overload wall outlets and extension cords as this can result in the risk of line or electric shock.
- Disconnect the cords on this product and refer servicing to qualified service personnel under the following conditions:
  - When the power supply cord or plug is damaged or frayed.
  - If liquid has been spilled into the product.
  - If the product has been exposed to rain or water.
  - If the product was dropped or the housing has been damaged.
  - If the product exhibits a distinct change in performance.
  - If the product does not operate normally by following the operating instructions.

The 1151A Power Supply

The 1151A Power Supply can be used to supply local power to ISDN-T 65xx, 75xx, 84xx, and 85xx series voice terminals connected to a system and to the DCP 7444 voice terminal or 302C Attendant Console that need auxiliary power for its display. The unit can supply power to adjunct equipment such as S201A and CS201A speakerphones or a 500A Headset Adapter attached to any currently manufactured analog, DCP, or ISDN-T voice terminal equipped with an adjunct jack.

CAUTION:
*The power supply can be used **only** with telecommunications equipment, indoors, and in a controlled environment.*

The power supply has a single output of -48 VDC, 0.4 Amps, and can operate from either a 120 VAC 60 Hz power source (105 to 129 VAC) or a 220/230/240 VAC 50 Hz power source (198 to 264 VAC). Input voltage selection is automatic. The output capacity is 19.2 watts.

The power supply can be placed on a flat surface such as a desk. For wall-mounting, keyhole slots are provided on the bottom of the chassis.

CAUTION:
Do not locate the unit within six inches of the floor.

Connect the Power Supply

One power supply supports one telephone with or without an adjunct. The maximum loop range is 250 feet (76 meters). Two modular jacks are used. Power is provided on the PHONE jack, pins 7 and 8 (- and +, respectively).

The PHONE and LINE jacks are 8-pin female non-keyed 657-type jacks that can accept D4, D6, and D8 modular plug cables. Figure 5-22 shows a 1151A Power Supply.

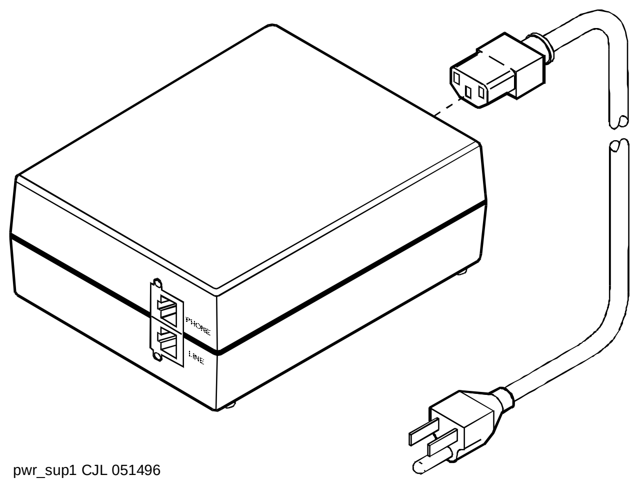


Figure 5-22. Typical 1151A Power Supply — Front

Install the BRI Terminating Resistor

The resistors balance the cable plant between the receiver and the transmitter on the interface. When using the TN2198 ISDN-BRI 2-Wire U Interface circuit pack, an NT1 is required. A terminating resistor is always required near the terminal when the BRI S-type interface circuit pack (TN556 BRI 4-Wire S-NT Line circuit pack) is used (see *#5ESS Switch Integrated Services Digital Network Customer Premises Planning Guide Issue 7*, 533-700-100).

The resistor is built into the NT1 and can be one of three values, depending on the configuration and the distance from the NT1 to the ISDN terminal. The resistor value is controlled from the NT1. A terminating resistor adapter may be needed near the terminal and can be placed in the satellite closet or work location.

NOTE:
The 440A4 terminating resistor and 110RA1-12 terminating resistor block are UL listed. Most new installations are the 110RA1-12 terminating resistor block. The following installation instructions should be observed.

- 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 wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Terminating Resistor Adapter

Figure 5-23 shows an 8-pin 440A4 terminating resistor adapter. The adapter is three inches long with an 8-wide plug at one end, a short cord, and an 8-wide jack at the opposite end.

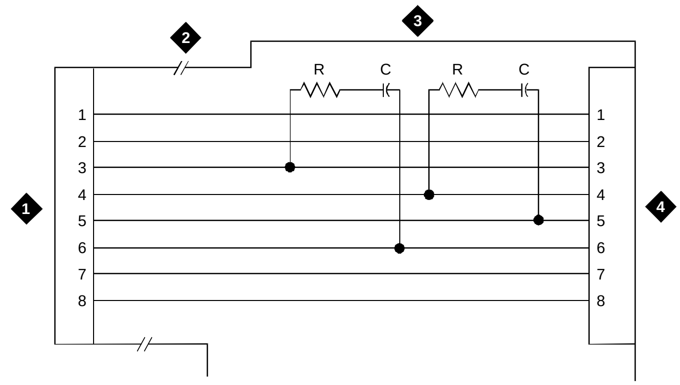


Figure Notes

1. 8-Wide Plug
2. Cord
3. Plastic Housing
4. 8-Wide Jack

Figure 5-23. 8-Wide Terminating Resistor Adapter (440A4)

Closet Mounted (110RA1-12)

The 110RA1-12 terminating resistor block is designed to mount in the telecommunications wire closet. It consists of twelve 2-pair circuits and provides the 100 Ohm termination used for ISDN-BRI circuits.

Figure 5-24 shows the wiring of the 110RA1-12. Three rows of 110D-4 connector blocks are mounted on a printed wire board along with circuit resistors and capacitors. The bottom row is designated as the input row and the top and middle rows are designated as the output rows. The circuit assembly is mounted on a standard 110A-100 pair mounting base. The 110RA1-12 is shipped with preprinted designation strips to simplify circuit identification and installation.

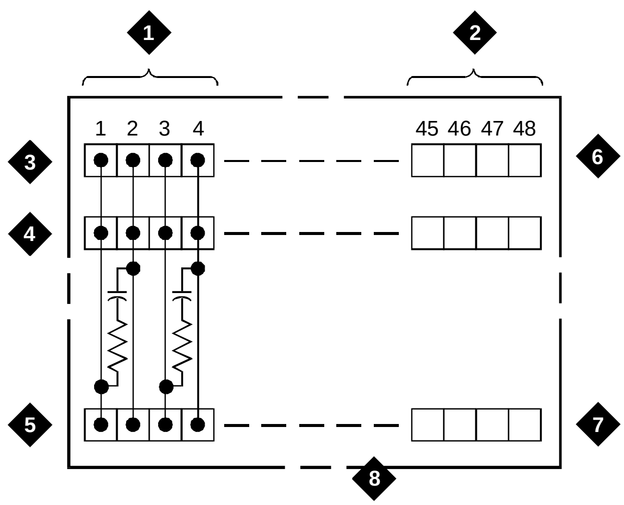


Figure Notes

1. Circuit 1
2. Circuit 12
3. Output Row “A”
4. Output Row “B”
5. Input Row “C”
6. Only First Circuit Shown to All 12 Circuits (2APR) Per Block
7. 110D-4 Connector Block
8. Printed Circuit Board Mounted on Standard 110A or 100APR Block

Figure 5-24. Terminating Resistor Block (110RA1-12)

Figure 5-25 shows the wiring connections for the 110RA1-12 terminal block. The TN556 Basic Rate Interface (BRI) switch port is terminated to bottom row C.

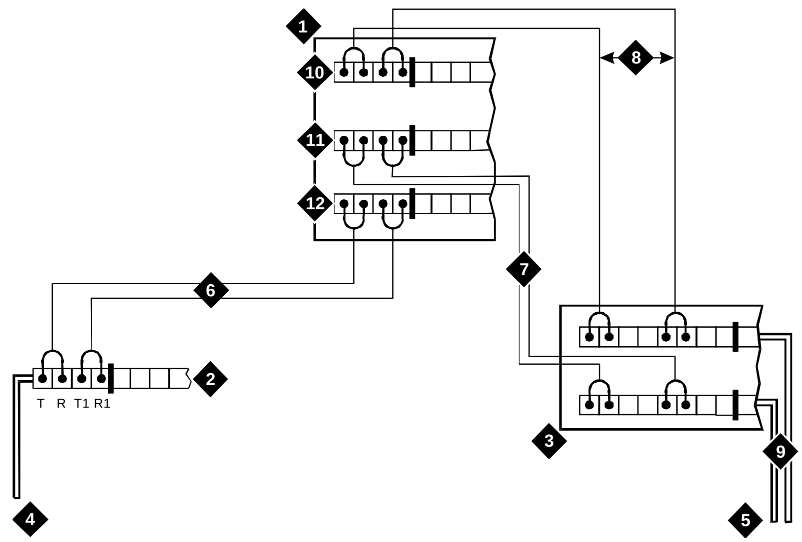


Figure Notes

1. Part of Terminating Resistor Block
2. White or Purple Field
3. Part of 4-Pair Blue Field
4. From ISDN T-interface Circuit (2-Pair)
5. To ISDN S/T-interface terminals
6. 2-Pair Cross-Connect
7. Basic Multipoint Option
8. 2-Pair Cross-Connect
9. 4-Pair Horizontal Cables
10. Row "A"
11. Row "B"
12. Row "C"

Figure 5-25. Typical Installation of Terminating Resistor Block (110RA1-12)

For point-to-point wiring, the top row is connected to the blue station field. The pair connects from the 110RA1-12 to the standard 4-pair circuit. Pair 1 from the 110RA1-12 is connected to Pair 1 of the station field, and Pair 2 is connected to Pair 3 of the station field.

Two terminal basic multipoint applications are accommodated by connecting row B (output) to the second terminal common to the multipoint circuit.

Install Multipoint Adapters

Multipoint Adapters are used to provide signal fanout of the T-interface. Fanout can be performed at the work station by the BR851-B or the 367A. These adapters support more than one ISDN terminal per horizontal 4-pair D-inside wire (DIW). To support multiple horizontal runs, fanout must be performed in the satellite closet by a MDF with multiple common rows. The 110RA1-12 provides fanout for two horizontal runs and contains the 100 Ohm terminating resistor. This can be used for Basic Multipoint or point-to-point with terminating resistor in the closet. Other fanout blocks include the 110AB1-025M and the 110AB1-050M.

BR851-B Adapter (T-Adapter)

The BR851-B supports two terminals on one multipoint BRI at the work station. It is a T-shaped device used to fanout transmission and power. The BR851-B is an 8-pin device with a single plug and two jacks. See Figure 5-26.

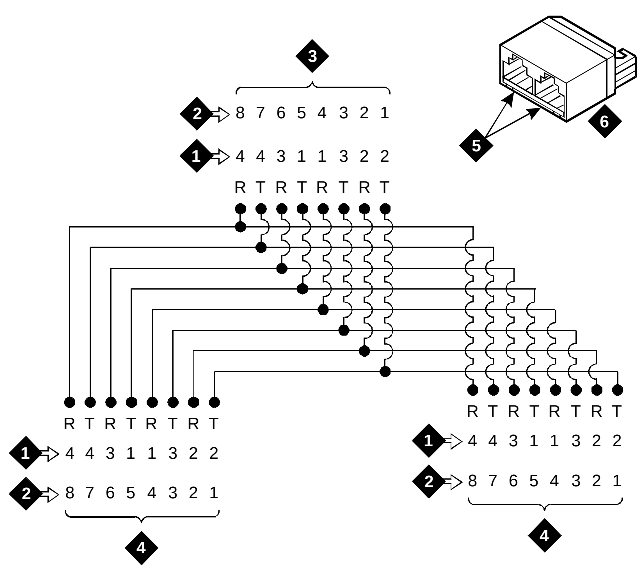


Figure Notes

1. Wire Pairs
2. Pin Numbers
3. Modular Plug (Male)
4. Female
5. Two 8-pin Modular Jacks
6. T-Type Adapter

Figure 5-26. Wiring Diagram of BR851-B

367A Adapter

The 367A adapter provides fanout. See Figure 5-27. It can provide inputs to up to seven terminals. The 367A is an 8-conductor adapter and can be is used at the work location for bridging three to seven terminals.

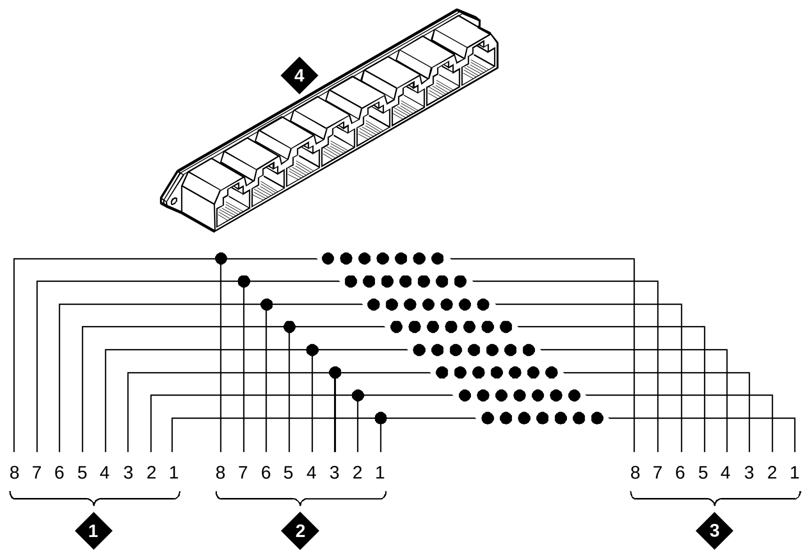


Figure Notes

1. Jack 1
2. Jack 2
3. Jack 8
4. 367A Adapter

Figure 5-27. Wiring Diagram of 367A

Basic Multipoint Installation Distances

Figure 5-28 provides cabling information for fan-out of ISDN-BRI multipoint installations. The terminating resistor is generally located in the satellite closet. All distances assume 24-gauge D-Inside Wire (DIW).

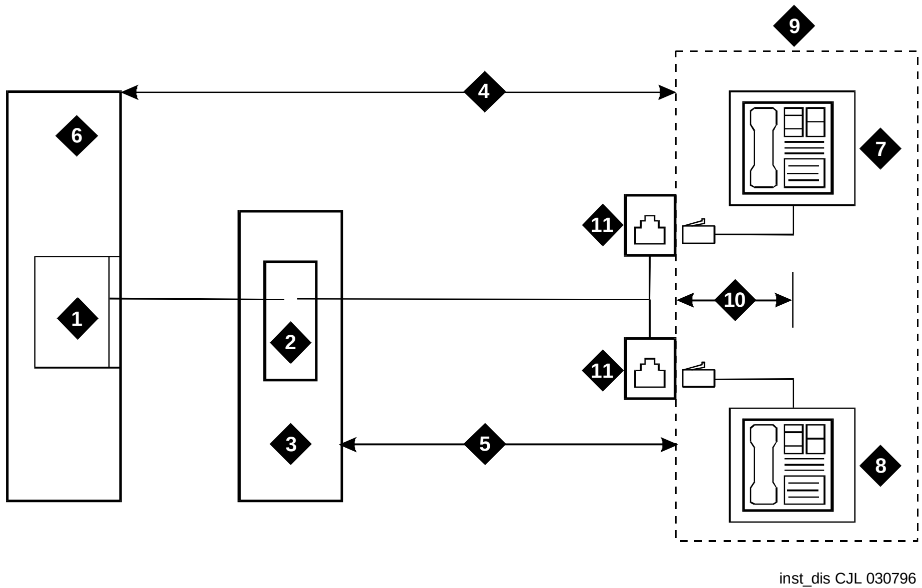


Figure Notes

1. S-Interface Source (TN556)
2. Terminating Resistor
3. Satellite Closet
4. Maximum Distance from S-Interface Source to Work Location (1600 Feet) (488 m)
5. Maximum Distance From Satellite Closet to Work Location (250 Feet) (76 m)
6. System Cabinet
7. Terminating Endpoint 1
8. Terminating Endpoint 2
9. Work Location
10. Maximum Distance from Information Outlet to Terminating Endpoint (33 Feet) (10 m)
11. Information Outlet (Bridged Tap)

Figure 5-28. Basic Multipoint with One Work Location

Install Auxiliary Equipment

Data Modules provide an interface to:

- — AUDIX
- — Call Management System (CMS)
- — Distributed Communications System (DCS)
- — Property Management System (PMS)
- — Customer-provided terminals and computers
- — Call Detailed Recording (CDR)

Asynchronous Data Units (ADU) provide an interface to:

- — Property Management System (PMS)
- — Call Detail Recording (CDR) equipment

909A/B Universal Coupler is used when equipment is not FCC-registered:

- — Music-On-Hold
- — Deluxe Queuing
- — Loudspeaker Paging Access
- — Recorded Telephone Dictation Trunk
- — Recorded Announcement Systems
- — AUX Trunk Paging (with or without background music)
- — Malicious Call Trace (MCT)

CONVERSANT™ Voice Information System

PagePac paging system. Three models are available:

- — PagePac 20, PagePac VS, and PagePac 50/100/200

PC Console

Model 15A Announcement System. The 15A system is FCC-registered and does not require a voice coupler. See the following PEC codes:

PEC 63240	1 chassis and 1 BLD1 circuit pack
PEC 63241	1 BLD1 circuit pack
PEC 63242	1 chassis and 1 BLD2 circuit pack
PEC 63243	1 BLD2 circuit pack
PEC 63246	1 remote record module

Install the 909A/B Universal Coupler

Figure 5-29 shows a typical 909A/B Universal Coupler. If the music source is FCC-registered (or equivalent) the 909A/B is not required. For installation and switch setting information, refer to *909A/909B Universal Coupler Installation Instructions*, (comcode 847369030).

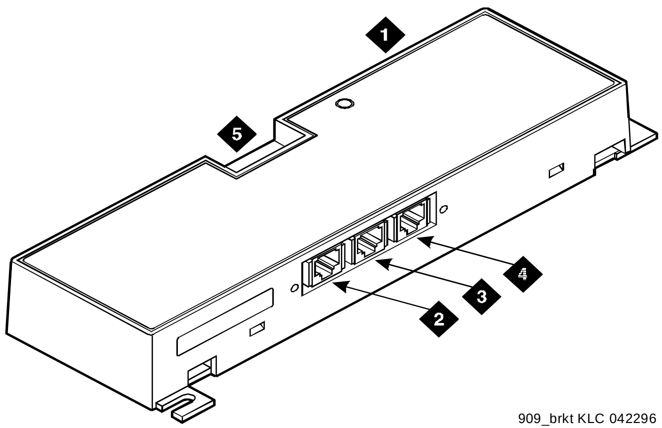


Figure Notes

1. 909A/B Universal Coupler
2. J1 8-Pin Modular Jack
3. J2 8-Pin Modular Jack
4. J3 6-Pin Modular Jack
5. DIP Switch Location

Figure 5-29. Typical 909A/B Universal Coupler

The 909A is the DC version of the coupler and -48 VDC power is supplied from cabinet power. The 909B is the AC powered version and power is supplied from a separate power supply (such as the KS-22911L2).

The DIP switches on the unit set:

- Protection/Paging selection — for AUX trunk paging and Malicious Call Trace, set to C2. Set the switch to C1 for all other applications.
- Output attenuation (-9 or -15 dBm) — setting depends on output level of music source.
- Output impedance (8, 1.5k, and 50k Ohms) — this switch only requires setting if the Protection/Paging switch is set to C2 and the coupler is supplying background music to a customer-supplied paging amplifier.

The pinouts for J1, J2, and J3 are provided in Table 5-13, Table 5-14, and Table 5-15. Refer to these tables when connecting music or paging equipment.

Table 5-13. J1 Pin Assignments (System Connections)

Pin	Color	Designation	Description
1	White-Orange	—	Not Used
2	Orange	PG2/BZ2	Seizure control lead, connected to -48 VDC from the system or from the 909A/B when the Protection/Paging switch is set to C2, or to -48 VDC on the 909A/B when Protection/Paging switch is set to C1
3	White-Green	PG1/BZ1	Seizure control lead, connected to SZ lead from the AUX trunk when the Protection/Paging switch is set to C2, or to -48 VDC on the 909A/B when the Protection/Paging switch is set to C1
4	Blue	R	Ring lead
5	White-Blue	T	Tip lead
6	Green	BSY2/BY2	Busy/Busy-Out lead, connected to S1 lead from the AUX trunk
7	White-Brown	BSY1/BY1	Busy/Busy-Out lead, connected to S lead from the AUX trunk
8	Brown	—	Not Used

Table 5-14. J2 Pin Assignments (Accessory Connections)

Pin	Color	Designation	Description
1	White-Orange	CMS1/M1	Customer-supplied music source
2	Orange	CMS2/M2	Customer-supplied music source
3	White-Green	COS1	Remote Busy-Out control contact closure from music source
4	Blue	CR	Customer Ring lead
5	White-Blue	CT	Customer Tip lead
6	Green	COS2	Remote Busy-Out control contact closure from music source
7	White-Brown	CBS1/C1	Seizure indication provided to music source
8	Brown	CBS2/C2	Seizure indication provided to music source

CAUTION:

Damage to the 909A/B may occur if the cable is plugged into J3 ***before*** *all cross-connects are completed.*

Table 5-15. J3 Pin Assignments (Power Connections)

Pin	Color	Designation	Description
1, 3, 4, & 6	—	—	Not Used
2	Black	GRD	-48 RET or ground lead from system or from positive lead of power supply
5	Yellow	-48 VDC	-48 VDC from system or from negative lead of power supply

Figure 5-30 shows the physical locations of the pins for J1, J2, and J3.

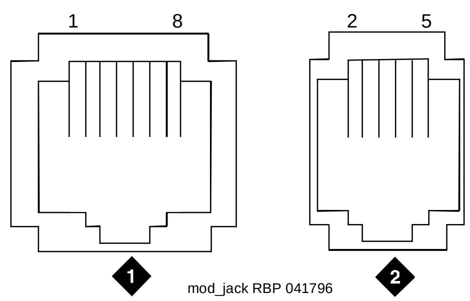


Figure Notes

1. J1 and J2 8-Pin Modular Jacks
2. J3 6-Pin Modular Jack

Figure 5-30. Typical Modular Jack Pinout

Install Loudspeaker Paging and Music-on-Hold

The Loudspeaker Paging feature provides a connection from a TN763B/C/D Auxiliary Trunk circuit pack (or equivalent) to a customer-supplied paging amplifier. The Music-on-Hold feature provides a connection from a TN2183 Analog Line circuit pack (or equivalent) or auxiliary trunk circuit pack to a customer-supplied music source.

Install Loudspeaker Paging Without Paging Adapter

Figure 5-31 shows the connections for the Loudspeaker Paging feature. These connections are used when the loudspeaker interface equipment is not located in the equipment room. If the equipment is located in the equipment room, the information outlet is not required. The connections shown are for one zone.

Figure 5-31 shows connections from the music source to the loudspeaker system through a paging amplifier. Figure 5-31 also shows connections to the loudspeaker system through a 909A/B coupler. A wiring block must be locally engineered.

NOTE:
If the loudspeaker paging system provides a talk-back microphone at the speakers, the microphone must be FCC approved (or equivalent) or a 909A/B Universal Coupler is required.

Refer to Table 5-31 on page 5-149 and Table 5-32 on page 5-150 for pinouts of the auxiliary trunk circuit pack.

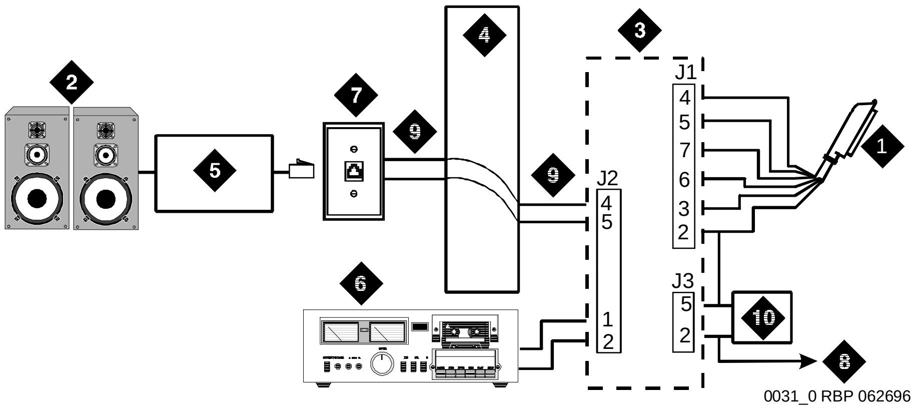


Figure Notes

1. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack (T, R, S, S1, SZ, SZ1) (SZ1 Connects to GRD on Callout 10)
2. Loudspeaker System
3. 909A/B Universal Coupler (if Required)
4. Part of Main Distribution Frame (MDF)
5. Paging Amplifier
6. Music Source or Paging System
7. 103A or Modular Wall Jack
8. To SZ1 on TN763 Connector
9. Tip and Ring Wires
10. -48 VDC Power Supply for 909B

Figure 5-31. Connections for Loudspeaker Paging

Install Loudspeaker Paging Access (Without Universal Coupler)

1. Determine port assignment of paging zone(s) from the Loudspeaker Paging Form.
2. At the MDF, locate the connecting block and terminals assigned to the selected port.
3. On the locally engineered wiring block, place a strap between terminals S and SZ. Place a strap between terminals S1 and SZ1.
4. Install patch cord/jumper wires at the MDF.
5. Connect a 2-pair line cord (modular plug at one end) from the information outlet to the paging amplifier (to the loudspeaker system).
6. Install loudspeaker equipment per the manufacturer's instructions.
7. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install Loudspeaker Paging with Universal Coupler

Access to loudspeaker paging is provided by an information outlet. The system side of the MDF is connected to a 909A/B Universal Coupler. Provisions must be made for obtaining the DC power required by the 909A/B Coupler. An 1151A or other approved -48V power supply can be used.

Six leads (T, R, SZ, SZ1, S, and S1) connect the adapter to an auxiliary trunk circuit pack in a Port Carrier.

1. Determine port assignment of paging zone(s) from Loudspeaker Paging Form.
2. Identify carrier slot and label both ends of an A25D (male to male) cable.
3. Connect a cable from the 909A/B to the system side of the MDF. A wiring block must be locally engineered.
4. Refer to Table 5-13, Table 5-14 and Table 5-15 to make connections from the 909A/B Universal Coupler to the wiring blocks.

   CAUTION:
   Damage to the 909A/B may occur if the cable is plugged into J3 ***before*** *all cross-connects are completed.*

5. On the 909A/B Universal Coupler:
   — Connect seizure control voltage of from -9 to -60 volts to the PG2/BZ2 connection (pin 2 of J1). Switching voltage to the PG2/BZ2 connection can be from the 909's -48 volt supply.
   — Connect a -48 VDC power source to the -48 and GRD terminals on the 909A/B
6. Install patch cord/jumper wires at MDF.
7. Connect a 2-pair line cord (modular plug at one end) from the information outlet to the loudspeaker system.
8. Install loudspeaker equipment per the manufacturer's instructions.
9. Connect an approved -48 VDC power source to the **-48** and **GRD** terminals (pins 5 and 2, respectively, of J3).
10. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install PagePac Paging System

Install PagePac 20

The PagePac 20 is a 20 watt amplifier that can be used alone or with a Zone-Mate 9 or 39 to provide multiple paging zones. If the PagePac 20 is used alone, a 909A/B Universal Coupler is required. See Figure 5-32.

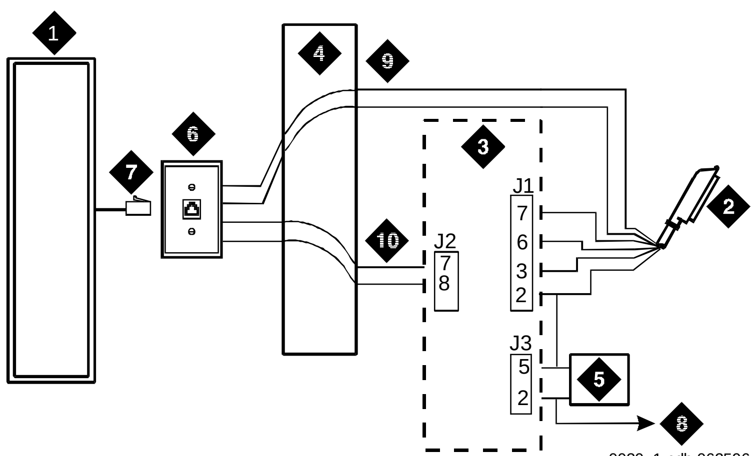


Figure Notes

1. PagePac 20 PowerMate
2. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack (T, R, S, S1, SZ, SZ1)
3. Universal Coupler (Used Only if PagePac 20 is Used Alone)
4. Part of Main Distribution Frame (MDF)
5. Power Supply for Universal Coupler
6. 103A or Modular Wall Jack
7. 4-Pair Modular Cord
8. To SZ1 on TN763B/C/D Connector
9. Tip and Ring Wires
10. CBS1/C1 and CBS2/C2

Figure 5-32. Connections for PagePac 20 Without Zone-Mate

- A wiring block must be locally engineered if a 909A/B is used.

Figure 5-33 shows a PagePac 20 with a Zone-Mate 9 or 39 incorporated into the PagePac 20. The 909A/B is not required when a Zone-Mate is installed.

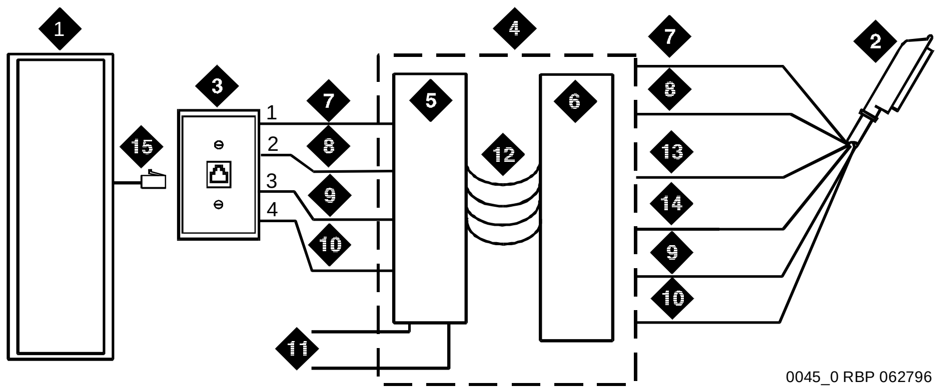


Figure Notes

1. PagePac 20 PowerMate (With Zone-Mate 9 or 39)
2. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack
3. 103A or Modular Wall Jack
4. Part of Main Distribution Frame (MDF)
5. Station Side (Yellow Field)
6. System Side (Purple Field)
7. Tip (Green)
8. Ring (Red)
9. S
10. S1
11. SZ and SZ1 Not Used on Station Side
12. 110P6A Patch Cord or Jumpers
13. SZ
14. SZ1
15. 4-Pair Modular Cord

Figure 5-33. Connections for PagePac 20 With Zone-Mate

- A wiring block must be locally engineered.

Install PagePac VS

The PagePac VS is a 35 watt amplifier that provides up to three paging zones. The PagePac VS does not require a 909A/B Universal Coupler. See Figure 5-34.

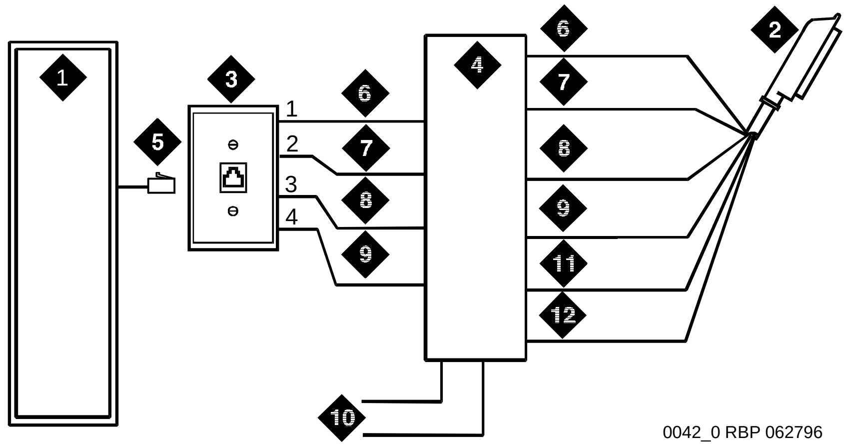


Figure Notes

1. PagePac VS
2. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack
3. 103A or Modular Wall Jack
4. Part of Main Distribution Frame (MDF)
5. 4-Pair Modular Cord
6. Tip (Green)
7. Ring (Red)
8. S (C Connection on Callout 1)
9. S1 (NO Connection on Callout 1)
10. SZ and SZ1 Are Not Used on Callout 1
11. SZ
12. SZ1

Figure 5-34. Connections for PagePac VS

- If a Universal Interface Card (UIC) is not provided on the PagePac VS, all connections are made to TB2.
- If a DB9 connector is used to connect to a Personal Computer (PC), use an ED3P001-70 G115 cable to convert DB9 to DB25.

Install PagePac 50/100/200

The 50/100/200 PagePac paging system can be wall-mounted. The unit provides three output wattages: 50, 100 and 200. See Figure 5-35. If the PagePac 50/100/200 Amplicenter is used alone, a 909A/B Universal Coupler is required.

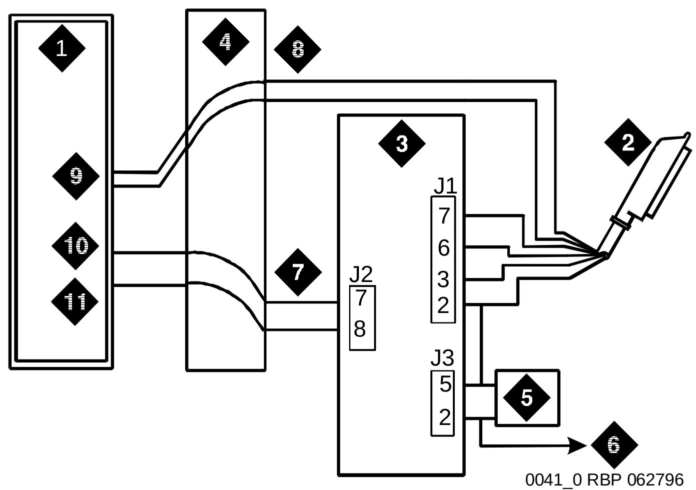


Figure Notes

1. PagePac 50/100/200 System
2. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack (T, R, S, S1, SZ, SZ1)
3. 909A/B Universal Coupler
4. Part of Main Distribution Frame (MDF)
5. Power Supply for Universal Coupler
6. To SZ1 on TN763 Connector
7. CBS1/C1 and CBS2/C2
8. Tip and Ring Wires
9. Page In Connections
10. Music/Page Connection
11. Signal Ground Connection

Figure 5-35. Connections for PagePac 50/100/200 System

- A wiring block must be locally engineered.

Install Music-on-Hold, Dial Dictation, or Recorded Announcement Access

Figure 5-36 shows the connections for music-on-hold, dial dictation, or recorded announcement features when the music source is FCC-registered (or equivalent). Figure 5-37 on page 5-76 shows the connections when the music source is not FCC-registered (or equivalent).

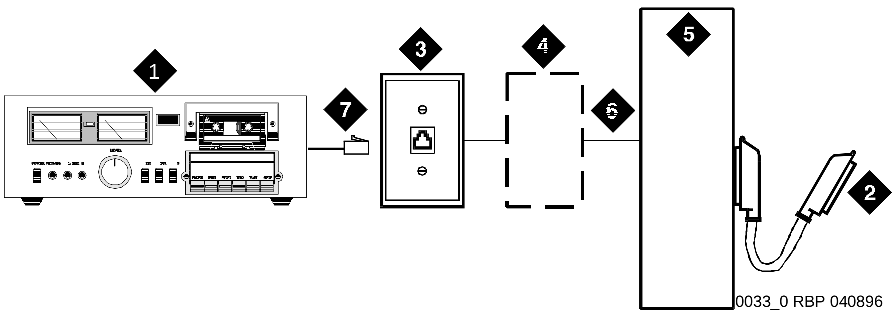


Figure Notes

1. Customer-Supplied Music Source
2. 25-Pair Cable to TN2183 Analog Line Circuit Pack
3. 103A or Modular Wall Jack
4. 122A Music Adapter (if Required) (Primarily France)
5. Part of Main Distribution Frame (MDF)
6. Tip (Green) and Ring (Red)
7. 4-Pair Modular Cord

Figure 5-36. Typical FCC-Registered Equipment Connections (Auxiliary Access)

If the music source is FCC-registered (or equivalent), the system side of the MDF is connected directly to the system. If the music source is not FCC-registered, the system side of the MDF is connected to a 909A/B Universal Coupler.

The following connection instructions are used when the music source is not located in the equipment room. If the music source is located in the equipment room, the connections do not have to be routed through the information outlet.

Install Registered Music Source

Refer to Figure 5-37 on page 5-76 to install an FCC (or equivalent) registered music source.

1. Determine feature port assignment from Feature-Related System Parameters Form.
2. Install music source per the manufacturer's instructions.
3. Install patch cord/jumper wires at the MDF.
4. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install Non-Registered Music Source

Refer to Figure 5-37 on page 5-76 and the following instructions to install a music source that is not registered with the FCC (or equivalent).

1. Determine feature port assignment from Feature-Related System Parameters Form.
2. Install the music source per the manufacturer's instructions.
3. Connect a cable from the assigned port carrier slot to J1 on the 909A/B. A wiring block must be locally engineered.
4. At the 909A/B Universal Coupler:
   - Connect the T-lead at pin 5 and the R-lead at pin 4 of J1 on the 909A/B to the corresponding leads from the TN2183
   - Connect the CT-lead at pin 5 and the CR-lead at pin 4 of J2 on the 909A/B to the MDF
   - Install patch cord/jumper wires at the MDF to connect Tip and Ring to the information outlet at the music source
   - Set the Protection/Paging Switch to C1
5. Connect a modular cord from the information outlet to the music source.
6. Connect -48V to pin 5 and -48V RET to pin 2 of J3 on the 909A/B. The power source may be an 1151A or other approved power supply.
7. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Figure 5-37 shows a system connected to a non-FCC-registered (or equivalent) customer-supplied music source via auxiliary access.

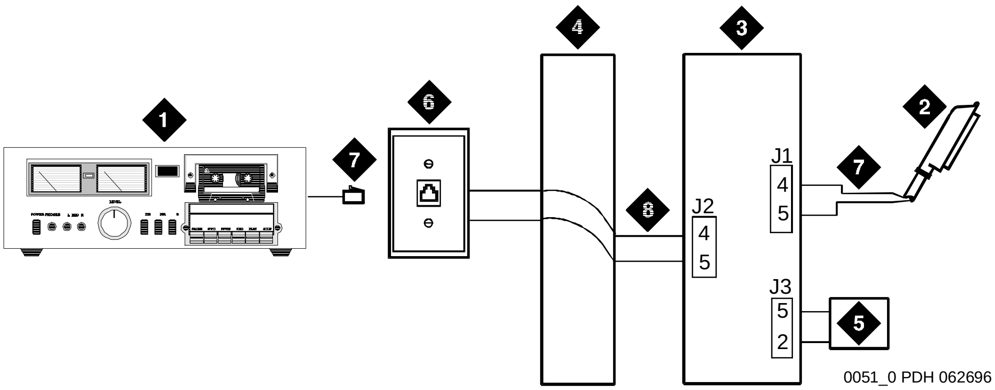


Figure Notes

1. Customer-Supplied Music Source
2. 25-Pair Cable to TN763B/C/D Auxiliary Trunk Circuit Pack
3. 909A/B Universal Coupler
4. Part of Main Distribution Frame (MDF)
5. Power Supply for Universal Coupler
6. 103A or Modular Wall Jack
7. 4-Pair Modular Cord
8. Tip and Ring Wires

Figure 5-37. Typical Non-FCC-Registered Equipment Connections (Auxiliary Access)

- A wiring block must be locally engineered.

Figure 5-38 shows a system connected to a non-FCC-registered (or equivalent) customer-supplied music source via an analog line.

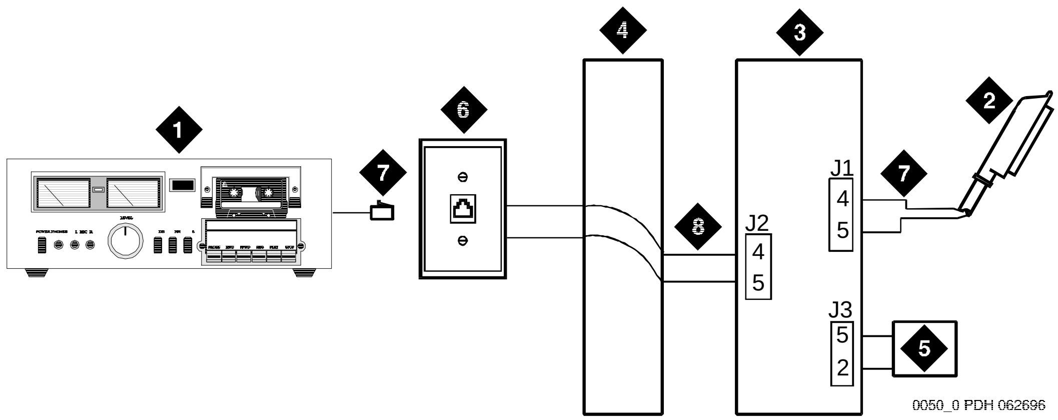


Figure Notes

1. Customer-Supplied Music Source
2. 25-Pair Cable to TN746B Analog Line Circuit Pack
3. 909A/B Universal Coupler
4. Part of Main Distribution Frame (MDF)
5. Power Supply for Universal Coupler
6. 103A or Modular Wall Jack
7. 4-Pair Modular Cord
8. Tip and Ring Wires

Figure 5-38. Connections to Music-on-Hold (non-FCC-registered) via Analog Line

- A wiring block must be locally engineered.

Malicious Call Trace

The malicious call trace voice recorder is directly connected to the Tip and Ring connections of a TN763/D Auxiliary Trunk circuit pack. See Figure 5-39. Seizure control to the recorder is provided by a 909A/B Universal Coupler.

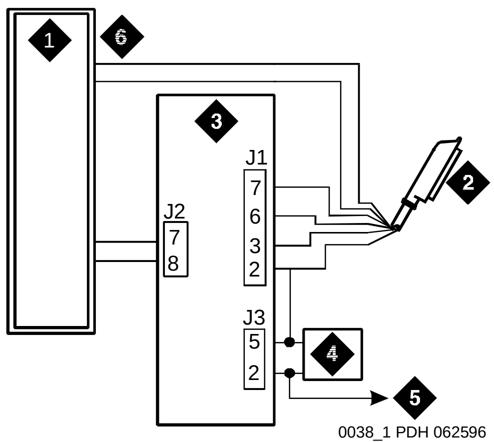


Figure Notes

1. Malicious Call Trace Voice Recorder
2. 25-Pair Cable to TN763/D Auxiliary Trunk Circuit Pack (T, R, S, S1, SZ, SZ1)
3. 909A/B Universal Coupler
4. Power Supply for Universal Coupler
5. To SZ1 on TN763 Connector
6. Tip and Ring Wires

Figure 5-39. Malicious Call Trace

- A wiring block must be locally engineered.
- The 909A is shipped with one DW4B-DE cable and two DW8B-SE cables.
- The 909B is shipped with one KS-22911L2 Power Supply, one DW4B-DE cable, and two DW8B-SE cables.

1. Determine the port assignment of the recorder from the Malicious Call Tracing Form.
2. Install the 909A/B Universal Coupler on a vertical surface.

3. Four leads (SZ, SZ1, S, and S1) connect the 909A/B to an auxiliary trunk circuit pack.
   a. Tip and Ring connect from the voice recorder to the auxiliary trunk circuit pack (J1 on the 909A/B).
   b. CBS1/C1 and CBS2/C2 connect from the voice recorder to J2 on the 909A/B.
4. On the 909A/B Universal Coupler:
   a. Connect seizure control voltage of from -9 to -60 volts to the PG2/BZ2 connection (pin 2 of J1). Switching voltage to the PG2/BZ2 connection can be from the 909A/B -48 VDC supply.
   b. Connect SZ1 to the ground lead of the DC power source used for PG2/BZ2.
   c. Set S1 to the “C2” position. Set S2 position 6 to “OPEN”.
   d. Connect an approved -48 VDC power source to the **-48** and **GRD** terminals (pins 5 and 2, respectively, of J3 on the 909A/B).

Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Asynchronous Data Units

The following section describes how Asynchronous Data Units (ADUs) are used to connect equipment to the system.

Asynchronous Data Units

Figure 5-40 shows a typical Z3A2 ADU assembly (without a cable). The addition of the male to female EIA-232 cable makes the assembly a Z3A1. The addition of a female to female EIA-232 cable makes the assembly a Z3A4.

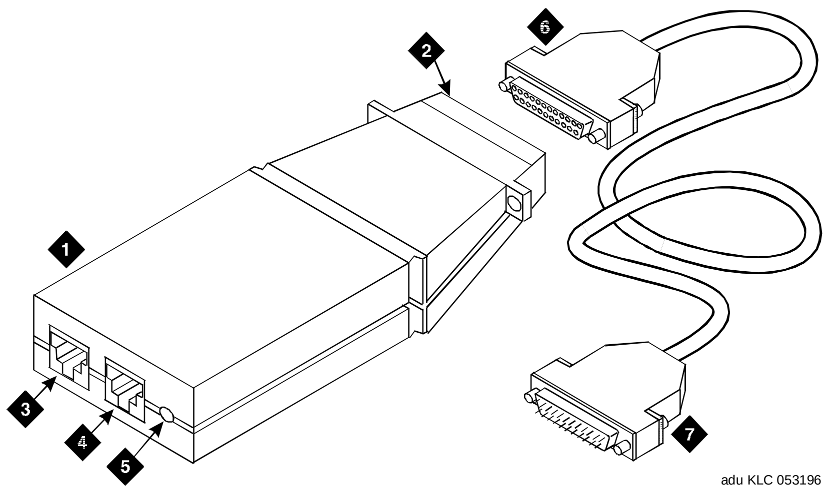


Figure Notes

1. Z3A2 Asynchronous Data Unit (ADU)
2. 25-Pin Male D-Connector (EIA-232-D) to DTE Equipment
3. Wall Jack Connector (To Data Line Circuit Pack (TN726) and Analog Line Circuit Pack (TN2183) or Equivalent)
4. Telephone Jack (To Analog Telephone)
5. Originate/Disconnect Jack
6. Female Connector on EIA-232-D Cable
7. Male Connector

Figure 5-40. Z3A2 Asynchronous Data Unit (ADU)

Refer to Table 5-31 on page 5-149 and Table 5-32 on page 5-150 for the pinouts of the data line circuit pack (TN726) and TN2183 Analog Line circuit pack (or equivalent) in the cabinet.

Data Modules

7400A/B/C/D and 8400B+ Data Modules

The interface between the system and many types of data equipment is provided by a data module connected to a digital line circuit pack (such as a TN754B). The following types of equipment can be connected by a data module:

- AUDIX Adjunct
- AUDIX Terminal
- Call Management System (CMS)
- Distributed Communications System (DCS)
- Property Management System (PMS)
- System Printer or Journal Printer
- Customer-supplied terminals and host computers
- Call Detail Recording (CDR)

Data Module Types

Figure 5-41 shows the front and rear of a 7400A Asynchronous Data Module. This unit is intended for connecting data processing or data communications equipment to the system. The 7400A does not provide voice functions. The options for the 7400A are set from the front panel interface. Refer to *7400A Data Module User's Manual*, 555-020-706, for procedures.

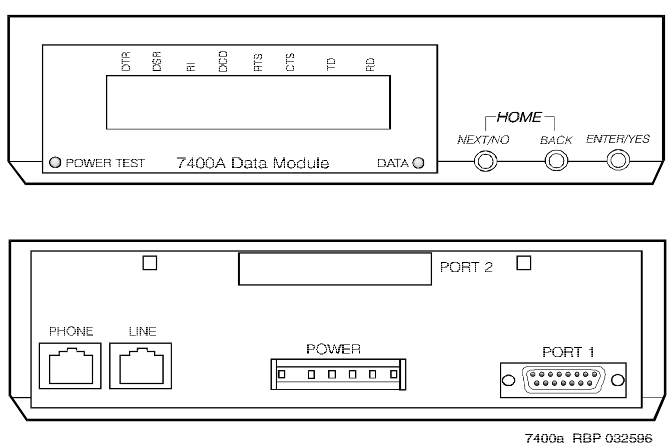


Figure 5-41. 7400A Data Module

Figure 5-42 shows the front and rear of a 7400B Asynchronous Data Module. An EIA-232-D standard interface connects a terminal device to the 7400B and a standard DCP interface connects the 7400B to the system. Refer to *AT&T 7400B Data Module User's Guide*, 555-020-707, *before* installing the unit.

