Lucent Technologies
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DEFINITY Generic 2 and System 85

Installation, Vol. 1

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Notice

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

Remote Access Feature: Security Considerations

AT&T has designed the Remote Access Feature incorporated in this product that, when properly administered by the customer, will enable the customer to minimize the ability of unauthorized persons to gain access to the network. It is the customer's responsibility to take the appropriate steps to properly implement the features, evaluate and administer the various restriction levels, protect access codes, and distribute them only to individuals who have been advised of the sensitive nature of the access information. Each authorized user should be instructed concerning the proper use and handling of access codes.

In rare instances, unauthorized individuals make connections to the telecommunications network through use of remote access features. In such event, applicable tariffs require that the customer pay all network charges for traffic. AT&T cannot be responsible for such charges, and will not make any allowance or give any credit for charges that result from unauthorized access.

FCC Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

Trademarks

DEFINITY is a trademark of AT&T. In this document, DEFINITY Communications System Generic 2 is often abbreviated to DEFINITY Generic 2 or Generic 2. Other trademarked terms may appear in this document as well. They are marked on first usage.

Ordering Information

The ordering number for this document is 555-104-104, Vol 1 and Vol 2. To order this document, call the AT&T Customer Information Center at 1-800-432-6600 (in Canada, 1-800-255-1242). For more information about AT&T documents, refer to the *Business Communications Systems Publications Catalog* (555-000-010).

Comments

To comment on this document, return the enclosed comment card.

Prepared by
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Denver, Colorado

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This document contains instructions for installing AT&T DEFINITY™ Communications System Generic 2 and AT&T System 85 cabinets and hardware components.

DEFINITY is a trademark of AT&T. In this document, DEFINITY Communications System Generic 2 is often abbreviated to DEFINITY Generic 2 or Generic 2. In tables and artwork, it is abbreviated to G2.

It is recommended that you become familiar with the content and organization of the document before starting. Due to the numerous changes in System 85 information, and the new information for DEFINITY Generic 2, it is recommended that you review the entire document before your next installation.

This document is primarily intended for use by personnel trained in the installation and connection of telephone switching equipment. It requires (and assumes) that you have the Customer System Document (CSD) and are familiar with its contents. The CSD identifies the equipment and cabling which will be installed as part of your system. This will enable you to identify in this document the installation and connection information which applies to your system.

HOW TO USE THIS DOCUMENT

This document provides a start-to-finish sequence to the installation process. Arranged into chapters, the book's organization permits several tasks to be accomplished at the same time if more than one person is working on the job. For example, one can install the cross-connect field components while another works on the cabinets.

Chapters have icons under the center lines at the bottom of oddnumbered pages to assist you in identifying the system the chapters are for. Below are the icons and explanations for their use.

(DEF/S85)	This icon is used to denote chapters that apply to DEFINITY Generic 2 and System 85
(S85)	This icon is used to denote chapters that only apply to System 85
(DEF)	This icon is used to denote chapters that only apply to DEFINITY Generic 2

Block diagrams, wiring tables, and line drawings of equipment units are used extensively to describe and illustrate the interfacing of system components. Text is limited to describing portions of the installation that are not given in pictorial format such as descriptions of systems options, cautions and warnings, and power and grounding requirements.

DOCUMENT ORGANIZATION

The installation document is organized into sections, with information in each section divided into chapters. Each chapter covers a major work area. The chapters are arranged within the document in a suggested installation sequence. This sequence may be revised as needed by individual job requirements. The sections and chapters of the document and the work areas covered are:

SECTION I: General Installation Information — The information in this section applies to both System 85 and DEFINITY Generic 2.

1. *System Information* — This chapter discusses the organization of information for both types of systems within this document. It lists all new DEFINITY Generic 2 and System 85 hardware and indexes each new hardware element to the chapters in which its installation is explained.
2. *Getting Started* — This chapter contains information on tools and test equipment required and describes use of the CSD. It also contains a list of the steps performed in a typical installation.
3. *Floor Plans* — This chapter contains general information for use in site preparation. This part of the document will serve as a guide as to what should be provided in the system floor plan.
4. *Cross-Connect Field* — This chapter contains information on the layout, assembly, and designation of the 110-type connecting blocks used for the main wall-mounted cross-connect field.
5. *Cabinet Installalion* — This chapter contains instructions on unpacking, locating, and installing the cabinets.
6. *Cable Ductwork* — This chapter describes the components and assembly of the overhead cable duct hardware between the switch cabinets and the wall cross-connect field.

SECTION II: Installing System 85 — The following chapters contain information that is specific only to System 85:

- Chapters 7 through 14
- Chapters 16 and 17

The following chapters contain information that applies to DEFINITY Generic 2 and System 85:

- Chapter 15
- Chapter 18

7. *AC Power Distribution* — This chapter contains requirements and wiring diagrams of the distribution of AC power to the various switch cabinets and components. The information in this chapter only applies to System 85.
8. *AC System Grounding* — This chapter describes the single-point grounding system required for the switch cabinets for AC systems. Requirements for the various grounding methods and diagrams of the ground lead connections are shown. The information in this chapter only applies to System 85.
9. *DC Power and Grounding* — This chapter contains wiring diagrams of the distribution of DC power and grounding to the various switch cabinets. It also covers the DC power alarm connections and the AC distribution for auxiliary equipment and an application processor (AP) if provided. The information in this chapter only applies to System 85.
10. *I/O Cables* — This chapter describes the 25-pair shielded cables from the switch cabinets to the wall cross-connect field. Connections for the various circuit packs in the cabinets are described. The information in this chapter only applies to System 85.
11. *Intra/Intercabinet Cabling* — This chapter describes the interconnection of the various cabinets. Fiber optic, flat-ribbon, and triaxial cables, as well as 25-pair shielded cables and loose wiring

28. *Circuit Pack Data* — This chapter contains information on the various circuit packs associated with the system. Option switch settings and option descriptions are also included.

29. *Power- Up Sequence* — This chapter describes the power up procedure for both AC and DC powered systems.

SECTION IV: Installing Aux/Data Equipment — This section contains information on auxiliary and data cabinets. This information applies to both DEFINITY Generic 2 and System 85.

30. *AUX and Data Equipment* — This chapter describes the connection and installation of a variety of peripheral and auxiliary hardware.

31. *Transmission Equipment* — This chapter describes how to install digital transmission terminal products.

32. *Data Equipment* — This chapter describes the installation of data interface and terminal equipment.

Also included are three reference sections to make using this document easier. These sections are:

- *Abbreviations*
- *Glossary*
- *lndex*

RELATED DOCUMENTS

This document is one of a series of documents used to install, test, administer, and maintain a DEFINITY Generic 2 and System 85. Other documents in this series are:

X-Ray Test (R2V1)	555-101-105
X-Ray Test (R2V2)	555-101-114
X-Ray Test (R2V3)	555-102-105
X-Ray Test (R2V4)	555-103-105
X-Ray Test (DEFINITY Generic 2)	555-104-105
Feature Translations (R2V1 and V2)	555-101-107
Feature Translations (R2V3)	555-102-107
Feature Translations (R2V4)	555-103-107
System Management - Vol. I, II, III (DEFINITY Generic 2)	555- l04-506/7/8
Maintenance (R2V1 and V2)	555-101-108
Maintenance (R2V3)	555-102-108
Maintenance (R2V4)	555-103-108
System Maintenance - Vol. I, II (DEFINITY Generic 2)	555-104-117/8
System Test	555-103-109
System Test (DEFINITY Generic 2)	555-104-109
DEFINITY™ Communications System Generic 2 and System 85 Upgrades	555-104-111
DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies	555-104-118
DEFINITY™ Communications System Generic 2 and System 85 Grounding, Exposure, and Protection Checklist	555-104-120

Many sites may require an auxiliary, data, or adjunct processor cabinet. Installers at these sites should refer to the following documentation:

3B5 AP Installation, Administration, and Acceptance Test Service Manual	585-210-101
DEFINITY™ Communications System Generic 2 and System 85 Equipment Room Floor Plans and Specifications	555-104-603
AP 16 Installation, Administration, and Acceptance Test Service Manual	585-201-106
AT&T 3B2 Messaging Server installation and Maintenance Guide	585-205-110
AUDIX-L Enhanced Installation Manual	585-300-101
AUDIX-M Enhanced Installation Manual	585-300-103

1. SYSTEM INFORMATION

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INSTALLING DEFINITY GENERIC 2 1-2
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GENERAL INFORMATION

This chapter provides information on the sequence for installing AT&T DEFINITY Communications System Generic 2 and AT&T System 85, as well as information on the changes between the two systems.

Nonsystem upgrades of System 85 are covered in *DEFINITY™ Communications System Generic 2 and System 85 Upgrades* (555-104-111).

For information on the changes in this book, descriptions of the chapter contents, and related documents, see *About This Document.*

Information on the icons that appear in the center bottom of the page is contained in *About This Document.* Reading that section will make your use of this book much easier.

INSTALLING SYSTEM 85

The installation of System 85 R2V1-V4 cabinets and associated hardware is covered in sections I and II of this document.

Information in section I applies to both DEFINITY Generic 2 and System 85.

All of the information in section II applies to System 85. Chapters 15 and 18 of section II also apply to DEFINITY Generic 2.

If auxiliary and data equipment arc to be installed, then you must also refer to the appropriate chapters within section IV of this document.

System upgrade information that allows you to upgrade a System 85 to a DEFINITY Generic 2 is covered in chapter 19 of section II. If part of the System 85 needs to be removed as part of the upgrade, refer to chapter 20 of section II. Both of these chapters arc incomplete at the time of this printing and will be provided in the future.

If other information from the DEFINITY Generic 2 section of this document is needed for a system upgrade, you are referred to the specific chapter where the information is provided.

INSTALLING DEFINITY GENERIC 2

The installation of DEFINITY Generic 2 is covered in sections I, II, and III of this document.

All of the chapters in section I are used in DEFINITY Generic 2 installations. They also apply to System 85.