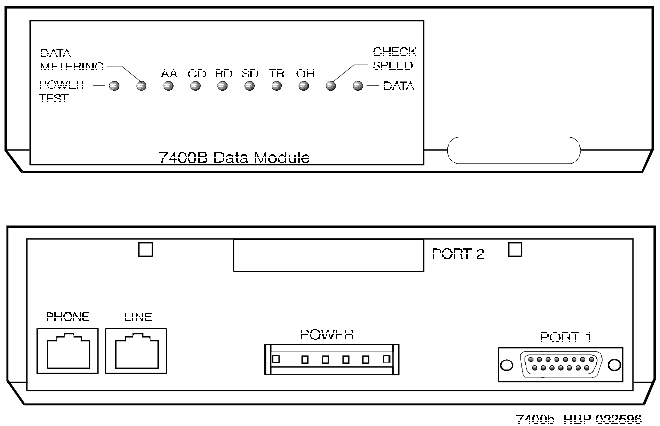


Figure 5-42. 7400B Data Module

Figure 5-43 shows the front and rear of a 7400C Data Module. The options for the 7400C are set from the front panel interface. Refer to *DEFINITY Communications System High Speed Link User's Guide*, 555-020-711, for procedures.

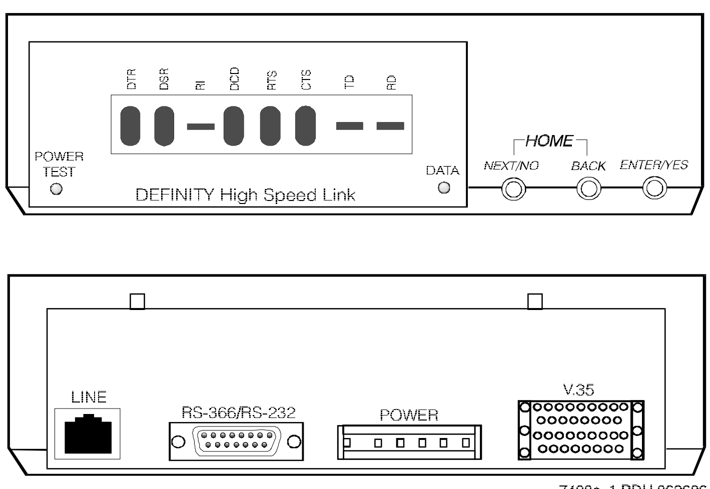


Figure 5-43. 7400C Data Module (High Speed Link)

Figure 5-44 shows the front and rear of a 7400D Synchronous Data Module. The 7400D is a full duplex 4-wire unit for the DCP environment. The 7400D can be used in DEFINITY AUDIX, CMS, and DCS low speed synchronous data applications. The options for the 7400D are set from the front panel interface. Refer to *AT&T 7400D Data Module User's Guide*, 555-020-712, for procedures.

NOTE:
The 7400D does not support DTE configurations. The DCE configuration is limited to the Answer Only interface.

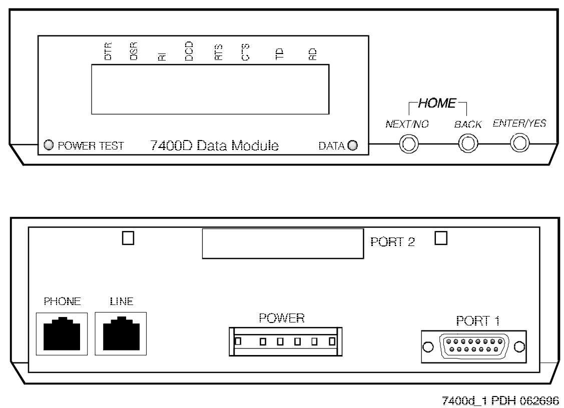


Figure 5-44. 7400D Data Module

Figure 5-45 shows the rear of a 8400B Plus Asynchronous Data Module. The unit provides integrated voice and data communications over standard twisted-pair wiring. The unit can emulate a Hayes-compatible interface for standard Personal Computer (PC) communication. The options for the 8400B Plus are set from the rear panel interface. Refer to *DEFINITY Communications System User's Guide*, 555-020-709, for procedures.

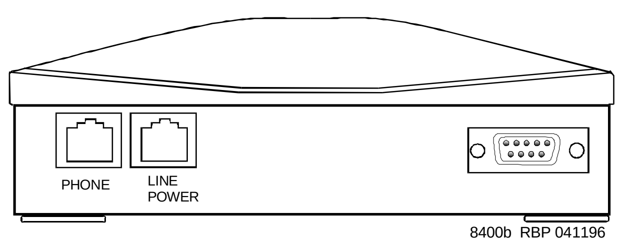


Figure 5-45. 8400B Plus Data Module

Figure 5-46 shows the front and rear of a 7500B ISDN Data Module. The unit is intended for connecting DTE and DCE equipment to the ISDN network. The options for the 7500 are set from the front panel interface. Refer to *Integrated Services Digital Network (ISDN) 7500B Data Module User's Manual*, 555-021-717, for detailed procedures.

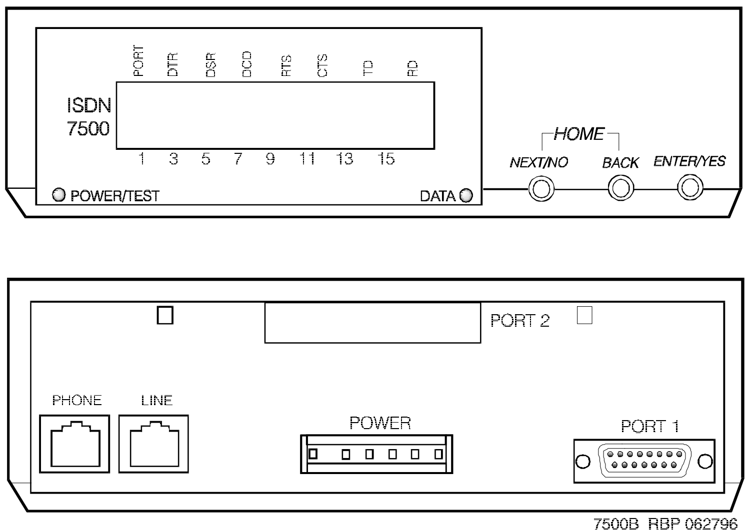


Figure 5-46. 7500B ISDN Data Module

Mode Selection

The data modules can be set for either DCE or DTE mode by changing the position of the Electronic Industries Association (EIA) connector board inside each unit. See Figure 5-47. The units are factory-set to the “DCE” mode. To change the mode:

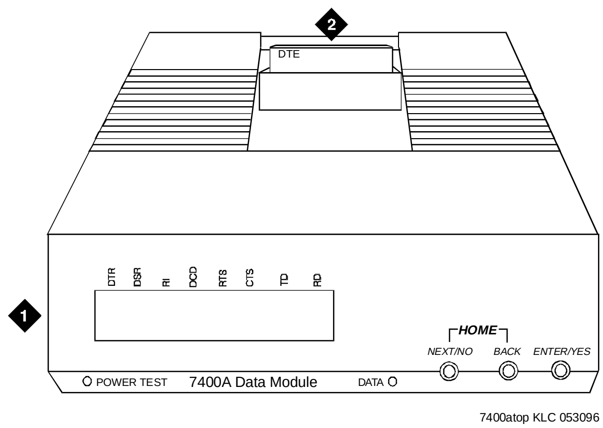


Figure Notes

1. Data Module (7400A Shown)
2. EIA Connector Board (Shown in “DTE” Mode)

Figure 5-47. Data ModuleMode Selector

1. Insert the tip of a pen into one of the small holes on the rear of the unit, near the label. Do not use a pencil.
2. Push the tab inward while pulling up on that side of the top cover. Repeat for the opposite side.
3. Remove the top cover. Check the position of the EIA connector board mounted vertically in the unit. If the “DTE” is facing the front, the unit is operating in DTE mode. If the “DCE” is facing the front, the unit is operating in DCE mode.
4. To change the mode, remove the board by grasping it and pulling it gently upward. Position the board so the desired mode is facing the front of the data module.
5. Press the board gently back into the holder.
6. Place the top cover back onto the unit and snap it into place.

Install Data Modules Into Data Mounting

Up to eight data modules can be mounted in a Z77A Data Mounting. See Figure 5-48. To install the data modules, perform the following:

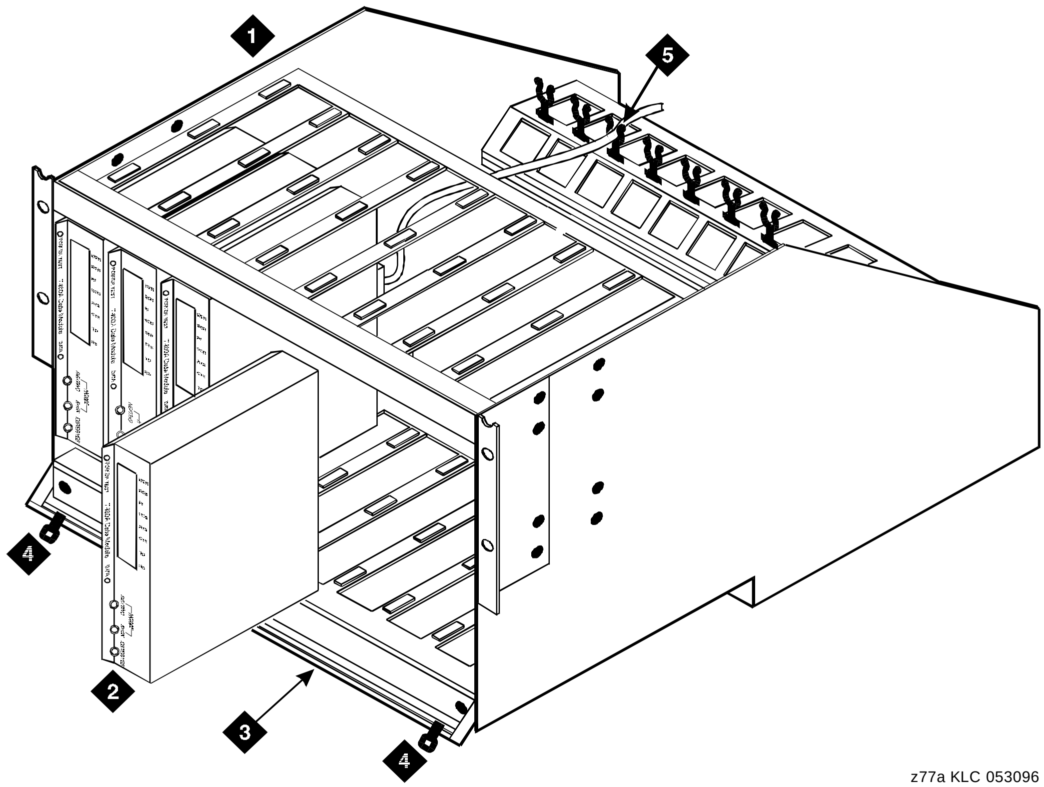


Figure Notes

1. Z77A Data Mounting
2. Data Module (7400A Shown)
3. Retaining Bar
4. Retaining Bar Plunger
5. Twist-Lock Cable Retainers

Figure 5-48. Z77A Data Mounting

1. From the Data Module Form, determine the port assignment of each data module. Set the operating mode of each unit to either “DTE” or DCE” mode (as applicable).
2. At the front of the data mounting, pull out the left and right plungers holding the horizontal retaining bar. Pull the retaining bar out and down.
3. Connect the supplied RS-232 cable to the 25-pin connector on the rear of the data module.
4. Route the cable through the data mounting and through the twist-lock cable retainer on the top of the data mounting. The cable is attached to DTE or DCE equipment as shown on the following page.
5. Insert the data module vertically into the data mounting. Be sure the display is to the top of the data mounting.
6. Repeat Steps 2 through 5 for each data module.
7. Return the horizontal retaining bar to its original position to secure the data modules inside the data mounting.

A data module must be connected to data equipment by an A25D and/or B25A cable and through the MDF to a digital line circuit pack (such as a TN754B). The following sections detail these connections.

Data Module Equipment Connections

CAUTION:
In DC-powered cabinet installations, a 105C Isolator adapter is required when connecting equipment to a data module.

7400B Data Module

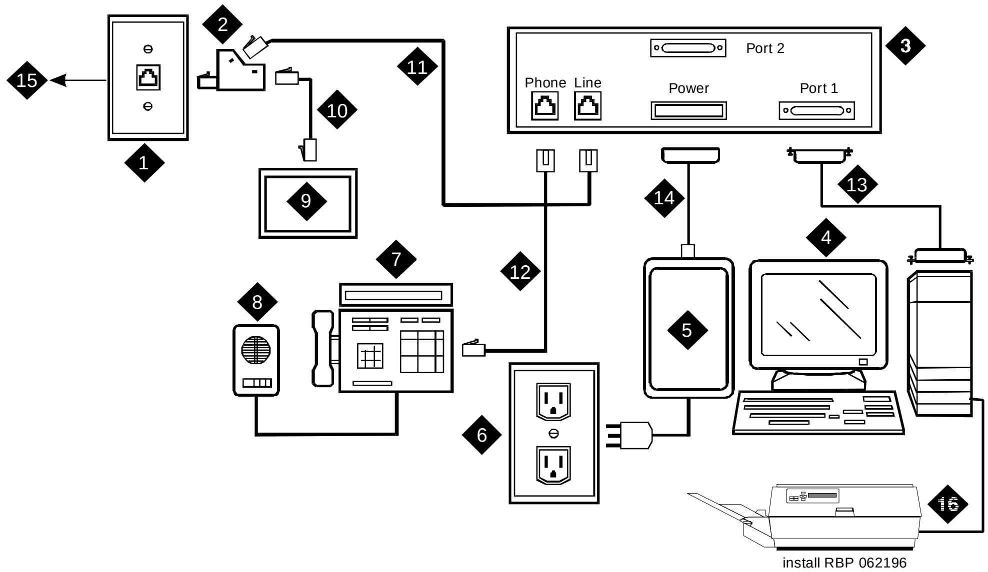


Figure Notes

1. 103A or Modular Wall Jack
2. 400B2 Adapter
3. Rear of Data Module (7400B Shown)
4. Host Computer
5. Data Module Power Supply
6. Electrical Outlet
7. Display Telephone
8. S101A Speakerphone
9. Auxiliary Power Supply for Telephone and Speakerphone
10. D6AP Cord
11. D8W Cord
12. Line to Display Telephone (D8W Cord)
13. EIA Cable
14. Power Cable (From Data Module Power Supply)
15. To Digital Line Circuit Pack via Main Distribution Frame (MDF)
16. Printer

Figure 5-49. Typical Connections to a 7400B Data Module

7500B Data Module

Typical connections between a 7500B Data Module and the associated equipment interface are shown in Figure 5-50.

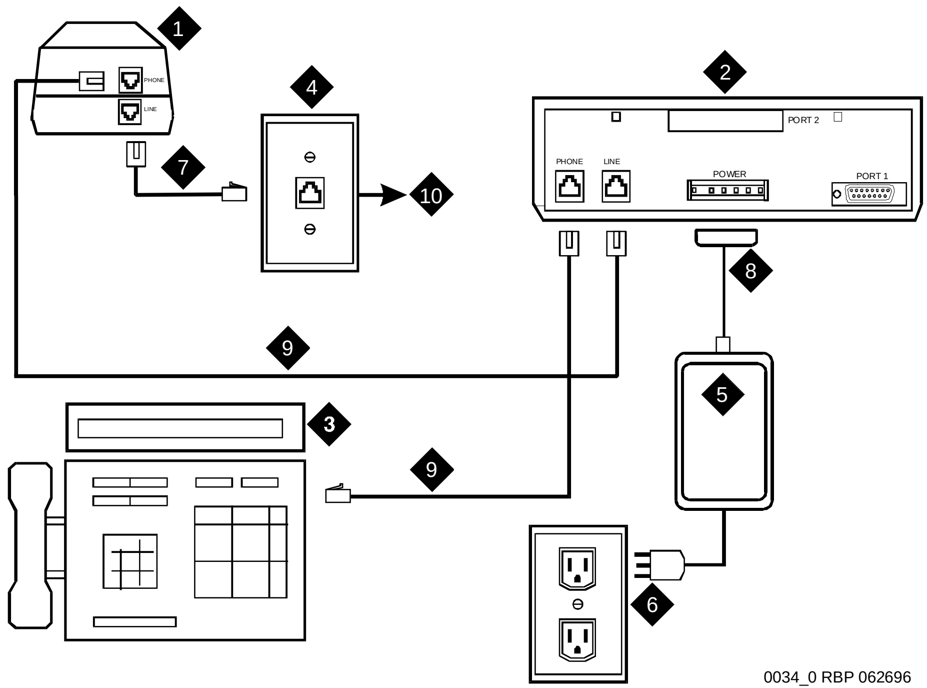


Figure Notes

1. 1151A Power Supply
2. Rear of Data Module (7500B Shown)
3. ISDN Display Telephone
4. 103A or Modular Wall Jack
5. Data Module Power Supply
6. Electrical Outlet
7. D6AP Cord
8. Power Cable (From Data Module Power Supply)
9. D8W Cord
10. To BRI Line Circuit Pack in System Cabinet via MDF

Figure 5-50. Typical Connections to a 7500B Data Module

8400B Plus Data Module

Typical connections between a 8400B Plus Data Module and the associated equipment are shown in Figure 5-51.

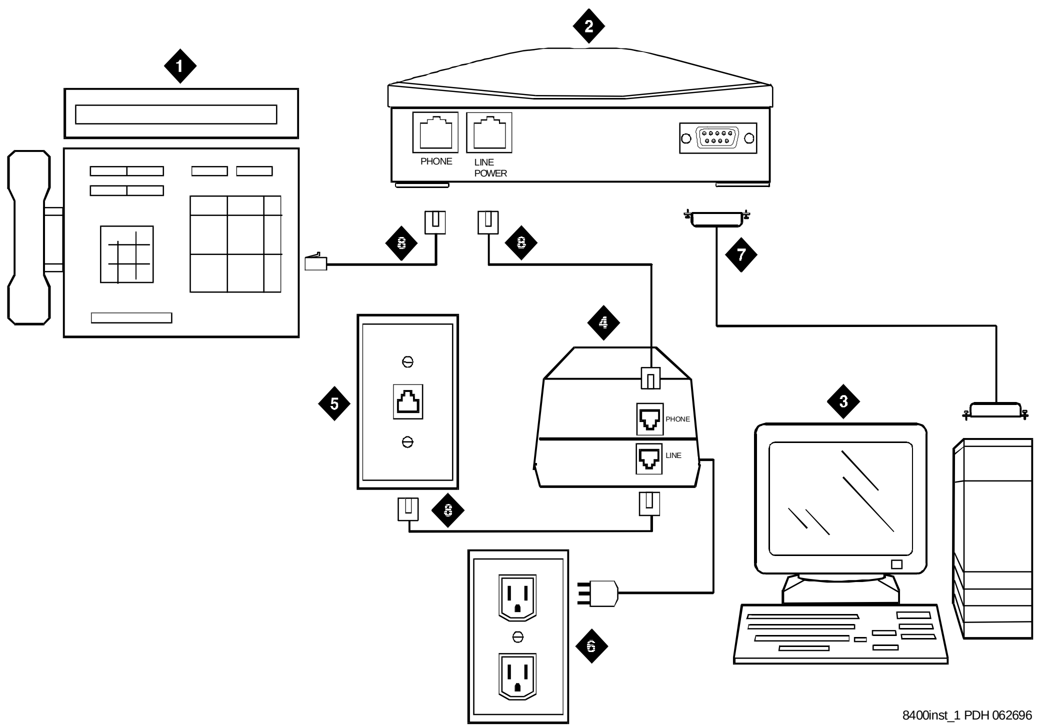


Figure Notes

1. Display Telephone
2. Rear of 8400B Plus Data Module
3. Host Computer
4. 1151A Power Supply (or Equivalent)
5. 103A or Modular Wall Jack
6. Electrical Outlet
7. EIA-232-D Cable (Use M9/F25 Adapter if Required)
8. D8W Cord

Figure 5-51. Typical Connections to a 8400B Plus Data Module

Install DEFINITY AUDIX R3 System or DEFINITY LAN Gateway

The DEFINITY Audio Information Exchange (AUDIX) R3 System and the DEFINITY LAN Gateway are installed in five adjacent purple slots in a carrier; preferably, the five rightmost slots. Refer to *DEFINITY AUDIX Installation and Upgrade*, 585-300-111. Figure 5-52 and the following procedures detail a typical AUDIX R3 installation, the LAN Gateway installation is similar.

CAUTION:
Do not power up the unit until the installation and cabling is completed.

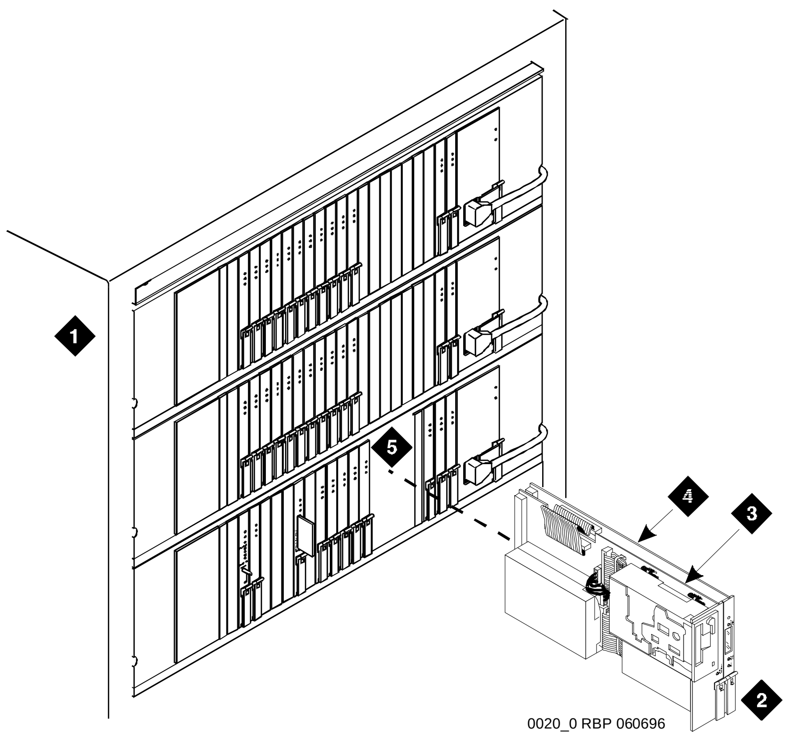


Figure Notes

1. System Cabinet
2. DEFINITY AUDIX R3 or LAN Gateway
3. Alarm Circuit Pack
4. Multi-Function Circuit Pack
5. Five Adjacent Slots in Carrier

Figure 5-52. Typical DEFINITY AUDIX/LAN Gateway Installation

Connect Alarm Origination Cable

Figure 5-53 shows a typical alarm origination cable installation. The alarm cable is connected to the MDF and cross-connected to the customer-supplied alarm equipment. Also refer to Table 5-16.

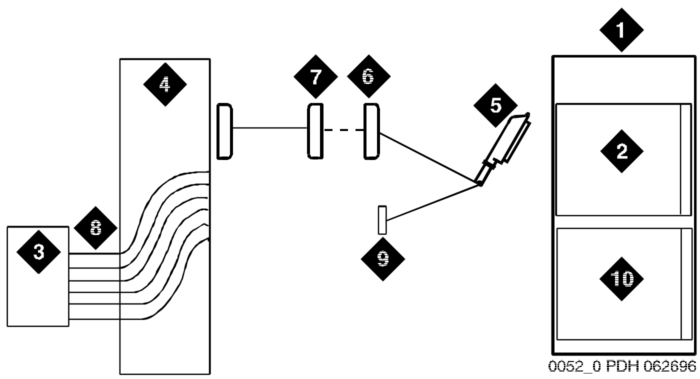


Figure Notes

1. System Cabinet
2. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)
3. Customer-Supplied Alarm Equipment
4. Part of Main Distribution Frame (MDF)
5. ALB Y Cable
6. Female “ALARM” Connector on ALB Y Cable
7. Male Connector on Group 300 Cable
8. Cross-Connections to Alarm Equipment
9. Unused RS-232 Connector
10. Multi-Function Circuit Pack (Part of AUDIX System)

Figure 5-53. Connecting the Alarm Origination Cable

1. Connect the ALB Y cable to the connector associated with the alarm circuit pack on the AUDIX System on the rear of the system cabinet.
2. Attach the male Amphenol connector on a Group 300 cable to the female Amphenol connector labeled **ALARM** on the ALB Y-cable.
3. Connect the opposite end of the Group 300 cable to the MDF.

NOTE:
Do not connect the RS-232 connector on the ALB Y cable. The standard alarm origination circuit uses an on-board modem that is internally wired to the connector on the ALB Y cable.

4. Perform the cross-connects for the alarm origination connection as described on the service order. Also see Table 5-16.

Table 5-16. Alarm Origination Pinouts (ALB Y Cable)

Pin Number	Definition
26	Tip (white/blue)
1	Ring (blue/white)
44	Minor RTN (Return) (yellow/brown)
19	Minor (brown/yellow)
47	Major RTN (Return) (violet/orange)
22	Major (orange/violet)

Install the Terminal(s)

Two terminals may be installed, a local maintenance terminal and an administration terminal. The local maintenance terminal is optional but the administration terminal is required. The local maintenance terminal can only be connected via a direct cable connection. However, there are four ways to connect the administration terminal.

1. Via a direct connection
2. Via modems
3. Via Asynchronous Data Units (ADU)
4. Via data modules

See the *DEFINITY AUDIX System Description*, 585-300-205, for a list of the supported terminals and modems. The connectivity for all supported terminals is similar.

If connecting a G3-MA as the administration terminal, see *DEFINITY Communications System Generic 3 Management Applications Station Provisioning*, 555-229-201 for installation instructions.

NOTE:
The AUDIX or LAN Gateway is DTE equipment, the DEFINITY System is DCE equipment. A null modem cable may be required to complete the DTE/DCE pair when connecting the G3-MA.

Install a Directly-Connected Terminal

Figure 5-54 shows typical connections for a local maintenance terminal. Figure 5-55 shows typical connections for a local administration terminal. Refer to the documentation shipped with the terminal to connect the keyboard, terminal power, and to set up the terminal after installation.

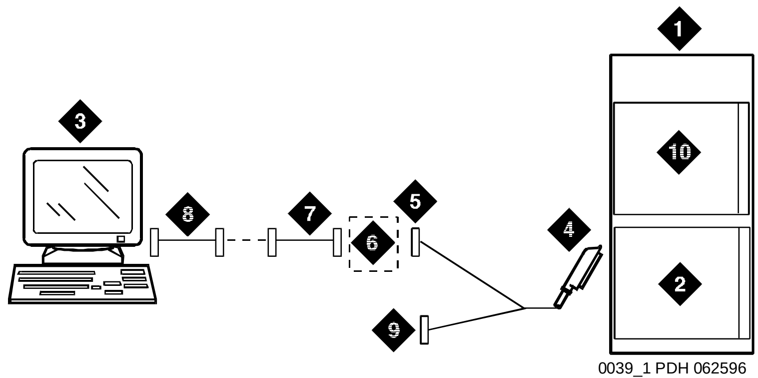


Figure Notes

1. System Cabinet
2. Multi-Function Circuit Pack (Part of AUDIX or LAN Gateway)
3. Maintenance Terminal
4. MFB Y Cable
5. "PORT A" Connector on MFB Y Cable
6. 116A Isolator (DC Powered Systems Only)
7. Group 311 Cable
8. Null Modem Cable (If Required)
9. Unused RS-232 Connector
10. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)

Figure 5-54. Typical Local Maintenance Terminal Connections

1. Connect the MFB Y cable to the appropriate connector on the rear of the system cabinet.
2. Attach one end of a Group 311 cable (supplied with the DEFINITY AUDIX or LAN Gateway PEC) to the RS-232 connector labeled **PORT A** on the MFB Y cable. If a 116A isolator is used, attach the isolator to the RS-232 connector on the MFB Y cable and attach the Group 311 cable to the isolator.
3. Attach the opposite end of the Group 311 cable to the **DCE** connector on the rear of the terminal. If a null modem cable is required, attach the Group 311 cable to the null modem cable. Connect the opposite end of the null modem cable to the **DCE** connector on the rear of the terminal.

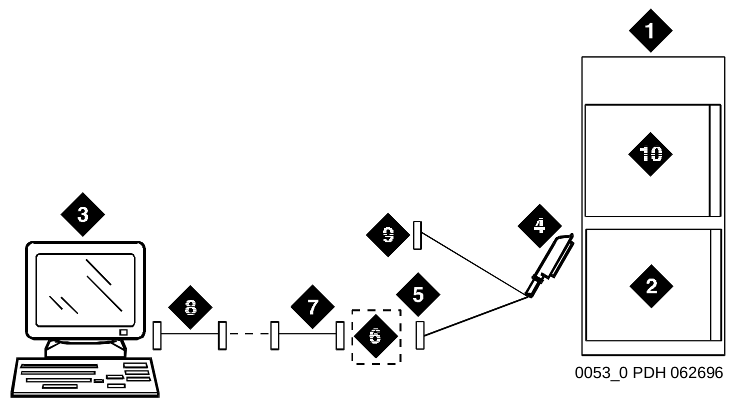


Figure Notes

1. System Cabinet
2. Multi-Function Circuit Pack (Part of AUDIX or LAN Gateway)
3. Administration Terminal
4. MFB Y Cable
5. “PORT B” Connector on MFB Y Cable
6. 116A Isolator (DC Powered Systems Only)
7. Group 311 Cable
8. Null Modem Cable (If Required)
9. Unused RS-232 Connector
10. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)

Figure 5-55. Typical Local Administration Terminal Connections

1. Connect the MFB Y cable to the appropriate connector on the rear of the system cabinet.
2. Attach one end of a Group 311 cable (supplied with the DEFINITY AUDIX or LAN Gateway PEC) to the RS-232 connector labeled **PORT B** on the MFB Y cable. If a 116A isolator is used, attach the isolator to the RS-232 connector on the MFB Y cable and attach the Group 311 cable to the isolator.
3. Attach the opposite end of the Group 311 cable to the **DCE** connector on the rear of the terminal. If a null modem cable is required, attach the Group 311 cable to the null modem cable. Connect the opposite end of the null modem cable to an RS-232 serial port connector on the rear of the terminal.

Testing the Connection

1. Plug the power cord on the terminal into a wall outlet.
2. Power on the terminal.
3. Set the terminal options. See *DEFINITY AUDIX Installation*, 585-300-111, for a complete list of option settings for all supported terminal.

   NOTE:
   When installing a serial printer, set the options on the printer as described in the manual supplied with the printer then set the corresponding options on the terminal to match.

   If the terminal is installed correctly (and the DEFINITY AUDIX or LAN Gateway is in either *ADX*, *OAM*, *OS* or *AINIT* state), the screen displays the `login` prompt.

   If the terminal does not display the `login` prompt, write down the state displayed, then see the troubleshooting procedures for terminal connections in *DEFINITY AUDIX System Maintenance*, 585-300-110.

Install the Administration Terminal via Modems

Figure 5-56 shows typical connections to the administration terminal using modems. Be sure the modems are on the list of supported peripherals. Refer to the *DEFINITY AUDIX System Description*, 585-300-205.

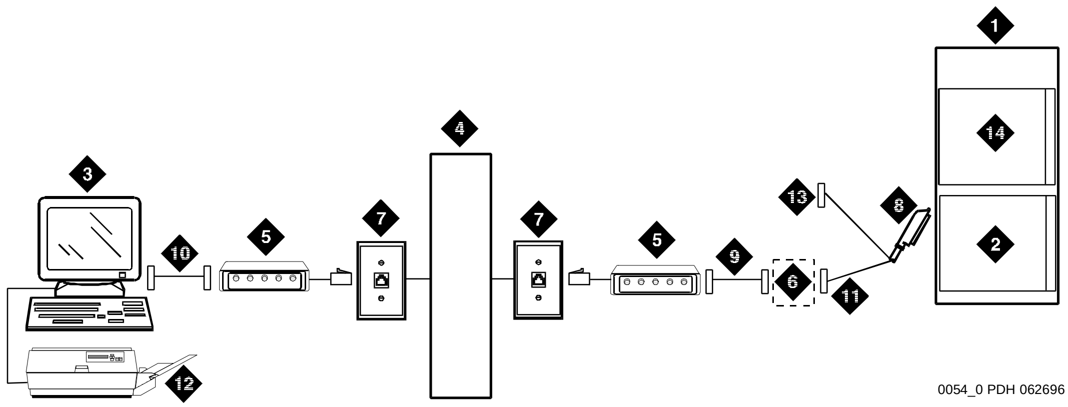


Figure Notes

1. System Cabinet
2. Multi-Function Circuit Pack (Part of AUDIX or LAN Gateway)
3. Administration Terminal
4. Public Switched Telephone Network
5. Modem
6. 116A Isolator (DC Powered Systems Only)
7. 103A or Modular Wall Jack
8. MFB Y Cable
9. Group 311 Cable
10. Null Modem Cable (If Required)
11. “PORT B” Connector on MFB Y Cable
12. Terminal Printer (Optional)
13. Unused RS-232 Connector
14. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)

Figure 5-56. Typical Administration Terminal Connections via Modems

1. Connect the MFB Y cable to the appropriate connector on the rear of the system cabinet.
2. Attach one end of a Group 311 cable (supplied with the DEFINITY AUDIX or LAN Gateway) to the RS-232 connector labeled **PORT B** on the MFB Y cable. If a 116A isolator is used, attach the isolator to the RS-232 connector on the MFB Y cable and attach the Group 311 cable to the isolator.
3. Attach the opposite end of the Group 311 cable to the female 25-pin connector on the modem.

4. Attach the connector on one end of a modular cord to the modem. Attach the other connector to the modular wall jack (information outlet).
5. Connect the second modem to the wall jack at the terminal site.
6. Connect a null modem cable (if required) from the modem to the terminal.
7. Connect the printer to the terminal (if required). See "Install Printers and Terminals" on page 5-107.

   NOTE:
   When installing a serial printer, set the options on the printer as described in the manual supplied with the printer then set the corresponding options on the terminal to match.

8. Set the terminal and modem options. See *DEFINITY AUDIX Installation*, 585-300-111, for a complete list of option settings for all supported terminals and modems.
9. At the terminal, enter `AT`.
10. If the modem is installed correctly, it responds with `OK` (on the terminal screen).
11. Enter `ATDT` and the telephone number of the modem connected to **PORT B** (listed on the Installing the Terminals worksheet).

    If the terminal is installed correctly (and the DEFINITY AUDIX or LAN Gateway is in either *ADX*, *OAM*, *OS* or *AINIT* state), the screen displays the `login` prompt.

    If the terminal does not display the `login` prompt, write down the state displayed, then see the troubleshooting procedures for terminal connections in *DEFINITY AUDIX System Maintenance*, 585-300-110.

Install the Administration Terminal via Asynchronous Data Units

Figure 5-57 shows typical connections to an administration terminal using ADUs.

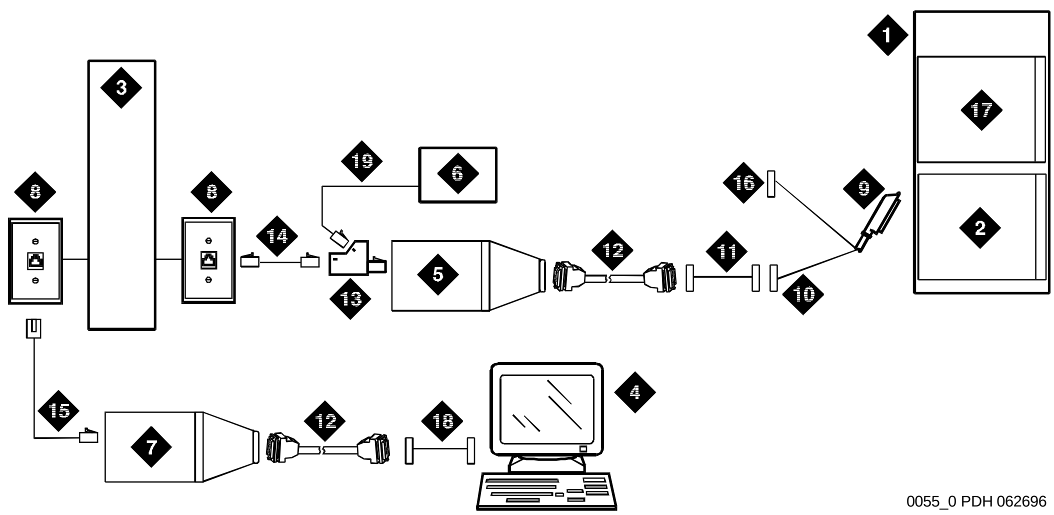


Figure Notes

1. System Cabinet
2. Multi-Function Circuit Pack (Part of AUDIX or LAN Gateway)
3. Part of Main Distribution Frame (MDF)
4. Administration Terminal
5. Z3A2 ADU
6. ADU Power Supply
7. Z3A1 ADU
8. 103A or Modular Wall Jack
9. MFB Y Cable
10. “PORT B” Connector on MFB Y Cable
11. Group 311 Cable
12. 25-Pin EIA-232-D Connector
13. 400B2 Adapter
14. D8W Cord
15. D8AM Crossover Cord
16. Unused RS-232 Connector
17. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)
18. Null Modem Cable
19. D6AP Cord

Figure 5-57. Typical Administration Terminal Connections through ADUs

1. Connect the MFB Y cable to the appropriate connector on the rear of the system cabinet.
2. Attach one end of a Group 311 cable (supplied with the DEFINITY AUDIX or LAN Gateway PEC) to the RS-232 connector labeled **PORT B** on the MFB Y cable.
3. Attach the opposite end of the Group 311 cable to the 25-pin female connector on the end of the Z3A2 ADU.
4. Plug the male end of a 400B2 or 248B adapter into the **Wall Jack** connector on the Z3A2 ADU.
5. Plug the 2012D ADU Power Supply into the 400B2 or 248B adapter.
6. Connect a D8W cord into the remaining female connector on the adapter.
7. Plug the opposite end of the D8W cable into an information outlet (modular wall jack).
8. At the MDF, cross-connect the four wires to the modular wall jack at the administration terminal location.
9. At the administration terminal location, connect the D8AM crossover cord to the modular wall jack.
10. Connect the opposite end of the D8AM cord to the **Wall Jack** connector on the Z3A1 ADU.
11. Attach the male 25-pin RS-232 connector on the Z3A1 ADU to the null modem cable.
12. Connect the opposite end of the null modem cable to the serial RS-232 port on the terminal (**DTE**).
13. Set the terminal options. See *DEFINITY AUDIX Installation*, 585-300-111, for a complete list of option settings for all supported terminals.
14. If the terminal is installed correctly (and the DEFINITY AUDIX or LAN Gateway is in one of the *ADX*, *OAM*, *OS* or *AINIT* state), the screen displays the `login` prompt.

    If the terminal does not display the `login` prompt, write down the state displayed, then see the troubleshooting procedures for terminal connections in *DEFINITY AUDIX System Maintenance*, 585-300-110.

Install the Administration Terminal via Data Modules

Figure 5-58 shows typical connections to an administration terminal using data modules.

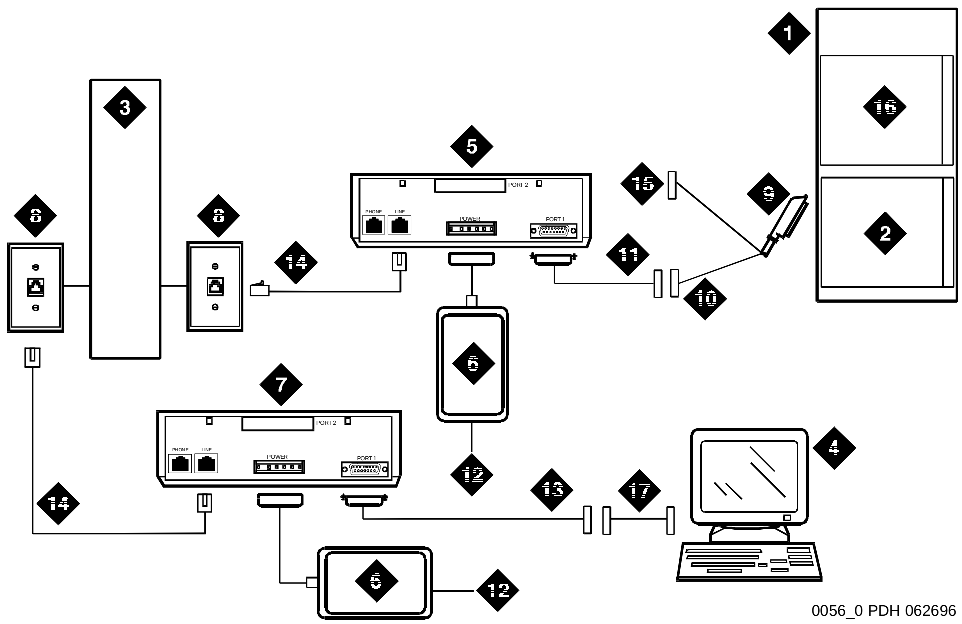


Figure Notes

1. System Cabinet
2. Multi-Function Circuit Pack (Part of AUDIX or LAN Gateway)
3. Part of Main Distribution Frame (MDF)
4. Administration Terminal
5. 7400A Data Module
6. Data Module Power Supply
7. 7400B Data Module
8. 103A or Modular Wall Jack
9. MFB Y Cable
10. “PORT B” Connector on MFB Y Cable
11. Group 311 Cable
12. To AC Electrical Outlet
13. 25-Pin RS-232 Connector
14. D8W Cord
15. Unused RS-232 Connector
16. Alarm Circuit Pack (Part of AUDIX or LAN Gateway)
17. Null Modem Cable

Figure 5-58. Typical Administration Terminal Connections Using Data Modules

NOTE:
Two data modules can be used in this configuration. The DEFINITY AUDIX or LAN Gateway side of the configuration requires the 7400A. A second 7400A can be used and is connected the same as a 7400B. Set the options as described in *7400A Data Module User's Manual*, 555-020-706.

1. Make sure the EIA connector board (located inside the data module) is set to DCE (factory default). If not, unplug the card and turn it around to the DCE setting (see "Mode Selection" on page 5-84 for details).
2. Connect the MFB Y cable to the appropriate connector on the rear of the system cabinet.
3. Attach one end of a Group 311 cable (supplied with the DEFINITY AUDIX or LAN Gateway) to the RS-232 connector labeled **PORT B** on the MFB Y cable.
4. Attach the opposite end of the Group 311 cable to the 25-pin female connector on the rear of the 7400A Data Module.
5. Plug one end of the D8W 4-pair modular cord (supplied with the data module) into the **LINE** connector on the 7400A data module. Plug the other end into an information outlet (modular wall jack).
6. At the MDF, cross-connect the wires to the modular wall jack at the administration terminal location.
7. Plug a D8W 4-pair modular cord into the wall jack at the administration terminal location. Plug the opposite end of the cord into the **LINE** connector on the 7400B (or second 7400A) data module.
8. Attach a 25-pin RS-232 cable to the null modem cable. Attach the opposite end of the null modem cable to the serial RS-232 port (**DTE**) on the terminal.
9. Plug the 4-pin connector on the end of each data module power supply into the **POWER** connector on each data module.
10. Set the options and interface baud rate on the 7400A data module. Refer to *7400A Data Module User's Manual*, 555-020-706. Set the options and interface baud rate on the 7400B data module. Refer to *AT&T 7400B Data Module User's Guide*, 555-020-707.
11. Check the dip switches inside the front panel. If a telephone is not connected with the data module, set the first dip switch (1) to the ON position. If a telephone is connected, set all dip switches OFF.
12. Set the terminal options. See *DEFINITY AUDIX Installation*, 585-300-111, for a complete list of option settings for all supported terminals.

    When installing a serial printer, set the options on the printer as described in the manual supplied with the printer then set the corresponding options on the terminal to match.

13. At the terminal, enter `AT.` If the 7400B data module is connected correctly, it responds with `OK` (written on the terminal screen).
14. Enter `ATDT` and the telephone number of the 7400A data module connected to the DEFINITY AUDIX or LAN Gateway (refer to the "Installing the Terminals" worksheet for this number).
15. After a connect interval, if the terminal and 7400 data modules are installed correctly (and the DEFINITY AUDIX or LAN Gateway is in either *ADX*, *OAM*, *OS* or *AINIT* state), the screen displays the `login` prompt.
16. If the terminal does not display the `login` prompt, write down the state displayed, then see the troubleshooting procedures for terminal connections in *DEFINITY AUDIX System Maintenance*, 585-300-110.

Install the Printer (Optional)

This task is required only if the customer requested a printer on the DEFINITY AUDIX or LAN Gateway administration terminal. See Figure 5-56 on page 5-97. The following instructions are typical for most installations. The instructions supplied with the printer should be followed.

1. Unpack and set up the printer according to the instructions supplied with the printer.
2. Be sure the printer has paper, the ribbon is properly installed, and the cover is closed.
3. Connect the printer to the administration terminal.
4. Connect one end of the printer cable to either the serial or parallel port on the terminal (depending on the type of terminal and printer). Secure the connector with the captive screws.

   NOTE:
   If a serial printer is connected to the DTE connector on the terminal, a null modem cable must be connected between the printer and the terminal.

5. Connect the opposite end of the printer cable to the matching port (serial or parallel) on the printer.
6. Set the options on the printer. See *DEFINITY AUDIX Installation*, 585-300-111, for a complete list of option settings for all supported printers.

   NOTE:
   When installing a serial printer, set the options on the printer as described in the manual supplied with the printer then set the corresponding options on the terminal to match.

Call Management System

Install Call Management System Interface

The interface between the system and the Call Management System (CMS) is through data modules. The DEFINITY Systems use the TN765 Processor Interface circuit pack as the required control circuit pack.

A typical CMS connection using mode conversion is shown in Figure 5-59.

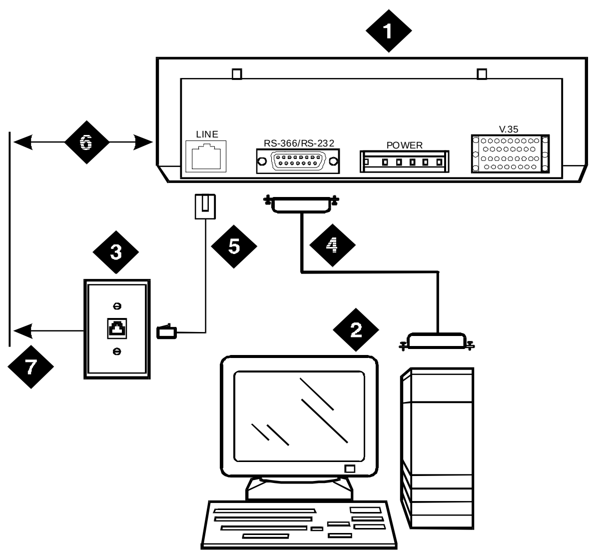


Figure Notes

1. Data Module (7400C Shown)
2. CMS AG 6386 Personal Computer (PC)
3. 103A or Modular Wall Jack
4. M25B Cable (25-Pin RS-232) (50 Feet, 15.24 m) Maximum
5. D8W-87 Cable
6. 5000 Feet (1524 Meters) Maximum
7. To TN754 Digital Line 4-Wire Circuit Pack Using B25A Cable (Male-to- Female) via MDF

Figure 5-59. Typical Call Management System Connections

Install Distributed Communications System

A typical connection between two cabinets can be through DCS links. The link to the system can be provided by direct connection or by modems. Figure 5-60 shows modem connections.

The system uses the TN765 Processor Interface as the required control circuit pack. The TN765 provides a single EIA port that allows access to one data link. Connections to the system vary depending on the distance between systems and the type of system being connected.

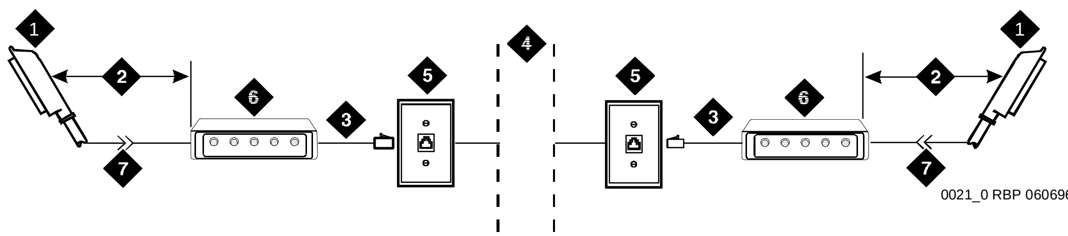


Figure Notes

1. To TN765 Processor Interface Circuit Pack to Processor Interface Circuit Pack via PI Connector on Rear of Control Carrier
2. 25 Feet (7.62 m) Maximum
3. Modular Cord
4. Public Switched Telephone Network (PSTN)
5. 103A or Modular Wall Jack
6. Modem
7. M25B 25-Pair RS-232 Cable

Figure 5-60. Typical DCS Link — System to System

Install Property Management System Interface

The interface between the system and the Property Management System (PMS) can be through data modules. Such connections are covered in the section for installing data modules. See Figure 5-61.

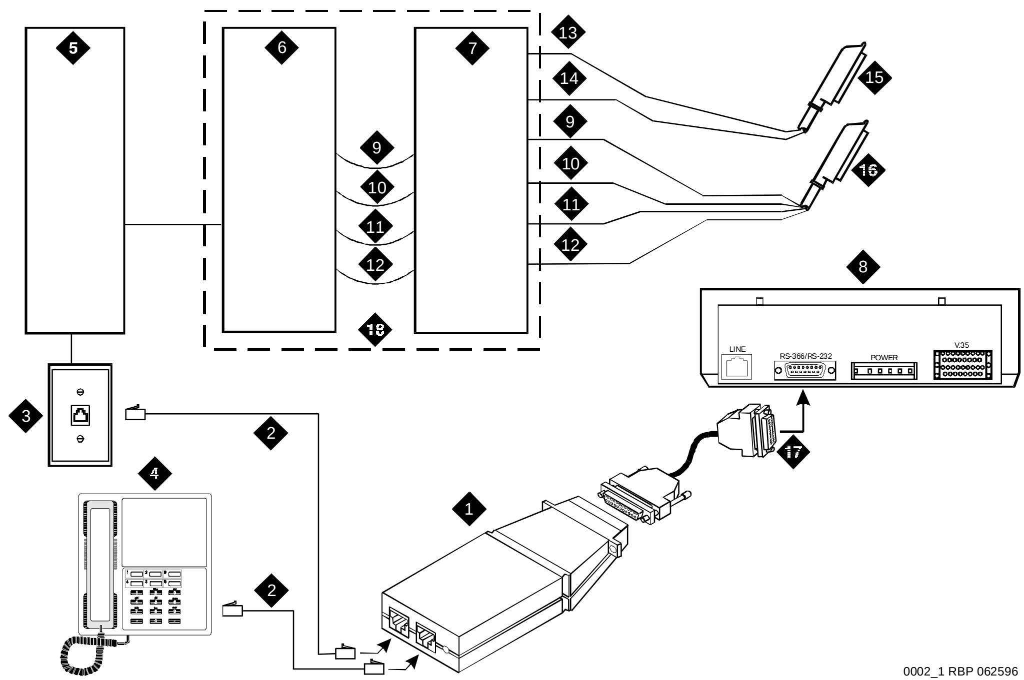


Figure Notes

1. Z3A1 or Z3A2 ADU
2. 4-Pair Line Cord
3. 103A Modular Wall Jack
4. Analog Telephone
5. Satellite Site or Adapter Location
6. Station Side (Blue or White Field)
7. System Side (Purple Field)
8. Data Module (7400C Shown)
9. TXT
10. TXR
11. PXT
12. PXR
13. Tip
14. Ring
15. To TN746 Analog Line Circuit Pack
16. To TN726B Data Line Circuit Pack
17. 25-Pin EIA-232-D Connector (Male)
18. Part of Main Distribution Frame (MDF)

Figure 5-61. Connections to Asynchronous Data Unit

Refer to the vendor’s documentation for connecting the data module to the PMS. The option switches on the data module should be set according to the requirements for the PMS.

The data unit can also be remotely or locally powered using a 2012D transformer equipped with a 248B adapter.

Install Printers and Terminals

Printers

A journal printer can be used with the PMS. The connections for the printer are the same as for the host computer Call Management System (CMS). See Figure 5-59 on page 5-104.

Refer to the vendor’s documentation for connecting the data module to the printer. The option switches on the data module are to be set according to the requirements for the printer.

The PMS interface and the journal printers can also be installed using ADUs. The connections are the same as for a customer-provided data terminal. Equipment connections can be through a modem or through a data module.

Terminals

The interface between the system and the customer’s data terminals and host computer can be through data modules.

Asynchronous data terminals can also be connected through a Z3A ADU to a data line circuit pack. Normally, the data unit is powered from the connected data terminal. The data unit can also be remotely or locally powered using a 2012D transformer with a 248B adapter. Data units connected to receive-only printers require external power.

For more information, refer to the *Z3A Asynchronous Data Unit Product Manual*, 461-120-005. To install a terminal, perform the following:

1. Determine data unit or data module port assignment from Data Module Form.
2. Make the MDF and closet/satellite connections from the data unit port assignment to the information outlet.
3. Connect the information outlet to the ADU or data module.
4. Connect the RS-232 plug on the ADU or data module to the data terminal.

Install Call Detail Recording Unit Interface

The interface between the system and Call Detail Recording (CDR) output devices can be through a data module or a 212-type modem. The connection between the system and the modem is the same as for external ringing. When a modem is used, an external pooled modem must be provided. One of the pooled modem's conversion resources is dedicated to the CDR output device.

Connections between the system and an ADU or data module are the same as for remote administration devices such as a management terminal.

Administer the system as described in *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

A data line circuit pack may also be used. If so, data modules are not required for DTE equipment. Connections to the CDR output device is the same as a customer-provided data terminal. The CDR output device can be connected directly to the **DCE** connector on the rear of the Control Carrier. This connection is made using an M25B (RS-232) cable. A data module or ADU is required.

Figure 5-62 on page 5-109 shows four types of connections to the output device. The following connections are shown:

1. Connection from digital line circuit pack, through a 7400C Data Module, and to the output device using an M25B 25-pin RS-232 cable.
2. Connection from a digital line circuit pack, through a 7400C Data Module, and to the output device using two M25B 25-pin RS-232 cables and an M10M null modem cable.
3. Connection from an analog line circuit pack, through a 212-type modem, and to the output device using two M25B 25-pin RS-232 cables and an M10M null modem cable. This option requires a pooled modem.
4. Direct connection from the **DCE** connector on the rear of the Control Carrier to the output device using an M25B 25-pin RS-232 cable. For DC powered systems, a 116A Isolator (comcode 106005242) is required and is connected in series with the output device.

Cabling to Call Detail Recording Output Device

Figure 5-62 shows the cabling required to connect a printer, a TELESEER unit, or customer-supplied DTE equipment for an AC-powered cabinet. If a TELESEER unit is installed, connect the M25B cable to the P1 connector.

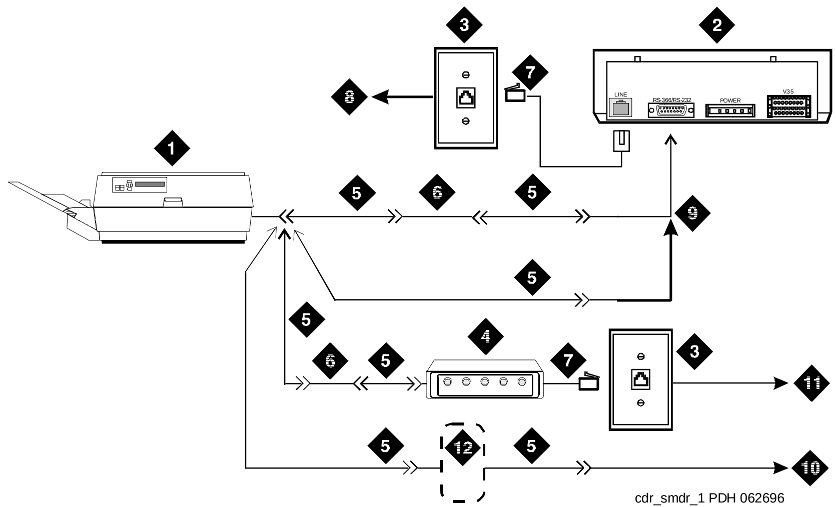


Figure Notes

1. Printer, 94A Local Storage Unit (LSU), Customer-Supplied DTE Equipment, or TELESEER Unit
2. Data Module (7400C Shown)
3. 103A or Modular Wall Jack
4. 212-Type Modem
5. M25B Cable (25-Pin RS-232)
6. M10M Null Modem Cable
7. 4-Pair Modular Cord
8. To TN754/B Digital Line Circuit Pack
9. To 25-Pair Connector on Data Module
10. To DCE Connector on Control Carrier
11. To TN746 Analog Line Circuit Pack
12. 116A Isolator (DC Powered Systems Only)

Figure 5-62. Call Detail Recording Cabling

CAUTION:

All peripherals connected to a DC-powered system through the Asynchronous EIA RS-232 interface on the Control Carrier require an EIA 116A Isolator (comcode 106005242). Plug the 116A Isolator into the RS-232 interface connector. The cable from the peripheral equipment is then plugged into the 116A.

Figure 5-63 shows the connections to a remote host connected by an analog line.

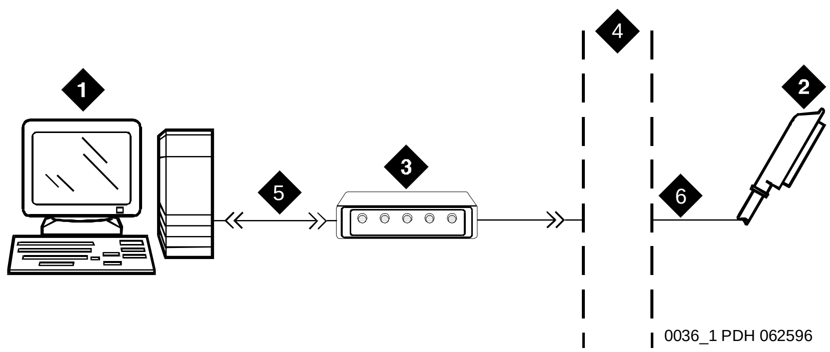


Figure Notes

1. Host Computer
2. To Analog Line or Central Office Trunk Circuit Pack
3. Modem or Data Service Unit (DSU)
4. Public Switched Telephone Network (PSTN)
5. M25B Cable (25-Pin RS-232)
6. 25-Pair Cable to Network Interface via the Main Distribution Frame (MDF)

Figure 5-63. Call Detail Recording Cabling to Remote Host

Install Wideband Endpoints

Wideband switching makes it possible for the system to support high-speed data transfer between endpoints. Wideband endpoints may include video equipment or bridge/routers for Local Area Networks (LANs).

Use the running list that accompanies the system to make cable connections. The following illustrations provide examples of how a system could be wired.

Non-Signaling Configuration

A non-signaling connection from the system to a wideband endpoint may be connected to a Channel Service Unit (CSU). If no CSU is used, the distance between the system and the endpoint is limited to a few hundred feet. See Figure 5-64. The maximum distance depends on the type of cable and type of endpoint used.

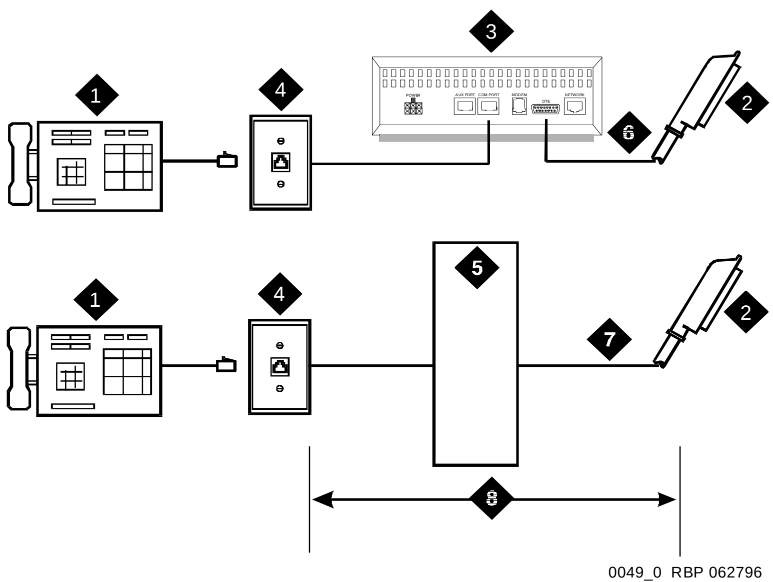


Figure Notes

1. Wideband Endpoint (Wire Per Endpoint's Manufacturer)
2. To TN464F DS1/E1 Circuit Pack
3. Channel Service Unit (CSU) (3150 Shown)
4. 103A or Modular Wall Jack
5. Part of Main Distribution Frame (MDF)
6. H600-307 Cable (To DTE Connector on Channel Service Unit)
7. A25D 25-Pair Cable (Male-to-Male)
8. Distance Limitation (Depends on Cable Type and Endpoint Type)

Figure 5-64. Typical Non-Signaling Wideband Configuration

If a CSU is used, the distance between connections may be up to 1300 feet (396.2 m). The maximum distance to the wideband endpoint depends on the type of cable used and the specifications of the wideband endpoint.

Signaling Configuration

A signaling connection from the system to a wideband endpoint passes through a bandwidth controller. The distance between the system and the bandwidth controller depends on the type of cable and controller used. Figure 5-65 shows connections with and without a CSU.

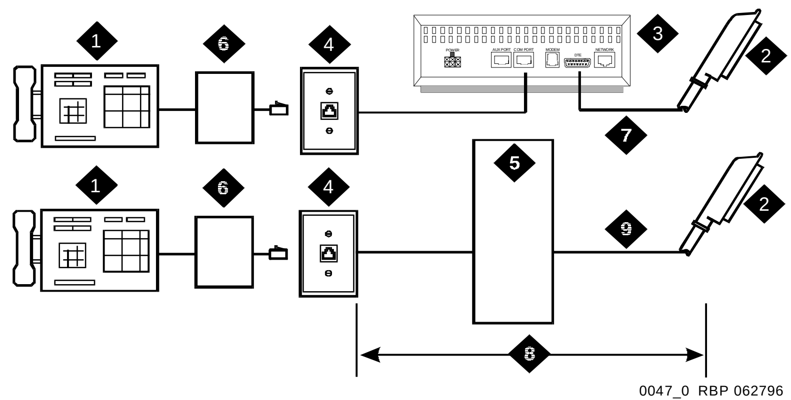


Figure Notes

1. Wideband Endpoint (Wire Per Manufacturer)
2. To TN464F DS1/E1 Circuit Pack
3. Optional Channel Service Unit (CSU) (3150 Shown)
4. 103A or Modular Wall Jack
5. Part of Main Distribution Frame (MDF)
6. Bandwidth Controller
7. H600-307 Cable (To DTE Connector on Channel Service Unit)
8. Distance Limitation (Depends on Cable Type and Bandwidth Controller Type)
9. A25D 25-Pair Cable (Male-to-Male)

Figure 5-65. Typical Signaling Wideband Configuration

Figure 5-65 shows the bandwidth controller connected directly to the wideband endpoint. The controller is typically installed near the wideband endpoint where they are directly connected (usually within a few feet of each other). See the "Digital Tie Trunk Example" on page 5-7 for wiring and pinout information.

- For non-CSU installations, cross the transmit and receive lines so a transmit signal from the TN464/F is connected to the receive connection on the bandwidth controller and a transmit signal from the bandwidth controller is connected to the receive connection on the TN464/F
- For CSU installations, cross the transmit and receive lines between the CSU and the bandwidth controller

Figure 5-66 shows a remote port module. In this configuration, there can be considerable distance between the bandwidth controller and the wideband endpoint. The maximum distance between elements depend on the quality of the cables and on the specifications of the wideband equipment.

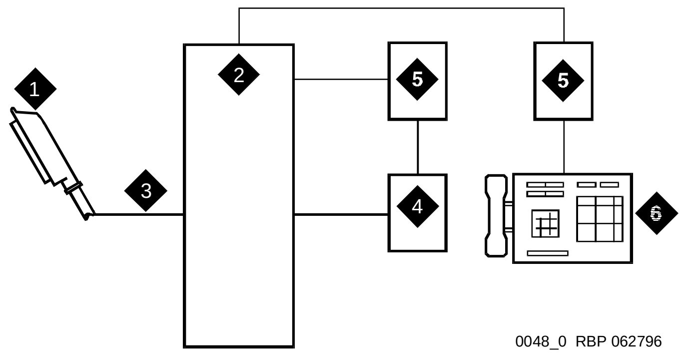


Figure Notes

1. To TN464F DS1/E1 Circuit Pack
2. Part of Main Distribution Frame (MDF)
3. H600-307 Cable
4. Bandwidth Controller
5. Remote Port Module
6. Wideband Endpoint (Wire Per Manufacturer)

Figure 5-66. Typical Signaling Wideband Configuration with Remote Port Module

- For non-CSU installations, cross the transmit and receive lines so a transmit signal from the TN464/F is connected to the receive connection on the bandwidth controller and a transmit signal from the bandwidth controller is connected to the receive connection on the TN464/F
- For CSU installations, cross the transmit and receive lines between the CSU and the bandwidth controller

Install PassageWay Adapter

The PassageWay adapter makes it possible to connect a Mu-Law digital telephone and a personal computer through a single four-wire Digital Communications Protocol (DCP) digital port to the system. See Figure 5-67.

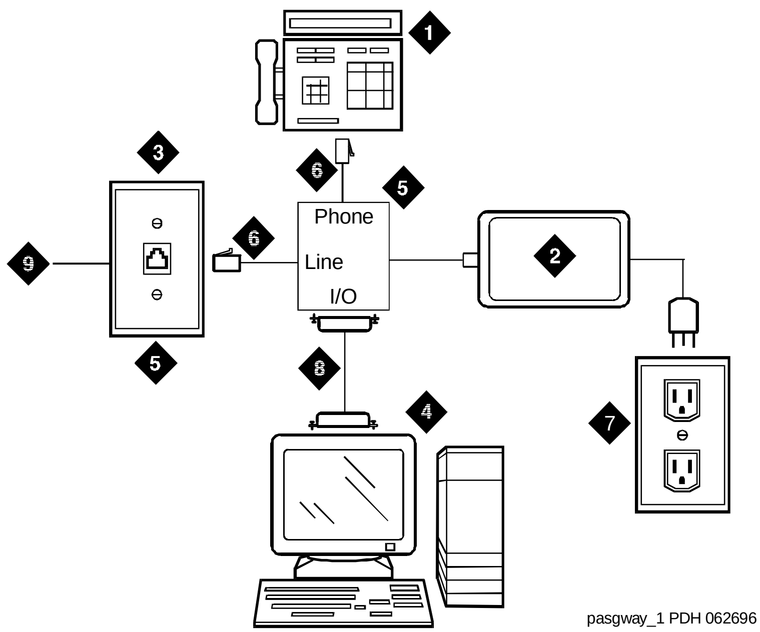


Figure Notes

1. Digital Telephone (Such as a CallMaster)
2. Individual Power Supply for the PassageWay Adapter
3. 103A or Modular Wall Jack
4. Host Computer (Serial I/O Connection)
5. PassageWay Adapter
6. 4-Pair Modular Cord
7. Electrical Outlet for Power Supply
8. 25-Pair Cable
9. To TN754B, TN2181, or TN2224 Digital Line Circuit Pack

Figure 5-67. Typical Connections Through PassageWay

PassageWay provides two standard 8-pin modular jacks, one for connection to the telephone and one for connection to a modular wall jack leading to the system. Connect the wall jack to the **Line** jack. Plug the telephone into the **Phone** jack. Plug an optional Personal Computer (PC) into the 25-pin serial **I/O** connector. The PassageWay interface requires one Watt at about -48 VDC that must be provided by a bulk or individual power supply.

Install PC Console

PC Console (United States)

Figure 5-68 shows a PassageWay adapter providing an interface between a Personal Computer (PC) and a DCP voice terminal (8403 or 8411).

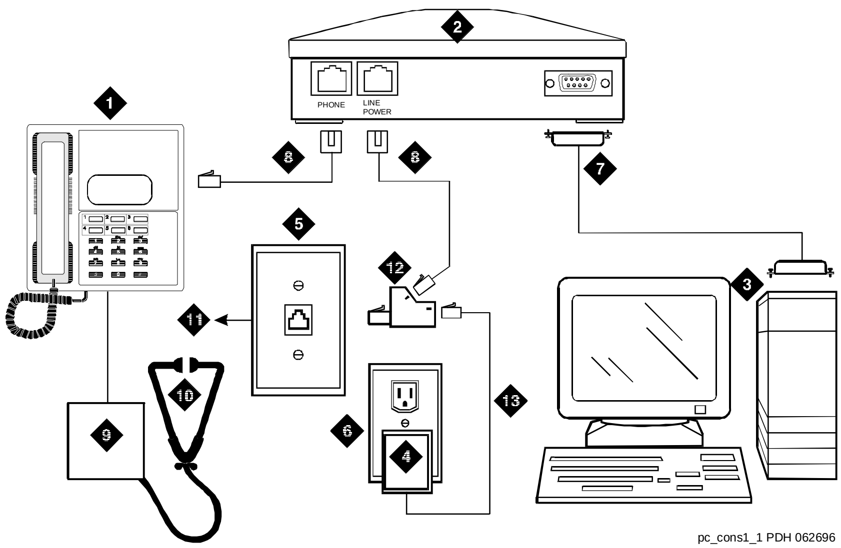


Figure Notes

1. DCP Telephone (Such as 8403 or 8411)
2. PassageWay Adapter
3. Host Computer (Serial I/O Connection)
4. KS-22911 Power Supply for PassageWay Adapter
5. 103A or Modular Wall Jack
6. Electrical Outlet for Power Supply
7. 25-Pair Cable
8. D8W 4-Pair Modular Cord
9. Optional 500A Adapter
10. Optional Headset
11. To TN754B, TN2181, or TN2224 Digital Line Circuit Pack
12. 400B2 Adapter
13. D6AP Cable

Figure 5-68. Typical PC Console Connections (United States)

The analog jack on the rear of the DCP voice terminal is inoperable when PC Console is used.

PC Console (Non-United States)

Figure 5-69 shows a PassageWay adapter providing an interface between a PC and a DCP voice terminal (8403 or 8411).

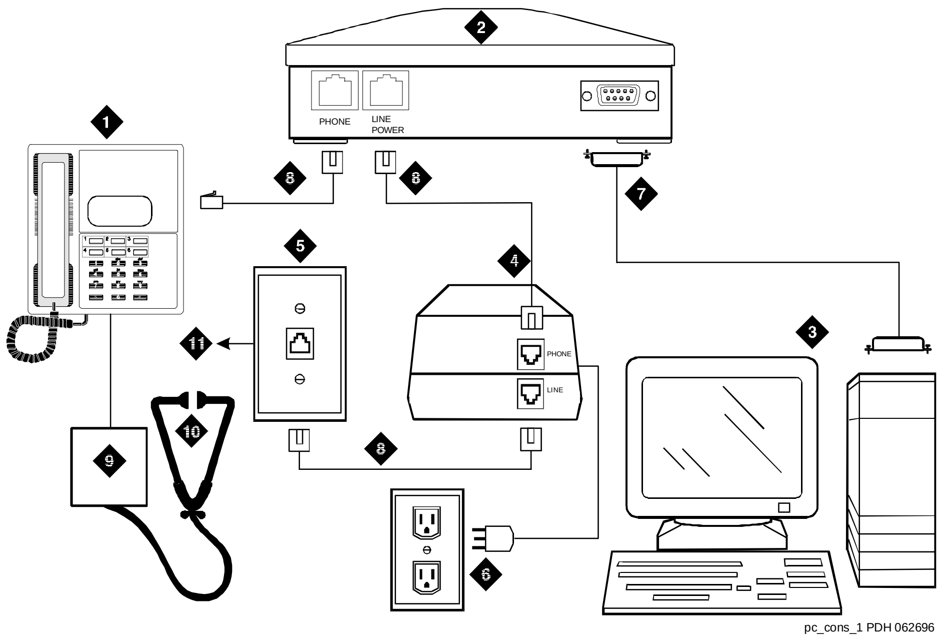


Figure Notes

1. DCP Telephone (Such as 8403 or 8411)
2. PassageWay Adapter
3. Host Computer (Serial I/O Connection)
4. 1151A Power Supply for PassageWay Adapter
5. 103A or Modular Wall Jack
6. Electrical Outlet for Power Supply
7. 25-Pair Cable
8. D8W 4-Pair Modular Cord
9. Optional 500A Adapter
10. Optional Headset
11. To TN754B, TN2181, or TN2224 Digital Line Circuit Pack

Figure 5-69. Typical PC Console Connections (Non-United States)

The analog jack on the rear of the DCP voice terminal is inoperable when PC Console is used.

Install Integrated Channel Service Unit Module

The Integrated Channel Service Unit (ICSU) is a combination of a 120A CSU module integrated with either a TN464F or TN767E (or later suffixes) DS1 circuit pack.

NOTE:
Throughout this document, the designation TN464F means any TN464F or later suffix. Similarly, TN767E means any TN767E or later suffix.

Install the 120A CSU Module

Refer to Figure 5-70 on page 5-119 when installing the 120A module. Installation instructions follow the figure and tables. Table 5-17 describes the components shipped with the 120A module.

Table 5-17. 120A Module Parts List

Part	Notes
120A CSU Module	
Cable H600-383	4-Pair Modular Cord Group 2, 50-Foot (15.2 m) cable is standard
Cord DW8A-DE	4-Pair Modular Cord to Alarm Contacts

The basic ICSU requires a TN464E or TN767D or later suffix. The Enhanced Integrated Channel Service Unit requires a TN464F or TN767E or later suffix.

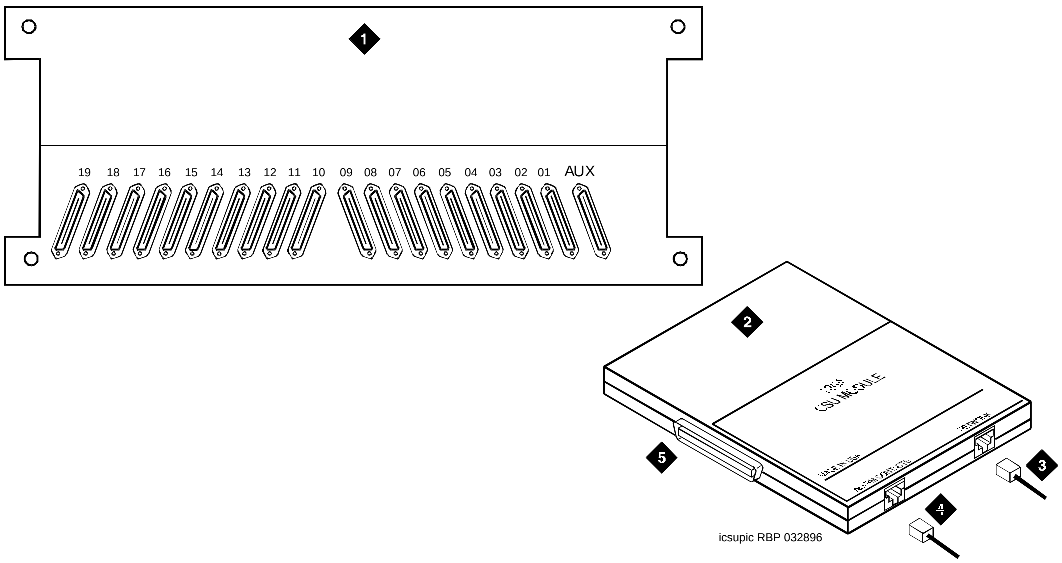


Figure Notes

1. Rear of Carrier Containing DS1 Circuit Pack
2. 120A Channel Service Unit (CSU)
3. 4-Pair Cord to Network Interface (H600-383)
4. DW8A-DE 4-Pair Cord to Alarm Contacts (Optional)
5. To 25-Pair Connector on Rear of Carrier Containing DS1 Circuit Pack

Figure 5-70. 120A Channel Service Unit Module

Table 5-18 provides the H600-383 cable pinouts. Table 5-19 provides the cable lengths for each cable group number.

Table 5-18. H600-383 Cable Pin Assignments

Pin	Color	Channel Service Unit Designation	Network Designation	Function
1	BK	Line in 0	R1	RCV
2	Y	Line in 1	T1	
3	Shield			
4	R	Line out 0	R	XMT
5	G	Line out 1	T	
6	Shield			
7				Not Assigned
8				Not Assigned

Table 5-19. H600-383 Cable Lengths by Group Number

Group	Length	Group	Length
1	25 Feet (7.62 m)	5	125 Feet (38.1 m)
2	50 Feet (15.24 m)	6	200 Feet (61 m)
3	75 Feet (22.86 m)	7	400 Feet (122 m)
4	100 Feet (30.48 m)	8	650 Feet (198.1 m)

Install the 120A Module

CAUTION:
Before installing the 120A, observe the following cautions:

- *Do not plug the 120A into any circuit pack other than a TN464F or TN767E or later release/vintage. Be sure the DS1 circuit pack is set for 24 channel operation (1.544 Mbps). The 120A does not operate with the 32 channel interface. This option is set both in administration and by a switch on the circuit pack.*
- *The connector terminals on the 120A can be damaged by static discharge. Wear an anti-static wrist strap.*
- *Do not touch the external alarm cable when it is connected to the 120A. A solid state relay in the 120A might be damaged by static discharge. Wear an anti-static wrist strap.*
- *Do not connect the 120A to any interface other than a network smart jack.*

NOTE:
If installing more than one 120A in a Release 5vs system, all the DS1 circuit packs should be located either in slots 1 through 4 or in slots 5 through 10 but not in both. This reduces cable congestion on the rear of the system. Placing DS1 circuit packs in both slot ranges causes 120A modules to be in close proximity on the backplane and requires the 120A module-to-network interface cable to be bent at a sharp angle. This configuration will work but should be avoided.

Always wear an anti-static wrist strap when installing a 120A module.

1. Make sure the DS1 circuit pack is unplugged from the slot.
2. Install a 4C retainer in the 50-pin plug associated with the DS1 circuit pack slot.
3. Plug the 120A's 25-pair connector directly into the plug associated with the DS1 circuit pack slot. Secure the 4C retainer around the 120A.
4. Attach the supplied H600-383 cable to the 120A and to the network smart jack. This cable is directional. To determine the end that connects to the 120A, perform a continuity test between pins 3 and 6. The end with this continuity is the 120A end. The shield is grounded only at the 120A end. Use the cable provided. If cabling other than that provided with the 120A is used, observe the following guidelines:
   - Use 24 gauge wire providing individually shielded, twisted pairs for transmit and receive signals. The cable is used between the network interface and the 120A. The shields of this cable should be grounded only at the 120A end to avoid ground loops.

- Cabling between the network interface and 120A can have no bridge taps.
- If using standard house riser cable for connections between the network interface and the 120A, a 100-pair separation should be maintained between the receive and transmit twisted pairs.
- If using standard house riser cable for connections between the network interface and the 120A, cross connects to 110-type cross connect blocks must be limited to a maximum of 2.
- Never use quad cable (untwisted two pair telephone cable) in a DS1 line.
- Avoid mixing wires of different gauges in a DS1 line.

5. If using external alarm equipment, attach the supplied DW8 cable to the 120A and the external equipment. The maximum length of this cable depends on the specifications of the alarm equipment.
6. If a TN464F is used, make sure the circuit pack is set for 24 channel operation. Set the switch on the circuit pack as shown in Figure A-4.
7. Set the line compensation value for 0-133 feet. This is the distance between the DS1 circuit pack and the 120A module. This is set from the system administration terminal. This is done in the DS1 circuit pack form in the field line compensation.
8. Insert the DS1 circuit pack into the slot

   NOTE:
   Removing and reinserting the DS1 circuit pack automatically resets the 120A. To completely test the 120A, the DS1 circuit pack must be inserted *after* the 120A is installed. Always reinsert the DS1 circuit pack to completely test the 120A.

9. Independent of the host system, the DS1 circuit pack initializes and tests the 120A. Initialization and testing is complete when the green LED goes off. The DS1 circuit pack indicates the status of the circuit pack and 120A.
10. The red LED must be off after the test. This indicates a working DS1 circuit pack and 120A combination.

    If the circuits do not pass the above test, troubleshoot the 120A as instructed in *Integrated CSU Module Installation and Operation,* 555-230-193.

Install CONVERSANT System

Figure 5-71 shows a typical CONVERSANT® System connected to a 3150 Channel Service Unit (CSU). The various CONVERSANT Systems connect similarly. The MAP/40 installs inside a PC. For installation information, refer to *MAP/40 Voice Processing Hardware Installation,* 585-310-150, or *MAP/100 Voice Processing Hardware Installation*, 585-310-148, or *MAP/100C Voice Processing Hardware Installation*, 585-350-108. The CONVERSANT System should be located within 75 feet (22.86 m) of the CSU.

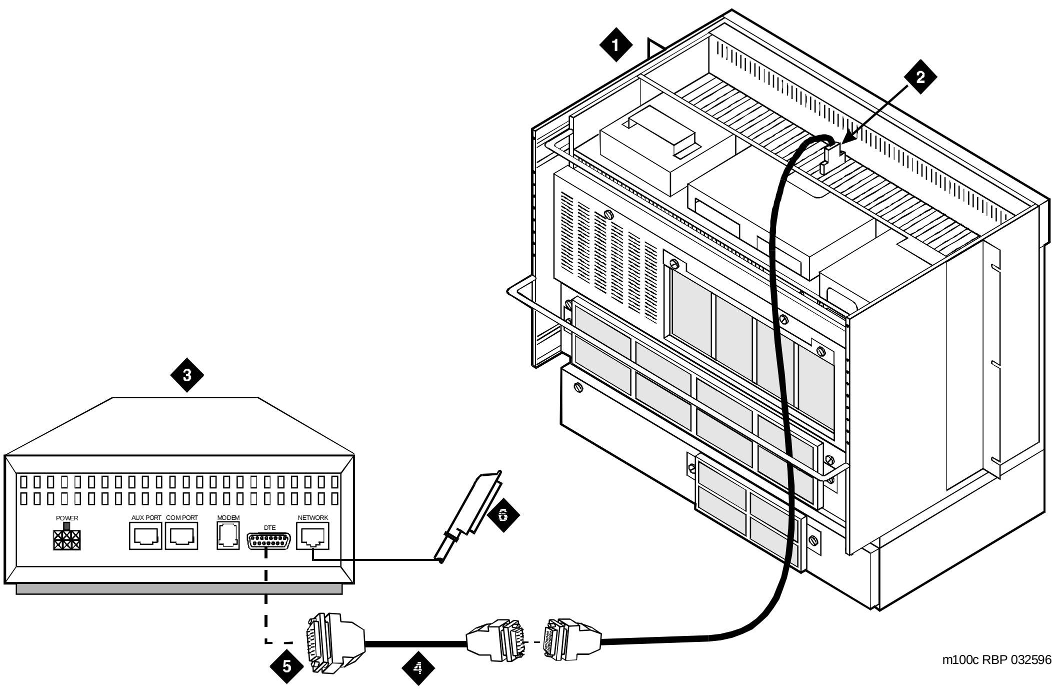


Figure Notes

1. MAP/100C Cabinet
2. T1 Extension Cable (ED5P208-30, G1) from T1 Interface Board (Slot 12)
3. 3150 Channel Service Unit (CSU)
4. Adapter Cable (comcode 107063711)
5. To 15-Pin DTE Connector on CSU
6. To DS1 Circuit Pack in DEFINITY System (TN767E or Later)

Figure 5-71. Typical Connections for CONVERSANT

Install a Two-Wire DCP Endpoint

The Tip and Ring connections of two-wire DCP endpoints are wired to a TN2224 Digital Line 2-Wire circuit pack (or equivalent) similar to the two-wire analog endpoints for a TN746B Analog Line circuit pack.

NOTE:
The TN2224 supports two-wire DCP sets only (not four-wire).

Install Two-Wire Voice Terminals

CAUTION:
*Except for auxiliary power, if necessary (wired per Table 5-20), these should be the **only** connections to the modular wall jack. Do not bridge or parallel these telephones.*

Table 5-20. DCP Information Outlet Pinout

Pin Number	Function	Pin Number	Function
1	4-wire output from terminal	5	2-wire Ring
2	4-wire output from terminal	6	4-wire input from system
3	4-wire input from system	7	Auxiliary power -48 VDC
4	2-wire Tip	8	Auxiliary power GRD

Install Two-Wire Voice and Data Terminals

Figure 5-72 shows a workstation connected to a data adapter. The line side of the adapter connects to the TN2181 Digital Line 2-Wire circuit pack via the MDF (to the system cabinet).

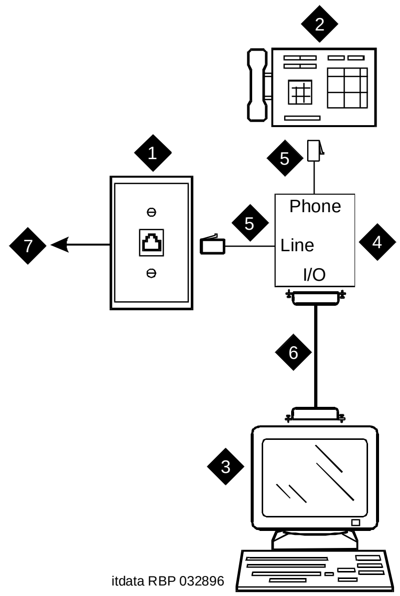


Figure Notes

1. 103A or Modular Wall Jack
2. 2-Wire Endpoint
3. Data Terminal (Serial Data)
4. Data Adapter (Such as Italtel)
5. 4-Wire Modular Cord
6. 25-Pair Cable
7. To TN2181 Digital Line Circuit Pack

Figure 5-72. Typical Connections to a Two-Wire DCP Workstation

Wire the circuit pack to the MDF with a 25-pair cable:

1. Wire to the data adapter per local standards.
2. Wire the data terminal and telephone as instructed in the document accompanying the data adapter.

Install Busy Tone Disconnect

The Busy Tone Disconnect external adjunct provides a method to detect disconnect of incoming calls connected via loop start 2-wire analog trunks. These 2-wire trunks are used in some countries outside the United States where the Public Switched Telephone Network (PSTN) sends tones in the voice band instead of line disconnect to indicate caller-disconnect. Figure 5-73 shows typical connections.

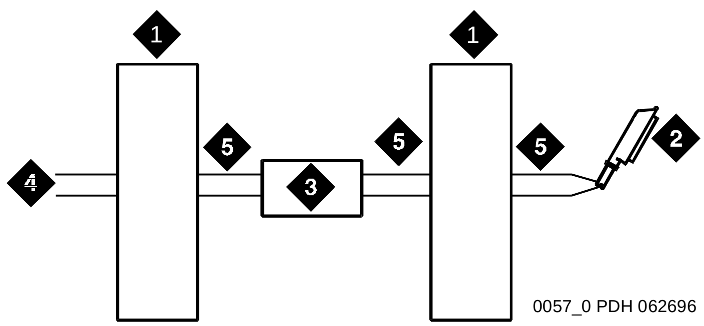


Figure Notes

1. Part of Main Distribution Frame (MDF)
2. To Loop Start Central Office Trunk Circuit Pack Such as TN465B or TN747B
3. Busy Tone Disconnect Device
4. Public Switched Telephone Network (PSTN) Central Office Trunk
5. Tip and Ring Wires

Figure 5-73. Typical Cabling for Busy Tone Disconnect

Install External Modem

Figure 5-74 shows a typical connection from the TN790 Processor circuit pack to a recommended COMSPHERE external modem. A customer-supplied, type-approved modem may be used in place of the COMSPHERE modem. Contact your Lucent Technologies representative for specifications.

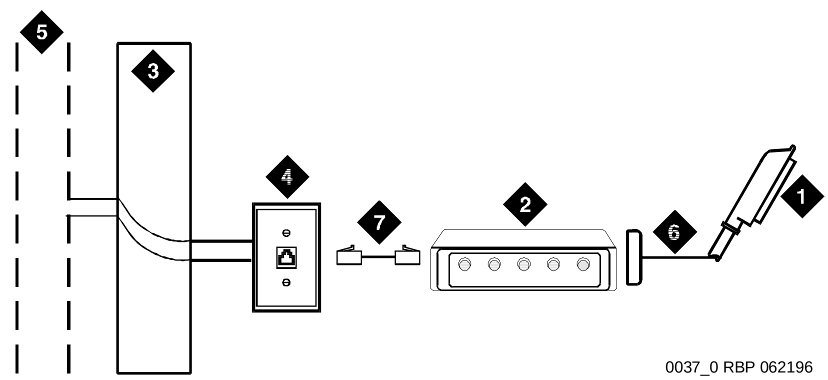


Figure Notes

1. To DCE Connector
2. External Modem
3. Part of Main Distribution Frame (MDF)
4. 103A or Modular Wall Jack
5. Public Switched Telephone Network (PSTN)
6. M25B Cable (25-Pin RS-232) (50 Feet, 15.24 m Maximum). An Adapter May be Required
7. Modular Line Cord to DTE Connector on Modem

Figure 5-74. Typical External Modem Connections

1. Connect the RS-232 (or EIA-232) cable to the **DCE** connector on the rear of the Control Carrier. Connect the opposite end to the modem. An adapter may be required.
2. Connect the modem to the network interface via the MDF.
3. Refer to Appendix A, "Option Switch Settings" to set the options.

NOTE:
The Release 5 systems are designed to operate with the COMSERVE modems set to the factory default settings.

Install T1 ATM Interface

Figure 5-75 shows a typical connection from a TN464F or TN767E DS1 circuit pack to a T1 Asynchronous Transfer Mode (ATM) interface.

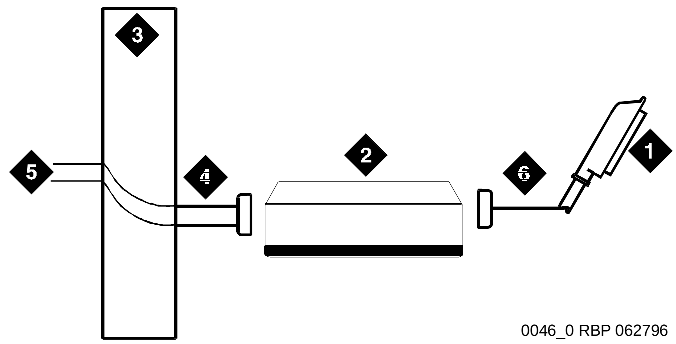


Figure Notes

1. To TN464F or TN767E DS1 Circuit Pack
2. T1 ATM Interface Device
3. Part of Main Distribution Frame (MDF)
4. 9-Pin Cable to Main Distribution Frame
5. To T1 Network
6. 25-Pair to 9-Pin Cable (To T1 NETWORK Connector on Callout 3) an Adapter may be Required

Figure 5-75. Typical T1 ATM Interface Connections

Install PRI Converters

PRI to DASS and PRI to DPNSS Converters

Figure 5-76 shows typical connections from the TNCCSC-1 PRI to DASS Converter or the TNCCSC-2 PRI to DPNSS Converters to the coaxial facility. The administration terminal is connected to the RS-232 connector on the front of the PRI Converter circuit pack. A “Y” coaxial cable is used to connect the TN464F to the PRI converter circuit pack. The remaining end of the cable connects to the 888B 75 Ohm Coaxial Adapter.

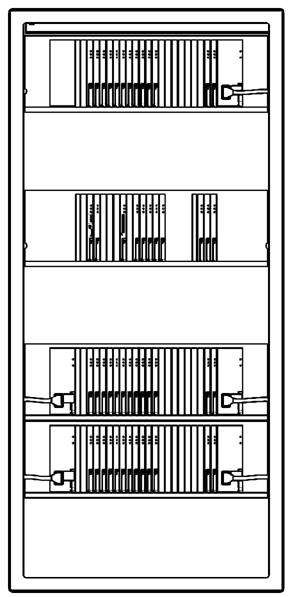


Figure Notes

1. To TN464F DS1 Circuit Pack and either a TNCSCC-1 PRI to DASS Converter or a TNCSCC-2 PRI to DPNSS Converter Circuit Pack
2. Administration Terminal
3. RS-232 Cable to Front of PRI Converter Circuit Pack
4. 888B 75 Ohm Coaxial Adapter
5. Coaxial Connection To 2 MB per Second Facility
6. Coaxial Cable from PRI Converter Circuit Pack to Coaxial Converter

Figure 5-76. Typical DASS or DPNSS Converter Cabling

PRI to BRI Converter

Figure 5-77 shows typical connections from the TNPRI/BRI converter to the coaxial facility. The administration terminal is connected to the RS-232 connector on the front of the PRI Converter circuit pack.

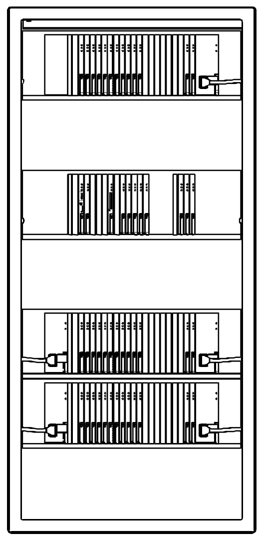


Figure Notes

1. To TN464F DS1 Circuit Pack and TNPRI/BRI Converter Circuit Pack
2. Administration Terminal
3. RS-232 Cable to Front of Converter Circuit Pack
4. 888B 75 Ohm Coaxial Adapter
5. Coaxial Connection to 2 MB per Second Facility
6. Coaxial Cable from PRI Converter Circuit Pack to Coaxial Converter
7. TN464F Circuit Pack
8. TNPRI/BRI Converter Circuit Pack
9. Jumper Coaxial Cable
10. Inset Showing Connections on Rear of Carrier

Figure 5-77. Typical PRI to BRI Converter Cabling

The inset shows a detailed view of the cable connections between the circuit packs.

Install ExpressRoute 1000 Data Module

The ExpressRoute 1000 data module can be used in place of the 8400B data module. For BRI connections, the TN556B is used. For DCP connections, the TN2198 or the TN2224 is used. Figure 5-78 shows typical connections.

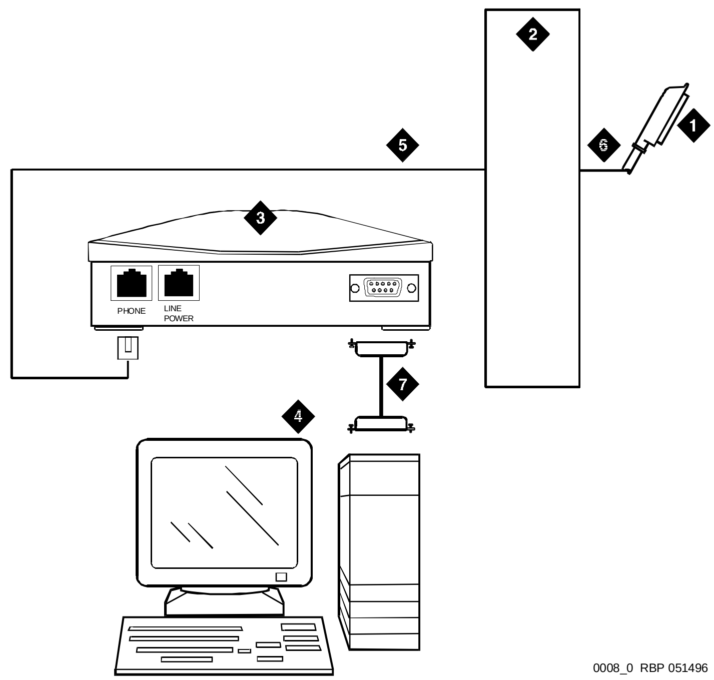


Figure Notes

1. To TN565B BRI Circuit Pack; or Either a TN2181 or TN2224 Digital Line Circuit Pack
2. Part of Main Distribution Frame (MDF)
3. ExpressRoute 1000 Data Module
4. Administration Terminal
5. Modular Line Cord
6. 25-Pair Connector to Circuit Pack Connector
7. M25B (25-Pin RS-232) Cable

Figure 5-78. Typical ExpressRoute 1000 Data Module Connections

CAUTION:

In DC-powered cabinet installations, a 105C Isolator adapter is required when connecting equipment to a data module.

Install DEFINITY DCP Extender

The DEFINITY DCP Extender is used to provide digital telecommunications features in a remote office that match the normal office environment. Figure 5-79 shows a typical connection from either a TN2181 Digital Line 2-Wire DCP circuit pack or a TN2224 Digital Line 24-port 2-Wire DCP circuit pack, through two DCP extender devices. The second extender is installed at the work location.