Only two of the chapters in section II, chapters 15 and 18, apply to DEFINITY Generic 2. The remaining chapters in section II only apply to System 85.

All of the chapters in section III apply to DEFINITY Generic 2 installations and do not apply to System 85.

The DEFINITY Generic 2 consists of the following components:

- Universal module control (UMC) cabinet
- Common control (CC)/time multiplexed switch (TMS) cabinet
- AUX/data cabinet (when necessary)

It may also include the following System 85 cabinets:

- CC cabinet
- TMS cabinet
- Traditional module control (MC) cabinet
- Traditional port cabinet (when necessary)

AUXILIARY AND DATA CABINETS

Auxiliary and data cabinet information for both DEFINITY Generic 2 and System 85 is provided in section IV of this document.

CHANGES FROM SYSTEM 85 TO DEFINITY GENERIC 2

Changes in System 85 as part of the migration to the DEFINITY Generic 2 product include the following:

- CC upgrade
- CC/TMS cabinet addition
- UMC cabinet addition
- Other changes, including:
  - — Power-up sequence
  - — Intercabinet cabling
  - — Attendant console revisions

These changes are summarized below. In addition, the chapters describing these changes are provided where appropriate.

CC Upgrade

The changes in the CC arc designed to upgrade an existing System 85 to a DEFINITY Generic 2, without having to add other DEFINITY Generic 2 hardware. This is considered a nonsystem upgrade. These procedures are provided in the *DEFINITY™ Communications System Generic 2 and System 85 Upgrades* (555-104-111).

CC/TMS Cabinet Addition

This change consists of the removal of traditional CC and TMS cabinets and their replacement with the CC/TNS cabinet. This would normally be done only when space problems occur with system growth. Information on the CC/TMS cabinet is found in chapter 22. Cabling within the CC/TMS cabinet is the same as for traditional CC and TMS cabinets Removal of the traditional CC and TMS cabinets are covered in section II, chapter 20, of this document.

UMC Cabinet Addition

This change consists of the addition of the UMC cabinet containing the UMC carrier(s) and common port carrier(s). Other changes that affect the UMC cabinets are:

- Grounding
- Input/output (I/O) Cables
- UMC cabling for remote arrangements
- Intercabinet cabling for central locations

Other Changes

The other changes described in this manual fall into four major categories. These categories are:

- DEFINITY Generic 2 Power-up sequence (described in chapter 29)
- DEFINITY Generic 2 Attendant consoles (local and remote) (described in chapter 27)
- New 4-MHz and fiber-optic cables and paddleboards for traditional modules in central locations (described in chapter 11)
- New 4-MHz and fiber-optic cables and paddleboards for traditional modules in remote arrangements (described in chapter 12)

2. GETTING STARTED

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INSTALLATION AND TEST STEPS 2-3

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GENERAL

Survey the designated area in which the AT&T System 85 components will be located to familiarize yourself with the proposed arrangement of the cabinets and adjuncts. Use the floor plan provided with your system and the CSD to visualize the installation and verify that any customer-provided equipment, such as AC power sources, are in place. The typical floor plans in chapter 3 can be used to identify customer-provided and installed equipment.

Special precautions must be taken if the AT&T System 85 is being installed in a building under construction. Refer to *DEFINITY Communications System Generic 2 and System 85, Equipment Room Floor Plans and Specifications* (AT&T 555-103-603) for this information.

INVENTORY

Using the hardware CSD equipment list, OPS order, and PEC explosion document, inventory the materials at the job site to identify any missing components. Make arrangements to obtain any missing items.

The X-Ray test procedures are in service manual AT&T SYSTEM 85, X-RAY TESTS (AT&T 555-103-108) furnished with the X-Ray tape for System 85. Use *DEFINITY Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) for DEFINITY Generic 2. If X-Ray tests will be run on your switch, be sure the tape and document are available.

INSTALLATION TOOLS AND EQUIPMENT

In addition to standard installation tools, installers should have on hand the special tools and equipment listed in table 2-1. Ready access to these items will produce quick, efficient completion of each phase of installation.

TABLE 2-1. Tools and Test Equipment Inventory

TASKS	EQUIPMENT REQUIRED	RECOMMENDED TYPE
Unpacking Cabinets	Utility Knife	NA
	Adjustable Wrench	6- or 8-inches
	Ratchet	1/2-inch drive
	Sockets	5/16- and 9/16-inch
	Socket Extension	6 inch
	Pinch Bar	3- feet
Installing Cabinets and Earthquake Mounting	Electric Drill	l/2-inch impact type
	Masonry Bit	l/2-inch
	Drill Bit (For Wood Floors Only)	l/4-inch
	Carpenter's Level	30-inches or longer
	Chalk Line	NA
	Measuring Tape	30-inches or longer
	Adjustable Wrench	6- or 8-inches
	Ratchet	l/2-inch drive
	Sockets	5/16- and 9/16-inch
	Drill Bit	9/16-inch masonry
	Torque Wrench	l/2-inch drive
Install Cable Ducts	Adjustable Wrench	6- or 8-inches
	Screwdrivers	8- and 18-inch flat blade
	Nutdrivers	3/8- and 5/16-inches
Final Cabinet Installation	Off-Set Screwdriver	Flat blade
System Test - SYSTEM 85	MAAP	NA
System Test - Generic 2	Manager II	PC 6286 WGS
Power Test - SYSTEM 85	Digital Multimeter	KS-20599 or equivalent
Power Test - UMC Cab.	Voltage Test Circuit Pack	TN2036
Battery Plant Voltage Checks (System 85 and Generic 2)	Digital Multimeter	Fluke 8060A*
Cutdown of 110-Type Hardwire	Single-Pair Insertion/Cutoff tool	788D or equivalent

* This meter is required, not recommended for battery plant checks.

INSTALLATION AND TEST STEPS

This procedure lists the steps and the chapters where the procedure is covered. Where there are two chapters listed, the first applies to System 85 cabinets and the second chapter applies to DEFINITY Generic 2 cabinets. If there is only one chapter listed, it applies to both System 85 and DEFINITY cabinets.

Switch Cabinets and Power Installation

I. Switch cabinets

1. Unpack and position cabinets (including auxiliary cabinet): chapter 5
2. Inventory system hardware CSD vs. shipment
3. Install cable ducts, ladder-work: chapter 6
4. Connect intracabinet, intercabinet, and load center: chapters 11 and 25
5. Install 25 pair connector cables and wall field: chapters 10 and 25
6. Install cable supports and secure cabling
7. Install and connect attendant consoles: chapters 14 and 27
8. Install remote modules: chapters 12 and 26

II. Power Installation for AC Systems

1. Install AC nonfusible disconnect, protector cabinet, and load center: chapters 7 and 23
2. Install AC power cabling: chapters 7 and 23
3. AC distribution panel: chapters 7 and 23
4. Connect system ground: chapters 8 and 23

III. Power Installation for DC Systems

1. Install the DCSPS or UPS: chapters 9 and 24
2. Install the DC power and ground wires: chapters 9 and 24
3. Connect system ground: chapters 9 and 24

Initialization and Acceptance Testing

I. Test and Accept

1. Make visual inspection and apply power to system: chapters 16 and 29
2. Test power system, record 5V/-48V rectifier output voltages on log-compare-retain log for future maintenance: chapters 16 and 29
3. Perform system microdiagnostic tests 0 through 8 only: *DEFINITY Communications System Generic 2 Maintenance Repair Strategies* (AT&T 555-104-118)
4. Establish RMATS data link: chapter 30
5. Perform X-Ray test: AT&T 555-101-105 (R2V1), AT&T 555-101-114 (R2V2), AT&T 555-102-105 (R2V3), AT&T 555-103-105 (R2V4), AT&T 555-104-105 (Generic 2)
6. Install and load system program tape: *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (AT&T 555-l04-118)
7. Examine software failure history record and solve trouble before clearing PMIBs log

8. Clear all software failure history records in the PMIBs log of System 85: AT&T 555-101-108 (R2V1 or V2), AT&T 555-102-108 (R2V3), AT&T 555-103-108 (R2V4), AT&T 555-104- 117/8/9 (Generic 2)

II. Operation Verification and Installation Wrap-up

1. Check for trunk dial tone at all trunk packs using 249A adapter and 1013 handset. Attach lead for ground start (possible 2 persons)

2. Connect telephone set to a station using C test cord at cross-connect field; check station for dial tone (one per line port pack)

3. Connect telephone set to a station connection using C test cord at cross-connect field and dial each console once, from each line carrier equipped cabinet in each module and then from each console dial back to the station (one per port carrier)

4. Test features applicable to system: AT&T 555-101-109 (R2V1, V2), AT&T 555-102-109 (R2V3), or AT&T 555-103-109 (R2V4), AT&T 555-104-109 (Generic 2)

5. Store records, install cable duct covers, rear panels (System 85 only), and front doors

3. FLOOR PLANS AND WORK SPACE

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Typical Floor Plan for Confined Equipment Room with Two Rows of Cabinets 3-3

NOTE

See chapter 2 of the *DEFINITY Communications System Generic 2 and System 85 Equipment Room Floor Plans and Specifications* (555-104-603) for further details.