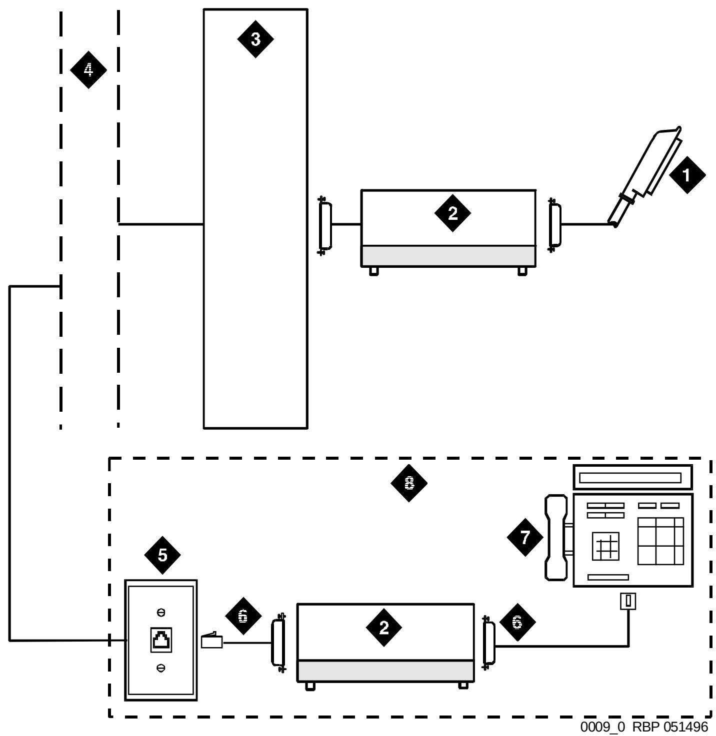


Figure Notes

1. To TN2181 or TN2224 Digital Line Circuit Pack
2. DEFINITY DCP Extender
3. Part of Main Distribution Frame (MDF)
4. Public Switched Telephone Network (PSTN)
5. 103A or Modular Wall Jack
6. 25-Pin to Modular Cable
7. DCP Telephone (Such as 603E, 8410D, or 8434)
8. Work Location

Figure 5-79. Typical DEFINITY DCP Extender Connections

Install ESPA Radio Paging

Figure 5-80 shows typical connections to European Standard Paging Access (ESPA) equipment. The LINE jack on the PassageWay Interface is connected to a TN754B Digital Line 4-Wire DCP circuit pack via the MDF.

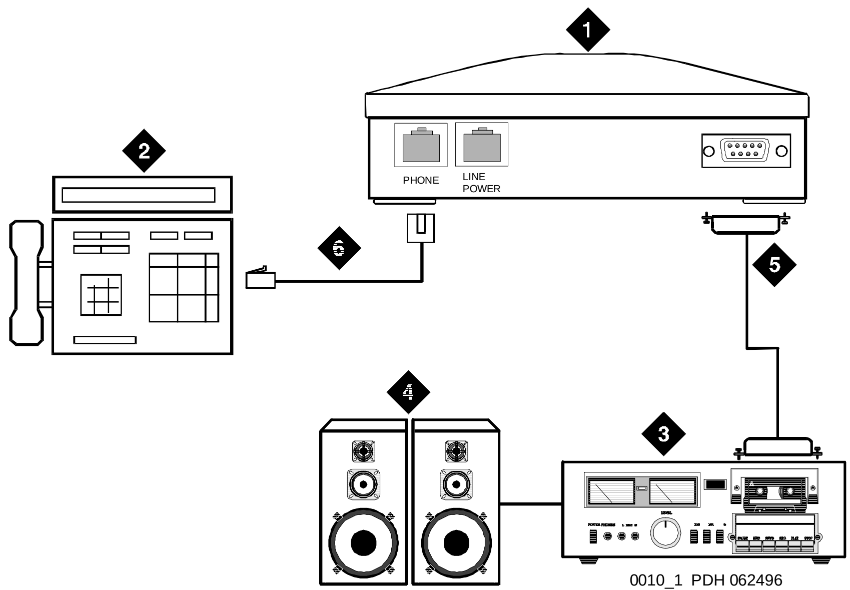


Figure Notes

1. PassageWay Interface
2. DCP Telephone (Such as 8410 or 8434)
3. ESPA Radio Paging Equipment
4. Paging Loudspeakers
5. RS-232 Connector
6. Modular Line Cord

Figure 5-80. Typical ESPA Radio Paging Connections

Connect Stratum 3 Clock

Set Clock Options

1. There are four sets of option switches on the clock. Set the options on the Clock Input Board (CI) per Table 5-21.

Table 5-21. CI Option Switch Settings

Switch	Function	Position
1	T1 Select	OFF = enable (default) ON = disable
2	CC Select	OFF = enable ON = disable (default)
3	Framing Select	OFF = ESF ON = D4 (default)
4	BX.25	OFF = enable ON = disable (default)

2. Set the options on the Stratum 3 Clock board (ST3) per Table 5-22.

Table 5-22. ST3 Clock Board Option Switch Settings

Switch	Status/Results
SW1 Minor Alarm Control	OFF = minor alarm never output ON = minor alarm is output if holdover occurs
SW2 Major Alarm Control	OFF = major alarm is output and fail lamp lights if 5 VDC power is lost and 4 kHz output is lost ON = major alarm is output and fail lamp lights if 5 VDC power is lost and 4 kHz output is lost and holdover occurs

NOTE:
Only SW 1 and SW2 are used. SW1 controls the output of alarm signals from the Stratum 3 Clock board.

3. Set the options on the Composite Clock Timing Output Board (TOCA) per Figure 5-81.

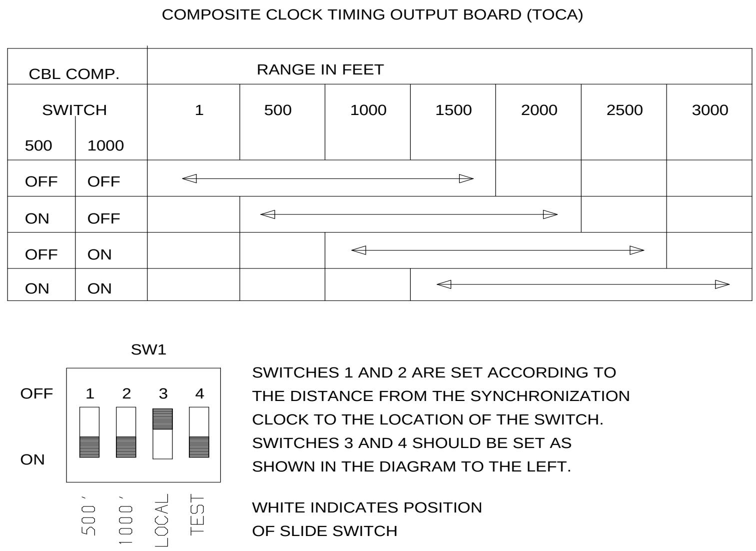


Figure 5-81. TOCA Option Switch Settings

4. Set the Stratum 2/Stratum 3 switch to the STRATUM 3 position.

Cabling the Stratum 3 Clock

Figure 5-82 shows typical connections to a Stratum 3 Clock cabinet. Connections are made through the yellow field cross-connect. A custom "Y" cable (H600-274) connects the CSU to the DS1 circuit pack and taps off the input required by the Stratum 3 Clock. A resistor built into the cable to provides the required isolation between the system and the clock. The "Y" cable plugs directly into the CSU and connects to standard cables for interface to the system and yellow field cross-connect.

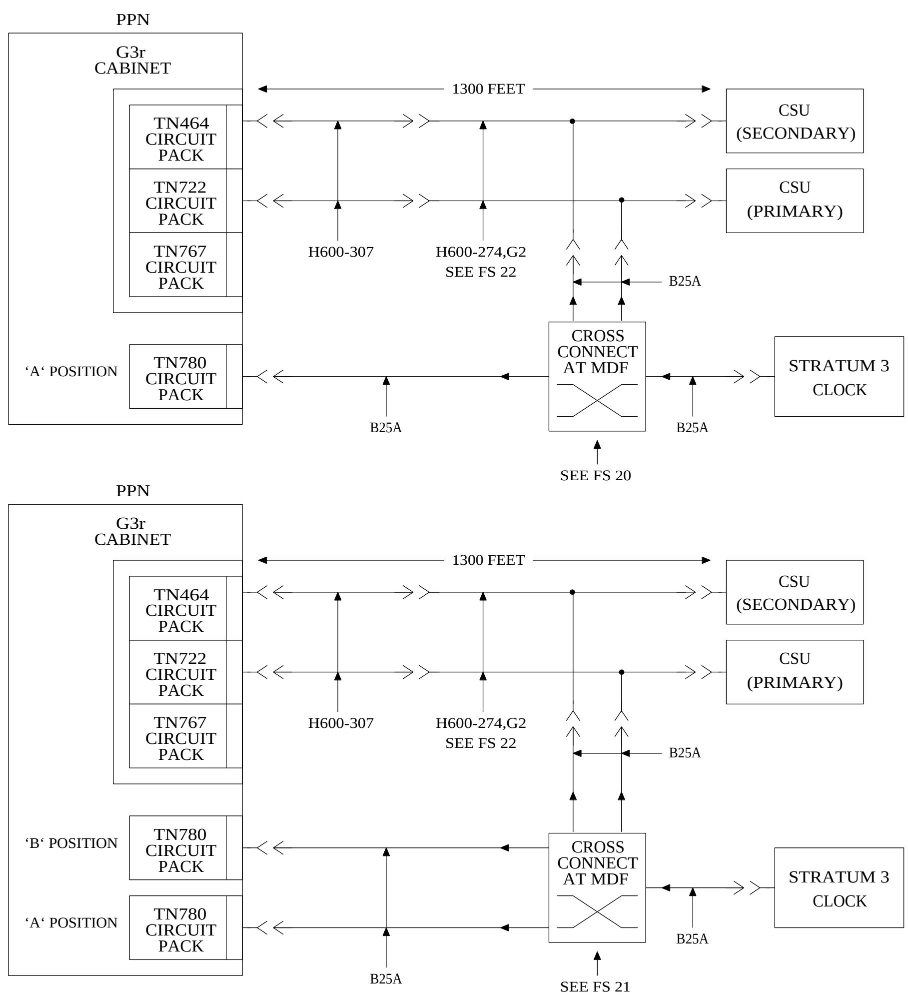


Figure 5-82. Typical Connections to Stratum 3 Clock

The H600-307 cable connects the system end of the "Y" cable to a DS1 circuit pack (shown as TN464, TN722, or TN767). The B25A cable connects the clock end of the "Y" cable to the yellow field cross-connect.

Stratum 3 Clock Wiring Installation Procedure

1. Connect the B25A cables from the TN780 connector panel slot on the system cabinet and the Stratum 3 Clock to the cross-connect module in the yellow field.
2. Connect the CSU plug end of the H-600-274 (Y) cable to the primary CSU. Route an H600-307 cable from the DS1 connector panel slot on the system cabinet to the connector on the "SYSTEM" end of the "Y" cable.
3. Route a B25A cable from the "CLOCK" end of the "Y" cable to the cross-connect module in the yellow field.
4. Repeat steps 2 and 3 for the secondary CSU. The maximum allowable cabling distance between the Stratum 3 clock and the CSU is shown in Table 5-23.

Table 5-23. Maximum Cabling Distance

Channel Service Unit (CSU)	Maximum Cabling Distance
551A	85 Feet (26 m)
551V	85 Feet (26 m)
551V EFS/R	655 Feet (199.6 m)
EFS T1	655 Feet (199.6 m)

5. For standard reliability systems, refer to Table 5-24 to cross-connect the TN780 and "CLOCK" end connections to the Stratum 3 Clock connections on the cross-connect module.
6. For critical reliability systems, refer to Table 5-25 to cross-connect the TN780 and "CLOCK" end connections to the Stratum 3 Clock connections on the cross-connect module.

Table 5-24. Cross-Connects for Standard Reliability

From: Stratum 3 Clock			To: Y Cable Clock End (Primary)		
Lead Designation	**Lead Color**	**Connecting Block Terminal**	**Lead Designation**	**Lead Color**	**Connecting Block Terminal**
RREF1	W-BL	1		V-O	43
TREF1	BL-W	2		O-V	44
			To: Y Cable Clock End (Secondary)		
RREF2	W-O	3		V-O	43
TREF2	O-W	4		O-V	44
			To: TN780 Carrier A		
BCLKRTN	R-O	13	ALRM5B	V-G	45
BCLKLST	O-R	14	ALRM5A	G-V	46
BPWRRTN	R-BR	17	ALRM4B	BK-BL	21
BPWRLST	BR-R	18	ALRM4A	BL-BK	22
REF2RTN	W-BR	7	ALRM3B	R-BR	17
REF2LST	BR-W	8	ALRM3A	BR-R	18
SCLKRTN	R-BL	11	ALRM2B	R-BL	11
SCLKLST	BL-R	12	ALRM2A	BL-R	12
SPWRRTN	R-G	15	ALRM1B	Y-BL	31
SPWRLST	G-R	16	ALRM1A	BL-Y	32
REF1RTN	W-G	5	ALRM0B	W-BR	7
REF1LST	G-W	6	ALRM0A	BR-W	8
CCA01R	R-S	19	EXTSYN0T	V-BL	41
CCA01T	S-R	20	EXTSYN0R	BL-V	42
CCB01R	BK-BL	21	EXTSYN1T	Y-G	35
CCB01T	BL-BK	22	EXTSYN1R	G-Y	36

Table 5-25. Cross-Connects for High or Critical Reliability

From: Stratum 3 Clock			To: Y Cable Clock End (Primary)					
Lead Designation	**Lead Color**	**Connecting Block Terminal**	**Lead Designation**	**Lead Color**	**Connecting Block Terminal**			
RREF1	W-BL	1		V-O	43			
TREF1	BL-W	2		O-V	44			
			To: Y Cable Clock End (Secondary)					
RREF2	W-O	3		V-O	43	**Lead Designation**	**Lead Color**	**Connecting Block Terminal**
TREF2	O-W	4		O-V	44			
			To: TN780 Carrier A			**To: TN780 Carrier B**		
BCLKRTN	R-O	13	ALRM5B	V-G	45	ALRM5B	V-G	45
BCLKLST	O-R	14	ALRM5A	G-V	46	ALRM5A	G-V	46
BPWRRTN	R-BR	17	ALRM4B	BK-BL	21	ALRM4B	BK-BL	21
BPWRLST	BR-R	18	ALRM4A	BL-BK	22	ALRM4A	BL-BK	22
REF2RTN	W-BR	7	ALRM3B	R-BR	17	ALRM3B	R-BR	17
REF2LST	BR-W	8	ALRM3A	BR-R	18	ALRM3A	BR-R	18
SCLKRTN	R-BL	11	ALRM2B	R-BL	11	ALRM2B	R-BL	11
SCLKLST	BL-R	12	ALRM2A	BL-R	12	ALRM2A	BL-R	12
SPWRRTN	R-G	15	ALRM1B	Y-BL	31	ALRM1B	Y-BL	31
SPWRLST	G-R	16	ALRM1A	BL-Y	32	ALRM1A	BL-Y	32
REF1RTN	W-G	5	ALRM0B	W-BR	7	ALRM0B	W-BR	7
REF1LST	G-W	6	ALRM0A	BR-W	8	ALRM0A	BR-W	8
CCA01R	R-S	19	EXTSYN0T	V-BL	41			
CCA01T	S-R	20	EXTSYN0R	BL-V	42			
CCB01R	BK-BL	21	EXTSYN1T	Y-G	35			
CCB01T	BL-BK	22	EXTSYN1R	G-Y	36			
CCA02R	BK-O	23				EXTSYN0T	V-BL	41
CCA02T	O-BK	24				EXTSYN0R	BL-V	42
CCB02R	BK-G	25				EXTSYN1T	Y-G	35
CCB02T	G-BK	26				EXTSYN1R	G-Y	36

7. The common cross-connection from the TN780 in A and B carriers to the Stratum 3 Clock should be done by bridging the jumper wires.
8. Dress the cables down sides of the cabinet and run through the Cable Slack Manager, if provided.
9. Administer per *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Install DEFINITY Wireless Business System

To install and test the hardware, refer to *DEFINITY Wireless Business System Installation and Tests Guide*, 555-232-102.

To interface the Wireless Business System to the system cabinet, refer to *DEFINITY Wireless Business System Interface*, 555-232-108.

To operate the wireless handsets, refer to *DEFINITY Wireless Business System User's Guide*, 555-232-105.

Install Cellular Business System

The DEFINITY Cellular Business System allows use of the same full-featured cellular telephone inside and outside of the building. The system supports up to 600 users. Total system coverage is up to 4 million square feet.

Refer to the installation and usage documentation that comes with the system components.

Install Forum PCM

The Forum Personal Communications Manager uses a Forum switch, which can serve as an adjunct to DEFINITY ECS, to manage mobility. The system uses Cordless Telephone Generation 2 (CT2) technology, which is a global standard for wireless telephone service. This standard defines the radio interface between the Forum pocket telephones and the base stations in the system.

Refer to the installation and usage documentation that comes with the Forum Personal Communications Manager components.

Connector and Cable Diagrams (Pinout Charts)

See Table 5-26 for lead designations. The circuit packs and auxiliary equipment are classified as shown in the tables at the end of this chapter.

Table 5-26. Lead and Color Designations

Cross-Connect Pin	Color	Amphenol Pin	Backplane Pin
1	W-BL	26	102
2	BL-W	01	002
3	W-O	27	103
4	O-W	02	003
5	W-G	28	104
6	G-W	03	004
7	W-BR	29	105
8	BR-W	04	005
9	W-SL	30	106
10	SL-W	05	006
11	R-BL	31	107
12	BL-R	06	007
13	R-O	32	108
14	O-R	07	008
15	R-G	33	109
16	G-R	08	009
17	R-BR	34	110
18	BR-R	09	010
19	R-SL	35	111
20	SL-R	10	011
21	BK-BL	36	112
22	BL-BK	11	012
23	BK-O	37	113
24	O-BK	12	013
25	BK-G	38	302
26	G-BK	13	202
27	BK-BR	39	303
28	BR-BK	14	203
29	BK-SL	40	304
30	SL-BK	15	204

Continued on next page

Table 5-26. Lead and Color Designations — *Continued*

Cross-Connect Pin	Color	Amphenol Pin	Backplane Pin
31	Y-BL	41	305
32	BL-Y	16	205
33	Y-O	42	306
34	O-Y	17	206
35	Y-G	43	307
36	G-Y	18	207
37	Y-BR	44	308
38	BR-Y	19	208
39	Y-SL	45	309
40	SL-Y	20	209
41	V-BL	46	310
42	BL-V	21	210
43	V-O	47	311
44	O-V	22	211
45	V-G	48	312
46	G-V	23	212
47	V-BR	49	313
48	BR-V	24	213
49	V-SL	50	300
50	SL-V	25	200

Table 5-27. Port Circuit Pack Lead Designations

Cross-Connect Pin	TN742/B TN747/B TN753 TN769 TN2147 TN465	TN754 TN726	TN760/B TN760C TN760D	TN762/B	TN763 TN763B TN763C	TN735	TN767 TN722/B TN464C	TN746/B TN2183	TN2224
1	T.0		T.0	T.0	T.0	T.0		T.0	T.1
2	R.0		R.0	R.0	R.0	R.0		R.0	R.1
3		TXT.0	T1.0	TXT.0	SZ.0	BT.0	GRD	T.1	T.2
4		TXR.0	R1.0	TXR.0	SZ1.0	BR.0	GRD	R.1	R.2
5		PXT.0	E.0	PXT.0	S.0	LT.0	GRD	T.2	T.3
6		PXR.0	M.0	PXR.0	S1.0	LR.0	GRD	R.2	R.3
7	T.1		T.1	T.1	T.1	T.1		T.3	T.4
8	R.1		R.1	R.1	R.1	R.1	GRD	R.3	R.4
9		TXT.1	T1.1	TXT.1	SZ.1	BT.1			T.5
10		TXR.1	R1.1	TXR.1	SZ1.1	BR.1	GRD		R.5
11		PXT.1	E.1	PXT.1	S.1	LT.1	GRD		T.6
12		PXR.1	M.1	PXR.1	S1.1	LR.1	GRD		R.6
13	T.2		T.2	T.2	T.2	T.2			T.7
14	R.2		R.2	R.2	R.2	R.2			R.7
15		TXT.2	T1.2	TXT.2	SZ.2	BT.2			T.8
16		TXR.2	R1.2	TXR.2	SZ1.2	BR.2	GRD		R.8
17		PXT.2	E.2	PXT.2	S.2	LT.2	GRD	T.4	T.9
18		PXR.2	M.2	PXR.2	S1.2	LR.2	GRD	R.4	R.9
19	T.3		T.3	T.3	T.3	T.3		T.5	T.10
20	R.3		R.3	R.3	R.3	R.3	GRD	R.5	R.10
21		TXT.3	T1.3	TXT.3	SZ.3	BT.3		T.6	T.11
22		TXR.3	R1.3	TXR.3	SZ1.3	BR.3	GRD	R.6	R.11
23		PXT.3	E.3	PXT.3	S.3	LT.3	+5	T.7	T.12
24		PXR.3	M.3	PX4.3	S1.3	LR.3	+5	R.7	R.12
25	T.4		T.4	T.4	T.4	T.4		T.8	T.13
26	R.4		R.4	R.4	R.4	R.4		R.8	R.13
27		TXT.4	T1.4	TXT.4	SZ.4	BT.4	GRD	T.9	T.14
28		TXR.4	R1.4	TXR.4	SZ1.4	BR.4	GRD	R.9	R.14
29		PXT.4	E.4	PXT.4	S.4	LT.4	GRD	T.10	T.15
30		PXR.4	M.4	PXR.4	S1.4	LR.4		R.10	R.15
31	T.5		T.5	T.5	T.5	T.5	LBACK1	T.11	T.16
32	R.5		R.5	R.5	R.5	R.5	LBACK2	R.11	R.16
33		TXT.5	T1.5	TXT.5	SZ.5	BT.5	GRD		T.17
34		TXR.5	R1.5	TXR.5	SZ1.5	BR.5	GRD		R.17
35		PXT.5	E.5	PXT.5	S.5	LT.5	GRD		T.18
36		PXR.5	M.5	PXR.5	S1.5	LR.5	GRD		R.18
37	T.6		T.6	T.6	T.6	T.6	LO		T.19
38	R.6		R.6	R.6	R.6	R.6	LO*		R.19

Continued on next page

Table 5-27. Port Circuit Pack Lead Designations — *Continued*

Cross-Connect Pin	TN742/B TN747/B TN753 TN769 TN2147 TN465	TN754 TN726	TN760/B TN760C TN760D	TN762/B	TN763 TN763B TN763C	TN735	TN767 TN722/B TN464C	TN746/B TN2183	TN2224
39		TXT.6	T1.6	TXT.6	SZ.6	BT.6	GRD		T.20
40		TXR.6	R1.6	TXR.6	SZ1.6	BR.6	GRD		R.20
41		PXT.6	E.6	PXT.6	S.6	LT.6	GRD	T.12	T.21
42		PXR.6	M.6	PXR.6	S1.6	LR.6		R.12	R.21
43	T.7		T.7	T.7	T.7	T.7	LI*	T.13	T.22
44	R.7		R.7	R.7	R.7	R.7	LI	R.13	R.22
45		TXT.7	T1.7	TXT.7	SZ.7	BT.7	GRD	T.14	T.23
46		TXR.7	R1.7	TXR.7	SZ1.7	BR.7	GRD	R.14	R.23
47		PXT.7	E.7	PXT.7	S.7	LT.7	+5	T.15	T.24
48		PXR.7	M.7	PXR.7	S1.7	LR.7	+5	R.15	R.24
49	GRD	GRD	GRD	GRD	GRD	GRD	GRD	GRD	
50	GRD	GRD	GRD	GRD	GRD	GRD	GRD	GRD	

Table 5-28. DS1 Interface Cable H600-307 (and C6C)

50-Pin			15-Pin		
Pin	**Color**	**Designation**	**Pin**	**Color**	**Designation**
02	W-BL				
03	BL-W				
47	W-G	LI (High)	11	W-G	LI (High)
22	G-W	LI	03	G-W	LI
48	W-BR	LO	09	W-BR	LO
23	BR-W	LO (High)	01	BR	LO (High)
49	W-SL	LOOP2	06	W-SL	LOOP2
24	SL-W	LOOP1	05	SL-W	LOOP1

All other pins empty.

Table 5-29. DS1 Interface Cable H600-348

50-Pin			15-Pin		
Pin	**Color**	**Designation**	**Pin**	**Color**	**Designation**
			Plug 04		
38	W-BL	LI (High)	11	W-BL	LI (High)
13	BL-W	LI	03	BL-W	LI
39	W-O	LO	09	W-O	LO
14	O-W	LO (High)	01	O-W	LO (High)
			Plug 03		
41	W-G	LI (High)	11	W-G	LI (High)
16	G-W	LI	03	G-W	LI
42	W-BR	LO	09	W-BR	LO
17	BR-W	LO (High)	01	BR-W	LO (High)
			Plug 02		
44	W-SL	LI (High)	11	W-SL	LI (High)
19	SL-W	LI	03	SL-W	LI
45	R-BL	LO	09	R-BL	LO
20	BL-R	LO (High)	01	BL-R	LO (High)
			Plug 01		
47	R-O	LI (High)	11	R-O	LI (High)
22	O-R	LI	03	O-R	LI
48	R-G	LO	09	R-G	LO
23	G-R	LO (High)	01	G-R	LO (High)

Table 5-30. TN1654 Lead Designations

Pin	Color	Designation	Pin	Color	Designation
26	W-BL	+5E	01	BL-W	+5E
27	W-O	GRD	02	O-W	XMITDAT -
28	W-G	GRD	03	G-W	GRD
29	W-BR	XMITDAT +	04	BR-W	RCVDAT -
30	W-SL	GRD	05	SL-W	GRD
31	R-BL	RCVDAT +	06	BL-R	GRD
32	R-O	+5E	07	O-R	+5E
33	R-G	CCSYNC	08	G-R	CDSYNC
34	R-BR	C2DCDATA	09	BR-R	C2DDDATA
35	R-SL	CASYNC	10	SL-R	CBSYNC
36	BK-BL	D2CDATA	11	BL-BK	ISCLOCK
37	BK-O	CCPRES	12	O-BK	CDPRES
38	BK-G	LID *	13	G-BK	LID
39	BK-BR	LOD	14	BR-BK	LOD*
40	BK-SL	CCRESET	15	SL-BK	CDRESET
41	Y-BL	LIC*	16	BL-Y	LIC
42	Y-O	LOC	17	O-Y	LOC*
43	Y-G	CARESET	18	G-Y	CBRESET
44	Y-BR	LIB*	19	BR-Y	LIB
45	Y-SL	LOB	20	SL-Y	LOB*
46	V-BL	C2DADATA	21	BL-V	C2DBDATA
47	V-O	LIA*	22	O-V	LIA
48	V-G	LOA	23	G-V	LOA*
49	V-BR	CAPRES	24	BR-V	CBPRES
50	V-SL	GRD	25	SL-V	GRD

Table 5-31. Circuit Pack and Auxiliary Equipment Classifications

Analog Line (8)	2-Wire Digital & Analog Line (16)	Data Line & Digital Line 4-Wire	Digital Line 2-Wire 24 Ports	Hybrid Line	MET Line	AUX Trunk	Central Office Trunk	Central Office Trunk 3-Wire	DID/ DIOD Trunk	Tie Trunk	DS1 Tie Trunk	ISDN BRI Line 4-wire	ISDN BRI Line 2-wire	Packet Data Line	Four Port DIOD
TN467	TN2149	TN726	TN2224	TN762	TN735	TN417	TN429	TN2199	TN429	TN478	TN483	TN556	TN2198	TN553	TN2184
TN432	TN2135	TN754B		TN762B		TN763	TN493		TN2139	TN458	TN722				
TN431	TN468B	TN564B				TN763D	TN422		TN459	TN449	TN767B				
TN411B	TN448	TN413					TN421		TN436B	TN760D	TN722B				
TN742	TN746						TN438		TN753	TN760	TN464D				
TN769	TN746B						TN447		TN2146	TN434					
	TN2181						TN465		TN414	TN415					
	TN2183						TN747B								
							TN2138								
							TN2147								
							TN2148								

.

1. DID means Direct Inward Dialing
2. DIOD means Direct Inward Outward Dialing
3. MET means Multibutton Electronic Telephone

Table 5-32. Circuit Pack and Auxiliary Equipment Leads (Pinout Charts)

Color	Connector Pin Numbers	Analog Line 8 ports	2-Wire Digital Line and Analog Line 16 ports	Data Line and Digital Line 4-wire	Digital Line 2-Wire 24 Ports	Hybrid Line	MET Line	AUX Trunk	CO Trk.	CO Trunk 3-wire	DID/ DIOD Trunk	Tie Trk.	DS1 Tie Trunk	ISDN BRI Line 4-wire	ISDN BRI Line 2-wire	Packet Data Line	Four Port DIOD
W-BL	26	T1	T1		T1	V1T1	T1	T1	T1	A1	T1	T1		PXR1	T1	TXT1	T1
BL-W	01	R1	R1		R1	V1R1	R1	R1	R1	B1	R1	R1		PXT1	R1	TXR1	R1
W-O	27		T2	TXT1	T2	CT1	TXT1	SZ1				T11		TXT1	T2	PXT1	
O-W	02		R2	TXR1	R2	CR1	TXR1	SZ11				R11		TXR1	R2	PXR1	
W-G	28		T3	PXT1	T3	P-1	PXT1	S1				E1		PXR2	T3	TXT2	
G-W	03		R3	PXR1	R3	P+1	PXR1	S11		C1		M1		PXT2	R3	TXR2	
W-BR	29	T2	T4		T4	V1T2	T2	T2	T2	A2	T2	T2		TXT2	T4	PXT2	T2
BR-W	04	R2	R4		R4	V1R2	R2	R2	R2	B2	R2	R2		TXR2	R4	PXR2	R2
W-S	30			TXT2	T5	CT2	TXT2	SZ2				T12		PXR3	T5	TXT3	
S-W	05			TXR2	R5	CR2	TXR2	SZ12				R12		PXT3	R5	TXR3	
R-BL	31			PXT2	T6	P-2	PXT2	S2				E2		TXT3	T6	PXT3	
BL-R	06			PXR2	R6	P+2	PXR2	S12		C2		M2		TXR3	R6	PXR3	
R-O	32	T3			T7	V1T3	T3	T3	T3	A3	T3	T3		PXR4	T7	TXT4	T3
O-R	07	R3			R7	V1R3	R3	R3	R3	B3	R3	R3		PXT4	R7	TXR4	R3
R-G	33			TXT3	T8	CT3	TXT3	SZ3				T13		TXT4	T8	PXT4	
G-R	08			TXR3	R8	CR3	TXR3	SZ13				R13		TXR4	R8	PXR4	
R-BR	34		T5	PXT3	T9	P-3	PXT3	S3				E3		PXR5	T9	TXT5	
BR-R	09		R5	PXR3	R9	P+3	PXR3	S13		C3		M3		PXT5	R9	TXR5	
R-S	35	T4	T6		T10	V1T4	T4	T4	T4	A4	T4	T4		TXT5	T10	PXT5	T4
S-R	10	R4	R6		R10	V1R4	R4	R4	R4	B4	R4	R4		TXR5	R10	PXR5	R4
BK-BL	36		T7	TXT4	T11	CT4	TXT4	SZ4				T14		PXR6	T11	TXT6	
BL-BK	11		R7	TXR4	R11	CR4	TXR4	SZ14				R14		PXT6	R11	TXR6	
BK-O	37		T8	PXT4	T12	P-4	PXT4	S4				E4		TXT6	T12	PXT6	
O-BK	12		R8	PXR4	R12	P+4	PXR4	S14				M4		TXR6	R12	PXR6	

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Table 5-32. Circuit Pack and Auxiliary Equipment Leads (Pinout Charts)

Color	Connector Pin Numbers	Analog Line 8 ports	2-Wire Digital Line and Analog Line 16 ports	Data Line and Digital Line 4-wire	Digital Line 2-Wire 24 Ports	Hybrid Line	MET Line	AUX Trunk	CO Trk.	CO Trunk 3-wire	DID/ DIOD Trunk	Tie Trk.	DS1 Tie Trunk	ISDN BRI Line 4-wire	ISDN BRI Line 2-wire	Packet Data Line	Four Port DIOD
BK-G	38	T5	T9		T13	V1T5			T5		T5			PXR7		TXT7	
G-BK	13	R5	R9		R13	V1R5			R5		R5			PXT7		TXR7	
BK-BR	39		T10	TXT5	T14	CT4								TXT7		PXT7	
BR-BK	14		R10	TXR5	R14	CR4								TXR7		PXR7	
BK-S	40		T11	PXT5	T15	P-5								PXR8		TXT8	
S-BK	15		R11	PXR5	R15	P+5								PXT8		TXR8	
Y-BL	41	T6	T12		T16	V1T6			T6		T6			TXT8		PXT8	
BL-Y	16	R6	R12		R16	V1R6			R6		R6			TXR8		PXR8	
Y-O	42			TXT6	T17	CT6								PXR9		TXT9	
O-Y	17			TXR6	R17	CR6								PXT9		TXR9	
Y-G	43			PXT6	T18	P-6								TXT9		PXT9	
G-Y	18			PXR6	R18	P+6								TXR9		PXR9	
Y-BR	44	T7			T19	V1T7			T7		T7			PXR10		TXT10	
BR-Y	19	R7			R19	V1R7			R7		R7			PXT10		TXR10	
Y-S	45			TXT7	T20	CT7								TXT10		PXT10	
S-Y	20			TXR7	R20	CR7								TXR10		PXR10	
V-BL	46		T13	PXT7	T21	P-7								PXR11		TXT11	
BL-V	21		R13	PXR7	R21	P+7								PXT11		TXR11	
V-O	47	T8	T14		T22	V1T8			T8		T8		LI*	TXT11		PXT11	
O-V	22	R8	R14		R22	V1R8			R8		R8		LI	TXR11		PXR11	
V-G	48		T15	TXT8	T23	CT8							LO	PXR12		TXT12	
G-V	23		R15	TXR8	R23	CR8							LO*	PXT12		TXR12	

Continued on next page

Table 5-32. Circuit Pack and Auxiliary Equipment Leads (Pinout Charts)

Color	Connector Pin Numbers	Analog Line 8 ports	2-Wire Digital Line and Analog Line 16 ports	Data Line and Digital Line 4-wire	Digital Line 2-Wire 24 Ports	Hybrid Line	MET Line	AUX Trunk	CO Trk.	CO Trunk 3-wire	DID/ DIOD Trunk	Tie Trk.	DS1 Tie Trunk	ISDN BRI Line 4-wire	ISDN BRI Line 2-wire	Packet Data Line	Four Port DIOD
V-BR	49		T16	PXT8	T24	P-8							LBACK2	TXT12		PXT12	
BR-V	24		R16	PXR8	R24	P+8							LBACK1	TXR12		PXR12	
V-S	50																
S-V	25																

†The wire colors in this chart apply only to B25A and A25B cables. H600-307 cable colors are not shown.

The following abbreviations apply for all circuit packs unless otherwise noted:

T,R	PBX transmit voice	T	Tip	(A)	Green
T1,R1	PBX receive voice	R	Ring	(B)	Red
M	PBX transmit signal	S	Sleeve		
E	PBX receive signal	PX	PBX transmit		
TX	Terminal transmit				
LI, LI*	Digital Trunk IN	LO, LO*	Digital Trunk OUT		

The following wire colors apply in the above chart:

W	White	S	Slate (Grey)
BL	Blue	R	Red
O	Orange	BK	Black
G	Green	Y	Yellow
BR	Brown	V	Violet

Test Telephones and Other Equipment

6

This chapter describes how to test the telephones and other equipment. The following tests are included in this chapter:

1. Make Test Calls
2. Test 302C Attendant Console
3. Test Selector Console
4. Test External Ringing
5. Test Queue Warning Indicator
6. Test Integrated Announcement
7. Test Music-on-Hold
8. Test Emergency Transfer
9. Test Remote Access Interface (formerly INADS)
10. Test Basic Rate Interface (BRI)
11. Test Duplication Option Processing Element Interchange
12. Test Terminating Trunk Transmission
13. Test Stratum 3 Clock

The following tests are acceptance tests and provide some assurance the system will perform properly after installation and administration. If problems occur or more extensive tests are required, refer to *DEFINITY Enterprise Communications Server Release 5r Maintenance*, 555-230-105 or *DEFINITY Enterprise Communications Server Release 5vs/si Maintenance*, 555-204-105.

Make Test Calls

Make two calls from one telephone to another telephone. Make the first call by dialing a telephone and make the second call by dialing a trunk access code and a Listed Directory Number (LDN).

Test 302C Attendant Console

Check all lamps are operational and call another telephone in the system.

1. Simultaneously press and hold the Ringer Volume up button and the **POS BUSY button**. This puts the console in the self-test mode.

   NOTE:
   Releasing the buttons causes the console to return to normal mode.

2. Verify all lamps on display light and remain lighted. Each row of lamps on the console lights and goes dark in sequence from top to bottom.
3. Press **Start.** Listen for dial tone. The green lamp associated with idle call appearance button lights. The **Position Available** lamp goes dark.
4. Dial number associated with a working telephone. Audible ringing tone is heard in ear piece.
5. Press **Release.** Audible ringing tone is silenced. The green lamp associated with idle call appearance button goes dark. The **Position Available** lamp lights.

Test Selector Console

Check all selector console lamps are operational. Make call to a telephone in the system.

1. Simultaneously press and hold the Ringer Volume up button and the **POS BUSY button** on the attendant console. This puts the console in the self-test mode.
2. Each row of lamps on the selector console lights and goes dark in sequence from top to bottom.
3. Press hundreds group select button. The hundreds group select lamp lights and any lamps associated with busy telephone light.
4. Press Direct Extension Selection (DXS) button for the desired extension. Audible ringing tone is heard in the earpiece on attendant console.
5. On attendant console, press **Release.** Audible ringing tone is silenced.

Test External Ringing

Make a test call to the attendant console to verify ringing device sounds when **Night** lamp on console is lighted. If ringing device has not been installed by customer, connect spare telephone to information outlet reserved for ringing device and make test call.

Test Queue Warning Indicator

Make a test call to an extension associated with a Uniform Call Distribution (UCD) or Direct Department Calling (DDC) group, and verify the queue warning indicator lamp lights. If the queue warning indicator has not been installed by customer, connect a spare telephone to the information outlet reserved for queue warning indicator and make a test call.

Test Integrated Announcement

The TN750/B/C Announcement circuit pack provides the ability to store messages. The messages can be recorded from telephones on- or off-premises and have flexible message lengths. The telephone selected as the test telephone must have a class of service (COS) with console permission enabled.

Record Announcement

1. Select test telephone with console permission enabled.
2. Dial access code followed by the integrated announcement extension number. Dial tone is heard.
3. Dial “1.” A short burst of tone is heard and recording begins. Speak the announcement into the telephone.
4. Dial “#” or hang up. Recording stops and dial tone is heard.

Playback Announcement

1. Dial access code followed by the integrated announcement extension number. Dial tone is heard.
2. Dial “2.” The announcement is heard and dial tone is heard at completion of announcement.

Delete Announcement

1. Dial access code followed by the integrated announcement extension number. Dial tone is heard.
2. Dial “3.” A confirmation tone is heard and announcement is deleted.

Test Music-on-Hold

Verify music is provided to a held party during any hold interval.

Test Emergency Transfer

Put system in emergency transfer mode and make call using emergency transfer telephone. There may be up to four Emergency Transfer switches depending on the system configuration. The switch is located on the Processor circuit pack(s) in the Processor Port Network (PPN) Control Carrier.

Test Remote Access Interface

Test the communication link between the system and the remote interface (formerly INADS) and verify the alarm notification process. Make a remote test from the remote interface to the DEFINITY System and a local test from the DEFINITY System to the remote interface.

In some countries, this remote access interface is not allowed. Contact your Lucent Technologies representative.

Remote Test

1. Call outside personnel who will be accessing the system remotely to perform administration, maintenance, and testing.
2. Ask remote personnel to call system and login and display System Parameters Maintenance screen. The login must be successful.

   NOTE:
   Product Identification on the System Parameters screen must match the Product Identification administered by the local technician.

3. Remote personnel enters **test inads-link** command, terminates login, and disconnects.
4. Remote personnel then check the appropriate trouble ticket. The trouble ticket should show "INADS,n,MINOR" in the description field to indicate a minor off-board alarm was reported to the remote personnel. There may be more text in the description field if other resolved alarms were reported.
5. Remote personnel makes second call and login to system and checks the error log to verify no problems. See *DEFINITY Enterprise Communications Server Release 5vs/si Maintenance*, 555-204-105, for error log and error code information.
6. Remote access personnel terminate login and disconnects.

Local Test

1. Log in and enter **test inads-link** command.
2. Request remote access personnel to verify a trouble ticket was created.
3. Check error log to verify no problems.
4. Log off the system.

Test Basic Rate Interface

Check for normal voice telephone function (dial tone, ability to make and receive calls). Check for the correct Service Profile Identifier (SPID) on a display telephone and the management terminal.

Test Duplication Option Processing Element Interchange

The process of the standby Processing Element (PE) taking over for the active PE is referred to as a PE Interchange. This interchange should not be performed immediately after powering up the system. Wait a few minutes to allow the system to complete its internal tests. The system default is **PE_B** after powering up the system, so the active PE should be the B processor for this test, and the interchange should make **PE_A** the active PE. Verify the system can successfully perform a PE interchange.

1. At the management terminal, verify the screen displays **PE_B** in the upper right corner.
2. Enter **check status** command. Verify **PE_B** is in the standby mode. If it is, proceed to Step 4. If it isn't, proceed to Step 3.
3. Enter **refresh-spr-standby** command.
4. Enter **reset system interchange** command. The management terminal will be logged off and a beep will be heard.
5. Login and verify that the screen displays **PE_A** in the upper right corner.

   NOTE:
   Processor A's yellow light is on and its green light is off.
   Processor B's yellow and green lights are off.
   The system is alarm free.

6. Make system test call. The call must complete and the conversation must be satisfactory.

Test Terminating Trunk Transmission

The Terminating Trunk Transmission Test provides for extension number access to three tone sequences that can be used for trunk transmission testing from the distant end of the trunks.

The three test types must have extension numbers assigned on the — **system-parameters maintenance** form:

Test Type 100:_______ Test Type 102:_______ Test Type 105:_______

Test type 100 provides:

- 5.5 Seconds of 1004 Hz tone at 0 dB
- Quiet until disconnect; disconnect is forced after one minute

Test Type 102 provides:

- 9 Seconds of 1004 Hz tone at 0 dB
- 1 Second of silence
- Cycle is repeated until disconnect, which is forced after 24 hours

Test Type 105 provides:

- 9 Seconds of 1004 Hz tone at -16 dB
- 1 Second of silence
- 9 Seconds of 404 Hz tone at -16 dB
- 1 Second of silence
- 9 Seconds of 2804 Hz tone at -16 dB
- 30 Seconds of silence
- 0.5 Seconds of test progress tone (2225 Hz)
- Approximately 5 seconds of silence
- Forced disconnect

Test Stratum 3 Clock

To test the ability of the Stratum 3 clock to correctly provide timing and alarms to the system.

- Check for red LEDs
- Verify timing to the system
- Verify loss of power supply alarms to the system
- Verify loss of DS1 reference alarms to the system

NOTE:
The following procedures are destructive to DS1 data and should not be attempted while there are DS1 facilities in active use.

Check for Red LEDs

1. Turn on the Stratum 3 clock and wait 40-50 seconds to allow the system to complete the on-board diagnostics before checking LEDs.
2. If there are any red LEDs, follow the procedures in Table 6-1.

Table 6-1. Synchronization Clock LED Indicators

Card	LED Label	Procedure
PAI	REF A	Check that the CI circuit pack on the left is inserted properly. Check wiring for DS1 in carrier A which connects the system to the CSU and the External Synchronization Clock at the MDF through a Y-cable assembly. If all else fails to clear the LED then replace the circuit pack.
PAI	REF B	Check that the CI circuit pack on the right is inserted properly. Check wiring for DS1 in carrier B which connects the system to the CSU and the External Synchronization Clock at the MDF through a Y-cable assembly. If all else fails to clear the LED then replace the circuit pack.
PAI	ST A	Replace the ST3 card
PAI	ST B	Replace the ST3 card
CI	FAIL	Check wiring for its associated DS1 reference and replace the circuit pack if necessary
ST3	FAIL	Replace the circuit pack
ST3	LOCK	Ignore this LED
ST3	HOLDOVER	Ignore this LED
ST3	FREE RUN	Ignore this LED
TOCA	FAIL	Replace the circuit pack
TOCA	PORT ALM	Replace the circuit pack if necessary

Verify Timing to the System

1. Administer the Stratum 3 clock by issuing the **change synchronization** command at the management terminal.
2. Type a "3" in the **stratum** field.
3. Type the port network number where the TN780 Tone-Clock circuit pack(s) reside in the **port network** field.

   NOTE:
   Wait one minute for the software to reconfigure the system synchronization.

4. Verify results of test 649. If test 649 fails with a code of 2101, then check the wiring for **EXTSYN0** and **EXTSYN1.** Refer to *DEFINITY Enterprise Communications Server Release 5r Maintenance*, 555-230-105.
5. If test 649 is successful, then the system is getting correct timing from the Stratum 3 clock.

Perform Complete System Test

Run the complete system test with the “Allports” option in the “SPE Interchange” and “Long Test” modes. The hardware group tests are described in *DEFINITY Enterprise Communications Server Release 5r Maintenance,* 555-230-105 or *DEFINITY Enterprise Communications Server Release 5vs/si Maintenance*, 555-204-105.

NOTE:
This test takes several hours. It may be best to run the test in the background, or at night, or both.

After the test has completed, inspect the alarms log. Type display alarms and resolve the alarms in the usual manner.

Check the error log for evidence of failure. The only failure results logged should be the outcome of tests requiring a connected station, where a station is not connected to the port under test. Repair all other failures or refer them to a maintenance technician for repair.

Activate and Test Alarm Origination Feature

1. Activate the Alarm Origination feature from the *change system-parameter maintenance* form. Refer to *DEFINITY Enterprise Communications Server Release 5 Implementation,* 555-230-302, for information.
2. Run “test inads link” to verify the system can reach the Remote Network Interface (formerly INADS) successfully.

Option Switch Settings

A

Some of the interface units used between the Multi-Carrier Cabinets and other types of equipment require specific option switch settings. This section lists the settings required for data modules, modems, printers, and so forth. Refer to the user's guide for each type of equipment for information on how to locate and set the option switches.

Data Module Option Switch Settings

DCS Switch Settings

The Distributed Communications System (DCS) for a system is sometimes connected to the system through the TN765 Processor Interface circuit pack or a TN778 Packet Interface circuit pack. The first circuit can be connected directly to the DCS through the processor interface (**PI**) connector on the rear of the control carrier.

Any of the remaining three circuits on the processor interface used to support the DCS must be connected through a data module serving as the interface link. The option settings for a 7400B Data Module are shown in Table A-1. Refer to Figure A-1 for the location of the switches.

NOTE:
The options for the 7400A and 7400C Data Modules are set from the front panel interface. For the 7400A, refer to *7400A Data Module User's Manual*, 555-020-706. For the 7400C, refer to *DEFINITY Communications System High Speed Link User's Guide*, 555-020-711.

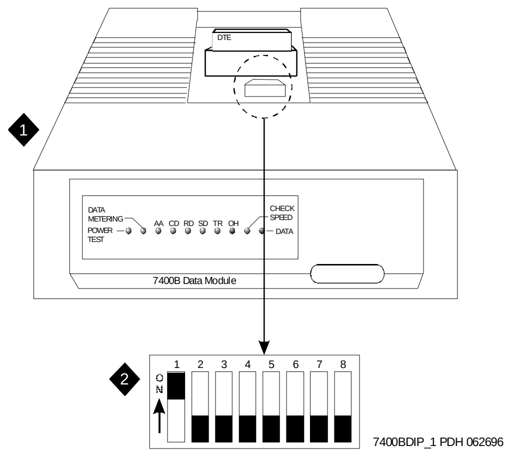


Figure Notes

1. Data Module (7400A Shown)
2. DIP Switch

Figure A-1. DIP Switch Locations

1. Remove the top cover from the data module.
2. Switches 1, 5, and 8 are the only switches to be set. Refer to Table A-1 for the switch option settings.