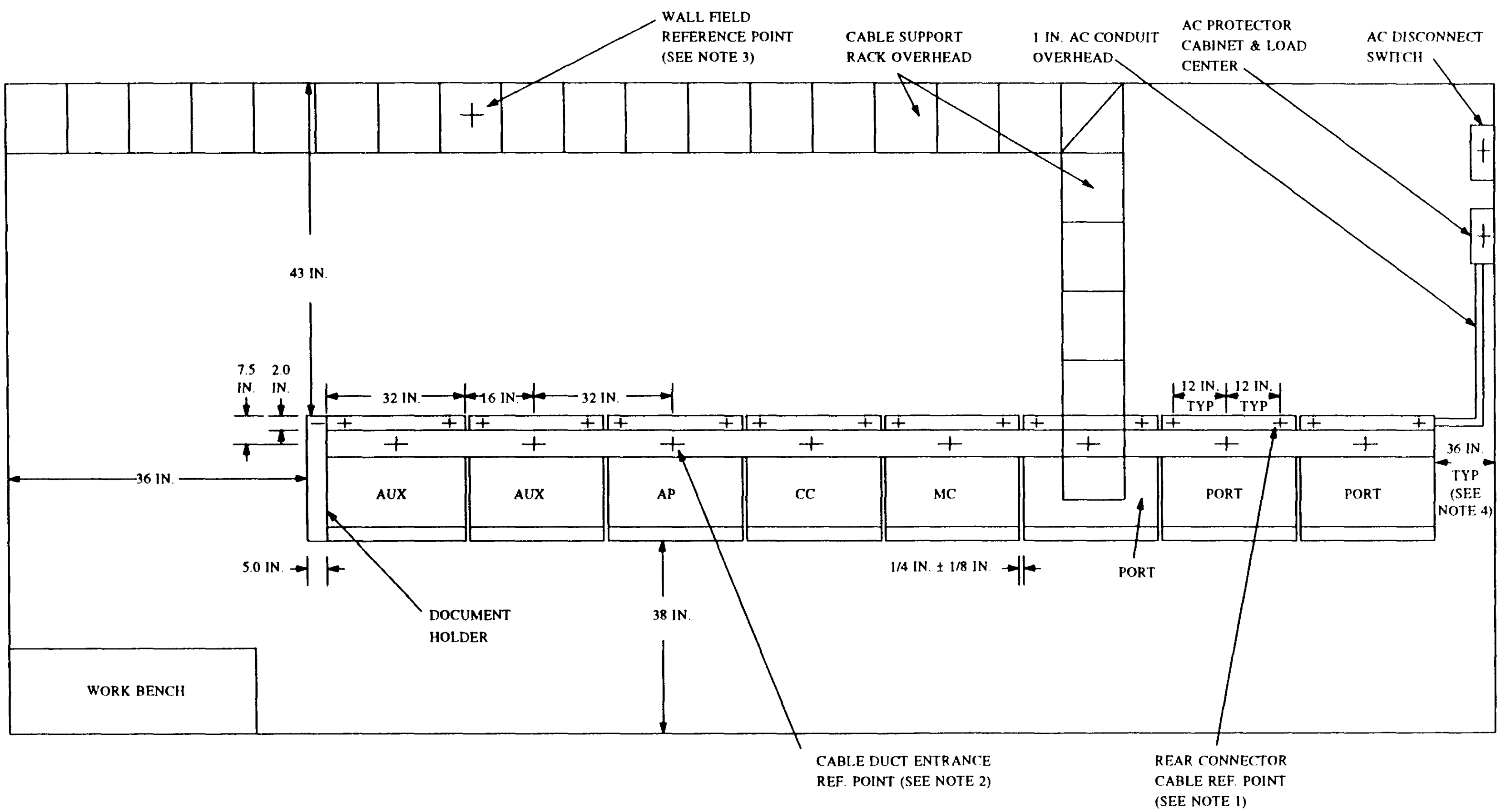
A drawing should be made of the installation area showing the desired placement of the system equipment cabinets and components. This floor plan layout is to be provided on site to the installation personnel. It is used for placing cabinets and auxiliary equipment and for laying out the connecting cables and wiring. The drawing assures that all system components are located according to agreements made with the user. AT&T System 85 and AT&T DEFINITY Communications System Generic 2 cabinets must not be installed in physical contact with cabinets of any other communication systems. Contact your Marketing Branch Office (MBO) if discrepancies are detected.

The installation personnel should use the floor plan as a site inspection guide to ensure that customer-provided electrical and mechanical facilities are correct and in accordance with plant and electrical codes or requirements before starting installation. Any discrepancies should be referred to the MBO.

If the System 85 and DEFINITY Generic 2 is being installed on a raised floor and is equipped with reserve power, special considerations are required for the unusually heavy battery weight.

All electrical outlets must be properly fused and labeled in accordance with existing electrical codes and any other local regulations that may apply. The AC disconnect switch is capable of removing power from the entire system in case of emergency.

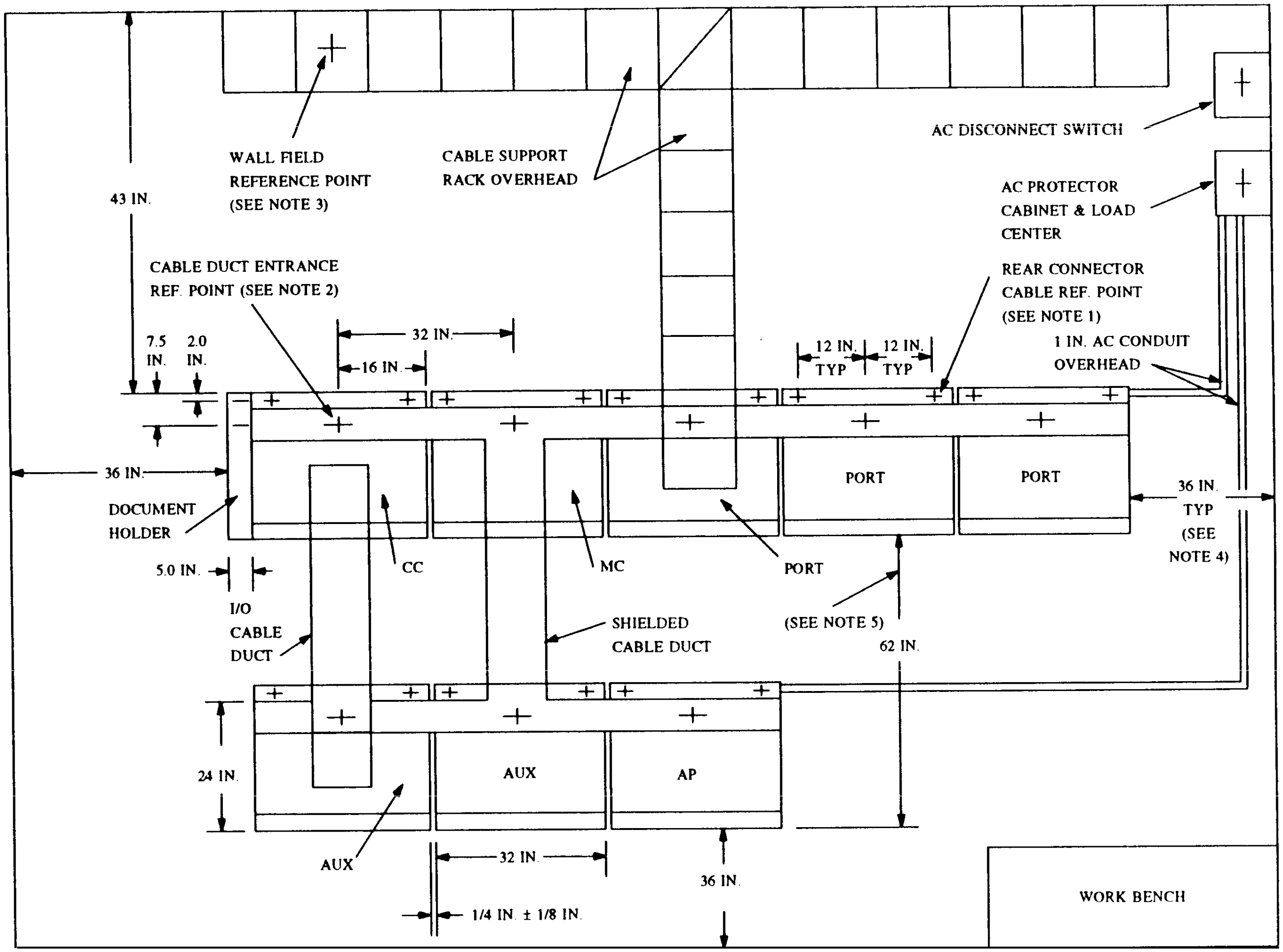
A facility should be provided near the cabinets to allow for disassembly and repair of components. Storage facilities for spare parts are also recommended.



NOTES:

1. Point where I/O cables dress up back of cabinet.
2. Center of the chimney of the shielded duct.
3. Center line of I/O cable drops to main cross-connect field.
4. When terminating I/O cables to wall from the end or side of a cabinet row, space from cabinet to wall must he 43 in.

Figure 3-1. Typical Floor Plan for Long Equipment Room with Cabinets in Line



NOTES:

1. Point where I/O cables dress up back of cabinet.
2. Center of the chimney of the shielded duct.
3. Center line of I/O cable drops to main cross-connect field.
4. When terminating I/O cables to wall from the side of a cabinet space, distance from cabinet to wall must he 43 in.
5. Measure from the front of one cabinet row to the front of the other cabinet row. Do not measure from the power duct.

Figure 3-2. Typical Floor Plan for Confined Equipment Room with Two Rows of Cabinets

4. CROSS-CONNECT FIELD

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Station Line Circuit Cross-Connection Arrangement 4-6
Cable Routing with Overhead Ducts 4-7
Cable Routing with Underfloor Cabling 4-8

NOTE

See the *DEFINITY Communications System Generic 2 and System 85 Equipment Room Floor Plans and Specifications* (555-104-603) *and DEFINITY*™ *Communications System Generic 2 and System 85 Wiring* (555-104-630) documents for further details.

The main cross-connect field (administration field) is the interface for the system cabling and wiring. It provides for interconnection of the system components. It organizes circuits into groupings consistent with the number of circuits on each circuit pack and the system cabling plan.

Cables from the local telephone company enter the building wiring system at the network interface (NI), from which they connect to the trunk/auxiliary (AUX) field. The switch contributes leads to both the trunk/AUX field and the building distribution field. House cables proceed to the satellite locations. The satellite modules in turn connect with the information outlets (IOs) to which terminal devices connect.