Table A-1. Data Module Option Switch Settings

DIP Switch	Function	Setting
1	With Phone Without Phone	ON OFF
5	Data Metering No Data Metering	ON OFF
8	Make Busy on Loc Loop No Make Busy on Loc Loop	ON OFF
2, 3, 4, 6, and 7		OFF

7400D Data Module Option Settings

The option settings shown in Table A-2 are for the Answer Only interface and are set from the front panel interface. Set only the desired speed of the 7400D. All other default settings can be used.

Refer to "Set 7400D Options" on page A-4 to set the speed.

Table A-2. 7400 Series Data Module Options (Answer Only Interface)

Set Option Display	Abbreviation	Possible Values	Default
Set 300 SPEED?	300	ON, OFF	ON
Set 1200 SPEED?	1200	ON, OFF	ON
Set 2400 SPEED?	2400	ON, OFF	ON
Set 4800 SPEED?	4800	ON, OFF	ON
Set 9600 SPEED?	9600	ON, OFF	ON
Set 19200 SPEED?	19200	ON, OFF	ON
Set ANSWER?	ANS	AUTO, MANUAL	AUTO
Set CI LEAD?	CI	ON, OFF	OFF
Set CH LEAD?	CH	ON, OFF	OFF
Set CTS LEAD?	CTS	NORMAL, ON	ON
Set DCD LEAD?	DCD	NORMAL, ON	ON
Set DSR LEAD?	DSR	NORMAL, ON	ON
Set DTR DETECT?	DTR	0, 10, 20, 30, 50, 100 MSEC	50
Set DTR LEAD?	DTR	EIA STANDARD, IGNORE	EIA STANDARD
Set LL LEAD?	LL	ON, OFF	OFF
Set REMOTE LOOP?	REMLOOP	GRANT, DENY	GRANT
Set RI LEAD?	RI	CYCLE, ON	ON
Set RL LEAD?	RL	ON, OFF	OFF
Set SIGLS DISC?	SIGLS DISC	ON, OFF	ON
Set TIMING?	TIMING	INTERNAL, EXTERNAL	INT
Set TM LEAD?	TM	ON, OFF	OFF

NOTE:
It is recommended that CI and CH be set to ON, and DCD and DSR be set to normal. This allows login information to be displayed on the screen without having to send a carriage return character.

Set 7400D Options

The following steps are used as an example to change the default setting of 9600 to the custom setting of 19200.

NOTE:
If the link is between a Release 5r and a CMS, set the 7400D to 19200. If the link is between any other system and a CMS, leave the speed of the 7400D set at 9600.

1. From the HOME screen, press **NEXT/NO** until `SET OPTIONS ?` is displayed.
2. Press **ENTER/YES** to stay in the `SET OPTIONS ?` menu.
3. Press **NEXT/NO** until `SET 9600 SPEED ?` is displayed.
4. Press **ENTER/YES** when `SET 9600 SPEED ?` is displayed.
5. Press **NEXT/NO** when `9600 = ON ?` is displayed.
6. Press **ENTER/YES** when `9600 -> OFF ?` is displayed.
7. Press **ENTER/YES** when `CONTINUE ?` is displayed.
8. Press **ENTER/YES** when `SET 19200 SPEED ?` is displayed.
9. Press **NEXT/NO** when `19200 = OFF ?` is displayed.
10. Press **ENTER/YES** when `19200 -> ON ?` is displayed.
11. Press **NEXT/NO** when `CONTINUE ?` is displayed.
12. Press **ENTER/YES** when `19200 -> ON ?` is displayed.
13. Press **ENTER/YES** when `SAVE CHANGES ?` is displayed.

NOTE:
The `SET OPTIONS ?` menu cannot be terminated if all speeds are set to off.

Modem Pooling (Combined) Option Settings

Combined modem pooling requires option switch settings on different modems and data modules. Refer to the vendor’s documentation.

7400A and 7400B Option Settings

Determine if the 7400A or 7400B is interfacing with D-lead modems or attention control modems. Use Table A-3 for D lead modems and Table A-4 for attention control modems.

Table A-3. 7400A Options for D-Lead Modems

Set Option Display	Option	Desired Setting
Set 300 Speed?	300	Note 1
Set 1200 Speed?	1200	Note 1
Set 2400 Speed?	2400	Note 1
Set 4800 Speed?	4800	Note 1
Set 9600 Speed?	9600	Note 1
Set 19200 Speed?	19200	Note 1
Set AT Control?	AT	OFF
Set CI Lead?	CI	Note 2
Set CI2 Lead?	CI2	Note 2
Set CH Lead?	CH	Note 2
Set CH2 Lead?	CH2	Note 2
Set LL Lead?	LL	Note 2
Set REMOTE Loop?	REMLOOP	Grant
Set RL Lead?	RL	Note 2
Set SIGLS Disc?	SIGLS DISC	ON
Set TM Lead?	TM	Note 2

NOTE:
1. Set speed to match remote modem. At least one speed must be set ON.

NOTE:
2. Set to match remote modem.

Table A-4. 7400A Options — Attention Control Modems

Set Option Display	Option	Setting
Set 300 Speed?	300	Note 1
Set 1200 Speed?	1200	Note 1
Set 2400 Speed?	2400	Note 1
Set 4800 Speed?	4800	Note 1
Set 9600 Speed?	9600	Note 1
Set 19200 Speed?	19200	Note 1
Set AT Control?	AT	ON
Set CI Lead?	CI	Note 2
Set CI2 Lead?	CI2	Note 2
Set CH Lead	CH	Note 2
Set CH2 Lead?	CH2	Note 2
Set LL Lead?	LL	Note 2
Set REMOTE Loop?	REMLOOP	Grant
Set RL Lead?	RL	Note 2
Set SIGLS Disc?	SIGLS DISC	ON
Set TM Lead?	TM	Note 2

NOTE:
1. Set speed to match remote modem. At least one speed must be set ON.

NOTE:
2. Set to match remote modem.

External Modem Option Settings

The COMSPHERE 3700, 3800, and 3900 series (recommended) external modems may require option switch settings. Refer to the documentation that accompanies each modem to set the options.

NOTE:
A locally obtained, type-approved external modem may be used. Contact your Lucent Technologies representative for more information.

The Release 5 systems operate with the COMSPHERE modems set to the factory default settings. See Screen A-1. Refer to *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302, to administer the modem after the options are set. The Customer Options Screen (Page 3) is modified.

```
  change system-parameters maintenance           Page 3 of 3

          MAINTENANCE-RELATED SYSTEM PARAMETERS

        Modem Connection: external
               Data Bits: 8
                  Parity: none
              Modem Name: ___

         RTS/CTS Enabled: \Q3       Auto Answer Ring Count (rings): ___
  Asynchronous Data Mode: &M0&Q0                         Dial Type: T
     DTE Auto-Data Speed: ___          Adjustable Make/Break Ratio: ___
Disable Data Compression: ___                         Dial Command: D
    Enable Error Control: ___                  No Answer Time-out: S7=255
       Misc. Init. Param: ____________________

Help/Error Message Line
Command Line
```

Screen A-1. External Modem Default Settings

There are fields that are hidden when the “Modem Connection” field is set to “internal.” When the “Modem Connection” field is set to “external” these fields are displayed. Two fields help setup the data format for the serial data from the system to the modem: the “Data Bits:” and “Parity:” fields. There are only two valid combinations of these two fields.

- Data Bits = 8, Parity = None
- Data Bits = 7, Parity =(odd , even, mark, or space)

The remaining modem fields are listed in Table A-5.

Table A-5. Modem Fields

Modem Connection	**Valid entries are "internal" or "external". Default is internal.**
Modem Name	This field is 20 characters long and permits alphanumeric characters to provide a unique qualifier for a given modem (such as INTEL).
RTS/CTS Enabled	Informs the modem that communication with the data source UART is driven with RTS/CTS flow control. The field name has a default of \Q3 in a field 6 characters long. This field is not case sensitive. Default is upper case.
Asynchronous Data Mode	Configures modem as an asynchronous communications device. The field name has a default value of &M0&Q0 in a field 8 characters long. This field is not case sensitive. Default is upper case.
DTE Auto-Data Speed	Adjusts the speed of the data source (DTE) UART to the outgoing (modem-to-modem) data rate. At maximum, this speed is 9600 baud. It is not desirable to have the serial data fill the modem buffer faster than the outgoing data rate, since data compression is disabled. The field name has a blank default value in a field of 6 characters. The Lucent products use the command S90=1 to enable this functionality while the Intel product uses the command \J1 to enable similar functionality. This field is not case sensitive. Default is upper case.
Disable Data Compression	Turns off the default data compression algorithms in use by most modems. The field has a blank field of 6 characters as default. The AT commands that control this are supported by similar commands; however, these commands do not operate in the same manner. The Intel modems require "H0%C0" to disable V.42bis & MNP Class 5 data compression algorithms. The Paradyne products only use %C0 to disable both algorithms. This field is not case sensitive. Default is upper case.
Enable Error Control	Turns on the V.42 LAPM and MNP error control protocols, if available. The field has a blank field of 6 characters as default. The Paradyne products use the command \N5 to enable V.42/MNP/Buffer error control while the Intel product uses \N3 to provide similar functionality. This V.42/MNP/Buffer mode attempts to negotiate V.42 error control with the remote modem. If this fails, the modem changes to MNP, if this fails, no error control is used. This field is not case sensitive. Default is upper case.

Continued on next page

Table A-5. Modem Fields — *Continued*

Modem Connection	Valid entries are "internal" or "external". Default is internal.
Misc. Init. Param	This field has a blank as a default and a field length of 20 characters. This field supports any initialization parameters not already specified. The AT commands specified in this free-form field is always the last initialization parameters to be sent to the external modem. This field is not case sensitive. Default is upper case.
Auto-Answer Ring Number	This field controls the number of rings required before the modem answers an incoming call. This field has a blank default value in a field 6 characters long. Typically, the maximum permissible value for this register is 255. The values 1-255 denote the number of incoming ring cycles. This field is not case sensitive. Default is upper case.
Dial Type	This field controls the type of interregister signaling to be used between the modem and the Central Office. The field has a default of "T " for tone dialing. Pulse dialing is indicated by "P". The field length should be 3 characters long. This field is concatenated with the dial string. This field is not case sensitive. Default is upper case.

Continued on next page

Table A-5. Modem Fields — *Continued*

Modem Connection	Valid entries are "internal" or "external". Default is internal.
Adjustable Make/Break Ratio	This field controls the make/break ratios of pulses and DTMF dialing. The Intel product information has support for different make/ break options for pulse dialing only. Intel uses &P0 to select a ratio of 39% make and 61% break for communication within the United States and Canada. The option &P1 sets a ration of 33% make and 67% break for the United Kingdom and Hong Kong. This field has a blank default and a 5 character long entry. This field is not case sensitive. Default is upper case.
Dial Command	This field has a default of "D" in a field 3 characters long. This field denotes the dialing command of the modem. This is a standard command. This field is not case sensitive. Default is upper case.
No Answer Time-Out	Most external modems provide a timer that abandons any outbound data call after a predetermined interval. Some modems disable this timer, allowing an outbound call to ring indefinitely. Paradyne does not provide this capability because it is undesirable to have an outbound call attempt to ring indefinitely. Therefore, the initialization string must contain the following ASCII string to set the "No-Answer Timer" to the maximum value: S7=255. The internal modem must have this parameter disabled or set to at least 255 seconds. This is a non-administrable parameter. For the modem connection, this parameter is the first initialization string to be transmitted to the modem. This field is visible on the administration form in display mode only. The new field is set to S7=255. This hardcoded constant can be overriden for type approval applications, specifically in the United Kingdom and other Western European nations, by the use of the "Misc. Init. Param:" field. (S7=255)

Printer Option Settings

Printers can be used with a management terminal as journal printers for the hospitality feature and also as an output device for Call Detail Recording (CDR).

A 572 printer can function as a CDR device, system printer, or journal printer. The options are set with function keys rather than DIP switches. Figure A-2 shows the arrangement of the function keys on the printer control panel.

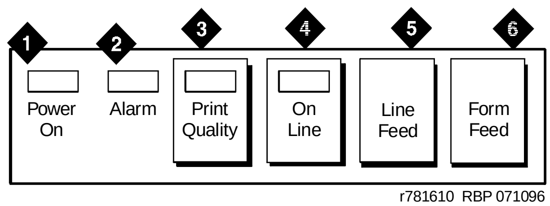


Figure Notes

1. Power On Button
2. Alarm Button
3. Print Quality Button
4. On Line Button
5. Line Feed Button
6. Form Feed Button

Figure A-2. Control Panel for 572 Printer

1. Load the printer with paper and turn the power off (Callout 1).
2. Simultaneously press and hold the **Print Quality** and **On Line** buttons.
3. Press the **Power On** button. Release all three buttons. The printer is now in set-up mode and it prints the following settings:

Form length	Buzzer on/off
Lines per inch	Letter quality or near letter quality
Characters per inch	

   If the printer is used with a management terminal, CDR, or as a Journal printer, set the options as shown in Table A-6. If the printer is used as the system printer, set the options as shown in Table A-7 on page A-13.

4. Use **Line Feed** to step forward through the list of functions or use **Form Feed** to step backward.
5. Press **On Line**. This activates the menu for the function. Use **Line Feed** and **Form Feed** to step through the options for the function.
6. When a desired option is located, press **Print Quality**. Each time an option is set, the setting is printed. Repeat Step 4 for each option to be set.
7. When finished, press **Print Quality**. The printer changes to normal mode.

Table A-6. 572 Printer Used with Management Terminal

Function	Function Name	Menu	Menu Status
01	FORM LENGTH	09	11
02	LPI	01	6
03	CPI	01	10
04	LQ or NLQ	01	LQ
05	BUZZER	01	ON
06	FONT	02	FONTCART
07	RESOLUTION	01	144
11	BUFFER	02	N-LINE
13	PW ON MODE	01	ON-LINE
14	DIRECTION	01	B1-DIR.1
15	BUFF FULL	02	LF + CR
16	P.E.	01	ACTIVE
17	AUTO CARRIAGE RETURN (CR)	01	CR + LF
18	ZERO	01	0
22	AUTO LINE FEED	01	CR ONLY
31	1" SKIP	01	OFF
32	CHAR.SET (GO, GL)	02	USA
33	CHAR.SET (G1, GR)	01	UK
34	CHAR SET (G2)	03	GE
35	CHAR SET (G3)	07	LINE DRAWING
81	OFF-LINE STATE	01	ALL RECEIVE
82	DSR	02	OFF
83	REQUEST TO SEND (RTS) TIMING	01	RTS
84	CD	02	OFF
85	CLEAR TO SEND (CTS)	02	OFF
91	OVER RUN	02	256
92	DATA BIT	02	8
93	PROTOCOL	03	XON/XOFF
94	STOP BIT	01	1
95	PARITY	01	NONE
96	PBS (matches connected device)	01	9600

Table A-7. 572 Printer used as System Printer

572 Printer Option Settings			
Function	**Function Name**	**Menu**	**Menu Status**
01	FORM LENGTH	09	11
02	LPI	01	6
03	CPI	01	10
04	LQ or NLQ	01	LQ
05	BUZZER	01	ON
06	FONT	02	FONTCART
07	RESOLUTION	01	144
11	BUFFER	02	N-LINE
13	PW ON MODE	01	ON-LINE
14	DIRECTION	01	B1-DIR.1
15	BUFF FULL	02	LF + CR
16	P.E.	01	ACTIVE
17	AUTO CARRIAGE RETURN (CR)	01	CR + LF
18	ZERO	01	0
22	AUTO LINE FEED	01	CR ONLY
31	1" SKIP	01	OFF
32	CHAR.SET (GO, GL)	02	USA
33	CHAR.SET (G1, GR)	01	UK
34	CHAR SET (G2)	03	GE
35	CHAR SET (G3)	07	LINE DRAWING
81	OFF-LINE STATE	01	ALL RECEIVE
82	DSR	02	OFF
83	REQUEST TO SEND (RTS) TIMING	01	RTS
84	CD	02	OFF
85	CLEAR TO SEND (CTS)	02	OFF
91	OVER RUN	02	256
92	DATA BIT	02	8
93	PROTOCOL	03	XON/XOFF
94	STOP BIT	01	1
95	PARITY	01	NONE
96	PBS	04	1200

Call Detail Recording Option Settings

The interface between the system and CDR equipment may be one of the following:

- Data Module — Recommended option settings are shown in Table A-3.
- Modem — Recommended option settings are in modem vendor document
- TN726 Data Line circuit pack and an Asynchronous Data Unit — Data modules or modems are not required.
- Connected directly to the **DCE** connector (EIA Port) located on the rear of the Control Carrier — Data modules or modems are not required.

A 572 Printer can be used as an output receiving device for CDR. The recommended option settings for this printer is shown in Table A-8 and Table A-9. Also, a TELESEER, CDR, 94A Local Storage Unit (LSU), or Customer Premises Equipment (CPE) can be used as the output receiving device.

Administration procedures for CDR equipment are provided in *DEFINITY Enterprise Communications Server Release 5 Implementation*, 555-230-302.

Table A-8. 572 Printer Used with Management Terminal, CDR, or Journal Printer

Function	Function Name	Menu	Menu Status
01	FORM LENGTH	09	11
02	LPI	01	6
03	CPI	01	10
04	LQ or NLQ	01	LQ
05	BUZZER	01	ON
06	FONT	02	FONTCART
07	RESOLUTION	01	144
11	BUFFER	02	N-LINE
13	PW ON MODE	01	ON-LINE
14	DIRECTION	01	B1-DIR.1
15	BUFF FULL	02	LF + CR
16	P.E.	01	ACTIVE
17	AUTO CARRIAGE RETURN (CR)	01	CR + LF

Continued on next page

Table A-8. 572 Printer Used with Management Terminal, CDR, or Journal Printer — *Continued*

Function	Function Name	Menu	Menu Status
18	ZERO	01	0
22	AUTO LINE FEED	01	CR ONLY
31	1" SKIP	01	OFF
32	CHAR.SET (GO, GL)	02	USA
33	CHAR.SET (G1, GR)	01	UK
34	CHAR SET (G2)	03	GE
35	CHAR SET (G3)	07	LINE DRAWING
81	OFF-LINE STATE	01	ALL RECEIVE
82	DSR	02	OFF
83	REQUEST TO SEND (RTS) TIMING	01	RTS
84	CD	02	OFF
93	PROTOCOL	03	XON/XOFF
94	STOP BIT	01	1
95	PARITY	01	NONE
96	PBS	01	9600

Continued on next page

AUDIX Interface Option Settings

The Audio Information Exchange (AUDIX) is sometimes connected to the system through the Processor Interface circuit pack. The first circuit on the processor interface can be connected directly to the AUDIX through the **PI** connector on the rear of the Control Carrier.

Any of the remaining three circuits on the processor interface to be used to support AUDIX must be connected through a 7400D Data Module serving as the interface link for AUDIX. The option settings are shown in Table A-9.

Table A-9. Data Module Settings for DEFINITY AUDIX

DIP Switch 1	Setting
9600	ON
DIP Switch 2	**Setting**
SYNC	ON
INT	ON
AANS	ON
All Other Switches	OFF

TN760D Tie Trunk Option Settings

The TN760D Tie Trunk circuit pack interfaces between four tie trunks and the TDM bus. Two tip and ring pairs form a 4-wire analog transmission line. An E and M pair are DC signaling leads used for call setup. The E-lead receives signals from the tie trunk and the M-lead transmits signals to the tie trunk.

To choose the preferred signaling format (Table A-10 and Table A-11), set the switches on the TN760D and administer the port per Figure A-3 and Table A-12.

CAUTION:
To prevent damage from static electricity, wear an EMC wrist strap (comcode 900698226) when handling circuit packs or other components.

Table A-10. Signaling Formats for TN760D

Mode	Type
E & M	Type I Standard (unprotected)
E & M	Type I Compatible (unprotected)
Protected	Type I Compatible, Type I Standard
Simplex	Type V
E & M	Type V
E & M	Type V Revised

Table A-11. Signaling Type Summary

Signaling	Transmit (M-Lead)		Receive (E-Lead)	
Type	On-Hook	Off-Hook	On-Hook	Off-Hook
Type I Standard	grd	bat	open[1]/bat	grd
Type I Compatible	open[1]/bat	grd	grd	open[1]/bat
Type V	open[1]/bat	grd	open	grnd
Type V Reversed	grd	open	grd	open

1. An open circuit is preferred instead of battery voltage.

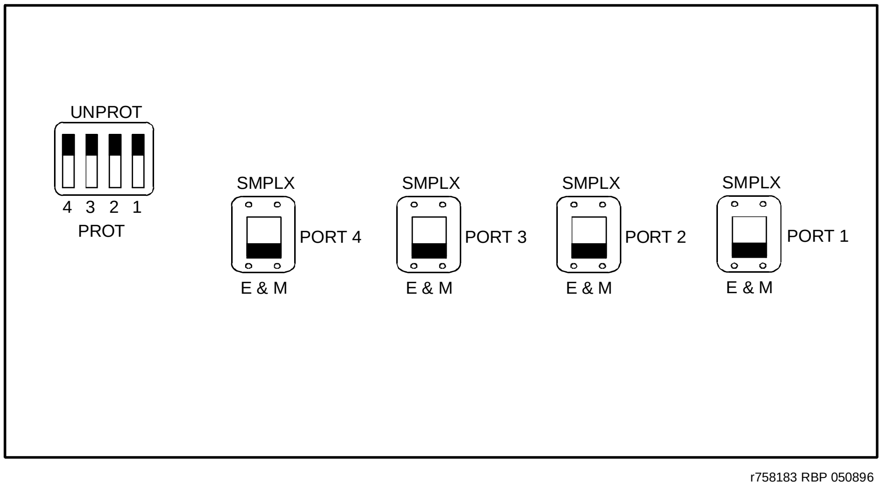


Figure A-3. TN760D Tie Trunk Circuit Pack (Component Side)

Table A-12. TN760D Option Switch Settings and Administration

Installation Situation		Preferred Signaling Format		Set E&M/SMPLX Option Switch	Set Prot/ Unprot Option Switch	Administered Port
Circumstance	To	System	Far-End			
Co-Located	Sys75/G1	Simplex	Simplex	SMPLX	Either	Type 5
		Type 5	Type 5			
Inter-Building	Sys75/G1	Simplex	Simplex	SMPLX	Either	Type 5
		Type 5	Type 5			
Co-Located	Sys85/G2	Simplex	Simplex	SMPLX	Either	Type 5
		Type 5	Type 5			
Inter-Building	Sys85/G2	Simplex	Simplex	SMPLX	Either	Type 5
		Type 5	Type 5			
Co-Located	DIMENSION	E&M Type 1	E&M Type 1	E&M	Unprotected	Type 1
	PBX	Compatible	Standard			Compatible
Inter-Building	DIMENSION	Protected Type 1	Protected Type 1	E&M	Protected	Type 1
	PBX	Compatible	Standard			Compatible
Co-Located	Other	E&M Type 1	E&M Type 1	E&M	Unprotected	Type 1
		Compatible	Standard			Compatible
Inter-Building	Other	Protected Type 1	Protected Type 1	E&M	Protected	Type 1
		Compatible	Standard Plus			Compatible
			Protection			
			Unit			
Co-Located	Net Integrated	E&M Type 1	Any PBX	E&M	Unprotected	Type 1
		Standard				

TN464E/F Option Settings

The TN464 DS1/E1 Interface - T1/E1 circuit pack interfaces between a 24 or 32 channel Central Office/ISDN or tie trunk and the TDM bus.

Set the switches on the circuit pack to select bit rate and impedance match. See Table A-13 and Figure A-4.

Table A-13. Option Switch Settings on TN464E/F

120 Ohms	Twisted pair
75 Ohms	Coaxial requiring 888A adapter
32 Channel	2.048 megabits per second
24 Channel	1.544 megabits per second

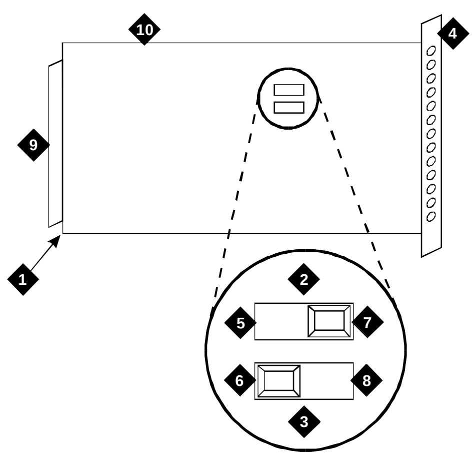


Figure Notes

1. Backplane Connectors
2. 24/32 Channel Selector
3. 75/120 Ohm Selector
4. Faceplate
5. 32 Channel
6. 120 Ohm (shown selected)
7. 24 Channel (shown selected)
8. 75 Ohm
9. Connector
10. TN464E/F

Figure A-4. TN464E/F Option Settings

212-Type Modem Switch Settings

Refer to Table A-14 for the 212-type modem settings for Call Detail Recording (CDR).

Table A-14. 212-Type Modem Switch Settings (for CDR)

Switch	Setting
AL	OFF
ST	OFF
RDL	OFF
DL	OFF
HS	ON

Cable Ductwork

B

The cable ductwork is assembled from various group numbers from ED-1E465 (facia paneling to cover the I/O ducts is assembled from ED-1E464). The assembly, installed after the cabinets have been installed, provides ducts for three types of cables: intercabinet cables, I/O cables (tip and ring), and AC power cables. DC power cables are installed in ductwork per local codes. Typical assembled ductwork is shown in Figure B-1. The three primary types of ductwork are detailed below:

- Shielded intercabinet cable duct — provides the path for cables connected between cabinets. This duct is the first installed. Covers for this duct should be stored until the intercabinet cabling is completed.
- I/O cable duct — provides the path for I/O cables to the Main Distribution Frame (MDF). The I/O cables originate at connectors on the rear of the cabinets and terminate on connectors at the MDF.
- AC power duct — provides the path for the AC wiring that powers the system. This duct mounts to the rear of the shielded duct that runs across each cabinet.

Five group numbers provide various arrangements of receptacles necessary for different types of cabinets. Knockouts are provided for 1-inch (2.54 cm), 1.5-inch (3.81 cm), or 2-inch (5 cm) conduits that provide AC power connection at one end of each cabinet lineup. Covers for the power duct should be stored until the AC wiring is completed.

Three methods are available for running I/O cables from the I/O ducts to the MDF:

1. Using an overhead cable rack
2. Using cable duct groups 22 to 26, and 39
3. Using multiples of either group as required

Equipment room layout and expected growth determines which method to use. Installation of an overhead rack is covered by *Cable Racks* (800-614-157).

NOTE:
Ensure all screws are installed in all appropriate places to comply with electromagnetic interference (EMI) requirements for shielding.

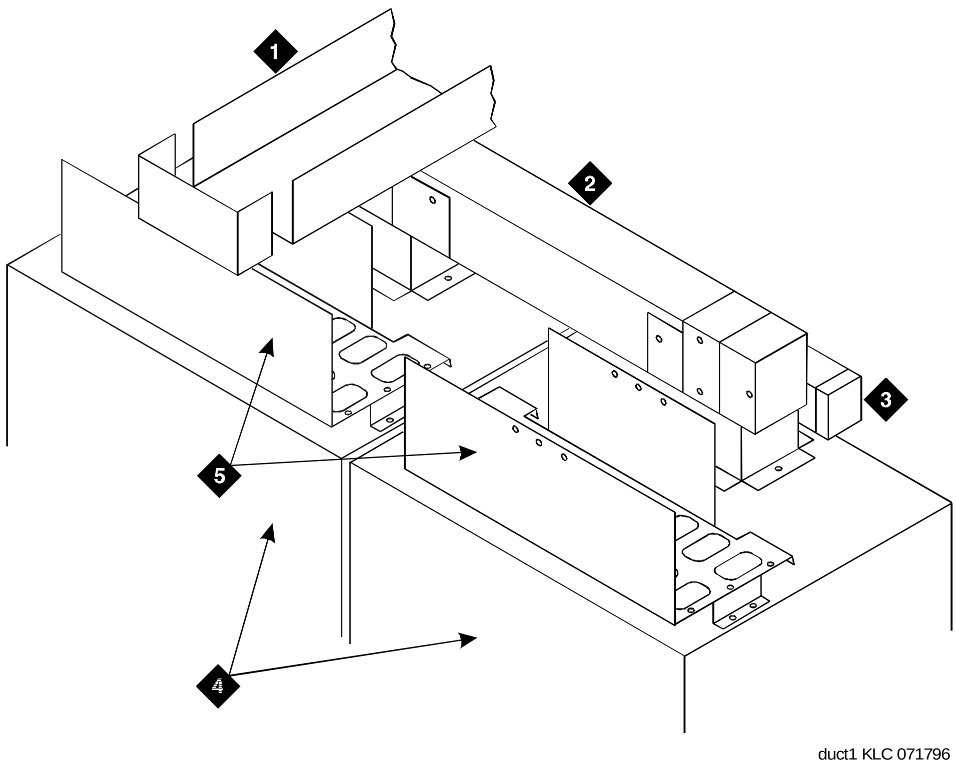


Figure Notes

1. I/O Cross-Isle Trough
2. Shielded Intercabinet Duct
3. AC Power Cable Duct
4. Front of Cabinets
5. I/O Ducts to Cross-Connect Field

Figure B-1. Typical Layout of Assembled Ductwork

Installation

This ductwork consists of ED-1E465 group numbers (facia paneling to cover the I/O ducts is assembled from ED-1E464). The group numbers match those in the Customer Service Document (CSD) and floor plan layout.

Inventory the materials received and mark a copy of the floor plan with the location of each group number to be installed. Hardware used to assemble each item is packaged with the individual groups.

Table B-1 shows the available group numbers and a brief description of each group. Some ducts are equipped with covers which should be stored until all cabling is completed. When storing, tag the covers with their associated group numbers for ease in identification.

Table B-1. ED-1E465 Group Numbers and Descriptions

Group	Description
6	Rear or front end plate for I/O ductwork
8	I/O cable rack coupling to rear of cabinet
9	I/O cable rack riser to side of cabinet
10	I/O cross-aisle ductwork
12	AC power duct
13	AC power duct with one 3-wire twist-lock receptacle (right side)
14	AC power duct with one 3-wire twist-lock receptacle (left side)
15	AC power duct with two 3-wire twist-lock receptacles (right side)
16	AC power duct with four 3-wire twist-lock receptacles (left side)
17	Raceway cover
18	Raceway cover with utility outlet
19	AC power duct combination end
21	AC power duct with one 4-wire twist-lock receptacle (right side)
22	I/O duct-side of cabinet to wall (43 inch (109.2 cm) aisle)
23	I/O duct-side of cabinet to wall over one cabinet
24	I/O duct-side of cabinet to wall over two cabinets
25	I/O duct-side of cabinets to wall over three cabinets
26	I/O duct-rear of cabinet to wall (43 inch (109.2 cm) aisle)
27	Transition between older DIMENSION system-type cabinet and new DEFINITY system cabinets for shielded cable ducts

Continued on next page

Table B-1. ED-1E465 Group Numbers and Descriptions — *Continued*

Group	Description
28	Transition between older DIMENSION system-type cabinet and new DEFINITY system cabinets for I/O cables
29	Shielded duct assembly transition from the front of a System 85-R1 cabinet to the rear of a DEFINITY cabinet
30	I/O duct transition assembly for cross-aisle (System 85-R1 lineup to bridge a DEFINITY lineup)
31	Shielded duct assembly transition from rear of a System 85-R1 to front of a DEFINITY cabinet
32	AC power with a 4-wire twist-lock receptacle (left side viewed from rear)
33	Ladder rack supported 86 or 88.5 inches (218.4 cm or 224.7 cm) from floor
34	AC power duct with two 3-wire receptacles (250 VAC) (right side)
35	AC power duct with one 3-wire receptacle (250 VAC) (right side)
37	AC power duct with one 3-wire receptacle (30 A, 208 VAC) for CC
39	I/O cross-aisle ductwork (48 inch (109.2 cm) aisle)
41	Basic hardware for one cabinet
42	Right or left end plate for shielded ductwork
44	Front and rear end plate for shielded ductwork
51	Shielded cross-aisle ductwork
78	Shielded cross-aisle ductwork (48 inch (122 cm) aisle)

Install the various cable ducts in the order shown in Table B-2. Refer to the figures for detailed information. Figure B-2 shows an overhead view of a typical ductwork installation.

WARNING:

To prevent damage to the cabinet circuitry or cables, place cardboard or equivalent in the cable ducts to catch any metal filings that may fall from the self-threading screws.

Table B-2. Installation Sequence

Step	Group	Remarks
1	41	Install basic ductwork on each cabinet
2	51	Install cross-aisle shielded ductwork
3	10 or 26	Install I/O cross-aisle or cabinet to wall cable trough
	22-25	Install I/O cross-aisle to wall trough duct
4	8 or 9	Install I/O cable rack coupling to rear of cabinet or install I/O cable rack riser to end of cabinet
5	12-19, 21, 32, 34, & 35	Install AC power ducts
6	27	Install shielded cable ducts between DEFINITY and DIMENSION cabinets
7	28	Install I/O cable ducts between DEFINITY and DIMENSION cabinets
8	29 & 31	Install shielded duct assembly from front of system cabinet to rear of a DEFINITY cabinet (group 29) or front of a DEFINITY cabinet to rear of system cabinet (group 31)
9	30	I/O transition assembly for cross-aisle (DEFINITY)
10	33	Ladder rack supported 86 or 88.5 inches (218.4 cm or 224.8 cm) from floor

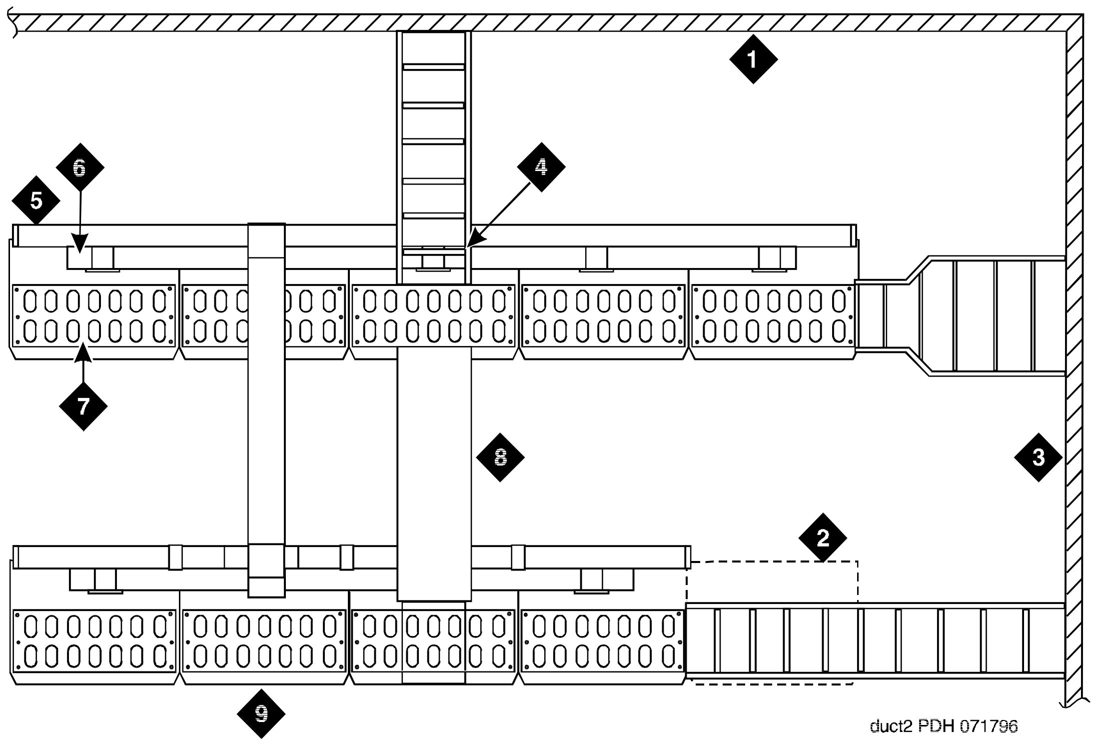


Figure Notes

1. Wall
2. Space for Future Cabinet
3. Plywood Wall and Cross-Connect Field
4. I/O Cable Rack Coupling to Rear of Cabinet
5. AC Power Cable Duct
6. Shielded Intercabinet Fiber Optic Cables
7. I/O Duct to Cross-Connect Field
8. I/O Cross-Isle Trough
9. Front of Cabinets

Figure B-2. Overhead View of a Typical Ductwork Layout

Install Intercabinet Shielded Ducts

1. Loosen (do not remove) the four bolts holding the dust cover to the cable access hole in the top of the cabinet.

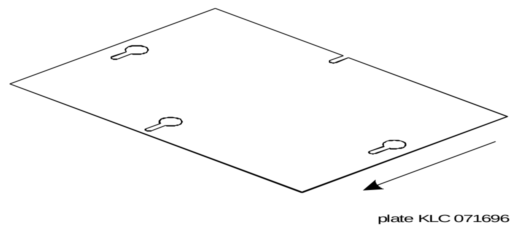


Figure B-3. Dust Cover Removal

2. Remove the dust cover by sliding it in the direction shown by the arrow in Figure B-3. Move the dust cover until it clears the bolts.
3. Set the cabinet riser ("A" in Figure B-4) with its base in place of the dust cover just removed. The four slots in its base should be just behind the bolts and the heads of the two middle bolts should have cleared the holes provided for them. Push the riser forward to seat the bolts in the four slots in the base of the riser. Then tighten the bolts.

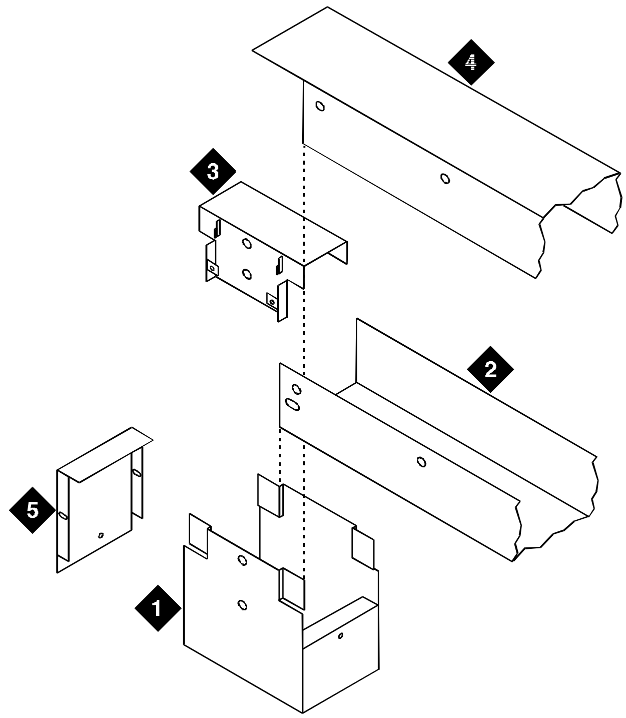


Figure Notes

1. A
2. B
3. C
4. D
5. E

Figure B-4. Assembly of Intercabinet Shielded Ducts

4. Install risers on any other cabinets that require shielded-duct connections.
5. Set a shielded trough ("B") between two cabinet risers (“A”). Push down on the trough so the slots in the ends of the trough engage the ears at the corners of the risers. The walls of the trough go inside the walls of the risers and outside of the ears of the risers.
6. Seat the bottom of the shielded trough on the support walls of the two cabinet risers that it connects. Attach the trough to each riser with a self-tapping screw.
7. Install shielded troughs on any other pairs of cabinets that require shielded-duct connections.

8. Route the appropriate cables between the cabinets just connected.
9. If a given cabinet is to support a cross-aisle shielded duct, set a cross-aisle riser ("C" in Figure B-4) on the cabinet riser ("A"). Otherwise set a shielded coupling ("D") on the cabinet riser. In either case, position the device so the two holes on the back wall line up with the holes on the back wall of the cabinet riser. Bolt the two pieces together at the holes just described.
10. If there is no trough to install in one end of the cabinet riser, press a shielded end cap ("E") on the unused end of the riser. The side walls of the end cap go inside the walls of the riser and outside of the ears of the riser. The top of the end cap should rest on top of the shielded coupling or cross-aisle riser previously installed. Bolt the bottom of the end cap to the cabinet riser with a self-tapping screw.
11. Set the shielded cover ("D") on the shielded trough ("B") and press it down so the dimples on the cover engage the holes in the trough.

Install Cross-Aisle Shielded Ducts

The inter-cabinet ducts and cross-aisle risers must be installed before any cross-aisle ductwork is installed.

1. Set the tongue on the bottom of a cross-aisle trough ("G" in Figure B-5) into the platform of the cross-aisle riser ("C"). From above the trough, run a self-tapping screw through the slot in the trough and into the hole in the riser.

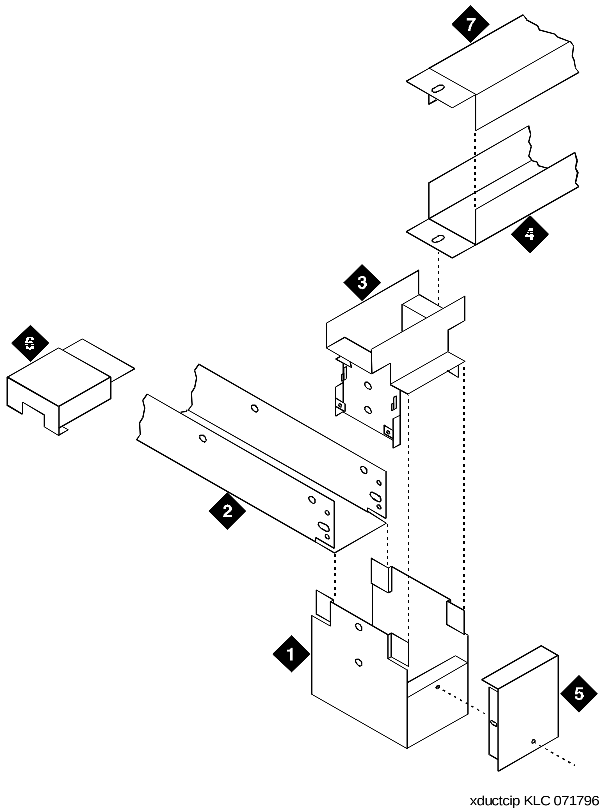


Figure Notes

1. A
2. B
3. C
4. G
5. E
6. F
7. H

Figure B-5. Assembly of Cross-Aisle Shielded Ducts

2. Install cross-aisle troughs on any other cabinets requiring such connections.
3. If there is no trough ("G") to install in one end of the cross-aisle riser ("C"), press a cross-aisle shielded end cap ("F") on the unused end of the riser. Unlike earlier ductwork, the endcap fits either end of the cross-aisle riser. The side walls of the end cap go outside the walls of the riser. The ears on the bottom of the end cap go outside of the riser’s bottom plate, and the bottom plate of the end cap goes inside of the riser’s bottom plate.

4. Route the appropriate cables between the cabinets just connected.
5. Set the shielded cross-aisle trough cover ("H") on top of the trough with its side walls outside of the walls of the trough, and press it down until it completely covers the trough.

Mating Cross-Aisle Risers to Old Cabinet Risers

The new shielded ductwork is constructed so cross-aisle risers can be attached to cabinet risers of the former design.

1. Remove the shielded coupling from the old cabinet riser. This assembly is illustrated in the older system's installation document.
2. Replace the shielded coupling with a cross-aisle riser. Set the cross-aisle riser ("C" in Figure B-6) on the cabinet riser ("A"). Position the cross-aisle riser so the two holes on the back wall line up with the holes on the back wall of the cabinet riser. Bolt the two pieces together at the holes just described.

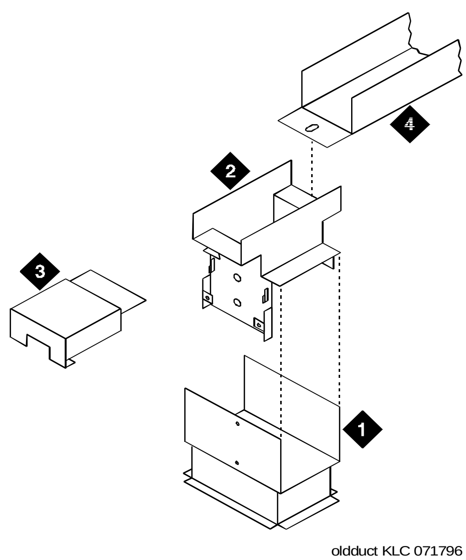


Figure Notes

1. A
2. C
3. F
4. G

Figure B-6. Mating Cross-Aisle Risers to System 85-R2 Cabinet Risers

3. Assemble cross-aisle ductwork as already described.

Mating Shielded Ducts to Risers

The new shielded ductwork is constructed so new cross-aisle troughs can be attached to risers of the former design. They fit outside of the older risers.

To attach the new shielded trough to a riser, first set it under the trough on the riser and install the other side of the trough as already described. Lift the trough as shown in Figure B-7, with the walls of the trough outside of the walls of the riser. Hold a nut under the trough, and bolt the parts together as shown.

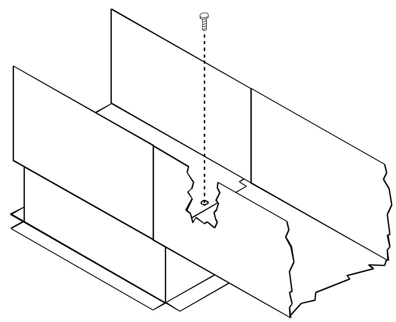


Figure B-7. Shielded Duct Connected to Old Style Riser

Install Cross Aisle I/O Ductwork

1. If required, attach I/O endplate (group 6) to the cross-aisle brackets (group 10). See Figure B-8.
2. Install a cross-aisle bracket on both sides of the I/O trough where cross-aisle or wall trough is to be used. Place the bracket inside the I/O trough with its angle end outside. Secure the bracket using three thread-forming screws in each trough (use the holes in the bracket closest to the angle).
3. If cross-aisle, install brackets on I/O trough of cross-aisle cabinet.
4. Place I/O cross-aisle trough (group 10) or I/O wall trough (group 26) on brackets and secure with thread-forming screws.

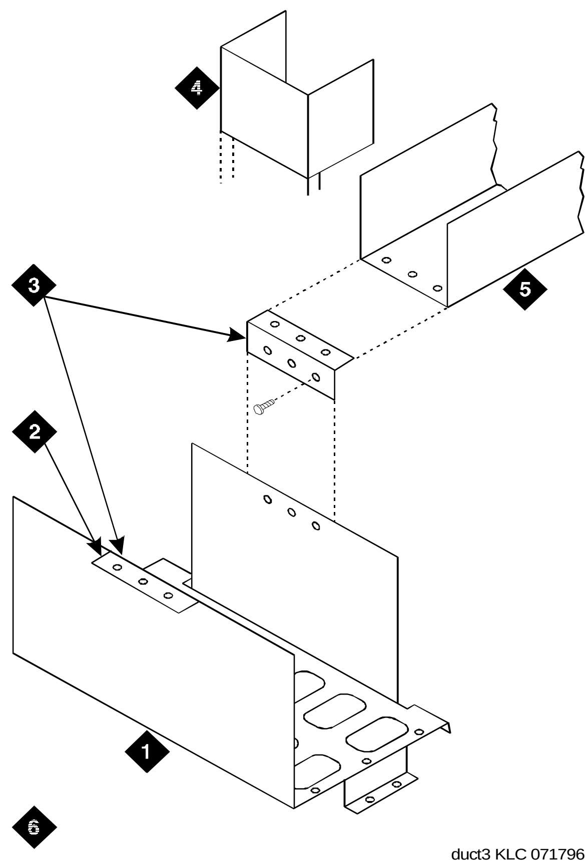


Figure Notes

1. I/O Trough
2. Use Only When Required
3. Cross-Aisle Brackets
4. I/O Endplate
5. Cross-Aisle I/O Trough or I/O Wall Trough
6. Front of Cabinet

Figure B-8. Install Cross-Aisle I/O Ductwork or I/O Cross-Aisle to Wall Trough

NOTE:
If wall trough is being installed, locally provided hardware is required at wall end of duct.

Install Cross-Aisle to Wall Trough

Refer to Figure B-9 to assemble the ductwork:

1. Install wall mounting bracket to designated location. Hardware to mount bracket should be determined according to wall type and should be locally provided.
2. Use thread-forming screws to attach the 3-hole face of the angle bracket to the I/O trough.
3. Attach the angle bracket to the 6-hole face of the cross-aisle bracket using three 10-24 X 3/4 inch screws, connected to nuts and washers through the bottom holes.
4. Attach the I/O cable duct to the cross-aisle bracket using the thread-forming screws. Attach the other end of the I/O duct to the wall mounting using 10-24 X 3/4 inch screws, nuts and washers.