Designation label inserts within fields are color coded as follows to identify field functions:

GREEN — Central Office (CO) connections (telephone company)
BLUE — IOs
PURPLE — Trunk and line terminations
YELLOW — AUX connections, applications processor (AP) and switch auxiliary leads
WHITE — House cable terminations
ORANGE — NI

In most AT&T System 85 installations, the connector cables and intercabinet cabling are run in overhead ductwork. This ductwork is provided with the switch. Its installation is covered in chapter 6. If the switch is installed on a raised floor, the cables may or may not be run in the space under the raised floor. There are several matters of concern that should be considered when running the cables under the floor.

If the raised floor space is being used as an air plenum, the National Electrical Code (NEC) has restrictions on what types of cables can be placed in that space. The amount of space under the floor must be considered. The customer should also be made aware of the fact that some of the floor tile will require cutting and modifying. All of these matters should be handled before the installation starts.

Only the input/output (I/O) cables and power cables can be run under the raised floor. Intercabinet cabling still runs in the normal cable ducts over each cabinet. Flat cables between cabinet lineups still require flat cable cross-aisle ducts.

If the cables are to be run under the raised floor, there are certain precautions that the installer should take. The module I/O cables must not cross similar I/O cables from another module or any house cables. All of the under floor cables must be dressed and run according to the customer service document (CSD).

REQUIREMENTS

The administration field includes two groups of terminal blocks: the trunk/AUX field and the building distribution field. The customer may elect to participate in the building distribution field with skilled personnel, but the trunk/AUX field is a craft area only.

Within the trunk/AUX field, the GREEN (CO) field in terminal block A receives the NI leads through 25-pair cables, arranged consecutively. The GREEN field is cross-connected to the PURPLE (trunk) or YELLOW (AUX) fields in terminal block B. The PURPLE field in turn connects with circuit packs in the switch with 25-pair shielded cables and a connector at each end. The PURPLE field is arranged in 3-pair modularity to correspond to the configuration of circuit packs in the switch.

The building distribution field is made up of three different color fields. The PURPLE field receives the lines from the switch. The YELLOW field receives the cables from the AP and the AUX cabinet. The WHITE field receives the house wiring cables.

The WHITE field is all mounted in one area. The house wiring is referred to as riser cables. The riser cables and the switch cables cannot approach the cross-connect facility from the same direction. Since the switch cable normally enters from the top, the riser cables normally enter from the bottom.

An ORANGE field is used as a NI, providing a demarcation point between the network cables and the switch. All trunks or off-premises stations going out to the network are connected via the NI field. Customer-provided equipment should be connected to the switch through an ORANGE field. This becomes the demarcation point to be used before extending service to the serving COs and customer-provided equipment.

If the switch is mounted on a raised floor, the cabling will sometimes be run under the floor. If this condition exists, there are differences that show up at the cross-connect field. All the cables exit the cross-connect field from the bottom. For raised floor applications, the wall field is recommended to have a 40-in. stub cable which will go about 18 in. under the floor to interconnect with the I/O cables and trunk cables.

The cross-connect field may not be wall-mounted, but is rack-mounted. If the cross-connect field is rack mounted, there are two structural rules that must be observed. The bottom of the frame must he secured and connected with manufacturer-recommended hardware to the base floor or must be suitably connected to the stringer system of the raised floor. The top of the frame requires lateral bracing. The bracing may be connected via rigid members to the ceiling, carries no load, and is used only to prevent lateral frame movement during normal activity on the frame.

TYPICAL MAIN CROSS-CONNECT FIELDS

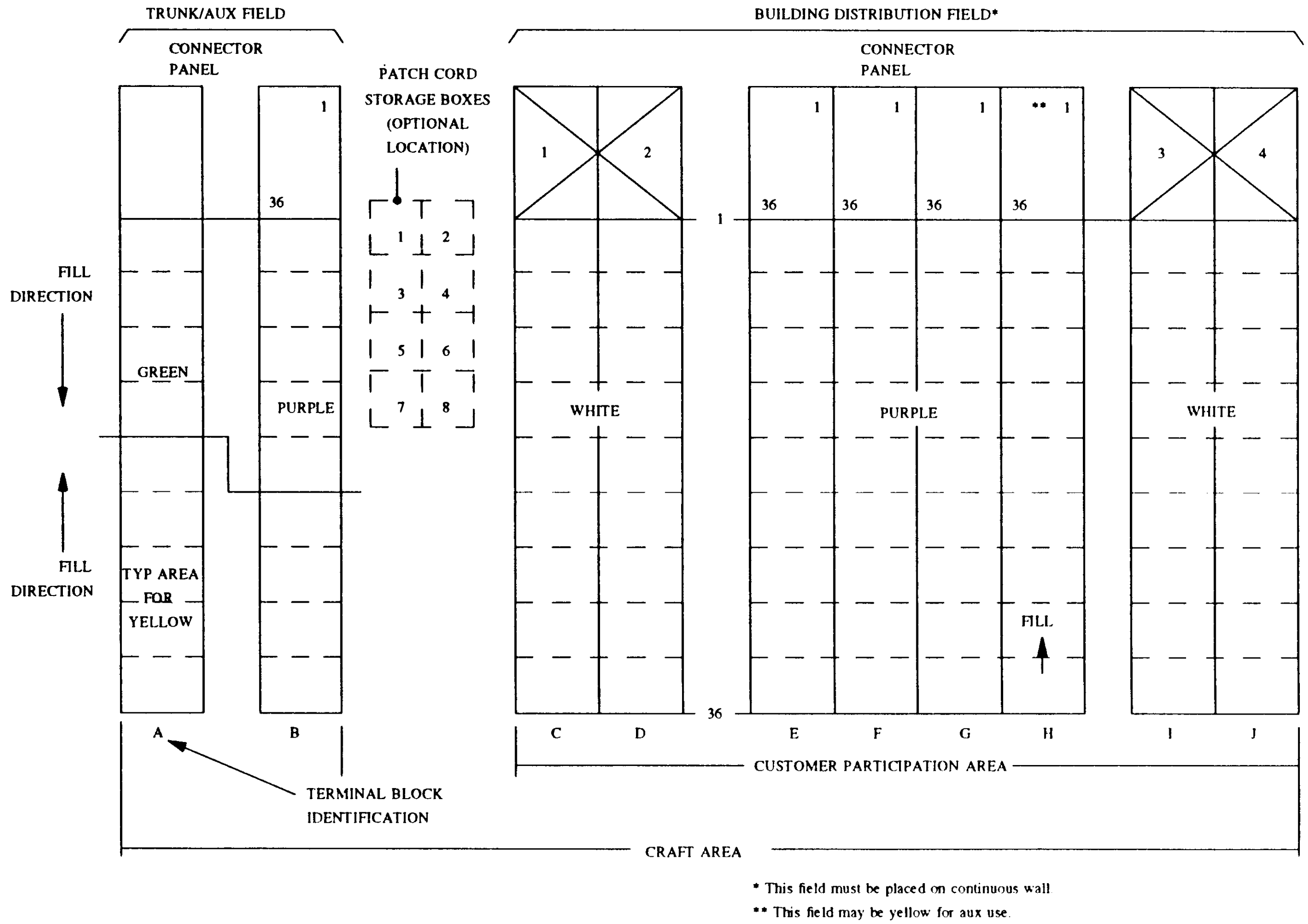
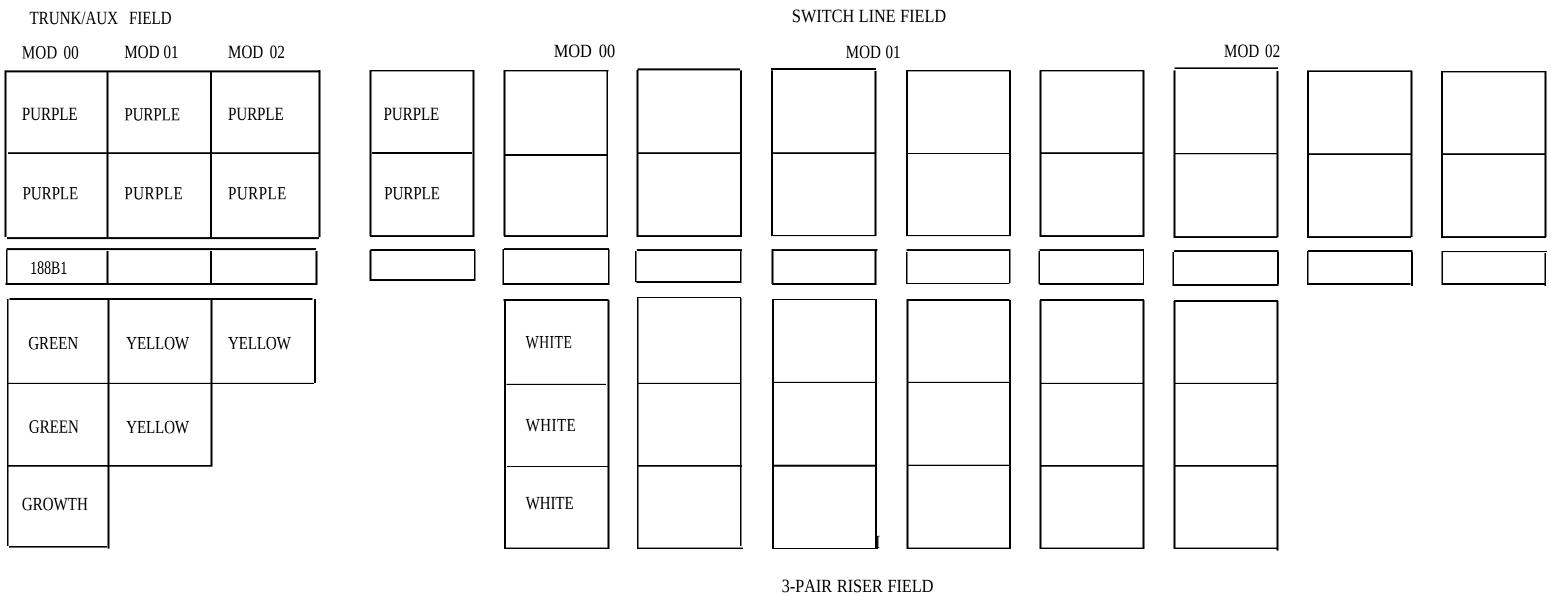


Figure 4-1. Typical Main Cross-Connect Field (Single Module)



NOTE:

Riser and switch cables must approach the cross-connect field from different directions.

Figure 4-2. Typical Main Cross-Connect Field (Multimodule)

Typical 110-Type Terminal Block

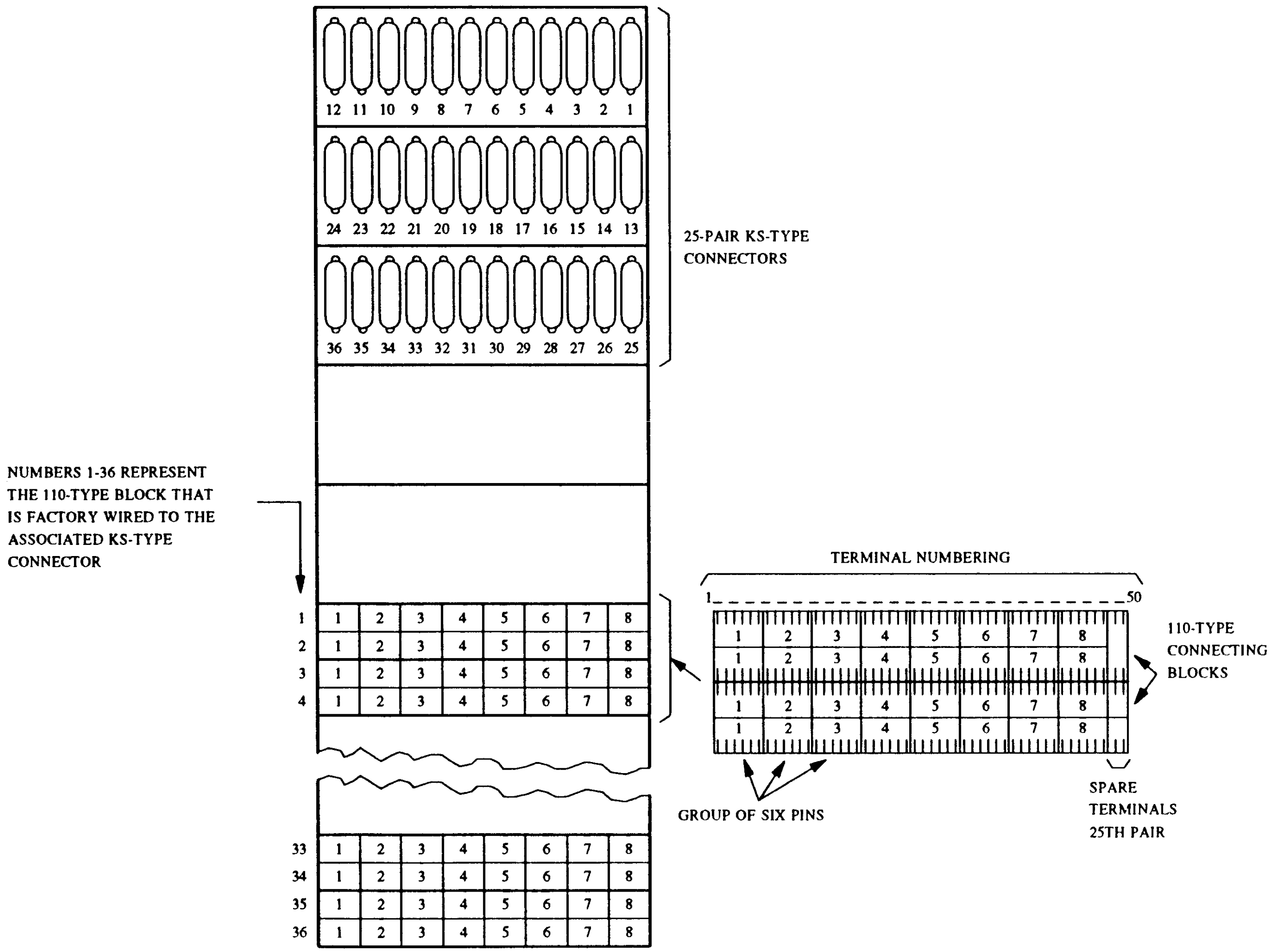


Figure 4-3. 110-Type Terminal Block and 25-Pair KS-Type Connector

Typical Station Line Circuit Cross-Connections

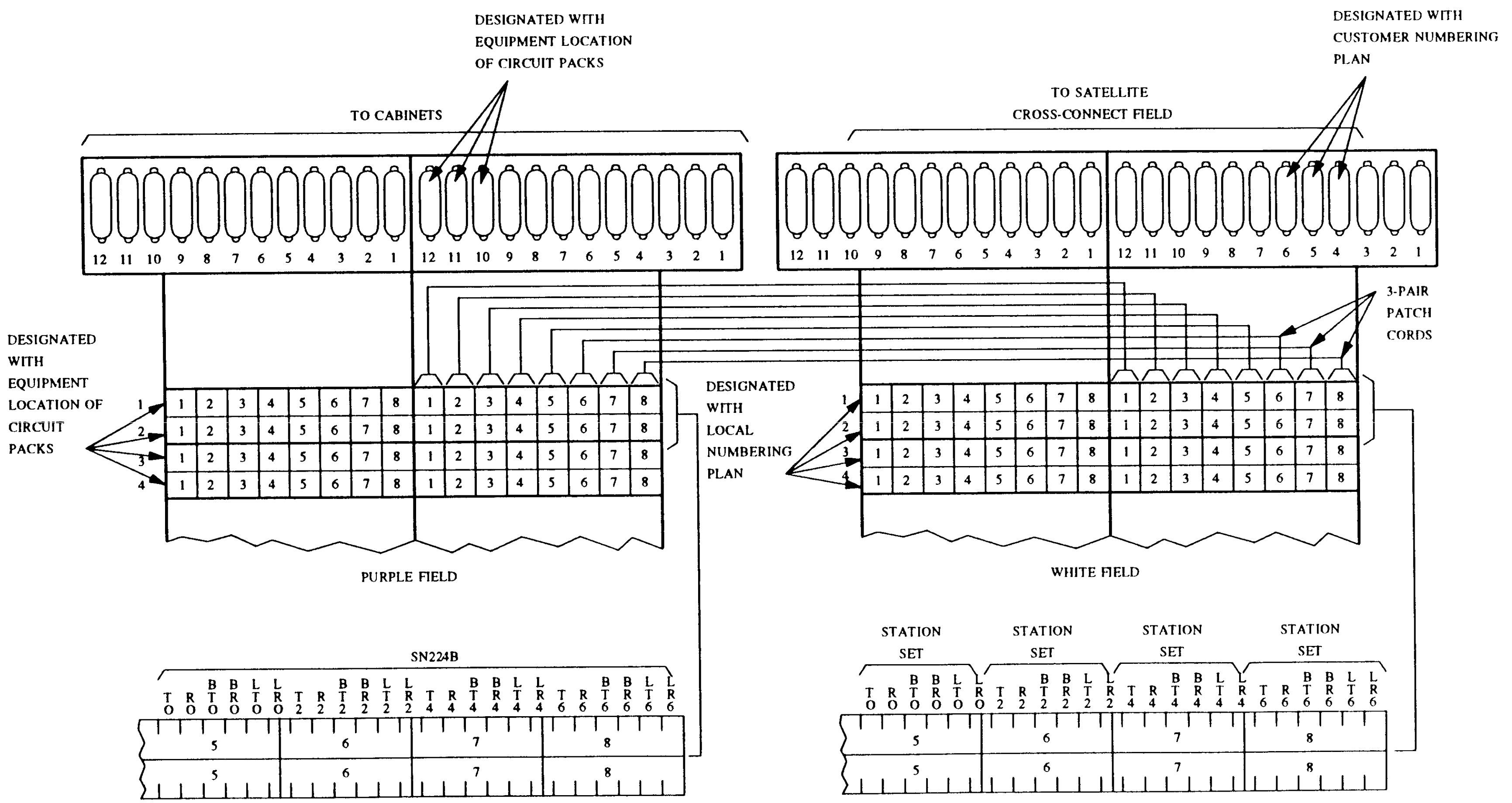


Figure 4-4. Station Line Circuit Cross-Connection Arrangement

Typical Cable Routing at Cross-Connect Field

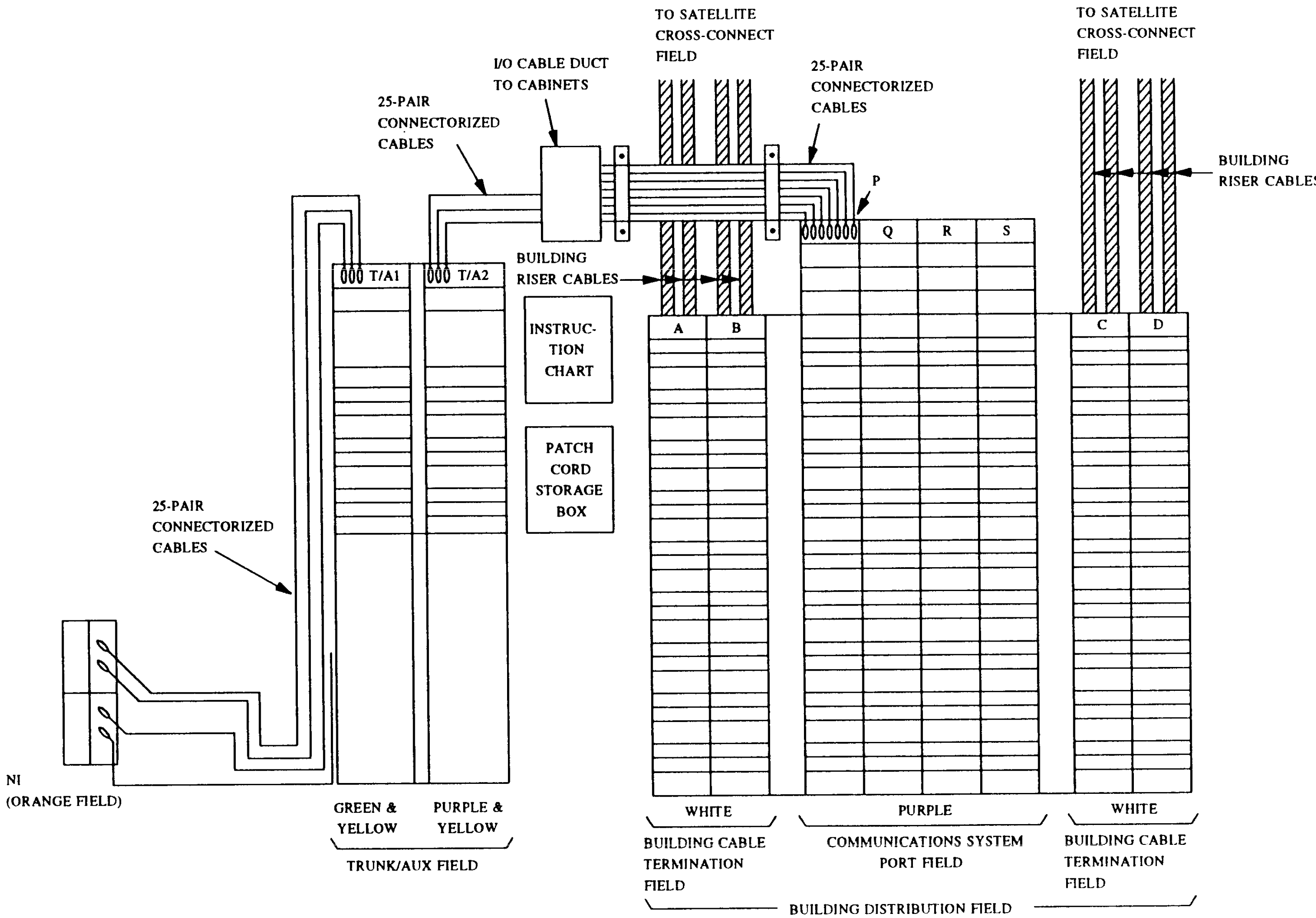


Figure 4-5 Cable Routing with Overhead Ducts

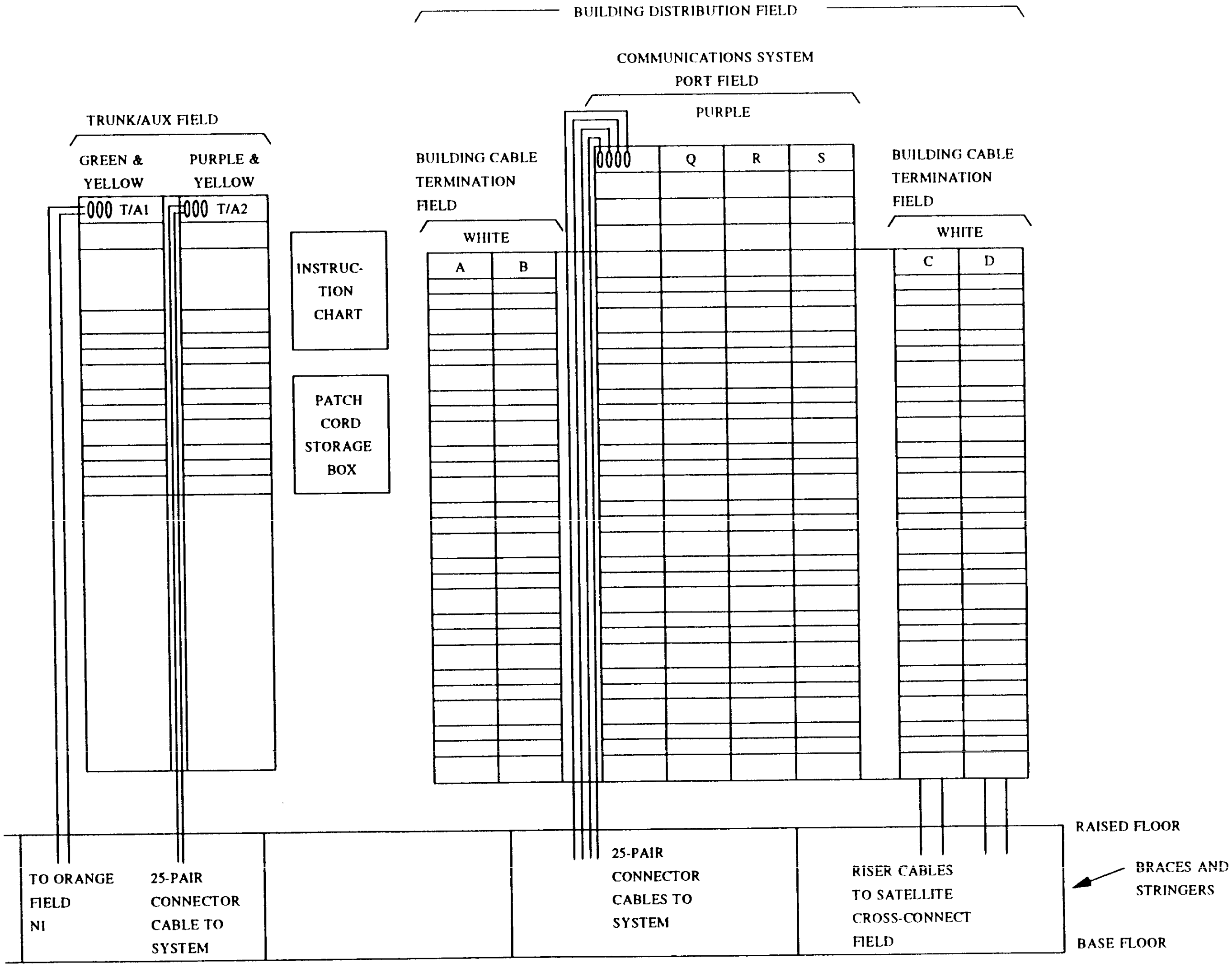


Figure 4-6. Cable Routing with Underfloor Cabling

5. CABINET INSTALLATION

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CABINET DAMAGE 5-2
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MARKING LOCATION LAYOUT

Using the floor layout of the equipment room, mark the floor with a chalk line at the front of the cabinets, allowing 32 in. per cabinet with 1/4 ± l/8-in. separation between each cabinet.

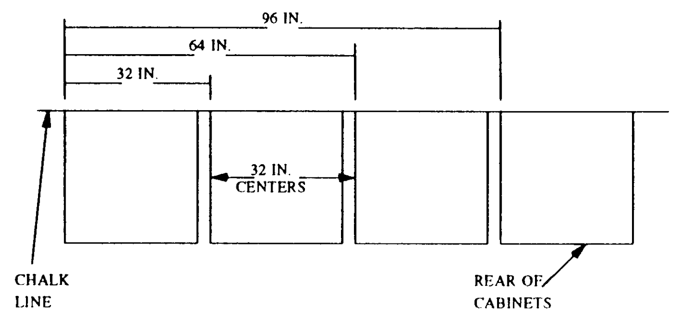


Figure 5-1. Cabinet Layout Measurements

CABINET DAMAGE

The cardboard container has shockwatch indicators attached to it. A red color shown in the center of the indicator (above the white arrow) indicates rough handling. If the indicator shows rough handling or has been removed, contact the Material Stock Location (MSL).