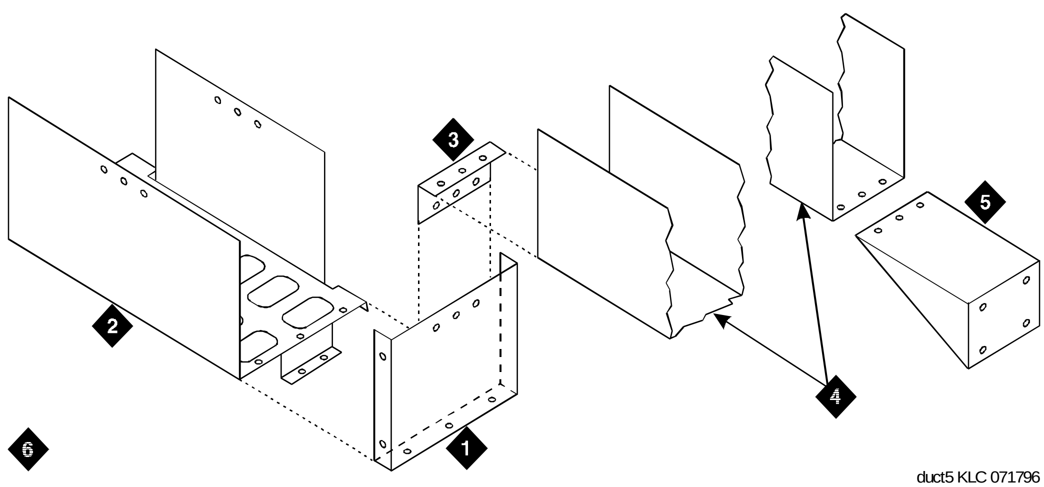


Figure Notes

1. Angle Bracket
2. I/O Trough
3. Cross-Aisle Bracket
4. I/O Cable Duct
5. Wall Mounting Bracket
6. Front of Cabinet

Figure B-9. Installation of I/O Cross-Aisle to Wall Trough

Install I/O Cable Rack Coupling

1. Attach I/O trough to top of cabinet using thread-forming screws. See Figure B-10.
2. Attach cross-aisle bracket to I/O trough using thread-forming screws through the top three holes on the bracket's 6-hole face.
3. Attach I/O coupling trough to cross-aisle bracket using thread-forming screws.
4. Attach cable rack to coupling trough using locally-provided coupling plates and 3/8-18 x 1/2 inch hex head bolts with nuts.
5. Attach other end of cable rack to wall using locally-provided hardware.

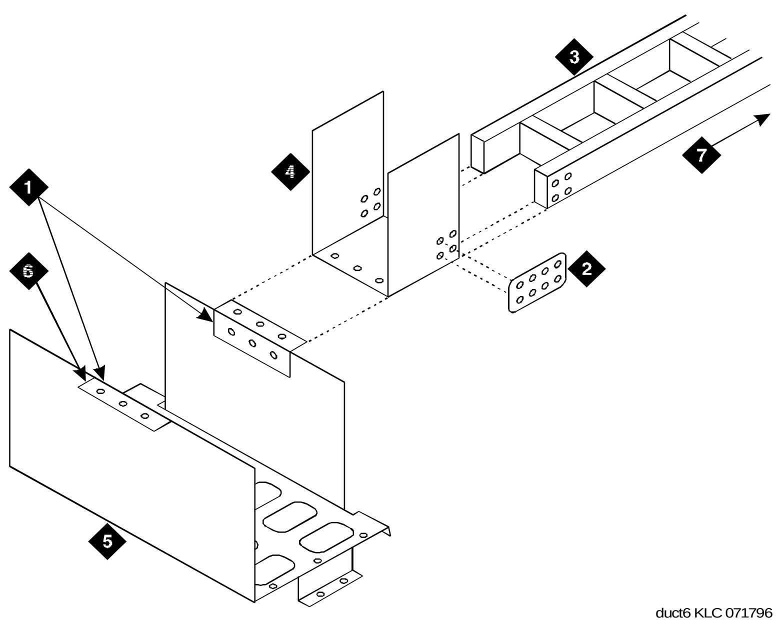


Figure Notes

1. Cross-Aisle Bracket
2. Coupling Plate
3. Cable Rack
4. I/O Coupling Trough
5. I/O Trough
6. Use Only When Required
7. To Wall

Figure B-10. Installation of I/O Cable Rack Coupling to Rear of Cabinet

Install I/O Cable Rack Riser

Refer to Figure B-11 and assemble the ductwork:

1. Attach angle bracket (group 9) to I/O trough using thread-forming screws.
2. Attach cross-aisle bracket to angle bracket using thread-forming screws. Attach the angle bracket to the 6-hole face of the cross-aisle bracket using three thread-forming screws through the bottom holes.
3. Attach I/O coupling trough (group 8) to cross-aisle bracket using thread-forming screws.
4. Attach cable rack to coupling trough using locally-provided coupling plates and 3/8-18 x 1/2 inch hex bolts and nuts.
5. Attach other end of cable rack to wall using locally provided hardware suitable to type of wall.

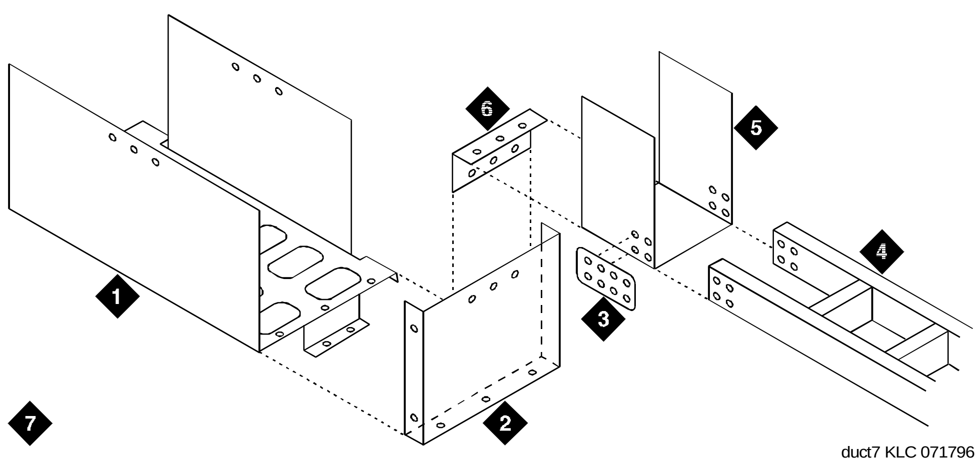


Figure Notes

1. I/O Trough
2. Angle Bracket
3. Coupling Plate
4. Cable Rack
5. I/O Coupling Trough
6. Cross-Aisle Bracket
7. Front of Cabinet

Figure B-11. Installation of I/O Cable Rack Riser to End of Cabinet (Group 9)

Install AC Power Duct

Refer to Figure B-12 and assemble the ductwork:

1. Hang AC power duct (group 12 through 16 and 21) on back of shielded duct and anchor in place using one thread-forming screw at each cabinet.
2. If required, slide utility outlet assembly (part of group 18) into the duct from the end.
3. Repeat steps 1 and 2 for each cabinet.
4. Interconnect ducts with couplings using four round-head machine screws.
5. Insert 4 wire holders into each duct spaced evenly along duct.
6. If equipped with an AC outlet, snap two group 18 raceway covers into place onto the AC power ducts.
7. If not equipped with an AC outlet, snap a group 17 raceway cover into place onto the AC power ducts.
8. If required, attach group 19 (combination end cap) by using two round head machine screws.
9. Assemble the ladder rack as shown in Figure B-13 on page B-19.

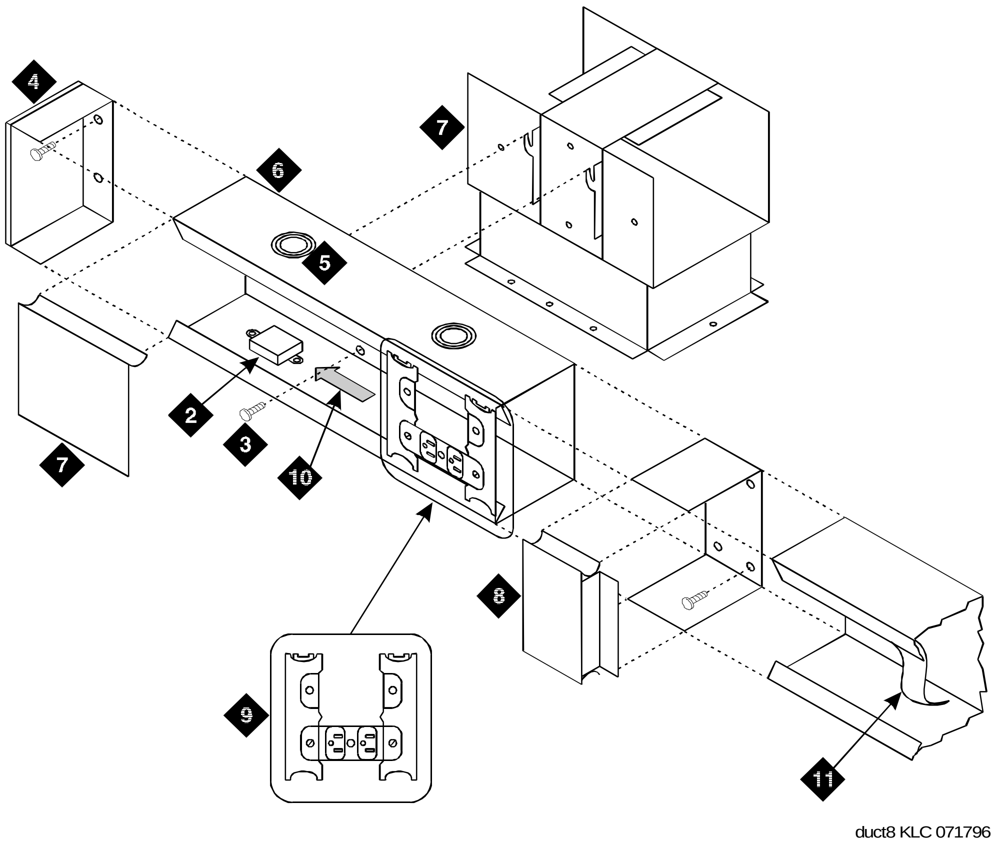


Figure Notes

1. Raceway Cover
2. Twist-Lock Receptacle
3. Thread-Forming Screw
4. Combination Endcap
5. Conduit Knockout
6. I/O Power Duct
7. Rear of Shielded Duct
8. Coupling
9. Typical Utility Outlet Assembly
10. Slide in Direction Shown
11. Wire Holders

Figure B-12. Install AC Power Duct

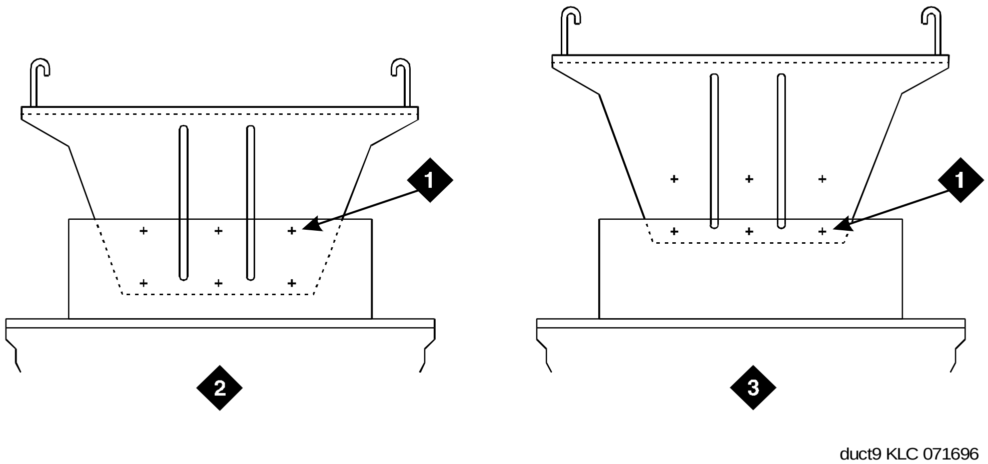


Figure B-13. Assembly of Ladder Rack

Connecting and Handling Fiber Optic Cables

C

Signals between the cabinets are carried by fiber optic cables. The electronic signals at the connectors on the rear of a cabinet must be converted into optical signals and optical signals from another cabinet must be converted back into electronic signals. Opto-electronic devices (lightwave transceivers) provide this interface.

Fiber Optic Requirements

The requirements that determine the maximum fiber optic cabling distances are:

- The mean loss and the length of the outside plant fiber cable
- The mean loss and the length of fiber cable shipped with the cabinet (including any fiber riser cable)
- The mean loss of an ST connector and the number of ST connections
- The mean loss due to the total number of splices
- Higher-order mode loss

NOTE:
If estimated fiber limits such as loss, length, excessive splices, and so forth are expected, OTDR (Optical Time Domain Reflectometer) tests should be made to ensure a successful installation of a remote Expansion Port Network (EPN) fiber link.

Fiber Optic Cable Connections

The Customer Service Document (CSD) provides an “Inter-Cabinet Cable Running List.” Each row on the list represents a cable connection. Use the running list to determine where to connect each fiber optic cable.

Multi-Mode Fiber Optic Connections

The following components are used in multi-mode fiber optic connections:

- Expansion Interface (EI) circuit packs in port slots in cabinet carriers
- Cables from each interface circuit pack to each port slot connector
- The 9823A lightwave transceiver transmits up to 4,900 feet or 0.93 miles (1.5 km). The 9823B lightwave transceiver transmits up to 25,000 feet or 4.73 miles (7.6 km).
- Multi-mode fiber optic cable consists of two separate 62.5 micron diameter fiber optic cables.

Single-Mode Fiber Optic Connections

The following components are used in single-mode fiber optic connections:

- Expansion Interface (EI) circuit packs in port slots in cabinet carriers
- Cables from each interface circuit pack to each port slot connector
- The 300A lightwave transceivers transmits light up to 115,000 feet or 22 miles (35 km). Fiber loss must be less than 17dB. Saturation may occur if distances are short; attenuators may be required if the total loss on the fiber link is less than 10dBm. An OTDR test is recommended to determine specific fiber optic hardware requirements.
- Single-mode fiber optic cable consists of two separate 8 to 10 micron core cables.

Optical Cross-Connect Hardware

Optical cross-connects consist of Lightguide Interconnect Units (LIUs) with lightguide troughs in between them. See Figure C-1. One LIU terminates the incoming cables and the other terminates the outgoing cables. A fiber optic patch cord or jumper is used to connect the circuits. Circuits can be routed the same as on 110-type connecting blocks, by moving the patch cord from one point on the Main Distribution Frame (MDF) to another.

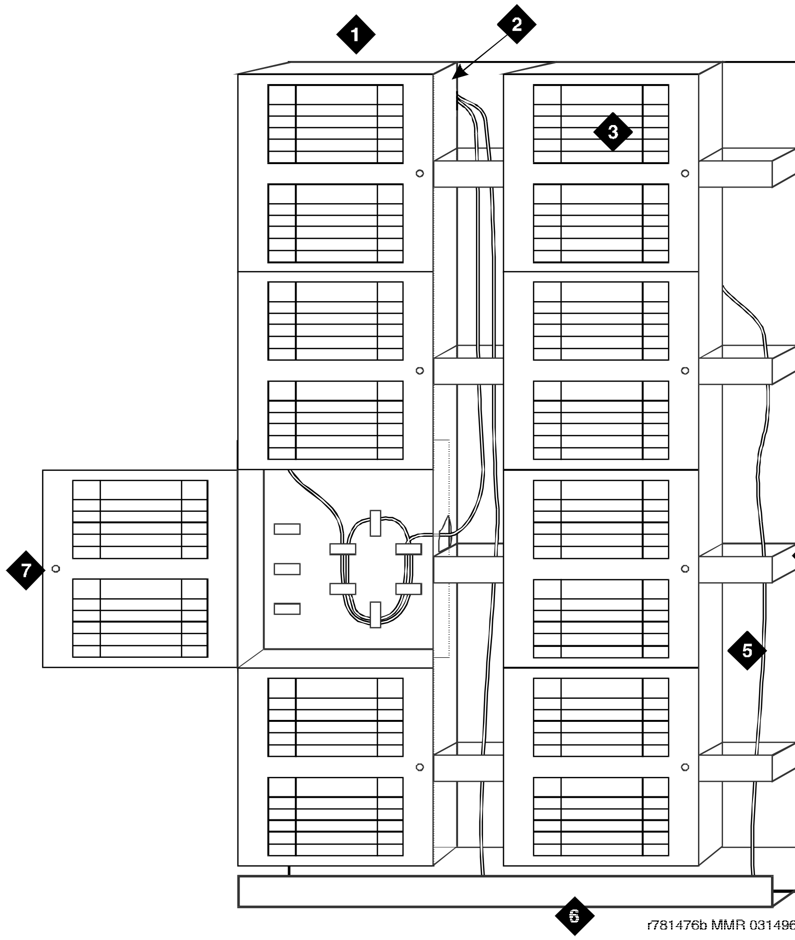


Figure Notes

1. 100A Lightguide Interconnect Unit (LIU)
2. C2000A-2 Connector (Multi-Mode)
   C3000A-2 Connector (Single-Mode)
3. Adhesive-Backed Circuit Labels
4. 1A4 Lightguide Trough
5. FL2P-P Fiber Patch Cord (Multi-Mode)
   FS2EP-EP Fiber Patch Cord (Single-Mode)
6. 1A6 Lightguide Trough
7. Open Lightguide Interconnect Unit (LIU) Door

Figure C-1. Optical Main Distribution Frame (MDF)

Optical interconnects consist of LIUs without a trough between them. See Figure C-2. Incoming and outgoing cables are connected directly to each other. This arrangement makes circuit changes more difficult, but reduces optical losses.

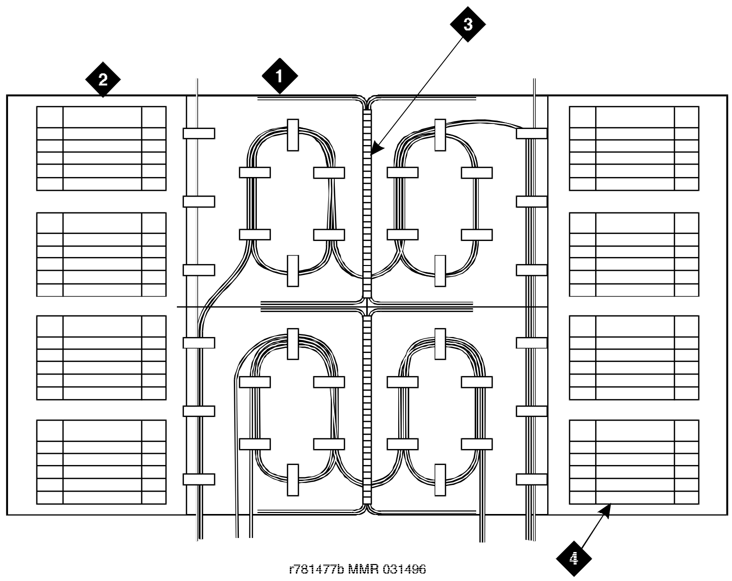


Figure Notes

1. 100A Lightguide Interconnect Unit (LIU)
2. Open Lightguide Interconnect Unit (LIU) Door
3. C2000A-2 Connector (Multi-Mode)
   C3000A-2 Connector (Single-Mode)

Figure C-2. Optical Interconnect Field

Optical cross-connect and interconnect fields are made up of the following:

- 100A LIU
- 10A Lightguide Connector Panel
- C2000A-2 Connector Coupling (Multi-Mode) or C3000A-2 Connector Coupling (Single-Mode)
- 1A4 Lightguide Trough
- 1A6 Lightguide Trough
- FL2P-P Fiber Interconnect Cable (Multi-Mode) or FS2EP-EP Fiber Interconnect Cable (Single-Mode)

100A Lightguide Interconnect Unit

The 100A LIU (comcode 104141841) consists of a cabinet with retainer rings to hold slack fiber cables, mounting cutouts for two 10A lightguide connector panels, and a door with circuit labels on each side. See Figure C-3.

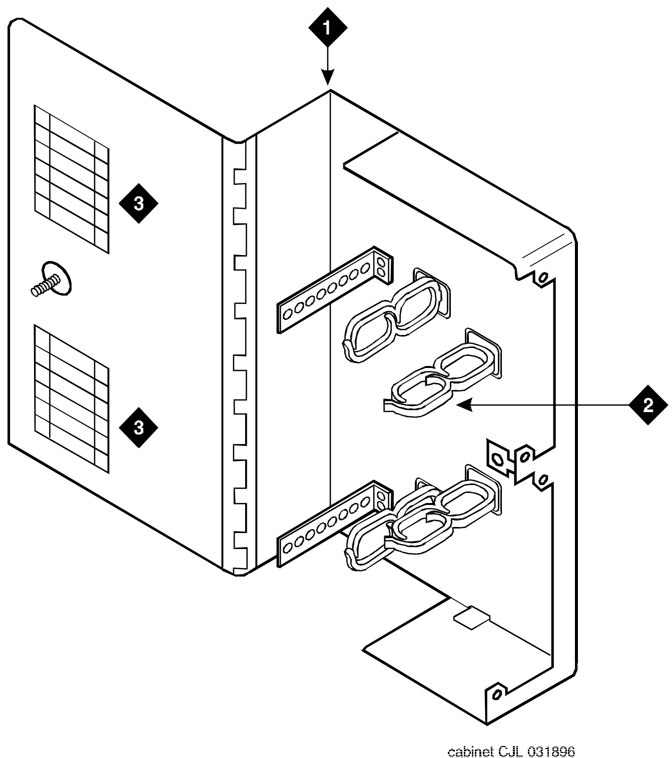


Figure Notes

1. 100A Lightguide Interconnect Unit (LIU)
2. Retainer Rings
3. Circuit Labels

Figure C-3. 100A Lightguide Interconnection Unit

10A Lightguide Connector Panel

The 10A Lightguide Connector Panel (comcode 104141858) mounts in the cutouts of a 100A LIU. An LIU contains two connector panels. Each connector panel can hold six C2000A-2 Connector Couplings.

The C2000A-2 Connector Coupling (comcode 104148028) is used to join multi-mode fiber optic cables equipped with ST connectors. It has a threaded midsection that allows it to be screwed into the 10A Lightguide Connector Panel.

The C3000A-2 Connector Coupling (comcode 105271142) is used to join single-mode fiber optic cables equipped with ST connectors. It has a threaded midsection that allows it to be screwed into the 10A Lightguide Connector Panel.

Lightguide Troughs

Two types of troughs are used with optical cross-connect hardware. The 1A4 trough secures single fiber optic jumpers routed between LIU columns, and the 1A6 trough is used at the bottom of an LIU column to prevent cable slack.

Ordering Information

Description	Comcode
1A4 Lightguide Trough	104141866
1A6 Lightguide Trough	104141874

Table C-1 provides the available cable lengths and associated comcode numbers.

Table C-1. Multi-Mode Fiber Cable Ordering Information

Description	Length	Comcode
Fiber Interconnection Cable	20 Feet (6.1 m)	407439975
Fiber Interconnection Cable	25 Feet (7.62 m)	407441427
Fiber Interconnection Cable	30 Feet (9.14 m)	407441435
Fiber Interconnection Cable	35 Feet (10.67 m)	407441443
Fiber Interconnection Cable	40 Feet (12.2 m)	407441450
Fiber Interconnection Cable	50 Feet (15.2 m)	407441468
Fiber Interconnection Cable	75 Feet (22.8 m)	407441476
Fiber Interconnection Cable	100 Feet (30.48 m)	407441484
Fiber Interconnection Cable	125 Feet (38.1 m)	407441492
Fiber Interconnection Cable	150 Feet (45.7 m)	407441500
Fiber Interconnection Cable	175 Feet (53.3 m)	407441518
Fiber Interconnection Cable	200 Feet (61 m)	407441666

Table C-2 provides the available cable lengths and associated comcode numbers.

Table C-2. Single-Mode Fiber Cable Ordering Information

Description	Length	Comcode
Fiber Interconnection Cable	20 Feet (6.1 m)	407598325
Fiber Interconnection Cable	30 Feet (9.14 m)	407598333
Fiber Interconnection Cable	40 Feet (12.2 m)	407598341
Fiber Interconnection Cable	50 Feet (15.2 m)	407598358
Fiber Interconnection Cable	75 Feet (22.8 m)	407598366
Fiber Interconnection Cable	100 Feet (30.48 m)	407598374
Fiber Interconnection Cable	125 Feet (38.1 m)	407598390
Fiber Interconnection Cable	150 Feet (45.7 m)	407598408

General Rules and Recommendations

Fiber optic cable requires careful handling and routing. Follow these rules and recommendations when installing fiber optic cables:

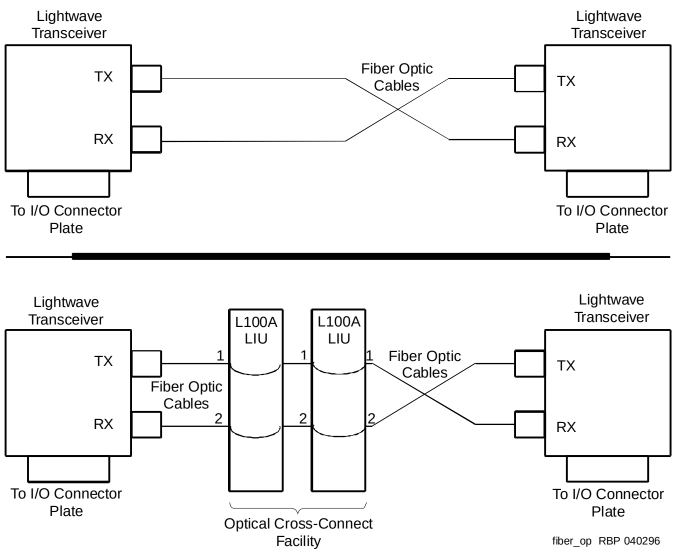


Figure C-4. Fiber Optic Cable Connections Between Transceivers

Rule 1

Cross-connect the fiber optic cable between two lightwave transceivers. That is, run the cable from the connector labeled TX on one transceiver to the connector labeled RX on the other transceiver, and in reverse for the other cable. See the top half of Figure C-4. Connections using a 100A LIU for fiber cross-connects are shown in the bottom half of Figure C-4.

Cross-connect the fiber optic cable between two lightwave transceivers for each connection (row) on the Running List contained in the CSD.

Rule 2

For multi-mode fiber, use the 9823A (shortwave) transceiver for distances of up to 4900 feet. Use the 9823B (longwave) transceiver for distances of up to 25,000 feet. Ensure all 9823As are connected to 9823As and all 9823Bs are connected to the corresponding 9823Bs.

For single-mode fiber, use the 300A Single-mode fiber optic transceivers for distances of up to 115,000 feet (22 miles or 35 km). Single-mode fiber optic cable is connected from the 300A lightwave transceiver on one carrier to the 300A lightwave transceiver on the other carrier.

Rule 3

Route fiber optic cables away from groups of other cables where they may be stretched by the weight of metal cable bundles.

Rule 4

Avoid bending fiber optic cables to a radius smaller than 1.5 inches (3.8 cm), to prevent mechanical stress on the cables. Plan the use of cable ties to avoid crimping the cable or creating a fixed stress point where, at a later time, movement of the cable causes it to exceed the minimum bend radius.

Rule 5

Ensure fiber optic cables are not pressed against any sheet metal edges by subsequently installed cables.

Recommendations

In some systems, it may be necessary to run fiber optic cables with the input/output cables, such as in the Cable Slack Manager or under a raised floor. In these situations, protect the cable by running it in a dedicated area if possible. When the cable must be run with other cabling, protect it by running it through flexible conduit.

In these situations, use the following steps to route the cable:

1. Route the fiber optic cable up toward the top of the cabinet. The excess cable should be looped and draped from the B25A cable clamp on the top ground plate in the stack.
2. Dress the cable running up the back of the cabinets by tie wrapping the cable to the outside of the B25A cable clamp (do not put the cable inside the clamp holding the B25A cables).

CAUTION:
Do not route fiber optic cables and the B25A cables together.

Labels for Fiber Optic Cables

There are two types of labels used with fiber optic cables:

- Cable labels
- Cross-connect labels

Cable labels are used on the cables and cross-connect labels are used on the cross-connect equipment.

Cable Labels

Cable labels, with adhesive backing, are installed on each end of a fiber optic cable. Each label displays the following information:

- The numbers of the cabinets, carriers, and slots connected by the cable
- Information on the cable itself, such as cable comcode number, and how it is used

Cross-Connect Labels

The label used with cross-connect fiber optic cables shows the cabinet, carrier and slot numbers of the source of the cable. It also indicates that the cable goes to the MDF. The type of cable is indicated by its comcode number.

Administering Fiber Optic Cables

When a fiber optic cable has been properly labeled, it is easy to trace the desired circuit by looking at the labels on the cross-connect, the cable itself, and the individual fibers in the cable. For more information, see the *PDS Fiber Installation Manual*, 555-401-102.

Making Changes at an Optical Main Distribution Frame

Circuit changes are made with fiber optic patch cords in the same manner as when using 110P patch cords.

To Remove a Fiber Optic Patch Cord

1. At the optical MDF, locate the patch cord to be removed.
2. Unplug the patch cord at one end.

3. Gently, lift the patch cord straight upward until it can be located in the trough.

   NOTE:
   Take care to ensure the patch cord is not bent beyond the minimum bend radius of 1.5 inches (3.8 cm).

4. Remove the patch cord from the trough.
5. Trace the other end of the patch cord to its termination point and unplug it.
6. Remove the label associated with the removed patch cord.
7. Place plastic covers over the connectors to prevent damage.

To Make a New Cross-Connection

1. At the optical MDF, locate the connector couplings associated with the circuit to be added.
2. Select a patch cord of the appropriate length for the cross-connection to be made. Excess cord length causes congestion in the trough and may cause the cable to be damaged.
3. Plug one end of the cord into the appropriate connector coupling.
4. Route the patch cord through the vertical and horizontal troughs.
5. Plug the other end of the patch cord into the appropriate connector coupling.
6. Prepare a label for the circuit added.
7. Test the circuit for loss levels. For more information, see the *PDS Fiber Installation Manual*, 555-401-102.

Making Changes on Optical Interconnect Fields

To Make a New Interconnection

1. At the optical interconnect field, locate the cable to be moved and unplug it from the connector coupling.
2. Unwind the cable from around the retainer rings, remembering the minimum bend radius.
3. If it is necessary to remove the cable from the module, carefully guide it through the split rings on the side of the module.
4. Locate the appropriate interconnection unit on the other side of the interconnect field and carefully route the cable through the split rings of the new module.
5. Wrap the cable from around the retainer rings, remembering the minimum bend radius.
6. Plug the cable into the appropriate connector coupling.
7. Prepare a label for the changed circuit.
8. Test the circuit for loss levels. For more information, see the *PDS Fiber Installation Manual*, 555-401-102.

Raised Floor or Cable Slack Managers

Figure C-5 on page C-14 shows the recommended fiber routing for a system with either Cable Slack Managers or raised floors. Route the fiber cable to the outside of the carriers behind the rear connector panel and cable troughs.

Do not route fiber in the side cable troughs used for the B25A cables. However, since the B25A cables are routed out of the bottom of the trough, loop slack fiber at the top of the trough. Use the cable tie holes provided at the top of the cabinet to secure the fiber. Route the fiber through the holes over the cable troughs in the corners of the cabinet tops.

Protect cables routed between cabinets with an 846929883 cover. When routing fiber to a cabinet that is not adjacent, route the fiber back into and under the top of the intermediate cabinet.

Overhead Ductwork

Figure C-6 on page C-15 shows the recommended fiber routing for a system with ductwork installed. For systems with overhead ductwork, route the fiber cable to the outside of the carriers behind the rear connector panel and cable troughs and into the shielded ductwork.

Do not route fiber in the side cable troughs that are used for the B25A cables. Use the shielded ductwork to manage slack fiber and use the cable tie holes at the top of the cabinet as needed.

Connections for Remote Applications Through a Fiber Cross-Connect

Figure C-7 on page C-16 shows systems that require connection to a PDS fiber cross-connect (for connection to remote cabinets). In some systems it may be necessary to run fiber with the I/O cables such as in the Cable Slack Manager or under a raised floor. In these situations protect the fiber by running it in a dedicated area if possible. In any situation where the fiber optic cable must be run with other cabling, protect it by first running it through flexible conduit.

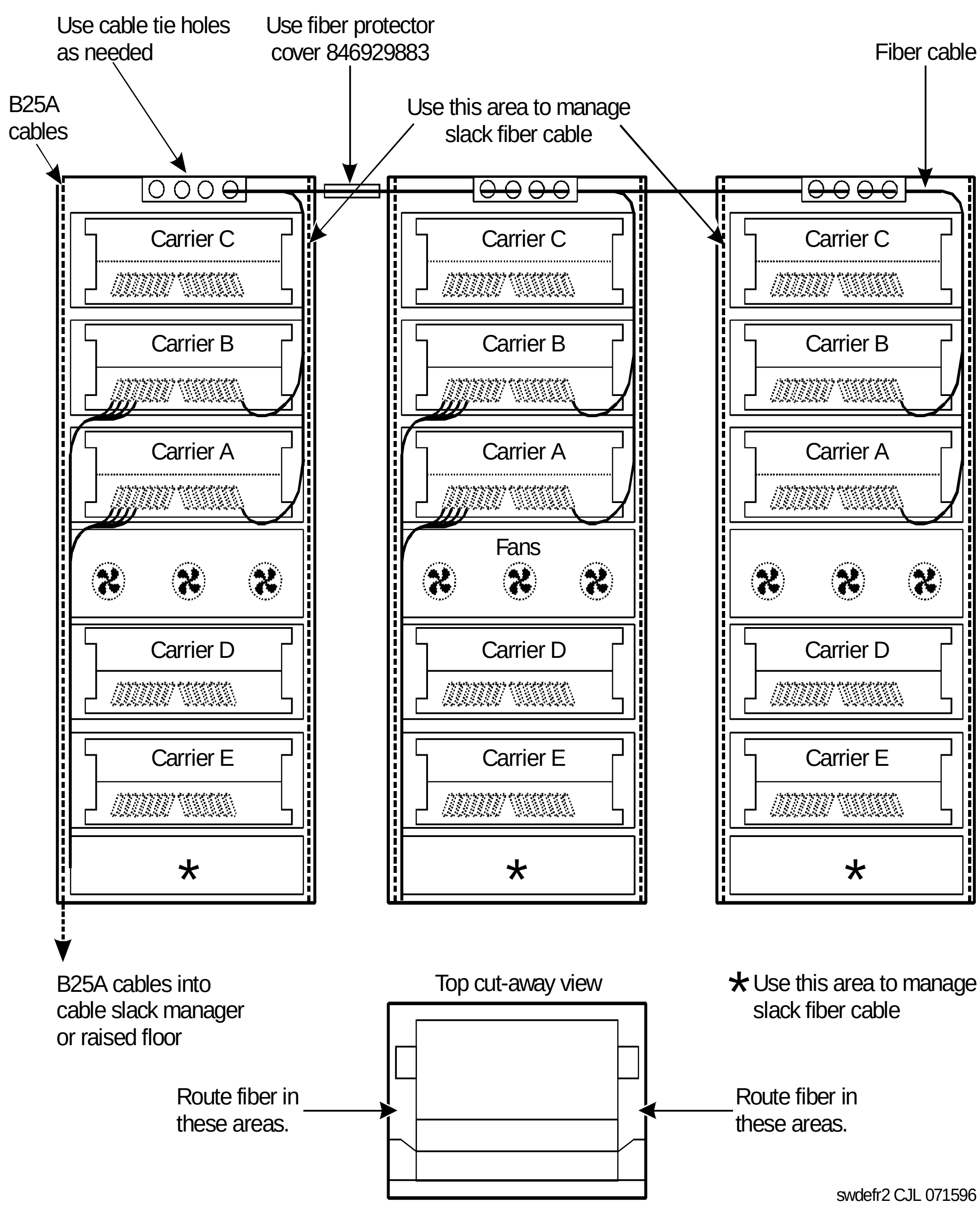


Figure C-5. Routing Fiber Between Adjacent Cabinets

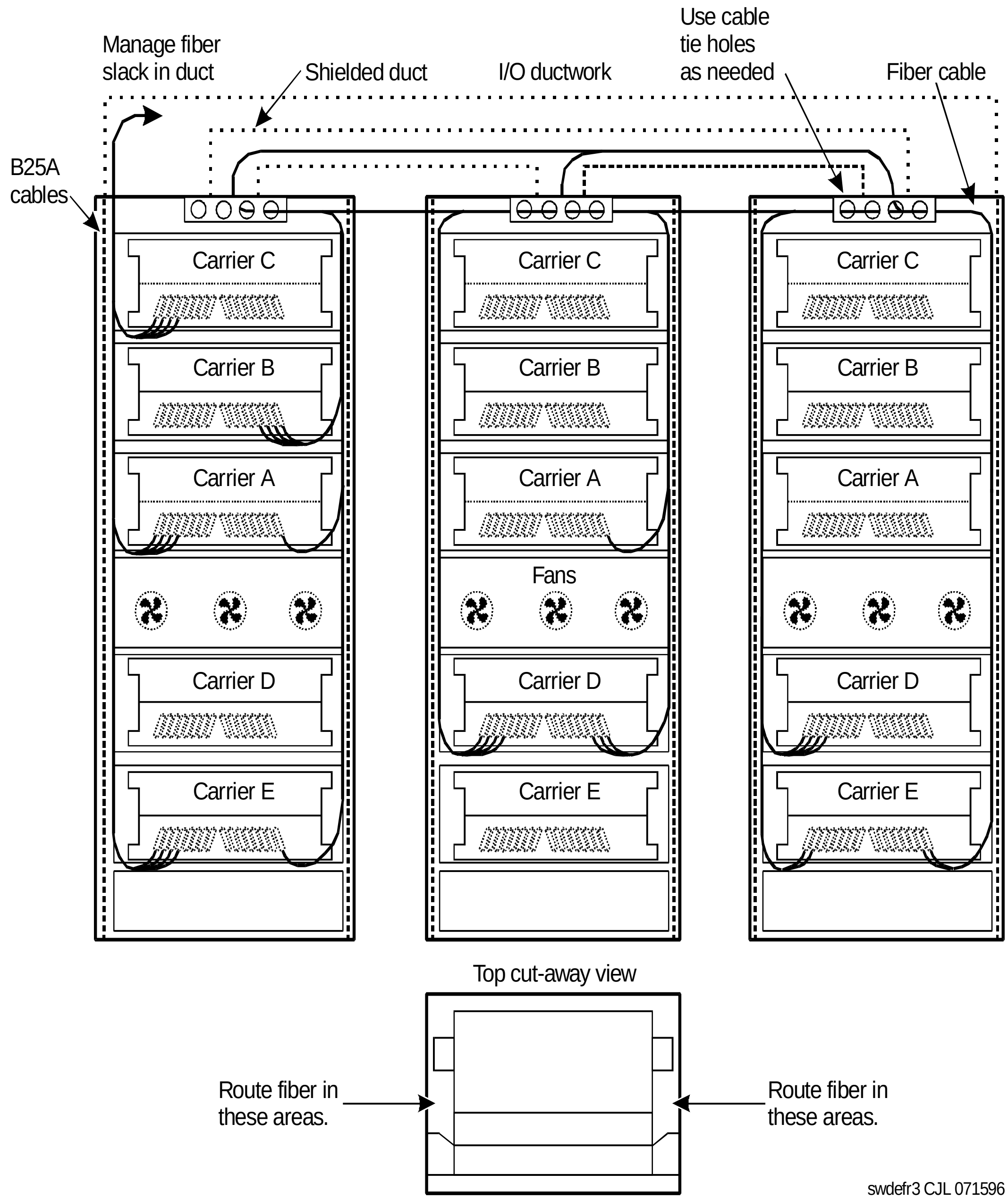


Figure C-6. Routing Fiber Through Ductwork

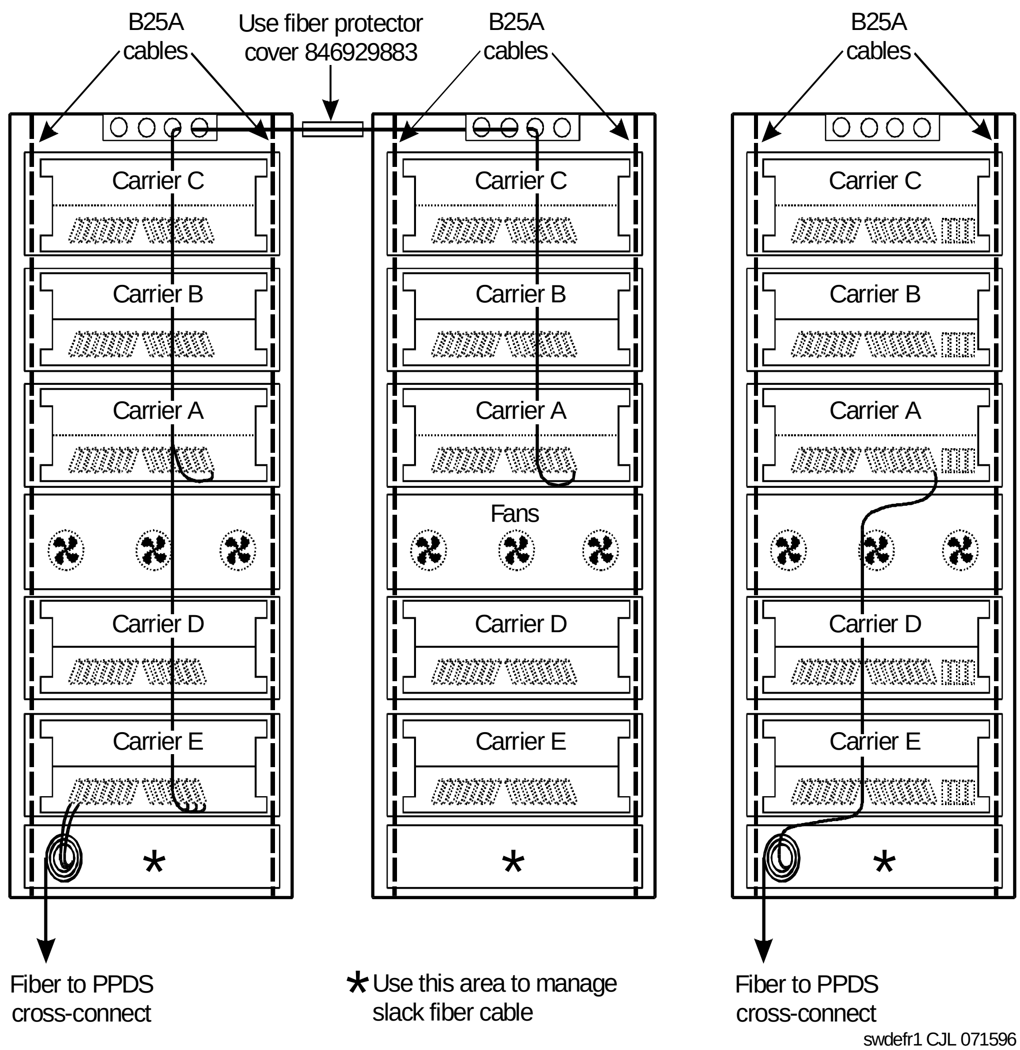


Figure C-7. Routing Fiber Under Raised Floor or Through Cable Slack Managers

Connector and Cable Diagrams

D

This chapter provides connector and cable diagrams for the DEFINITY Enterprise Communications Server.

For circuit pack and auxiliary equipment classifications, see the tables at the end of Chapter 5, "Install and Wire Telephones and Other Equipment".

See Figure D-1 for Expansion Interface to Expansion Interface fiber interconnect.