If any damage to the cabinets is observed while unpacking and installing, contact the MSL.

UNPACKING AND POSITIONING OF CABINETS

Each cabinet is shipped in a polyethylene bag and packed in a cardboard container. Cabinets are fastened to a wood/styrofoam pallet by four 3/8-in. carriage bolts. The cardboard container is strapped to the pallet by two metal bands.

DANGER

Each cabinet may weigh as much as 750 pounds.

Perform the following procedures to install the cabinits:

1. Determine which cabinet has ramps stored under it. It must be the first cabinet unpacked.
2. Move one packaged cabinet to its position directly behind the chalk line indicating the rear of that cabinet.

WARNING

Deep knife penetration may damage the cabinet.

3. Use the utility knife to cut the plastic shipping bands.
4. Use the utility knife to cut the tape.

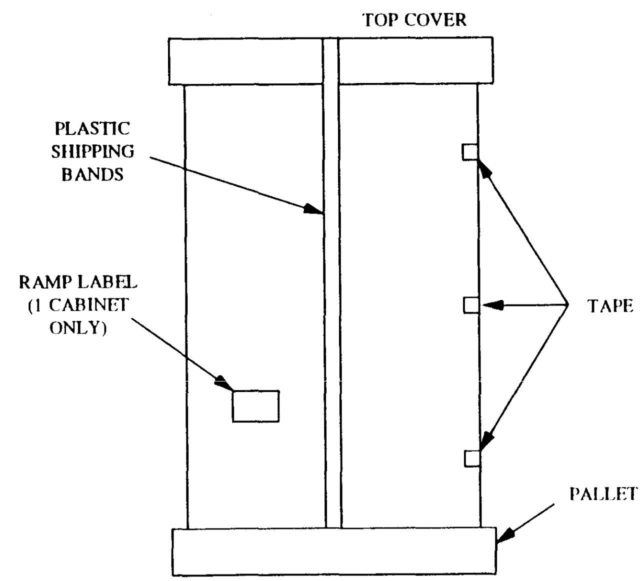


Figure 5-2. Cabinet Shipping Carton — Side View

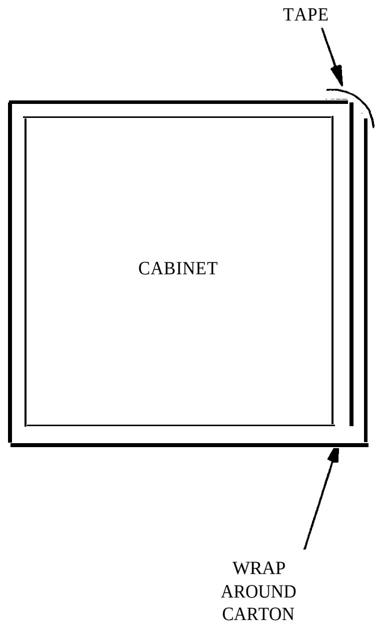


Figure 5-3. Cabinet Shipping Carton — Top View

1. Remove all cardboard, tape, and plastic.
2. Open the front door panel of the cabinet.
3. Remove the lower rear panel using a 5/16-in. socket wrench (AT&T System 85 cabinets only).
4. Remove the carriage bolt nuts located at each of the four bottom corners using a 9/16-in. socket wrench.
5. Remove the carriage bolts holding the cabinet to the pallet.

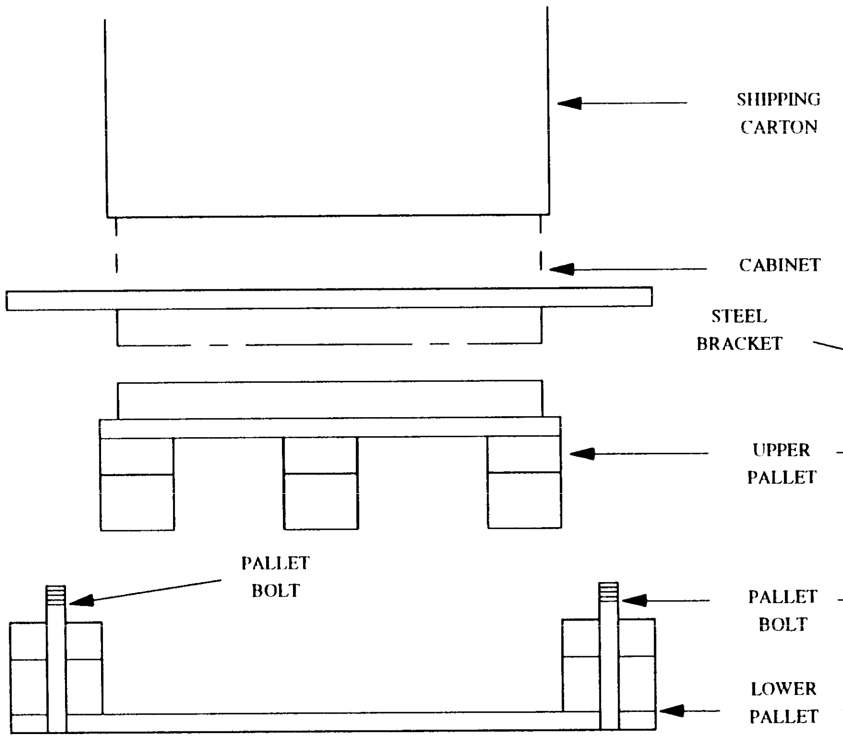


Figure 5-4. Traditional Cabinet Pallet — Side View

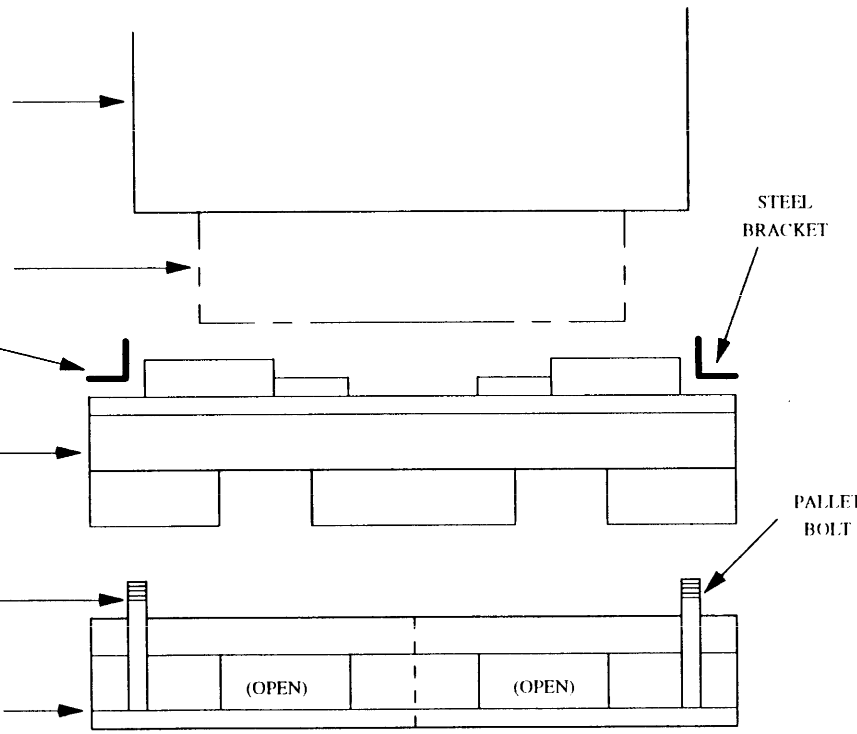
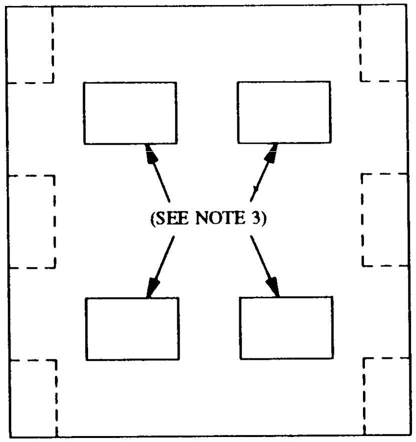


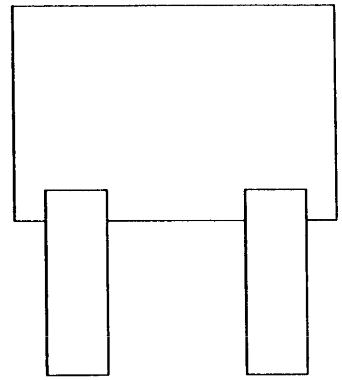
Figure 5-5. DEFINITY Generic 2 Cabinet Pallet — Side View



NOTES:

1. Remove the top pallet only if moving the cabinets through an opening smaller than the complete pallet.
2. Filler blocks are included with the ramp.
3. Remove the upper pallet and insert the four filler blocks for use with a pallet jack.

Figure 5-6. DEFINITY Generic 2 Cabinet Lower Pallet — Top View

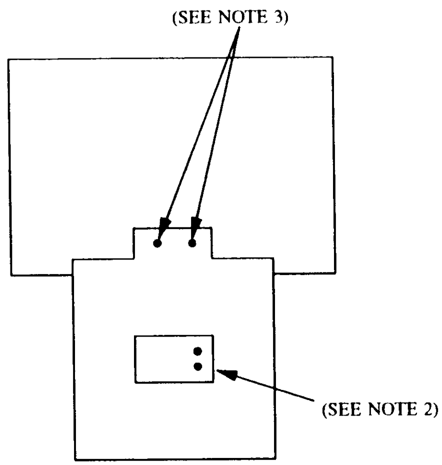


(TOP VIEW)

NOTE:

Ramps are stored under the pallet in one of the cabinets. The cabinet with the ramps should be unpacked first. These ramps hook into slots.

Figure 5-7. Traditional Pallet Ramps



(TOP VIEW)

NOTES:

1. The ramp is stored in the side of the shipping container of one of the cabinets. Determine which cabinet contains the ramp and unpack it first.
2. This bag contains the ramp mounting hardware (two bolts) and filler blocks.
3. Use the mounting bolts to connect the ramp to the pallet.

Figure 5-8. DEFINITY Generic 2 Pallet Ramp

6. Remove the ramps stored under the cabinet.

7. Using one of the ramps as a pry bar, place it under one of the rear comers and pry up just enough to remove the wooden supporting blocks. Repeat the procedure for the other rear corner.

8. Turn the leveling feet all the way up to clear the pallet while being removed.

9. Align ramps with cabinet rollers and secure.

10. Roll the cabinet off the pallet. There is a 3/4-in. drop when the cabinet reaches the ramp.

WARNING

Leveling legs become fragile under the weight of the cabinet. Care must be taken to assure that legs do not bend or break.

11. Carefully move the cabinet into its designated position.

WARNING

Anchor bolts must not contact building steel.

12. If earthquake mounting is required:

    a. Open the front door panel.

    b. Insert a pencil or marker through the holes previously occupied by the carriage bolts and mark the floor directly beneath each hole.

    c. Move the cabinet away from the installation location and drill holes where marked according to the type of floor:

       - computer 5/8-in. hole
       - concrete l/2-in. hole
       - wood l/4-in. hole

    d. If the floor is concrete, insert anchors in the holes (see figures 5-10 and 5-11 for the types of anchors and how to install them).

e. Move the cabinet back into place and align the cabinet holes with the holes in the floor.

5. Repeat procedure from step 1 for each cabinet to be installed.

6. When all cabinets are in place, adjust the leveling legs until cabinets are level. The cabinets must be level front to rear, as well as side to side, and with each other.

NOTE	If equipped with an application processor (AP) cabinet that does not have leveling feet, cabinets in line with the AP must be leveled to it.