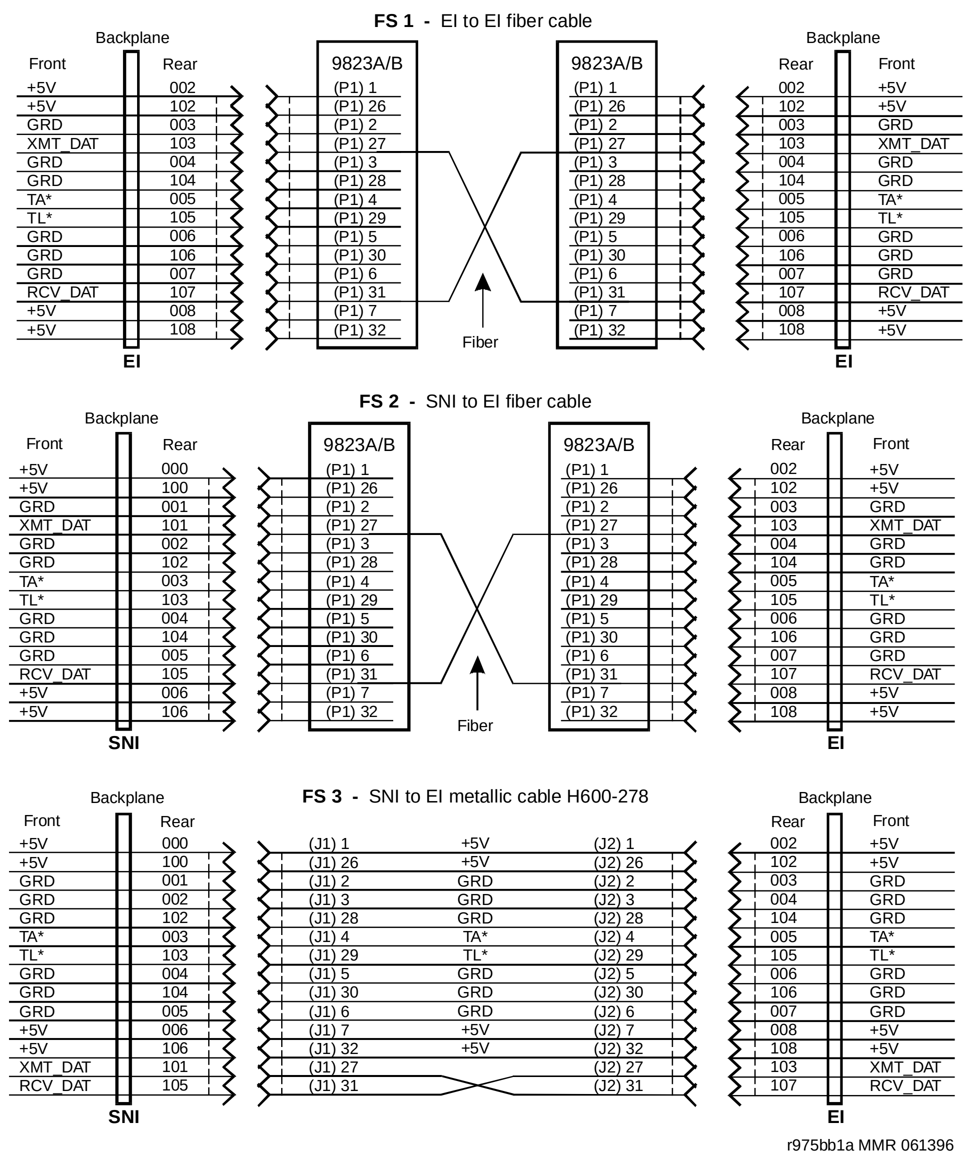


Figure D-1. Expansion Interface to Expansion Interface Fiber (Part 1)

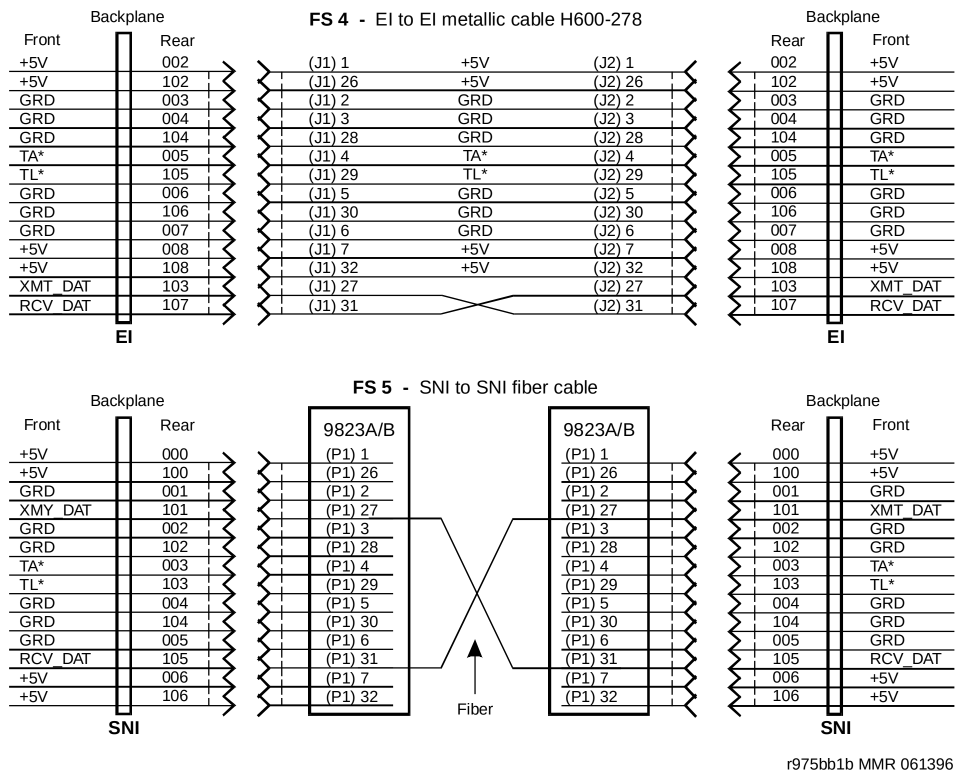
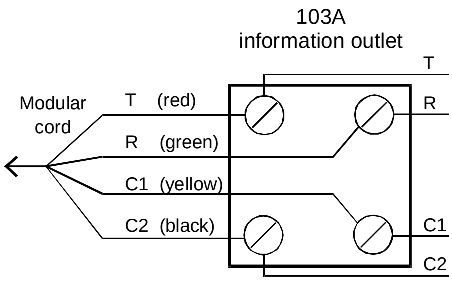
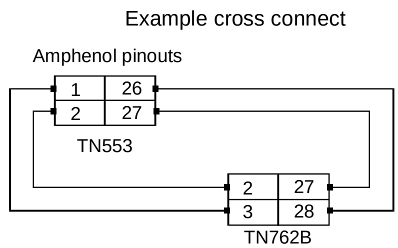
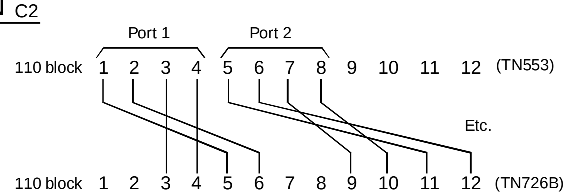


Figure D-2. Expansion Interface to Expansion Interface Fiber (Part 2)







Pinouts

TN553 (12 ports)

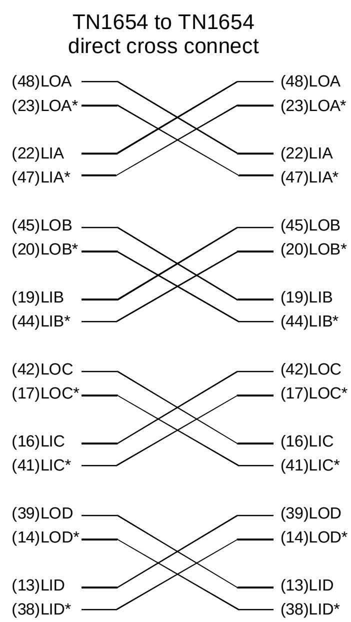
1	26	1
2	27	
3	28	2
4	29	
5	30	3
6	31	
7	32	4
8	33	
9	34	5
10	35	
11	36	6
12	37	
13	38	7
14	39	
15	40	8
16	41	
17	42	9
18	43	
19	44	10
20	45	
21	46	11
22	47	
23	48	12
24	49	
25	50	G

TN726 (8 ports)

1	26	BLANK
2	27	1
3	28	
4	29	BLANK
5	30	2
6	31	
7	32	BLANK
8	33	3
9	34	
10	35	BLANK
11	36	4
12	37	
13	38	BLANK
14	39	5
15	40	
16	41	BLANK
17	42	6
18	43	
19	44	BLANK
20	45	7
21	46	
22	47	BLANK
23	48	8
24	49	
25	50	BLANK

TN1654 Amphenol pinouts

25	GRD	GRD	50
24	GSP0/2	GSP0*	49
23	LOA*	LOA	48
22	LIA	LIA*	47
21	GSP1/3	GSP1*	46
20	LOB*	LOB	45
19	LIB	LIB*	44
18	GSP3*	GSP2*	43
17	LOC*	LOC	42
16	LIC	LIC*	41
15	RSS0*	RSS1*	40
14	LOD*	LOD	39
13	LID	LID*	38
12	CPERXD	CPETXD	37
11	PTD*	BAT DISC*	36
10	RES FLT*	ON RES*	35
9	CHG RT*	ENVB*	34
8	PSSG	PSS	33
7	+5E	+5E	32
6	GRDE	RCV DAT*	31
5	GRDE	GRDE	30
4	TA*	TL*	29
3	GRDE	GRDE	28
2	GRDE	XMT DAT*	27
1	+5E	+5E	26



r975bb2 MMR 061396

Figure D-3. Sample Cross-Connects

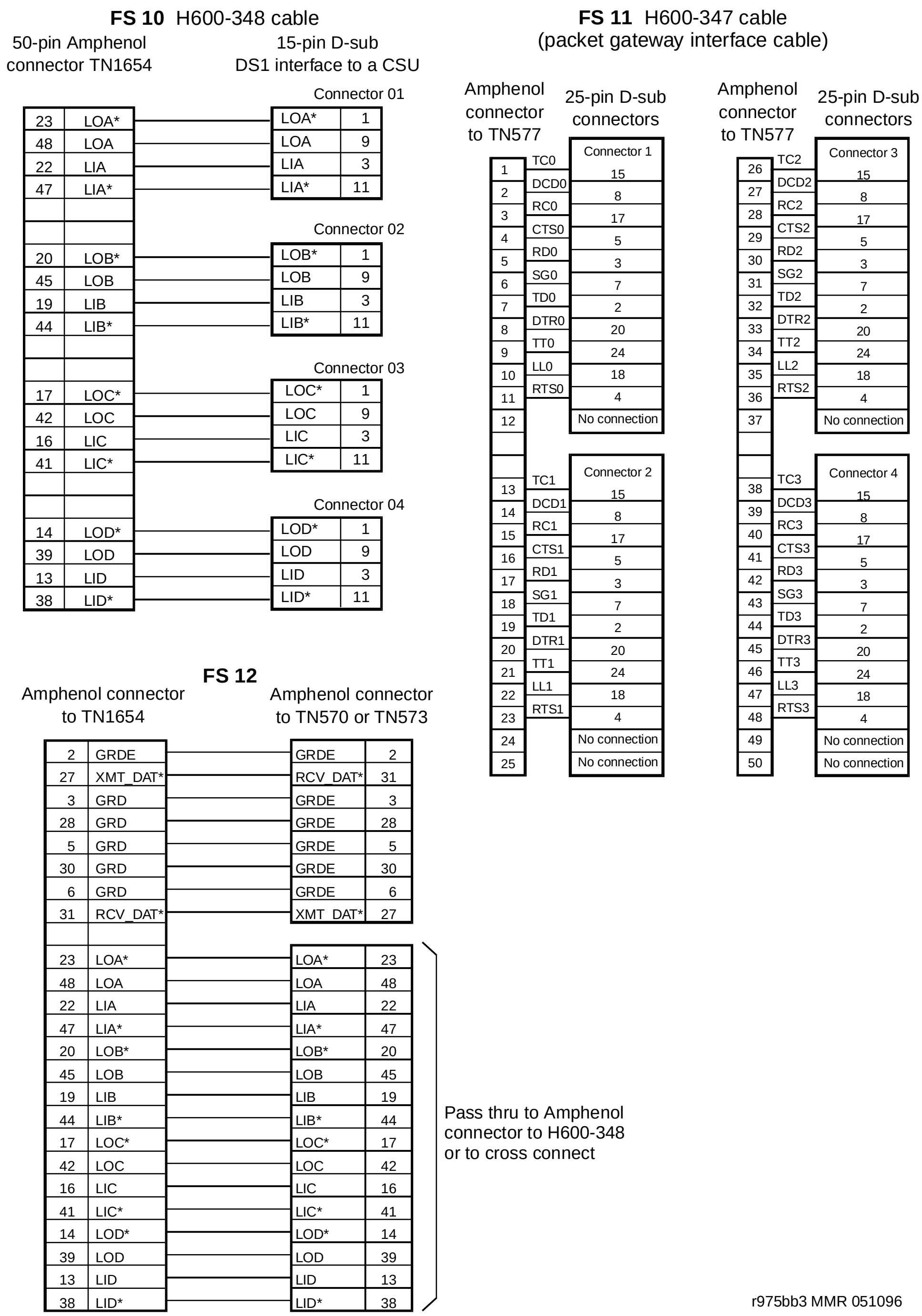


Figure D-4. Sample Cable Pinouts

FS 13 600-307 cable

50-pin Amphenol connector to TN767,TN722,TN464		15-pin D-sub to a CSU	
2	GRD		
3	GRD		
22	LI	LI	3
47	LI*	LI*	11
23	LO*	LO*	1
48	L0	L0	9
24	LOOP1	LOOP1	5
49	LOOP2	LOOP2	6

FS 14 846448652

Amphenol connection to TN1654		Amphenol connection to fiber transceiver	
1	+5	+5	1
26	+5	+5	26
2	GRD	GRD	2
27	TX	TX	27
3	GRD	GRD	3
28	GRD	GRD	28
4	TA*	TA*	4
29	TL*	TL*	29
5	GRD	GRD	5
30	GRD	GRD	30
6	GRD	GRD	6
31	RX	RX	31
7	+5	+5	7
32	+5	+5	32
23	LOA*	LOA*	23
48	LOA	LOA	48
22	LIA	LIA	22
47	LIA*	LIA*	47
20	LOB*	LOB*	20
45	LOB	LOB	45
19	LIB	LIB	19
44	LIB*	LIB*	44
17	LOC*	LOC*	17
42	LOC	LOC	42
16	LIC	LIC	16
41	LIC*	LIC*	41
14	LOD*	LOD*	14
39	LOD	LOD	39
13	LID	LID	13
38	LID*	LID*	38

Pass thru to Amphenol connection to H600-348 or to cross connect

FS 15 Clock (STRATUM 3 clock interface)

PPN control carrier

25			50
24			49
23			48
22	ALRM5A	ALRM5B	47
21			46
20	EXTSYN0R	EXTSYN0T	45
19			44
18			43
17	EXTSYN1T	EXTSYN1R	42
16			41
15	ALRM1A	ALRM1B	40
14			39
13			38
12			37
11			36
10	ALRM4A	ALRM4B	35
09			34
08	ALRM3A	ALRM3B	33
07			32
06			31
05	ALRM2A	ALRM2B	30
04			29
03	ALRM0A	ALRM0B	28
02			27
01			26

FS 16 TERMINAL

PPN & EPN terminal connections

Pin number	Lead designation
1	
2	TD
3	RD
4	RTS
5	CTS
6	DSR
7	SGRD
8	CD
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	DTR
20	
21	
22	
23	
24	

r975bb4 MMR 061396

Figure D-5. Sample Pinouts

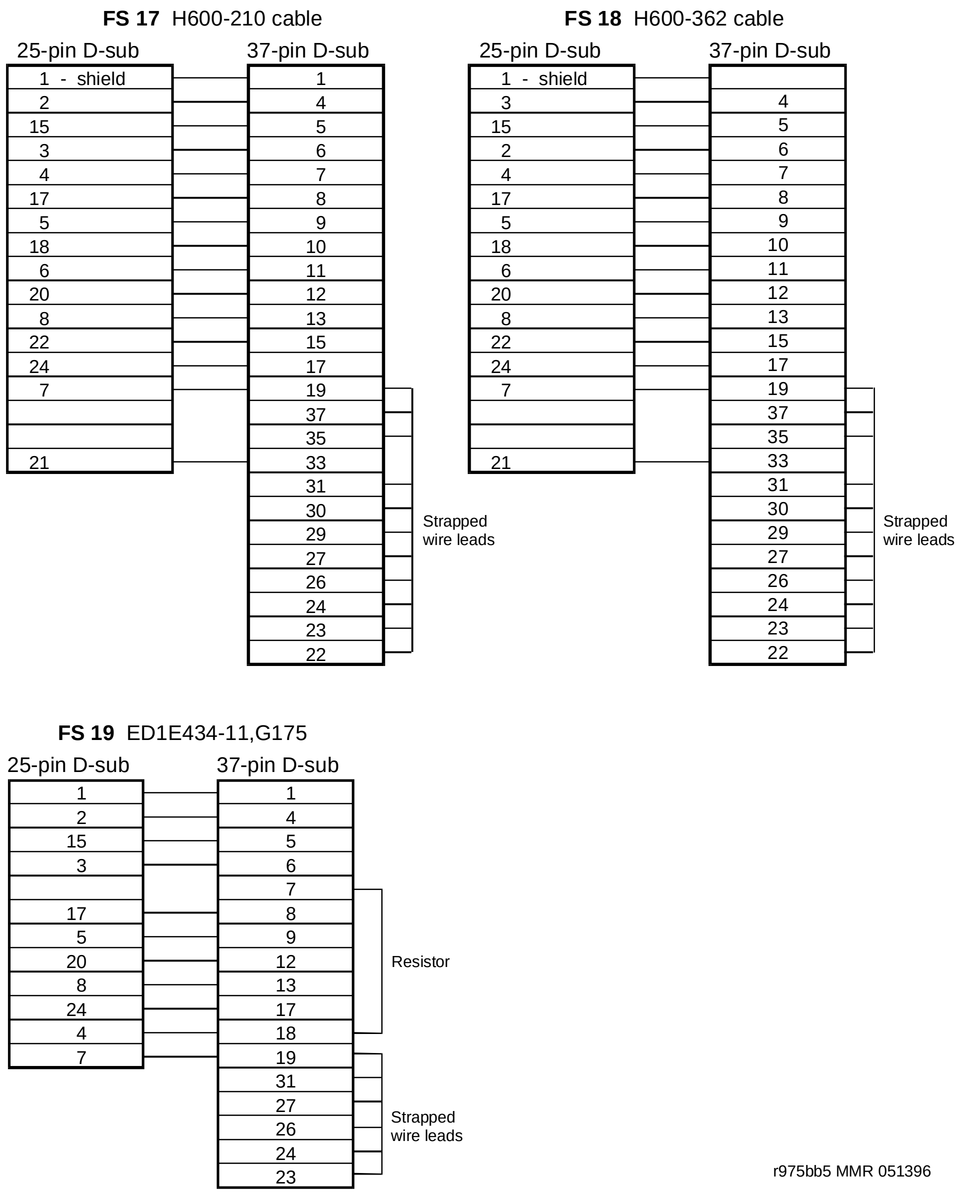


Figure D-6. Sample Cable Pinouts

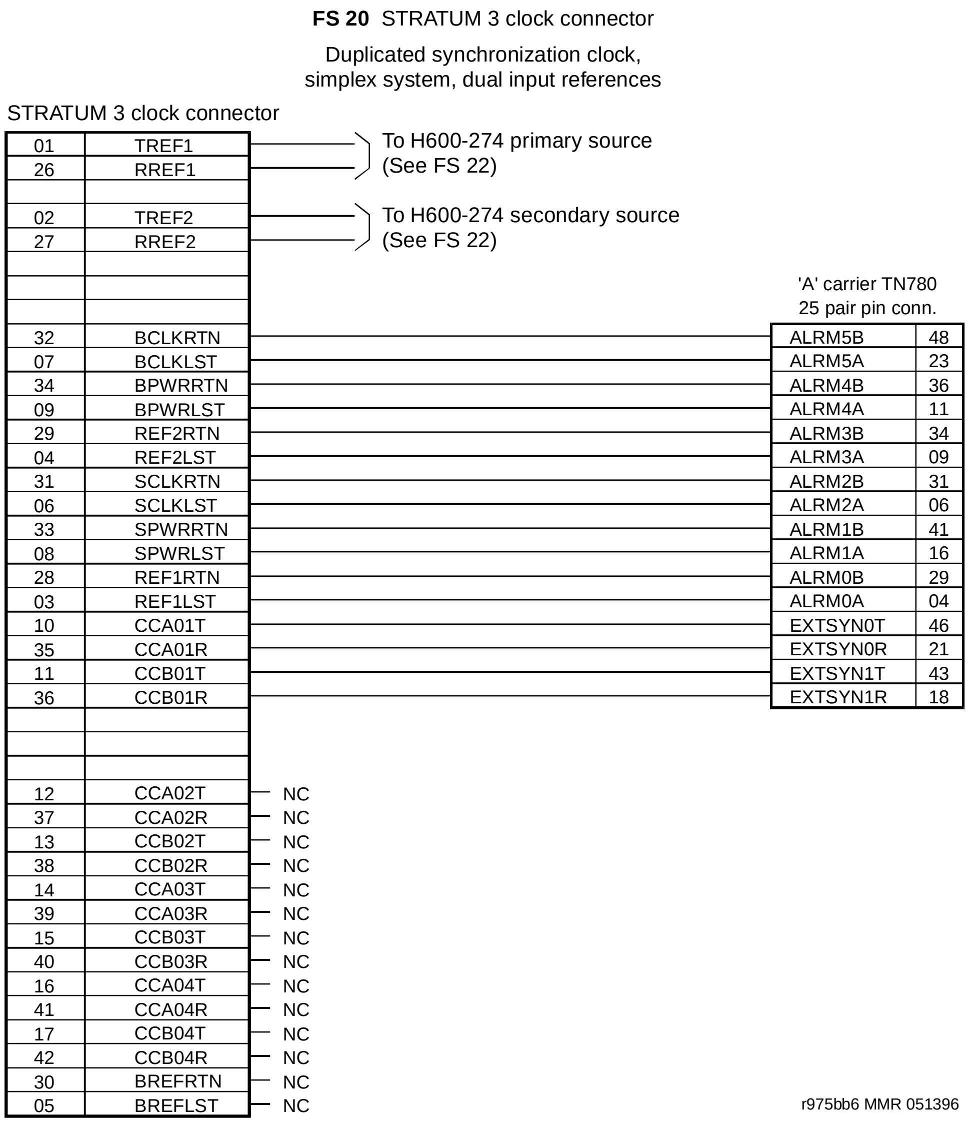


Figure D-7. STRATUM 3 Clock Connector Pinout

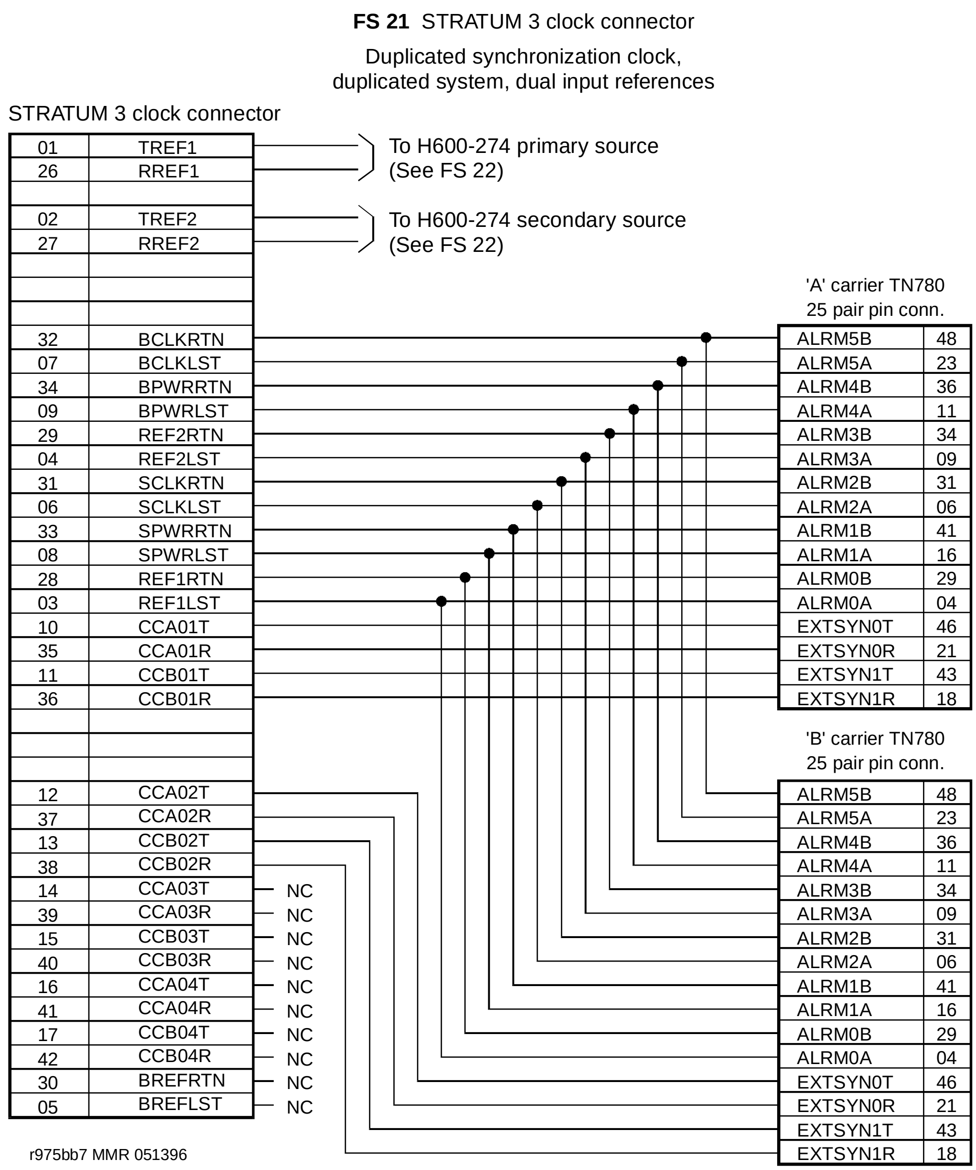


Figure D-8. STRATUM 3 Clock Connector

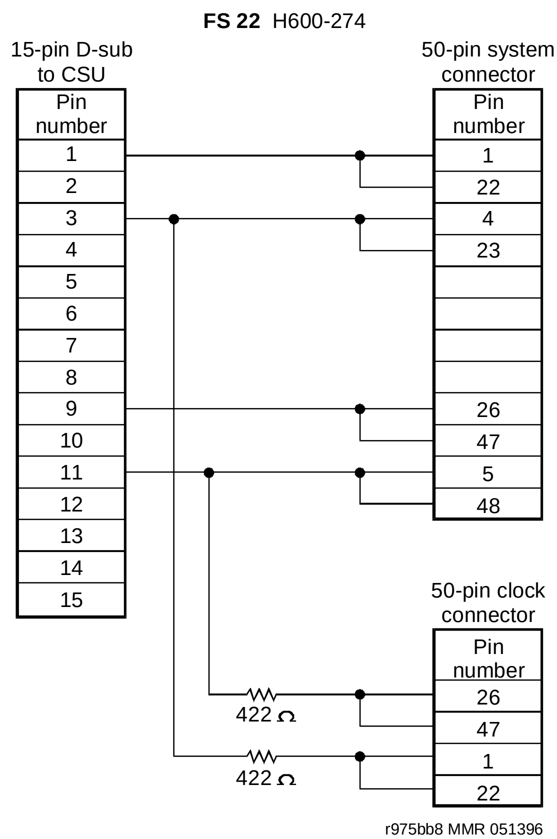


Figure D-9. Sample H600-274 Cable

Abbreviations

A

AA
Archangel

AAC
ATM Access Concentrator

AAR
Automatic Alternate Routing

AC
Alternating Current

ACA
Automatic Circuit Assurance

ACB
Automatic Callback

ACD
Automatic Call Distribution

ACU
Automatic Call Unit

ACW
After Call Work

AD
Abbreviated Dialing

ADAP
AUDIX Data Acquisition Package

ADM
Asynchronous Data Module

ADU
Asynchronous Data Unit

AE
Access Endpoint

AG
ASAI Gateway

AIM
Asynchronous Interface Module

AIOD
Automatic Identification of Outward Dialing

ALBO
Automatic Line Build Out

ALM-ACK
Alarm Acknowledge

AMW
Automatic Message Waiting

AN
Analog

ANI
Automatic Number Identification

AOL
Attendant Offered Load

AP
Applications Processor

APLT
Advanced Private Line Termination

ARS
Automatic Route Selection

ASAI
Adjunct Switch Applications Interface

ASCII
American Standard Code for Information Interchange

ATB
All Trunks Busy

ATD
Attention Dial

ATM
Asynchronous Transfer Mode

AUDIX
Audio Information Exchange

AUX
Auxiliary

AVD
Alternate Voice/Data

AWOH
Administration Without Hardware

AWT
Average Work Time

B

BCC
Bearer Capability Class

BCMS
Basic Call Management System

BCT
Business Communications Terminal

BER
Bit Error Rate

BLF
Busy Lamp Field

BN
Billing Number

BOS
Bit Oriented Signaling

BPN
Billed Party Number

BPS
Bits Per Second

BRI
Basic Rate Interface

BTU
British Thermal Unit

B8ZS
Bipolar Eight Zero Substitution

C

CA-TSC
Call-Associated Temporary Signaling Connection

CACR
Cancellation of Authorization Code Request

CAG
Coverage Answer Group

CAMA
Centralized Automatic Message Accounting

CARR-POW
Carrier Port and Power Unit for AC Powered Systems

CAS
Centralized Attendant Service or Call Accounting System

CBC
Coupled Bonding Conductor

CC
Country Code

CCIS
Common Channel Interoffice Signaling

CCITT
Consultative Committee for International Telephone and Telegraph

CCMS
Control Channel Message Set

CCS
Centum (Hundred) Call Seconds

CCSA
Common Control Switching Arrangement

CDM
Channel Division Multiplexing

CDOS
Customer-Dialed and Operator Serviced

CDR
Call Detail Recording

CDRP
Call Detail Record Poller

CDRR
Call Detail Recording and Reporting

CDRU
Call Detail Recording Utilities

CEM
Channel Expansion Multiplexing

CEPT1
European Conference of Postal and Telecommunications Rate 1

CI
Clock Input

CISPR
International Special Commitee on Radio Interference

cm
Centimeter

CM
Connection Manager

CMDR
Centralized Message Detail Recording

CMS
Call Management System

CO
Central Office

COR
Class of Restriction

COS
Class of Service

CP
Circuit Pack

CPE
Customer Premises Equipment

CPN
Called-Party Number

CPN/BN
Calling Party Number/Billing Number

CPTR
Call Progress Tone Receiver

CRC
Cyclical Redundancy Checking

CSA
Canadian Safety Association

CSCC
Compact Single Carrier Cabinet

CSCN
Center Stage Control Network

CSD
Customer Service Document

CSM
Centralized System Management

CSS
Center Stage Switch

CSSO
Customer Services Support Organization

CSU
Channel Service Unit

CTS
Clear to Send

CWC
Call Work Codes

D

DAC
Dial Access Code or Direct Agent Calling

dB
Decibel

dBA
Decibels in reference to Amperes

dBrnC
Decibels above reference noise with C filter

DC
Direct Current

DCE
Data Communications Equipment

DCO
Digital Central Office

DCP
Digital Communications Protocol

DCS
Distributed Communications System

DDC
Direct Department Calling

DDD
Direct Distance Dialed

DID
Direct Inward Dialed

DIOD
Direct Inward and Outward Dialing

DIVA
Data In/Voice Answer

DLC
Data Line Circuit

DLDM
Data Line Data Module

DMI
Digital Multiplexed Interface

DND
Do Not Disturb

DNIS
Dialed Number Identification Service

DOD
Direct Outward Dialing

DOSS
Delivery Operations Support System

DOT
Duplication Option Terminal

DPM
Dial Plan Manager

DPR
Dual Port RAM

DS1
Digital Signal Level 1

DS1C
Digital Signal Level-1 protocol C

DSI
Digital Signal Interface

DSU
Data Service Unit

DTDM
Digital Terminal Data Module

DTE
Data Terminal Equipment

DTGS
Direct Trunk Group Select

DTMF
Dual-Tone Multi-Frequency

DTS
Disk Tape System

DXS
Direct Extension Selection

E

E & M
Ear and Mouth (receive and transmit)

EAA
Expansion Archangel

EAL
Expansion Archangel Link

EBCDIC
Extended Binary-Coded Decimal Interexchange Code

ECC
Error Correct Code

ECMA
European Computer Manufacturers Association

EFP
Electronic Power Feed

EI
Expansion Interface

EIA
Electronic Industries Association

EMI
Electro-Magnetic Interference

EPN
Expansion Port Network

EPROM
Erasable Programmable Read Only Memory

EPSCS
Enhanced Private Switched Communications Services

ERL
Echo Return Loss

ESF
Extended Superframe Format

ESPA
European Standard Paging Access

ETA
Extended Trunk Access, also Enhanced Terminal Administration

ETN
Electronic Tandem Network

ETSI
European Telecommunications Standards Institute

F

FAC
Feature Access Code

FAS
Facility-Associated Signaling

FAT
Facility Access Trunk

FAX
Facsimile

FCC
Federal Communications Commission

FEAC
Forced Entry of Account Codes

FEP
Front End Processor

FIC
Facility Interface Codes

FNPA
Foreign Numbering-Plan Area

FRL
Facilities Restriction Level

FX
Foreign Exchange

G

G3-MA
Generic 3 Management Applications

G3-MT
Generic 3 Management Terminal

G3r
Generic 3, RISC (Reduced Instruction Set Computer)

GM
Group Manager

GPTR
General-Purpose Tone Receiver

GRS
Generalized Route Selection

H

HNPA
Home Numbering Plan Area Code

Hz
Hertz

I

IAS
Inter-PBX Attendant Service

IC
Inter-Cabinet

ICC
Intercarrier Cable

ICD
Inbound Call Director

ICDOS
International Customer Dialed Operator Serviced

ICHT
Incoming Call-Handling Table

ICI
Incoming Call Identifier

ICM
Inbound Call Management

IDDD
International Direct Distance Dialing

IDF
Intermediate Distribution Frame

IE
Information Element

IMT
Intermachine Trunk

in
Inch

INADS
Initialization and Administration System

INS
ISDN Network Service

INWATS
Inward Wide Area Telephone Service

IO
Information Outlet

ISDN
Integrated Services Digital Network

IS/DTT
Integrated Services/Digital Tie Trunk

ISN
Information Systems Network

ISO
International Standards Organization

ISV
Independent Software Vendor

ITP
Installation Test Procedures

ITU
International Telecommunications Union

IXC
Interexchange Carrier Code

K

kB
Kilobyte

kHz
Kilohertz

kbps
Kilobits Per Second

kbyte
Kilobyte

kg
Kilogram

L

LAN
Local Area Network

LAP-D
Link Access Procedure on the D-channel

LAPD
Link Access Procedure Data

LATA
Local Access and Transport Area

lb
Pound

LBO
Line Build Out

LDN
Listed Directory Number

LDS
Long-Distance Service

LEC
Local Exchange Carrier

LED
Light Emitting Diode

LINL
Local Indirect Neighbor Link

LSU
Local Storage Unit

LWC
Leave Word Calling

M

MAC
Medium Access

M-Bus
Memory Bus

MA-UUI
Message Associated User-to-User Signaling

MADU
Modular Asynchronous Data Unit

MAP
Maintenance Action Process

MAPD
Multi-Application Platform for DEFINITY

Mbps
Megabits Per Second

MCC
Multi-Carrier Cabinet

MCS
Message Center Service

MCT
Malicious Call Trace

MCU
Multipoint Control Unit

MDF
Main Distribution Frame

MDM
Modular Data Module

MDR
Message Detail Record

MEM
Memory

MET
Multibutton Electronic Telephone

MF
Multi-Frequency

MFB
Multifunction Board

MFC
Multi-Frequency Code

MHz
Megahertz

MIM
Management Information Message

MIPS
Million Instructions Per Second

MIS
Management Information System

MISCID
Miscellaneous Identification

MMCS
Multimedia Call Server

MMCH
Multimedia Call Handling

MMI
Multimedia Interface

MMS
Material Management Services

MO
Maintenance Object

MOS
Message-Oriented Signaling

MPDM
Modular Processor Data Module

MS
Message Server

ms
Millisecond

MS/T
Main Satellite/Tributary

MSA
Message Servicing Adjunct

MSG
Message Service

MSM
Modular System Management

MSS
Mass Storage System

MSSNET
Mass Storage/Network Control

MT
Management Terminal

MTDM
Modular Trunk Data Module

MTP
Maintenance Tape Processor

MTT
Multi-Tasking Terminal

MWL
Message Waiting Lamp

Mbps
Megabits Per Second

Mbyte
Megabytes

N

NANP
North American Numbering Plan

NAU
Network Access Unit

NCA/TSC
Non-Call Associate/Temporary Signaling Connection

NCOSS
Network Control Operations Support Center

NCSO
National Customer Support Organization

NEC
National Engineering Center

NEMA
National Electrical Manufacturer's Association

NETCON
Network Connection Circuit Pack

NFAS
Non-Facility Associated Signaling

NI
Network Interface

NID
Network Inward Dialing

NM
Network Management

NN
National Number

NPA
Numbering Plan Area

NPE
Network Processing Element

NQC
Number of Queued Calls

NSE
Night Service Extension

NSU
Network Sharing Unit

NXX
Public Network Office Code

O

OA
Operator Assisted

OCM
Outbound Call Management

ONS
On-Premises Station

OPS
Off-Premises Station

OPX
Off Premises Extension

OQT
Oldest Queued Time

OSHA
Occupational Safety and Health Act

OSI
Open Systems Interconnect

OSS
Operations Support System

OSSI
Operational Support System Interface

OTDR
Optical Time Domain Reflectometer

OTQ
Outgoing Trunk Queuing

P

PACCON
Packet Control

PAD
Packet Assembly/Disassembly

PBX
Private Branch Exchange

PC
Personal Computer

PCM
Pulse Code Modulation

PCOL
Personal Central Office Line

PCOLG
Personal Central Office Line Group

PCS
Permanent Switched Calls

PDM
Processor Data Module

PDS
Premises Distribution System

PE
Processing Element

PEC
Price Element Codes

PEI
Processor Element Interchange

PGATE
Packet Gateway

PGN
Partitioned Group Number

PI
Processor Interface

PIB
Processor Interface Board

PIDB
Product Image Database

PKTINT
Packet Interface

PL
Private Line

PLS
Premises Lightwave System

PMS
Property Management System

PN
Port Network

PNA
Private Network Access

POE
Processor Occupancy Evaluation

POP
Point Of Presence

PPM
Parts Per Million or Periodic Pulse Metering

PPN
Processor Port Network

PRI
Primary Rate Interface

PROCR
Processor

PSC
Premises Service Consultant

PSDN
Packet Switch Public Data Network

PT
Personal Terminal

PTC
Positive Temperature Coefficient

PTT
Postal Telephone and Telegraph

R

RAM
Random Access Memory

RBS
Robbed-Bit Signaling

RC
Radio Controller

RCL
Restricted Call List

REN
Ringer Equivalency Number

RFP
Request For Proposal

RHNPA
Remote Home Numbering Plan Area

RINL
Remote Indirect Neighbor Link

RISC
Reduced Instruction Set Computer

RLT
Release Link Trunk

RMATS
Remote Maintenance, Administration, and Traffic System

RNX
Route Number Index (Private Network Office Code)

ROM
Read-Only Memory

RPN
Routing Plan Number

RS-232C
Recommended Standard 232C

RS-449
Recommended Standard 449

RSC
Regional Support Center

S

SABM
Set Asynchronous Balance Mode

SAC
Send All Calls

SAKI
Sanity and Control Interface

SAT
System Access Terminal

SCC
Single Carrier Cabinet or Serial Communications Controller

SCD
Switch-Control Driver

SCI
Switch Communications Interface

SCO
System Control Office

SCOTCH
Switch Conferencing for TDM Bus in Concentration Highway

SCSI
Small Computer System Interface

SDDN
Software Defined Data Network

SDI
Switched Digital International

SDLC
Synchronous Data Link Control

SDN
Software Defined Network

SFRL
Single-Frequency Return Loss

SID
Station Identification Number

SIT
Special Information Tones

SMDR
Station Message Detail Recording

SN
Switch Node

SNA
Systems Network Architecture

SNC
Switch Node Clock

SNI
Switch Node Interface

SNMP
Simple Network Management Protocol

SPE
Switch Processing Element

SPID
Service Profile Identifier

SSI
Standard Serial Interface

SSM
Single Site Management

SSV
Station Service

ST3
Stratum 3 Clock Board

STARLAN
Star-Based Local Area Network

SVN
Security Violation Notification

SWG
Standard Wire Gauge

SXS
Step-by-Step

SYSAM
System Access and Administration

T

TAAS
Trunk Answer from Any Station

TABS
Telemetry Asynchronous Block Serial

TAC
Trunk Access Code

TC
Technical Consultant

TCM
Traveling Class Mark

TDM
Time Division Multiplex(ing)

TDR
Time of Day Routing

TEG
Terminating Extension Group

TEI
Terminal Endpoint Identifier

TOD
Time of Day

TOP
Task Oriented Protocol

TSC
Technical Service Center

TTR
Touch-Tone Receiver

TTT
Terminating Trunk Transmission

TTTN
Tandem Tie Trunk Network

TTY
Teletypewriter

U

UAP
Usage Allocation Plan

UART
Universal Asynchronous Transmitter

UCD
Uniform Call Distribution

UCL
Unrestricted Call List

UDP
Uniform Dial Plan

UL
Underwriter Laboratories

UM
User Manager

UNMA
Unified Network Management Architecture

UNP
Uniform Numbering Plan

UPS
Uninterruptible Power Supply

USOP
User Service Order Profile

UUCP
UNIX-to-UNIX Communications Protocol

UUI
User-to-user information

V

VAR
Value Added Reseller

VDN
Vector Directory Number

VIS
Voice Information System

VLSI
Very Large Scale Integration

VM
Voltmeter

VNI
Virtual Nodepoint Identifier

W

WATS
Wide Area Telecommunications Service

WCC
World Class Core

WCR
World Class Routing

WCTD
World Class Tone Detection

WFB
Wireless Fixed Base

WSA
Waiting Session Accept

WSS
Wireless Subscriber System

Z

ZCS
Zero Code Suppression

Glossary

Numerics

3B2 Message Server
A software application that combines voice and data messaging services for voice terminal users whose extensions are connected to a system.

800 service
A service in the United States that allows incoming calls from a certain area or areas to an assigned number for a flat-rate charge based on usage.

A

abandoned call
An incoming call, where the caller hangs up before being answered.

access code
A 1-, 2-, or 3-digit dial code used to activate or cancel a feature, or access an outgoing trunk. The star (*) and pound (#) can be used as the first digit of an access code.

access endpoint
Either a nonsignaling channel on a DS1 interface or a nonsignaling port on an analog tie trunk circuit pack that is assigned a unique extension.

access tie trunk
A trunk that connects a main communications system with a tandem communications system in an Electronic Tandem Network (ETN). An access tie trunk can also be used to connect a system or tandem to a serving office or service node. Also called "access trunk."

ACCUNET
A trademarked name for a family of digital services offered by AT&T in the United States.

ACD
See **Automatic Call Distribution**. ACD also refers to the "Work State" indicating the agent is on an ACD call.

ACD split (or split)
A group of extensions that are staffed by agents trained to handle a certain type of incoming call. Valid split numbers range from 1 through 99. Each number identifies a unique grouping of ACD agent positions. ACD split is also referred to as an *ACD hunt group* or *hunt group*.

ACD work modes
See **work modes**.

active-notification association
A "link" that is initiated by the adjunct allowing it to receive Event Reports for a specific switch entity, for example, an outgoing call. This association is initiated by the adjunct via the *Event Notification Request* capability.

active-notification call
A call for which Event Reports are being sent over an active-notification association (communication channel) to the adjunct. Sometimes referred to as a monitored call.

active notification domains
Domains are VDNs and ACD split extensions for which Event Notification has been requested.

adjunct-control association
A relationship initiated by an application via the *Third Party Make Call*, the *Third Party Take Control* or *Domain (Station) Control* capabilities to set up calls and control calls already in progress.

adjunct-controlled calls
Include all the calls that can be controlled using an adjunct-control association. These calls must have been originated via the *Third Party Make Call* or *Domain (Station) Control* capabilities or must have been taken control of via the *Third Party Take Control* or *Domain (Station) Control* capabilities.

adjunct-controlled splits
ACD splits administered to be under adjunct control. Agents logged into such splits must do all telephony and ACD login and/or logout and change work mode functions through the adjunct (except for auto-available adjunct controlled splits, whose agents may not be logged in and/or logged out or have their work modes changed).

adjunct-monitored calls
Include all the adjunct-controlled calls and the active-notification calls. In addition it includes calls which provide event reporting over domain-control associations.

ANSI
The **American National Standards Institute.** This is a United States professional/technical association supporting a variety of standards.

adjunct
A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor.

adjunct-switch application interface (ASAI)
A recommendation for interfacing adjuncts and communications systems, based on the CCITT Q.932 specification for layer 3.

administer
To access and change parameters associated with the services or features of a system.

Administered Connection (AC)
Administered Connection is a feature that allows the switch to automatically establish and maintain end-to-end connections between access endpoints (trunks) and/or data endpoints (data modules).

administration terminal
A terminal used to administer and maintain a system. See also **terminal**.

Administration Without Hardware (AWOH)
Provides the ability to administer ports without the need for the associated terminals or other hardware to be physically present.

after call work (ACW) mode
In this mode, agents are unavailable to receive ACD calls. Agents should enter the ACW mode to perform ACD-related activities such as filling out a form after an ACD call. If agents are in the Manual-In mode and disconnect from an ACD call, they automatically enter the ACW mode. Agents normally using Auto-In mode can enter the ACW state by pressing the ACW button during a call.

agent (or ACD agent)
An answering position who receives calls directed to a split. A member of an ACD hunt group (ACD split).

agents in multiple splits
An agent may be logged into more than one split (three maximum). If, while logged into more than one split, the agent (1) answers an ACD call, (2) is in ACW mode for any split, or (3) makes or receives a direct extension call, the switch will not distribute additional ACD calls to that agent.

agent report
Provides historical traffic information for internally measured agents.

American National Standard Code for Information Interchange
See **ASCII**.

analog
The representation of information by means of continuously variable physical quantities such as amplitude, frequency, and phase.

analog data
Data that is transmitted over a digital facility in analog (pulse code modulation) form. The data must pass through a modem either at both ends or at a modem pool at the distant end.

analog telephone
A telephone that receives acoustic voice signals and sends analog electrical signals along the telephone line. Analog telephones are usually served by a single wire pair (tip and ring). The model-2500 telephone set is a typical example of an analog telephone.

analog-to-digital converter (ADC)
A device that converts an analog signal to digital form. See also **digital-to-analog converter**.

angel
A microprocessor located on each port card in a processor port network (PPN). The angel uses the control-channel message set (CCMS) to manage communications between the port card and the archangel on the controlling switch processing element (SPE). The angel also monitors the status of other microprocessors on a port card and maintains error counters and thresholds. See also **archangel**.

answerback code
An assigned number used to respond to a page from a code-calling or loudspeaker-paging system, or to retrieve a parked call.

appearance
A software process that is associated with an extension and whose purpose is to supervise a call. Also called "call appearance," "line appearance," and "occurrence."

application
Refers to an adjunct entity that requests and receives ASAI services or capabilities. One or more applications can reside on a single adjunct. However, the switch cannot distinguish among several applications residing on the same adjunct and treats the adjunct, and all resident applications, as a single application. The terms application and adjunct are used interchangeably throughout this document.

applications processor
A micro-computer based, program controlled computer providing application services for the DEFINITY switch. The processor is used with several user-controlled applications such as traffic analysis and electronic documentation.

architecture
The organizational structure of a system, including hardware and/or software.

ARS
See **Automatic Route Selection**.

ASCII (American National Standard Code for Information Interchange)
The standard code, using a coded character set consisting of 7-bit coded characters (eight bits, including parity check), used for information interchange among data processing systems, data communications systems, and associated equipment. The ASCII set consists of control characters and graphic characters.

asynchronous data transmission
A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. This type transmission is advantageous when transmission is not regular (characters typed at a keyboard). Also called "asynchronous transmission." See also **synchronous data transmission**.

association
An association is a communication channel between the adjunct and switch for messaging purposes. An active association is one which applies to an existing call on the switch or to an extension on the call.

asynchronous data unit (ADU)
A data communications equipment (DCE) type device that allows direct connection between RS-232C equipment and a digital switch.

asynchronous transfer mode
The Asynchronous Transfer Mode (ATM) Interface is a high speed access concentrator for data networking in Local Area Network (LAN), campus, and Wide Area Network (WAN) environments. Data rates can be as high as 155 Mbps (Mega bits per second).

attendant
A person at a console on a customer’s premises who provides personalized service for incoming callers and voice-services users by performing switching and signaling operations. See also attendant console.

attendant console
The workstation used by an attendant. The attendant console allows the attendant to originate a call, answer an incoming call, transfer a call to another extension or trunk, put a call on hold, and remove a call from hold. Attendants using the console can also manage and monitor some system operations. Also called "console." See also **attendant**.

Audio Information Exchange (AUDIX)
A fully integrated voice-mail system that can be used with a variety of communications systems to provide call-history data, such as subscriber identification and reason for redirection.

auto-in trunk groups

Those trunk groups where the CO processes all of the digits for the incoming call. Whenever the switch determines that the CO has seized a trunk from an Auto-In trunk group, it automatically (without processing any digits) connects the trunk to the destination. The destination will typically be an ACD split where(emif there are no agents available(emthe call will go into a queue in which the callers wait to be answered in the order in which they arrived.

auto-in work mode

One of four agent work modes. The work mode where an agent indicates, to the system, that the agent is ready to process another call as soon as the current call is completed. Specifically, if an agent disconnects from an ACD call while in Auto-in Work Mode, then that agent immediately becomes available to receive another ACD call. *See* **Manual-In Work Mode** for a contrast.

Automatic Call Distribution (ACD) split

Calls of a similar type are distributed among agents.

automatic trunk

A trunk that does not require the sending or receiving of addressing information because the destination is predetermined. A request for service on the trunk, called a "seizure," is sufficient to route the call. The normal destination of an automatic trunk is the communications-system attendant group. Also called "automatic incoming trunk" and "automatic tie trunk."

automatic restoration

A service that restores disrupted connections between access endpoints (nonsignaling trunks) and data endpoints (devices that connect the switch to data terminal and/or communications equipment). This restoration is done within seconds of a service disruption so that critical data applications can remain operational.

auxiliary equipment

Equipment used for optional system features, such as Loudspeaker Paging and Music-on-Hold.

auxiliary trunk

A trunk used to connect auxiliary equipment, such as radio-paging equipment, to a communications system.

aux-work mode

In this mode, agents are unavailable to receive ACD calls. Agents should enter aux-work mode when involved in non-ACD activities such as taking a break, going to lunch, or placing an outgoing call.

When agents log in, they are automatically placed in the Aux-Work mode. They can then use the Auto-In or Manual-In feature to make themselves available to answer the first call.

Also, the last available agent in a split cannot enter the aux-work mode if any ACD calls are remaining in the queue. If the last available agent attempts to enter aux-work mode, the following occurs: (1) Calls in the queue are routed to the agent until the queue is empty (2) If the last available agent has an aux-work button, the light next to the button flashes until all calls in the queue are answered. When the last call is answered, the light next to the button goes on steadily, and the agent then enters aux-work mode.

B

bandwidth
The difference, expressed in Hertz, between the defined highest and lowest frequencies in a frequency range.

barrier code
A security code used with the Remote Access feature to prevent unauthorized access to the system.

baud
In telecommunications applications, a unit of transmission speed equal to the number of signal events per second. See also **bit rate** and **bits per second**.

BCC
The Bearer Capability Class (BCC) identifies the type of a call, for example, voice and different types of data. Determination of BCC is based on the call originator's characteristics for non-ISDN endpoints and on the Bearer Capability and Low-Layer Compatibility Information Elements of an ISDN endpoint. Current BCCs are:

a. 0: Voice-grade data and voice
b. 1: DMI Mode 1, 56 kbps data transmission
c. 2: DMI Mode 2, synchronous/asynchronous data transmission up to 19.2 kbps
d. 3: DMI Mode 3, 64 kbps circuit/packet data transmission
e. 4: DMI Mode 0, 64 kbps synchronous data
f. 5: Temporary Signaling Connection
g. 6: Wideband Call, 128 to 1984 kbps synchronous data

bit (binary digit)
One unit of information in binary notation having two possible states or values, 0 or 1.

bits per second (bps)
The number of binary units of information that are transmitted or received per second. See also **baud** and **bit rate**.

bit rate
The speed at which bits are transmitted, usually expressed in bits per second. Also called "data rate." See also **baud** and **bits per second**.

bridge (bridging)
The appearance of a voice terminal's extension at one or more other voice terminals.

BRI
The ISDN Basic Rate Interface specification.

bridged appearance
A call appearance on a voice terminal that matches a call appearance on another voice terminal for the duration of a call.

buffer
(1) In hardware, a circuit or component that isolates one electrical circuit from another. Typically, a buffer holds data from one circuit or process until another circuit or process is ready to accept the data. (2) In software, an area of memory used for temporary storage.

bus
A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

business communications terminal (BCT)
An integrated digital data terminal used for business applications. A BCT can function via a data module as a special-purpose terminal for services provided by a processor or as a terminal for data entry and retrieval.

BX.25
A version of the CCITT X.25 protocol for data communications. BX.25 adds a fourth level to the standard X.25 interface. This uppermost level combines levels 4, 5, and 6 of the International Standards Organization (ISO) reference model.

bypass tie trunks
A one-way, outgoing tie trunk from a tandem switch to a main switch in an electronic tandem network (ETN). Bypass tie trunks, provided in limited quantities, are used as a "last-choice" route when all trunks to another tandem switch are busy. Bypass tie trunks are used only if all applicable intertandem trunks are busy.

byte
A sequence of (usually eight) bits processed together.

C

cabinet
Housing for racks, shelves, or carriers that hold electronic equipment.

cable
The physical connection between two pieces of equipment (for example, cable from a data terminal to a modem (or between a piece of equipment and a termination field (for example, circuit pack I/O cables.

cable connector
A cable connector is either a jack (female) or plug (male) on the end of a cable. A cable connector connects wires on a cable to specific leads on telephone or data equipment.

call appearance, attendant console
Six buttons, labeled "a" through "f," and used to originate, receive, and hold calls. Each button has two lights to show the status of the call appearance.

call appearance, voice terminal
A button labeled with an extension number and used to place outgoing calls, receive incoming calls, or hold calls. Two lights next to the button show the status of the call appearance or the status of the call.

call control capabilities
call control capabilities are all the capabilities (*Third Party Selective Hold, Third Party Reconnect, Third Party Merge*) that can be used in either of the Third Party Call Control ASE (cluster) subsets: Call Control and Domain Control.

call detail recording
A switch feature that uses software and hardware to record call data (same as CDRU).

call detail recording utility (CDRU)
Applications software that collects, stores, optionally filters, and outputs call detail records for direct or polled output to peripheral devices.

call management system (CMS)
An application, running on an adjunct processor, that collects information from an Automatic Call Distribution (ACD) unit. CMS enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and vector directory numbers (VDNs), and enables customers to partially administer the ACD feature for a communications system.

call reference value (CRV)
An identifier present in ISDN messages that serves to associate a related sequence of messages. In ASAI, the CRVs distinguish between associations.

call vector
A set of up to 15 vector commands to be performed for an incoming or internal call.

callback call
A call that is automatically returned to a voice terminal user who activated the Automatic Callback or Ringback Queuing feature.

call-waiting ringback tone
A low-pitched tone identical to ringback tone except that the tone decreases in the last 0.2 seconds (in the United States). A call-waiting ringback tone notifies the attendant that the Attendant Call Waiting feature has been activated and that the called user is aware of the waiting call. Tones in international countries may sound different.

call work code
A number, up to 16 digits, entered by Automatic Call Distribution (ACD) agents to record the occurrence of customer-defined events (such as account codes, social security numbers, or phone numbers) on ACD calls.

carrier
An enclosed shelf containing vertical slots that hold circuit packs.

carried load
The amount of traffic actually served by traffic-sensitive facilities during a given interval.

CCS or hundred call seconds
A unit of traffic measure used to determine usage. To determine usage for a facility, it is scanned every 100 seconds. If the facility is found busy, then it is assumed to have been busy for the entire scan interval. There are 3600 seconds per hour. The Roman numeral for 100 is the capital letter "C." The abbreviation for call seconds is CS. Therefore, 100 call seconds is abbreviated as CCS. If a facility is busy for an entire hour, then it is said to have been busy for 36 CCS. *See also* **Erlang**.

capability
A capability is a either a request or indication of an operation. For example, a *Third Party Make Call* is a request for setting-up a call and an *Event Report* is an indication that an event has occurred.

capability groups
Capability groups are sets of capabilities, provisioned through switch administration, that can be requested by an application. Each capability group may contain capabilities from several capability groups. Capability groups are also referred to, in other documentation, as administration groups or Application Service Elements (ASEs). Capability groups denote association types. For example, *Call Control* is a type of association which allows certain functions (the ones in the capability group) to be performed over this type of association.

cause value

A Cause Value is returned in responses to requests or in event reports when a denial occurs or an unexpected condition is encountered. ASAI cause values fall into two "coding standards": Coding Standard 0 includes any cause values that are part of AT&T and CCITT ISDN specifications, and, Coding standard 3 includes any other ASAI cause values. This document uses a notation for cause value where the coding standard for the cause is given first, then a slash, then the cause value. For example, CS0/100 is coding standard 0, cause value 100.

CCITT

CCITT (Comitte Consultatif International Telephonique et Telegraphique) is now called *International Telecommunications Union* (ITU). See this name for information.

center stage switch (CSS)

The central interface between the processor port network (PPN) and expansion port networks (EPNs) in a CSS-connected system.

central office (CO)

The location housing telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling.

central office (CO) codes

The first three digits of a 7-digit public network telephone number in the USA. CO codes are numbered from 200 through 999.

central office (CO) trunk

A telecommunications channel that provides access from the system to the public network through the local CO.

channel

The term channel is nonspecific and must be taken in context. Channel can refer to a circuit-switched call or a communications path for transmitting voice and/or data.

In wideband, a channel refers to all of the time slots necessary to support a call. For example, an H0-channel uses six 64 kbps time slots. This definition of channel is the same whether the time slots necessary to support the call are contiguous or noncontiguous.

Channel can also refer to a DS0 on a T1 or E1 facility not specifically associated with a logical circuit-switched call. In this context, a channel is analogous to a single trunk.

channel negotiation

Channel negotiation is the process by which the channel offered in the Channel Identification Information Element (CIIE) in the SETUP message is "negotiated" to be another channel acceptable to the switch receiving the SETUP message and ultimately to the switch that sent the SETUP. Negotiation will only be attempted if the CIIE is encoded as *Preferred*. Channel negotiation will not be attempted for wideband calls.

circuit

(1) An arrangement of electrical elements through which electric current flows, providing one or more specific functions. (2) A channel or transmission path between two or more points.

circuit pack

A card on which electrical circuits are printed, and integrated circuit (IC) chips and electrical components are installed. A circuit pack is installed in a switch carrier.

Class of Restriction (COR)

A feature that allows up to 64 classes of call-origination and call-termination restrictions for voice terminals, voice terminal groups, data modules, and trunk groups. See also **Class of Service (COS)**.

Class of Service (COS)
A feature that uses a number (0 through 15) to specify if voice terminal users can activate the Automatic Callback, Call Forwarding All Calls, Data Privacy, or Priority Calling features.

common control switching arrangement (CCSA)
A private telecommunications network using dedicated trunks and a shared switching center for interconnecting company locations.

communications system
The software-controlled processor complex that interprets dialing pulses, tones, and/or keyboard characters and makes the proper interconnections both within the system and external to the system. The communications system itself consists of a digital computer, software, storage device, and carriers with special hardware to perform the actual connections. A communications system provides voice and/or data communications services, including access to public and private networks, for telephones and data terminals on a customer's premises. See also **switch**.

confirmation tone
A tone confirming that a feature activation, deactivation, or cancellation has been accepted.

connectivity
The connection of disparate devices within a single system.

console
See **attendant console**.

contiguous
Contiguous refers to adjacent DS0s within one T1 or E1 facility or adjacent TDM or fiber time slots. Note that the first and last TDM bus, DS0, or fiber time slots are not considered contiguous (no wraparound). For an E1 facility with a D-channel, DS0s 15 and 17 are considered contiguous.

control cabinet
See **control carrier**.

control carrier
A carrier in a Multi-Carrier Cabinet that contains the switch processing element (SPE) circuit packs and, unlike a Release 5r control carrier, port circuit packs. Also called "control cabinet" in a single-carrier cabinet. See also **switch processing element**.

controlled station
A station that is being monitored and controlled via a domain-control association.

coverage answer group
A group of up to eight voice terminals that ring simultaneously when a call is redirected to it by Call Coverage. Any one of the group can answer the call.

coverage call
A call that is automatically redirected from the called party's extension number to an alternate answering position when certain coverage criteria are met.

coverage path
The order in which calls are redirected to alternate answering positions.

coverage point
An extension or attendant group, vector directory number (VDN), or Automatic Call Distribution (ACD) split designated as an alternate answering position in a coverage path.

covering user
A person at a coverage point who answers a redirected call.

critical reliability system
A system that has the following duplicated items: control carriers, tone-clocks, expansion interface (EI) circuit packs, and cabling between port networks (PNs) and center stage switch (CSS) in a CSS-connected system. See also **duplicated common control**, **duplicate processor-only system**, and **duplication**.

D

data channel
A communications path between two points used to transmit digital signals.

data communications equipment (DCE)
The equipment (usually a modem, data module, or packet assembler/disassembler) on the network side of a communications link that provides the functions to make the binary serial data from the source or transmitter compatible with the communications channel.

data link
The configuration of physical facilities enabling end terminals to communicate directly with each other.

data module
An interconnection device between a basic rate interface (BRI) or digital communications protocol (DCP) interface of the switch and data terminal equipment (DTE) or data communications equipment (DCE).

data path
The end-to-end connection used for a data communications link. A data path is the combination of all elements of an interprocessor communication in a distributed communications system (DCS).

data port
A point of access to a computer that uses trunks or lines for transmitting or receiving data.

data rate
See **bit rate**.

data service unit (DSU)
A device designed to transmit digital data on transmission facilities.

data terminal
An input/output (I/O) device that has either switched or direct access to a host computer or to a processor interface.

data terminal equipment (DTE)
Equipment consisting of the endpoints in a connection over a data circuit. In a connection between a data terminal and host, the terminal, the host, and their associated modems or data modules make up the DTE.

D-channel backup
D-channel backup is used with Non-Facility Associated Signaling (NFAS). With D-channel backup, a primary D-channel provides signaling for an NFAS D-channel group (two or more PRI facilities). A second D-channel, located on a separate PRI facility of the NFAS D-channel group is designated as backup for the D-channel. The failure of the primary D-channel causes an automatic transfer of call-control signaling to the backup D-channel. In this case, the backup

becomes the primary D-channel, and when the previous primary is returned to service it becomes the backup D-channel.

delay-dial trunk
A trunk that allows dialing directly into a communications system (the digits are received as they are dialed).

denying a request
Denying a Request is the same as sending a negative acknowledgement (NAK), and is done by sending a Facility Information Element (FIE) with a *return error* component (a cause value is also provided). It should not be confused with the "denial" event report which applies to calls.

designated voice terminal
The specific voice terminal to which calls, originally directed to a certain extension number, are redirected. Commonly used to mean the "forwarded-to" terminal when Call Forwarding All Calls is active.

dial-repeating tie trunk
A tie trunk that transmits called-party addressing information between two communications systems.

digit conversion
A process used to convert specific dialed numbers into other dialed numbers.

digital communications protocol (DCP)
A proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two 64 kbps information (I-) channels and one 8-kbps signaling (S-) channel.

digital data endpoints
In Release 5si, digital data endpoints include devices such as the 510D terminal or the 715-type business communications system(BCS).

digital multiplexed interface (DMI)
An interface that provides connectivity between a communications system and a host computer or between two communications systems using digital signal level-1 (DS1) 24th-channel signaling. DMI provides twenty three 64 kbps data channels and 1 common signaling channel over a twisted-pair connection. DMI is offered through two capabilities: bit-oriented signaling (DMI-BOS) and message-oriented signaling (DMI-MOS).

digital signal level 0 (DS0)
A single 64 kbps voice channel. A DS0 is a single 64 kbps channel in a T1 or E1 facility and consists of eight bits in a T1 or E1 frame every 125 micro-seconds.

digital signal level 1 (DS1)
A single 1.544 Mbps (United States) or 2.048 Mbps (outside the United States) digital signal carried on a T1 transmission facility. A DS1 converter complex consists of a pair, one at each end, of DS1 converter circuit packs and the associated T1/E1 facilities.

digital terminal data module (DTDM)
An integrated or adjunct data module that shares with a digital telephone the same physical port for connection to a communications system. The function of a DTDM is similar to that of a processor data module (PDM) and modular processor data module (MPDM) in that it converts RS-232C signals to DCP signals.

digital-to-analog converter
A device that converts data in digital form to the corresponding analog signals. See also **analog-to-digital converter**.

digital transmission
A mode of transmission in which the information to be transmitted is first converted to digital form and then transmitted as a serial stream of pulses.

digital trunk
A circuit in that carries digital voice and/or digital data in a telecommunications channel.

dial-repeating trunks
A PBX tie trunk that is capable of handling PBX station signaling information without attendant assistance.

direct agent
A switch feature accessed only via Adjunct Switch Applications Interface (ASAI) which allows a call to be placed in a split queue but routed only to a specific agent in that split. This allows a call to receive normal ACD call treatment (for example, announcements) and to be measured as an ACD call while ensuring that a particular agent answers.

Direct Extension Selection (DXS)
A feature on an attendant console that allows an attendant direct access to voice terminals by pressing a group select button and a DXS button.

Direct Inward Dialing (DID)
A feature that allows an incoming call from the public network (not FX or WATS) to reach a specific telephone without attendant assistance. DID calls to DID-restricted telephone lines are routed to an attendant or recorded announcement, depending on the option selected.

direct inward dialing (DID) trunk
An incoming trunk used for dialing directly from the public network into a communications system without help from the attendant.

disk drive
An electromechanical device that stores data on and retrieves data from one or more disks.

distributed communications system (DCS)
A network configuration linking two or more communications systems in such a way that selected features appear to operate as if the network were one system.

domain
Available domains are VDNs, ACD splits, and stations. The VDN domain is only used for active-notification associations, the station domain is only used for the domain-control associations. The ACD-split domain is for active-notification associations and domain-control associations.

domain-control association
A *Third Party Domain Control Request* capability initiates a unique "CRV/link number" combination, which is referred to as a domain-control association.

domain-controlled split
A split for which *Third Party Domain Control* request has been accepted. A domain-controlled split provides an event report for logout.

domain-controlled station
A station for which a *Third_Party_Domain_Control* request has been accepted. A domain-controlled station provides event reports for calls that are alerting, connected, or held at the station.

domain-controlled station on a call
A station active on a call which provides event reports over one or two domain-control associations.

duplicated common control
Two processors ensuring continuous operation of a communications system. While one processor is on-line, the other functions as a backup. The backup processor goes on-line periodically or when a problem condition occurs.

duplication
The use of redundant components to improve availability. When a duplicated subsystem fails, its backup redundant system automatically takes over.

duplication option
A system option that duplicates the following:

a. Control carrier containing the Switch Processing Element (SPE)

b. Expansion interface (EI) circuit packs in carriers

c. Fiber optic cabling between Port Networks (PNs)

d. Center-Stage Switch (CSS) in a CSS-connected system

E

E1
A digital transmission standard that carries traffic at the rate of 2.048 Mbps. The E1 facility is divided into 32 channels (DS0s) of 64 kbps information numbered from 0 to 31. Channel 0 is reserved for framing and synchronization information. A D-channel occupies channel 16.

ear and mouth (E & M) signaling
Trunk supervisory signaling, used between two communications systems, whereby signaling information is transferred through two-state voltage conditions (on the E and M leads) for analog applications and through a single bit for digital applications.

EIA-232
A physical interface specified by the Electronic Industries Association (EIA). EIA-232 transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet. EIA-232 replaces RS-232 protocol in some DEFINITY applications.

electronic tandem network (ETN)
A tandem tie trunk network that has automatic call routing capabilities based on the number dialed and the most preferred route available at the time the call is placed. Each switch in the network is assigned a unique private network office code (RNX), and each voice terminal is assigned a unique extension number.

Electronics Industries Association (EIA)
A trade association of the electronics industry that establishes electrical and functional standards.

emergency transfer
If a major system failure occurs, the automatic transfer is initiated to a group of telephones capable of making outgoing calls. The system operates in this mode until the failure is repaired and the system automatically returns to normal operation. Also called "power-failure transfer."

end-to-end signaling
The transmission of touch-tone signals generated by dialing from a voice terminal user to remote computer equipment. A connection must first be established over an outgoing trunk from the calling party to the computer equipment. Then additional digits can be dialed to transmit information to be processed by the computer equipment.

enhanced private-switched communications service (EPSCS)
An analog private telecommunications network based on the No. 5 Crossbar and 1A ESS that provides advanced voice and data telecommunications services to companies with many locations.

Erlang
A unit of traffic intensity, or load, used to express the amount of traffic it takes to keep one facility busy for one hour. One Erlang is equal to 36 CCS. See also **Hundred Call Seconds**.

expansion archangel (EAA)
A network-control microprocessor located on an expansion interface (EI) port circuit pack in an expansion port network (EPN). The EA provides an interface between the EPN and its controlling switch processing element (SPE).

expansion-archangel link (EAL)
A link-access function on the D-channel (LAPD) logical link that exists between a switch processing element (SPE) and an expansion archangel (EA). The EAL carries control messages from the SPE to the EA and to port circuit packs in an expansion port network (EPN).

expansion control cabinet
See **expansion control carrier**.

expansion control carrier
A carrier in a Multi-Carrier Cabinet that contains extra port circuit packs and a maintenance interface. Also called "expansion control cabinet" in a single-carrier cabinet.

expansion interface (EI)
A port circuit pack in a port network (PN) that provides the interface between a PN's time-division multiplex (TDM) bus and packet bus, and a fiber-optic link. The EI carries circuit-switched data, packet-switched data, network control, timing control, and DS1 control. In addition, an EI in an expansion port network (EPN) communicates with the master maintenance circuit pack to provide the EPN's environmental and alarm status to the switch processing element (SPE).

expansion port network (EPN)
A port network (PN) that is connected to the TDM bus and packet bus of a processor port network (PPN). Control is achieved by indirect connection of the EPN to the PPN via a port-network link (PNL). See also **port network**.

extension-in
Extension-In (ExtIn) is the work state agents go into when they answer (receive) a non-ACD call. If the agent is in Manual-In or Auto-In and receives an extension-in call, it is recorded by CMS as an AUX-In call.

extension-out
Extension-Out (ExtOut) is the work state agents go into when they place (originate) a non-ACD call. If the agent is in Manual-In or Auto-In and places an extension-out call, it is recorded by CMS as an AUX-Out call.

external measurements
Refers to those ACD measurements that are made by the External CMS adjunct.

extension number
A 1- to 5-digit number by which calls are routed through a communications system or, with a Uniform Dial Plan (UDP) or main-satellite dialing plan, through a private network. Extension numbers are primarily used for telephones and data terminals but can also be used with specific features.

external call
A connection between a communications system user and a party on the public network or on another communications system in a private network.

F

facility
A general term used for a telecommunications transmission pathway and associated equipment.

facility associated signaling (FAS)
When a D-channel carries the signaling only for those channels on the same physical interface.

feature
A specifically defined function or service provided by the system.

feature button
A labeled button on a telephone or attendant console used to access a specific feature.

fiber optics
A technology using materials that transmit ultrawideband electromagnetic light-frequency ranges for high-capacity carrier systems.

fixed
Fixed is a trunk allocation term. In the fixed allocation scheme, the time slots necessary to support a wideband call are contiguous, and the first time slot is constrained to certain starting points.

flexible
Flexible is a trunk allocation term. The flexible allocation scheme allows the time slots of a wideband call to occupy noncontiguous positions within a single T1 or E1 facility.

floating
Floating is a trunk allocation term. In the floating allocation scheme, the time slots necessary to support a wideband call are contiguous, but the position of the first time slot is not fixed.

foreign exchange (FX)
A central office (CO) other than the one providing local access to the public telephone network.

foreign exchange trunk
A telecommunications channel that directly connects the system to a CO other than its local CO.

foreign numbering-plan area code (FNPAC)
An area code other than the local area code and must be dialed to call outside the local geographical area.

G

generalized route selection (GRS)
An enhancement to Automatic Alternate Routing/Automatic Route Selection (AAR/ARS) that performs routing based on call attributes, such as Bearer Capability Classes (BCCs), in addition to the address and facilities restriction level (FRL), thus facilitating a Uniform Dial Plan (UDP) that is independent of the type of call being placed.

glare
The simultaneous seizure of a two-way trunk by two communications systems, resulting in a standoff.

grade of service
The number of call attempts that fail to receive service immediately. Grade of service is also expressed as the quantity of all calls that are blocked or delayed.

ground-start trunk
A trunk on which, for outgoing calls, the system transmits a request for services to a distant switching system by grounding the trunk ring lead. To receive the digits of the called number, that system grounds the trunk tip lead. When the system detects this ground, the digits are sent.

H

H0
An ISDN information transfer rate for 384 kbps data defined by CCITT and ANSI standards.

H11
An ISDN information transfer rate for 1536 kbps data defined by CCITT and ANSI standards.

H12
An ISDN information transfer rate for 1920 kbps data defined by CCITT and ANSI standards.

handshaking logic
A format used to initiate a data connection between two data module devices.

Hertz (Hz)
A unit of frequency equal to one cycle per second.

high reliability system
A system having the following: two control carriers, duplicate expansion interface (EI) circuit packs in the PPN (in Release 5r with CSS), and duplicate switch node clock circuit packs in the switch node (SN) carriers. See also **duplicated common control**, **duplication**, **duplication option**, and **critical reliability system**.

holding time
The total length of time in minutes and seconds that a facility is used during a call.

home numbering-plan area code
The local area code. The area code does not have to be dialed to call numbers within the local geographical area.

hop
Nondirect communication between two switch communications interfaces (SCI) where the SCI message passes automatically without intermediate processing through one or more intermediate SCIs.

host computer
A computer, connected to a network, that processes data from data-entry devices.

hunt group
A group of extensions that are assigned the Station Hunting feature so that a call to a busy extension will reroute to an idle extension in the group.

I

I2 Interface
A proprietary interface used for the DEFINITY Wireless Business System for the radio controller circuit packs. Each interface provides communication between the radio controller circuit pack and up to two Wireless Fixed Bases.

I3 Interface
A proprietary interface used for the DEFINITY Wireless Business System for the Cell Antenna Units. Each Wireless Fixed Base can communicate to up to four Cell Antenna Units.

immediate-start tie trunk
A trunk on which, after making a connection with a distant switching system for an outgoing call, the system waits a nominal 65 ms before sending the digits of the called number. This allows time for the distant system to prepare to receive digits. On an incoming call, the system has less than 65 ms to prepare to receive the digits.

information exchange
The exchange of data between users of two different systems, such as the switch and a host computer, over a local area network (LAN).

information systems network (ISN)
A wide area network (WAN) and local area network (LAN) with an open architecture combining host computers, minicomputers, word processors, storage devices, PCs, high-speed printers, and nonintelligent terminals into a single packet-switching system.

inside call
A call placed from one telephone to another within the local communications system. A public or private network that provides end-to-end digital communications for all services to which users have access by a limited set of standard multipurpose user-network interfaces defined by the CCITT. Through internationally accepted standard interfaces, ISDN provides digital circuit-switched or packet-switched communications within the network and links to other ISDNs to provide national and international digital communications. See also **Integrated Services Digital Network Basic Rate Interface** and **Integrated Services Digital Network Primary Rate Interface**.

Integrated Services Digital Network Basic Rate Interface (ISDN-BRI)
The interface between a communications system and terminal that includes two 64 kbps B-channels for transmitting voice or data and one 16 kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information. ISDN-BRI also includes 48 kbps for transmitting framing and D-channel contention information, for a total interface speed of 192 kbps. ISDN-BRI serves ISDN terminals and digital terminals fitted with ISDN terminal adapters. See also **Integrated Services Digital Network Primary Rate Interface**.

Integrated Services Digital Network Primary Rate Interface (ISDN-PRI)
The interface between multiple communications systems that in North America includes 24 64 kbps channels, corresponding to the North American digital signal level-1 (DS1) standard rate of 1.544 Mbytes per second.

The most common arrangement of channels in ISDN-PRI is twenty three 64 kbps B-channels for transmitting voice and data and one 64 kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information. Although with non-facility-associated signaling (NFAS), ISDN-PRI can include 24 B-channels and no D-channel. See also **Integrated Services Digital Network**and **Integrated Services Digital Network Basic Rate Interface**.

intercept tone
A tone that indicates a dialing error or denial of the service requested.

interface
A common boundary between two systems or pieces of equipment.

internal call
A connection between two users within a system.

International Tele-communications Union (ITU)
Formerly known as International Telegraph and Telephone Consultative Committee (CCITT), ITU is an international organization that sets universal standards for data communications, including Integrated Services Digital Network (ISDN). ITU members are from telecommunications companies and organizations around the world. See also **BX.25**.

International Telegraph and Telephone Consultative Committee
See **International Telecommunications Union (ITU)**.

interflow
Allows calls to forward to other splits on the same PBX or a different PBX using the Call Forward All Calls switch feature.

intraflow
Allows calls to be redirected to other splits on the same PBX on a conditional or unconditional basis using call coverage "busy," "don't answer," or "all" criteria.

internal measurements
Refers to those BCMS measurements that are made by the system. ACD measurements that are made external to the system (via External CMS) are referred to as external measurements.

in-use lamp
A red light on a multiappearance voice terminal that is illuminated to show which call appearance will be selected when the handset is lifted or which call appearance is active when a user is off-hook.

ISDN Gateway (IG)
A feature allowing integration of the switch and a host-based telemarketing application via a link to a gateway adjunct. The gateway adjunct is a 3B-based product that notifies the host-based telemarketing application of call events.

ISDN trunk
A trunk administered for use with Integrated Services Digital Network primary rate interface (ISDN-PRI). Also called "ISDN facility."

ISDN-PRI Terminal Adapter
A terminal adapter acts as interface between endpoint applications and an ISDN PRI facility. ISDN-PRI terminal adapters are currently available from other vendors and are primarily designed for video conferencing applications. Accordingly, currently available terminal adapters adapt the two pairs of video codec data (V.35) and dialing (RS-366) ports to an ISDN PRI facility.

L

light-emitting diode (LED)
A semiconductor device that produces light when voltage is applied. LEDs provide a visual indication of the operational status of hardware components, the results of maintenance tests, and the alarm status of circuit packs, and the activation of telephone features.

lightwave transceiver
Hardware that provides an interface to fiber-optic cable from port circuit packs and digital signal level-1 (DS1) converter circuit packs. Lightwave transceivers convert electrical signals to light signals and vice versa.

line
A transmission path between a communications system or CO switching system and a voice terminal or other terminal.

line port
The hardware that provides the access point to a communications system for each circuit associated with a telephone and/or data terminal.

link
A transmitter-receiver channel that connects two systems.

link-access procedure on the D-channel (LAPD)
A link-layer protocol on the Integrated Services Digital Network basic rate interface (ISDN-BRI) and primary rate interface (ISDN-PRI) data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D-) channel and for mode-3 data communications on a bearer (B-) channel.

local area network (LAN)
A networking arrangement designed for a limited geographical area. Generally, a LAN is limited in range to a maximum of 6.2 miles and provides high-speed carrier service with low error rates. Common configurations include daisy chain, star (including circuit-switched), ring, and bus.

logical link
The communications path between a processor and a basic rate interface (BRI) terminal.

loop-start trunk
A trunk on which, after establishing a connection with a distant switching system for an outgoing call, the system waits for a signal on the loop formed by the trunk leads before sending the digits of the called number.

M

main distribution frame
This device mounts to the wall inside the system equipment room. The main distribution frame (MDF) provides a connection point from the outside telephone lines, to the PBX switch, and to the inside telephone stations.

main-satellite-tributary
A private network configuration that can either stand alone or access an electronic tandem network (ETN). A "main" switch provides interconnection, via tie trunks, with one or more subtending

switches, called "satellites"; all attendant positions for the main/satellite configuration; and access to and from the public network. To a user outside the complex, a main/satellite configuration appears as one switch, with one listed directory number (LDN). A "tributary" switch is connected to the main switch via tie trunks, but which has its own attendant positions and LDN.

maintenance
The activities involved in keeping a telecommunications system in proper working condition: the detection and isolation of software and hardware faults, and automatic and manual recovery from these faults.

management terminal
The terminal that is used by the system administrator to administer the switch. The terminal may also be used to access the BCMS feature.

major alarm
An indication of a failure that has caused critical degradation of service and requires immediate attention. Major alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, logged to the alarm log, and reported to a remote maintenance facility, if applicable.

manual-in work mode
In this mode, agents automatically enter the ACW mode when they disconnect from an ACD call. However, in order to become available to receive another ACD call, they must then manually enter the Auto-In or Manual-In mode. *See* **Auto-In Work Mode** for a contrast.

memory
A device into which information can be copied and held, and from which the information can be obtained at a later time.

message center
An answering service that supplies agents to and stores messages for later retrieval.

message center agent
A member of a message center hunt group who takes and retrieves messages for voice terminal users.

minor alarm
An indication of a failure that could affect customer service. Minor alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, sent to the alarm log, and reported to a remote maintenance facility, if applicable.

modem
A device that converts digital data signals to analog signals for transmission over telephone circuits. The analog signals are converted back to the original digital data signals by another modem at the other end of the circuit.

modem pooling
A capability that provides shared conversion resources (modems and data modules) for cost-effective access to analog facilities by data terminals. When needed, modem pooling inserts a conversion resource into the path of a data call. Modem pooling serves both outgoing and incoming calls.

modular processor data module (MPDM)
A processor data module (PDM) that can be configured to provide several kinds of interfaces (RS-232C, RS-449, and V.35) to customer-provided data terminal equipment (DTE). See also **processor data module**.

modular trunk data module (MTDM)
A trunk data module that can be configured to provide several kinds of interfaces (RS-232, RS-449, and V.35) to customer-provided data terminal equipment (DTE).

modulator-demodulator
See **modem**.

multiappearance voice terminal
A terminal equipped with several call appearance buttons for the same extension number, allowing the user to handle more than one call, on that same extension number, at the same time.

Multi-Carrier Cabinet
A structure that holds one to five carriers. See also **Single-Carrier Cabinet**.

Multi-Frequency Compelled (MFC), Release 2 (R2) signalling
A signal consisting of two frequency components, such that when a signal is transmitted from a switch, another signal acknowledging the transmitted signal is received by the switch. "R2" designates signaling used in the United and countries outside the United States.

multiplexer
A device used to combine a number of individual channels into a single common bit stream for transmission.

multiplexing
A process whereby a transmission facility is divided into two or more channels, either by splitting the frequency band into a number of narrower bands or by dividing the transmission channel into successive time slots. See also **time-division multiplexing**.

multi-rate
Multi-rate refers to the new N x DS0 service (see N x DS0).

N

N+1
The method of determining redundant backup requirements. For example, if four rectifier modules are required for a DC-powered Single-Carrier Cabinet, a fifth rectifier module is installed for backup.

N x DS0
N x DS0, equivalently referred to as N x 64 kbps, is an emerging standard for wideband calls separate from H0, H11, and H12 ISDN channels. The emerging N x DS0 ISDN multirate circuit mode bearer service will provide circuit-switched calls with data rate multiples of 64 kbps up to 1536 kbps on a T1 facility or up to 1920 kbps on an E1 facility. In the switch, N x DS0 channels will range up to 1984 kbps using NFAS E1 interfaces.

narrowband
A circuit-switched call at a data rate up to and including 64 kbps. All nonwideband switch calls are considered narrowband.

Non-Facility Associated Signaling (NFAS)
A method that allows multiple T1 and/or E1 facilities to share a single D-channel to form an Integrated Services Digital Network primary rate interface (ISDN PRI). If D-Channel Backup is not used, one facility is configured with a D-channel, while the other facilities that share the D-channel are configured without D-channels. If D-Channel Backup is used, two facilities are configured to

have D-channels (one D-channel on each facility), while the other facilities that share the D-channels are configured without D-channels.

On every facility, all DS0s that are not D-channels are available as B-channels. Therefore, a T1 facility without a D-channel has 24 B-channels, and an E1 facility without a D-channel has 31 B-channels.

network
A series of points, nodes, or stations connected by communications channels.

network-specific facility (NSF)
An information element in an ISDN-PRI message that specifies which public-network service is used. NSF applies only when Call-by-Call Service Selection is used to access a public-network service.

network interface
A common boundary between two systems in an interconnected group of systems.

node
A switching or control point for a network. Nodes are either "tandem" (they receive signals and pass them on) or "terminal" (they originate or terminate a transmission path).

O

offered load
The traffic that would be generated by all the requests for service occurring within a monitored interval, usually one hour.

othersplit
The Work State that indicates the agent is currently active on another split's call, or in ACW for another split.

P

packet
A group of bits (including a message element, which is the data, and a control information element (IE), which is the header) used in packet switching and transmitted as a discrete unit. In each packet, the message element and control IE are arranged in a specified format. See also **packet bus** and **packet switching**.

packet bus
A wide-bandwidth bus that transmits packets.

packet switching
A data-transmission technique whereby user information is segmented and routed in discrete data envelopes called "packets," each with its own appended control information, for routing, sequencing, and error checking. Packet switching allows a channel to be occupied only during the transmission of a packet; on completion of the transmission, the channel is made available for the transfer of other packets. See also **BX.25** and **packet**.

paging trunk
A telecommunications channel used to access an amplifier for loudspeaker paging.

party/extension active on call
A party is on the call if it is actually connected to the call (in active talk or in held state). An originator of a call is always a party on the call. Alerting parties, busy parties, and tones are not parties on the call.

PCOL
Personal Central Office Line.

primary extension
The main extension associated with the physical station set.

principal
A station that has its primary extension bridged on one or more other stations.

personal computer (PC)
A personally controllable microcomputer.

pickup group
A group of individuals authorized to answer any call directed to an extension number within the group.

port
A data- or voice-transmission access point on a device that is used for communicating with other devices.

port carrier
A carrier in a Multi-Carrier Cabinet or a single-carrier cabinet containing port circuit packs, power units, and service circuits. Also called a "port cabinet" in a single carrier cabinet.

port network (PN)
A cabinet containing a TDM bus and packet bus to which the following components are connected: port circuit packs, one or two tone-clock circuit packs, a maintenance circuit pack, service circuit packs, and (optionally) up to four expansion interface (EI) circuit packs in Release 5. Each PN is controlled either locally or remotely by a switch processing element (SPE). See also **expansion port network** and **processor port network**.

port-network connectivity
The interconnection of port networks (PNs), regardless of whether the configuration uses direct or switched connectivity.

Primary Rate Interface (PRI)
A standard Integrated Services Digital Network (ISDN) frame format that specifies the protocol used between two or more communications systems. PRI runs at 1.544 Mbps and, as used in North America, provides 23 64 kbps B-channels (voice or data) and one 64 kbps D-channel (signaling). The D-channel is the 24th channel of the interface and contains multiplexed signaling information for the other 23 channels.

PRI endpoint (PE)
The wideband switching capability introduces PRI Endpoints on switch line-side interfaces. A PRI endpoint consists of one or more contiguous B-channels on a line-side T1 or E1 ISDN PRI facility and has an extension number. Endpoint applications have call control capabilities over PRI endpoints.

principal (user)
A person to whom a telephone is assigned and who has message center coverage.

private network
A network used exclusively for the telecommunications needs of a particular customer.

private network office code (RNX)
The first three digits of a 7-digit private network number. These codes are numbered 220 through 999, excluding any codes that have a 0 or 1 as the second digit.

processor carrier
A phrase used for "control carrier." See also **control carrier**.

processor data module (PDM)
A device that provides an RS-232C data communications equipment (DCE) interface for connecting to data terminals, applications processors (APs), and host computers and provides a digital communications protocol (DCP) interface for connection to a communications system. See also **modular processor data module**.

processor port network (PPN)
A port network (PN) controlled by a switch processing element (SPE) that is directly connected to that PN's time-division multiplex (TDM) bus and local area network (LAN) bus. See also **port network**.

processor port network (PPN) control carrier
A carrier containing the maintenance circuit pack, tone/clock circuit pack, and switch processing element (SPE) circuit packs for a processor port network (PPN) and, optionally, port circuit packs.

Property Management System (PMS)
A stand-alone computer used by lodging and health services organizations use for services such as reservations, housekeeping, and billing.

protocol
A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

public network
The network that can be openly accessed by all customers for local or long-distance calling.

pulse-code modulation (PCM)
An extension of pulse-amplitude modulation (PAM) in which carrier-signal pulses modulated by an analog signal, such as speech, are quantized and encoded to a digital, usually binary, format.

Q

quadrant
A quadrant is a group of six contiguous DS0s in fixed locations on an ISDN PRI facility. Note that this term comes from T1 terminology (one-fourth of a T1), but there are five quadrants on an E1 ISDN PRI facility (30B + D).

A quadrant is considered available or idle when all six contiguous DS0s are idle. Otherwise, the quadrant is considered contaminated or partially contaminated. This is a dynamic condition; quadrants become idle and contaminated as calls are placed and dropped. Note that a T1 facility containing the primary or backup D-channel (23B + D) has a maximum of three idle quadrants. The fourth quadrant (DS0s 19-24) never has six contiguous idle DS0s because one is always allocated to the D-channel. On an E1 facility, channel 0 is reserved for framing and synchronization, and channel 16 contains the D-channel when present, but five quadrants are potentially available.

queue
An ordered sequence of calls waiting to be processed.

queuing
The process of holding calls in order of their arrival to await connection to an attendant, to an answering group, or to an idle trunk. Calls are automatically connected in first-in, first-out sequence.

R

random access memory (RAM)
A storage arrangement whereby information can be retrieved at a speed independent of the location of the stored information.

read-only memory (ROM)
A storage arrangement primarily for information retrieval applications.

recall dial tone
Tones signalling that the system has completed a function (such as holding a call) and is ready to accept dialing.

redirection criteria
The information administered for each voice terminal's coverage path that determines when an incoming call is redirected to coverage.

redirection on no answer
An optional feature that redirects an unanswered ringing ACD call after an administered number of rings. The call is then redirected back to the agent.

remote home numbering-plan area code (RHNPA)
A foreign numbering-plan area code that is treated as a home area code by the Automatic Route Selection (ARS) feature. Calls can be allowed or denied based on the area code and the dialed central office (CO) code rather than just the area code. If the call is allowed, the ARS pattern used for the call is determined by these six digits.

reorder tone
A tone to signal that at least one of the facilities, such as a trunk or a digit transmitter, needed for the call was not available at the time the call was placed.

report scheduler
Software that is used in conjunction with the system printer for the purpose of scheduling the days of the week and time of day that the desired reports are to be printed.

RS-232C
A physical interface specified by the Electronic Industries Association (EIA). RS-232C transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet.

ROSE
Remote Operations Service Element is a CCITT and ISO standard that defines a notation and services that support interactions between the various entities that make up a distributed application.

S

sanity and control interface (SAKI)
A custom, very-large-scale-integration (VLSI) microchip located on each port circuit pack. The SAKI provides address recognition, buffering, and synchronization between the angel and the five control time slots that make up the control channel. The SAKI also scans and collects status information for the angel on its port circuit pack and, when polled, transmits this information to the archangel.

simplex system
A system that has no redundant hardware.

simulated bridged appearance
The same as a **temporary bridged appearance**, allows the station user (usually the principal) the ability to bridge onto a call which had been answered by another party on its behalf.

single-carrier cabinet
A combined cabinet and carrier unit that contains one carrier. See also **Multi-Carrier Cabinet**.

single-line voice terminal
A voice terminal served by a single-line tip and ring circuit (models 500, 2500, 7101A, 7103A).

small computer system interface (SCSI)
An ANSI bus standard that provides a high-level command interface between host computers and peripheral devices.

software
A set of computer programs that perform one or more tasks.

split
A condition whereby a caller is temporarily separated from a connection with an attendant. A split condition automatically occurs when the attendant, active on a call, presses the start button.

split number
The split's identity to the switch and BCMS.

split report
Provides historical traffic information for internally measured splits.

split (agent) status report
Provides the real-time status and measurement data for internally measured agents and the split to which they are assigned.

staffed
Indicates an agent position is logged-in. A staffed agent will be functioning in one of four work modes: Auto-In, Manual-In, ACW, or AUX-work.

Station Message Detail Recording (SMDR)
An obsolete term now called "CDR" (see call detail recording), which is a switch feature that utilizes software and hardware to record call data.

standard serial interface (SSI)
A communications protocol developed for use with the 500-type business communications terminals (BCTs) and the 400-series printers.

status lamp
A green light that shows the status of a call appearance or a feature button by the state of the light (lit, flashing, fluttering, broken flutter, or unlit).

stroke counts
A method used by Automatic Call Distribution (ACD) agents to record up to nine customer-defined events per call when the Call Management System (CMS) is active.

switch
Any kind of telephone switching system. See also **communications system**.

switchhook
The buttons located under the receiver on a voice terminal.

switch node (SN) carrier
A carrier containing a single switch node, power units, and, optionally, one or two digital signal level-1 (DS1) converter circuit packs. An SN carrier is located in a center stage switch (CSS).

switch node (SN) clock
The circuit pack in a switch node (SN) carrier that provides clock and maintenance alarm functions and environmental monitors for an SN.

switch node interface (SNI)
The basic building block of a switch node. An SNI circuit pack controls the routing of circuit, packet, and control messages.

switch node link (SNL)
The hardware that provides a bridge between two or more switch nodes. The SNL consists of the two switch node interface (SNI) circuit packs residing on the switch nodes and the hardware connecting the SNIs. This hardware can include lightwave transceivers that convert the SNI's electrical signals to light signals, the copper wire that connects the SNIs to the lightwave transceivers, a full-duplex fiber-optic cable, digital signal level-1 (DS1) converter circuit cards and DS1 facilities if a company does not have rights to lay cable, and appropriate connectors.

switch processing element (SPE)
A complex of circuit packs (processor, memory, disk controller, and bus-interface cards) mounted in a processor-port-network (PPN) control carrier. The SPE serves as the control element for that PPN and, optionally, for one or more expansion port networks (EPNs).

synchronous data transmission
A method of sending data in which discrete signal elements are sent at a fixed and continuous rate and specified times.

system administrator
The person who maintains overall customer responsibility for system administration. Generally, all administration functions are performed from the Management Terminal. The switch requires a special login, referred to as the system administrator login, in order to gain access to the system administration capabilities.

system printer
An optional printer that may be used to print scheduled reports via the report scheduler.

system report
Provides historical traffic information for all internally measured splits.

system status report
Provide real-time status information for internally measured splits.

system manager
A person responsible for specifying and administering features and services for a system.

system reload
A process that allows stored data to be written from a tape into the system memory (normally after a power outage).

T

T1
A digital transmission standard that in North America carries traffic at the digital signal level-1 (DS1) rate of 1.544 Mbps. A T1 facility is divided into 24 channels (DS0s) of 64 kbps information numbered from 1 to 24. These 24 channels, with an overall digital rate of 1.536 Mbps, and an 8 kbps framing and synchronization channel make up the 1.544 Mbps transmission. When a D-channel is present, it occupies channel 24.

T1 facilities are also used in Japan and some Middle-Eastern countries.

TAC
Trunk Access Code.

tandem switch
A switch within an electronic tandem network (ETN) that provides the logic to determine the best route for a network call, possibly modifies the digits outpulsed, and allows or denies certain calls to certain users.

tandem through
The switched connection of an incoming trunk to an outgoing trunk without human intervention.

tandem tie-trunk network
A private network that interconnects several customer switching systems by dial-

TEG
Terminating Extension Group.

terminal
A device that sends and receives data within a system. See also **administration terminal**.

tie trunk
A telecommunications channel that directly connects two private switching systems.

time-division multiplex (TDM) bus
A bus that is time-shared regularly by preallocating short time slots to each transmitter. In a PBX, all port circuits are connected to the TDM bus, permitting any port to send a signal to any other port.

time-division multiplexing (TDM)
Multiplexing that divides a transmission channel into successive time slots. See also **multiplexing**.

time interval
The period of time, either one hour or one-half hour, that BCMS measurements are collected for a report(s).

time slice
See **time interval**.

time slot
A time slot refers to 64 kbps of digital information structured as eight bits every 125 micro-seconds. In the switch, a time slot refers to either a DS0 on a T1 or E1 facility or a 64 kbps unit on the TDM bus or fiber connection between port networks.

time slot sequence integrity
Time slot sequence integrity means that the "N" octets of a wideband call that are transmitted in one T1 or E1 frame arrive at the output in the same order that they were introduced.

to control
To control means that an application can invoke Third Party Call Control capabilities using either an adjunct-control or a domain-control association.

to monitor
To monitor means that an application can receive *Event_Reports* on either an active-notification, adjunct-control, or a domain-control association.

tone ringer
A device with a speaker, used in electronic voice terminals to alert the user.

trunk
A dedicated telecommunications channel between two communications systems or central offices (COs).

trunk allocation
The manner in which trunks are selected to form wideband channels.

trunk data module
A device that provides the interface for connection between off-premises private-line trunk facilities and a Release 5 system. The trunk data module provides conversion between the RS-232C and the Digital Communications Protocol (DCP), and can connect to direct distance dialing (DDD) modems as the DCP member of a modem pool.

trunk group
Telecommunications channels assigned as a group for certain functions that can be used interchangeably between two communications systems or central offices (COs).

U

uniform dial plan
A feature that allows a unique 4- or 5-digit number assignment for each terminal in a multiswitch configuration such as a distributed communications system (DCS) or main-satellite-tributary system.

V

vector directory number (VDN)
An extension that provides access to the Vectoring feature on the switch. Vectoring allows a customer to specify the treatment of incoming calls based on the dialed number.

vector-controlled split
A hunt group or ACD split administered with the "vector" field enabled. Access to such split is only possible by dialing a VDN extension. Vector-Controlled Splits cannot be Active Notification Domains.

voice terminal
A single-line or multiappearance telephone.

W

wide area telecommunications service (WATS)
A service in the USA that allows calls to a certain area or areas for a flat-rate charge based on expected usage.

wideband
A circuit-switched call at a data rate greater than 64 kbps. A circuit-switched call on a single T1 or E1 facility with a bandwidth between 128 and 1536 (T1) or 1984 (E1) kbps in multiples of 64 kbps. H0, H11, H12, and N x DS0 calls are all wideband.

wideband access endpoint
The wideband switching capability extends Access Endpoints to include wideband access endpoints. A wideband access endpoint consists of one or more contiguous DS0s on a line-side T1 or E1 facility and has an extension number. The Administered Connections feature provides call control for calls originating from wideband access endpoints.

wink-start tie trunk
A trunk with which, after making a connection with a distant switching system for an outgoing call, the system waits for a momentary signal (wink) before sending the digits of the called number. Similarly, on an incoming call, the system sends the wink signal when ready to receive digits.

work modes (or ACD work modes)
A work mode is one of four states (Auto-In, Manual-In, ACW, AUX-work) that an ACD agent enters after logging in. Immediately upon logging in, an agent enters the AUX-work mode. To become available to receive ACD calls, the agent enters either the Auto-In or Manual-In work modes. To do work associated with an ACD call, at the conclusion of the call, an agent enters the ACW mode. If an agent changes work modes while handling a call, the change becomes effective when the agent finishes the call. The system does not recognize the change until the call is completed.

To answer an ACD call, the ACD agent must specify a work mode. Generally, two methods are available: (1) by pressing the appropriate button on their voice terminal, and (2) by dialing an access code. An agent can change work modes while handling a call, but the system will not recognize the change until the call is completed. It is important that the ACD agents always accurately indicate their correct work mode, otherwise the BCMS measurements will not be accurate.

work state
An ACD agent may be a member of up to three different splits. Each ACD agent continuously exhibits a work state for every split that it is a member of. Valid work states are Avail, Unstaffed, AUX-work, ACW, ACD (answering an ACD call), ExtIn, ExtOut, and OtherSpl. An agent’s work state for a particular split may change for a variety of reasons (for example, whenever a call is answered, abandoned, the agent changes work modes, and so forth). The BCMS feature monitors the work states and uses this information to provide the BCMS reports.

write operation
The process of putting information onto a storage medium, such as a hard disk.

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