7. If earthquake mounting is required:

a. Install hardware for securing cabinet to floor according to floor-type (see figures 5-10 and 5-11):

- computer l/2-in. bolt with flat washer and nut
- concrete 3/8-in. lag bolt with flat washer
- wood 3/8-in. lag bolt with flat washer

b. Tighten bolts in sequence shown:

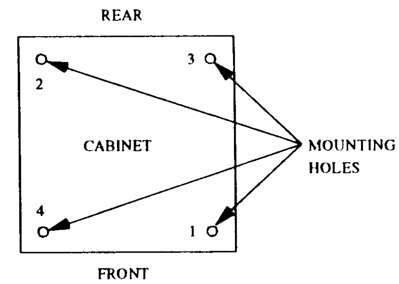
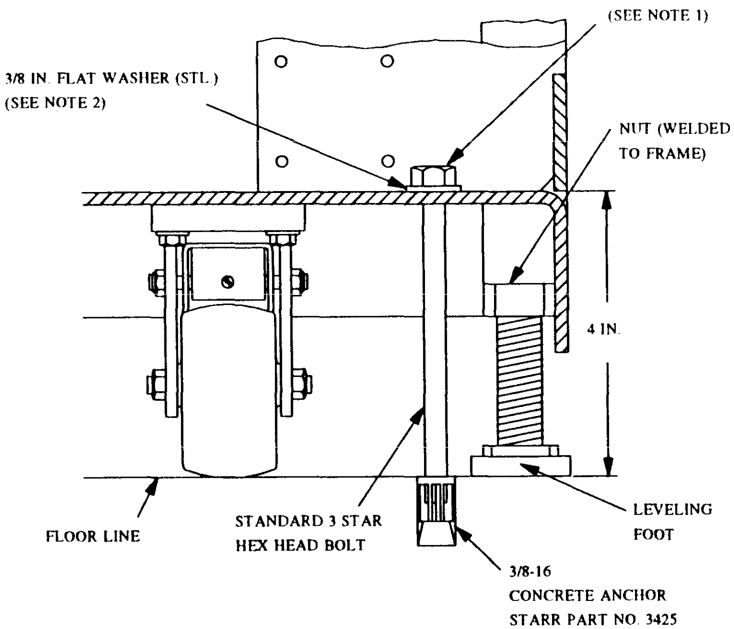


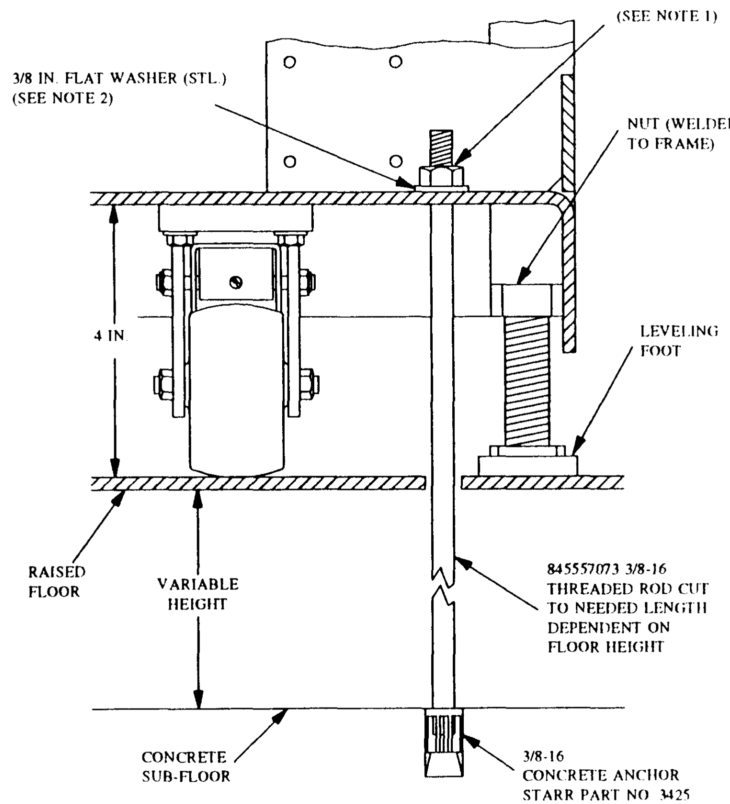
Figure 5-9. Bolt Tightening Sequence



NOTE:

1. Use no more than 60 to 70 in.-pounds of torque in tightening this nut. More torque than that will damage the cabinet base.
2. Insert 3/8 in. molded nylon shoulder washer between the cabinet base and the flat head washer when required. Use these when the cabinet mounting bolts must be insulated from the cabinet frame.

Figure 5-10. Cabinet Earthquake Mounting — Standard Floor



NOTE:

1. Use no more than 60 to 70 in.-pounds of torque in tightening this nut More torque than that will damage the cabinet base.
2. Insert 3/8 in. molded nylon shoulder washer between the cabinet base and the flat head washer when required. Use these when the cabinet mounting bolts must be insulated from the cabinet frame.

Figure 5-11. Cabinet Earthquake Mounting — Raised Floor

DOCUMENT FILE INSTALLATION

Position document file hooks over the upper edge of the cabinet side panel as shown in figure 5-12. Slide file down until hooks are secured to cabinet edge. Open front door of document file to access holder assembly in bottom of file. Rotate the holder assembly until its hook is under the bottom edge of cabinet and tighten bolt to secure it.

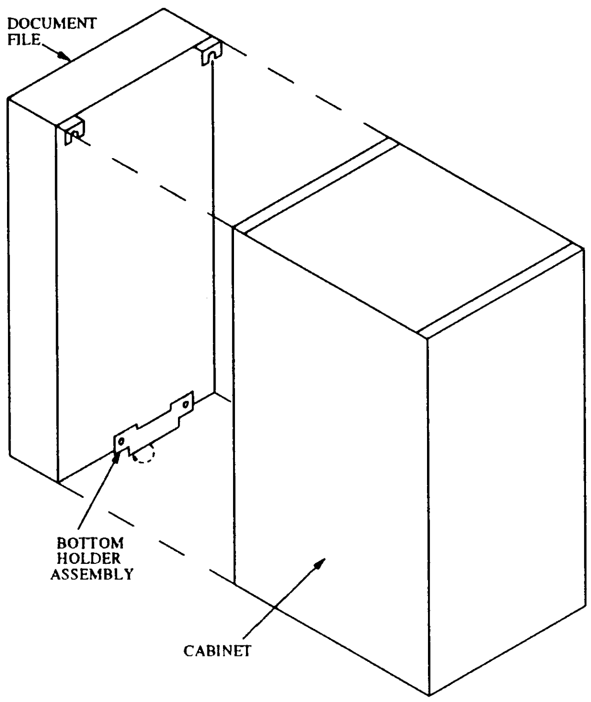


Figure 5-12. Document File Installation

CARRIER COVERS

At the front of each cabinet, remove any shipping bars from the carriers.

Install the plastic covers on each carrier. These covers must be in place to provide the air flow to cool the carrier components.

A liquid anti-static coating has been applied to the plastic covers to prevent electric static discharge (ESD) damage to circuit components. If fingerprints and/or smudges appear on these covers, use only a soft, clean, dry cloth or tissue to clean the cover.

6. CABLE DUCTWORK

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NOTE

See the *DEFINITY Communications System Generic 2 and System 85 Equipment Room Floor Plans and Specifications* (555-104-603) for further details.

The cable duct is assembled from various group numbers of ED-1E465. The assembly, installed after the cabinets have been installed, provides ducts for three types of cables: intercabinet cables, input/output (I/O) cables (tip and ring), and AC power cables. (DC power cables are installed in ductwork per national and local codes.) Typical assembled duct work is shown in figure 6-1.

The shielded intercabinet cable duct provides the path for flat cables, for optical fiber cables, and/or for 4 MHz cables connected between the cabinets of a module. This duct is the first installed. Covers for the shielded duct should be stored until the intercabinet cabling is completed.

The I/O cable duct provides the path for I/O cables to the cross-connect field. The I/O cables originate at connectors on the backs of the cabinets and terminate on connectors at the yellow cross-connect field.

The AC power duct provides the path for the AC wiring that will power the system. This duct mounts to the back 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-in., 1-1/2 in., or 2-in. conduits which 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 cross-connect field. These methods are:

- Using an overhead cable rack
- Using cable duct groups 22 to 26
- Using multiples of either group as required

Equipment room layout and expected growth determines which method is to be used. Installation of an overhead rack is covered by *Cable Racks* (800-614-157).

NOTE

Ensure that you use all of the screws provided with the ductwork during installation to comply with electromagnetic interference (EMI) requirements for shielding.

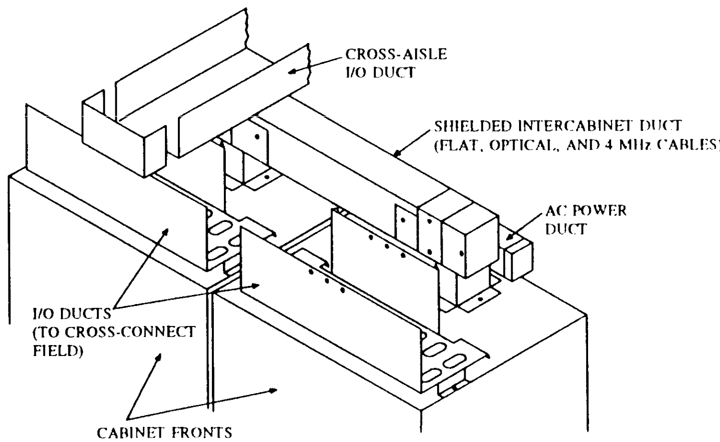


Figure 6-1. Typical Layout of Assembled Ductwork

INSTALLATION

This ductwork consists of ED-1E465 group numbers. 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 6-1 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 6-1. ED-1E465 Group Numbers and Descriptions

Group	Description
1	Basic hardware for one cabinet
2	Right or left end plate for shielded ductwork
4	Front end plate for shielded ductwork
5	Rear end plate for shielded ductwork
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
11	Shielded cross-aisle ductwork
12	AC power duct
13	AC power duct with one 3-wire twist-lock receptacle (right side viewed from the rear)
14	AC power duct with one 3-wire twist-lock receptacle (left side viewed from the rear)
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
20	MD replaced by group 26
21	AC power duct with one 4-wire twist-lock receptacle (right side viewed from the rear)
22	I/O duct-side of cabinet to wall (43 in. aisle)
23	I/O duct-side of cabinet to wall over one cabinet

(continued)

TABLE 6-1. ED-1E465 Group Numbers and Descriptions *(continued)*

Group	Description
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-center rear of cabinet to wall (43 in. aisle)
27	Transition between older DIMENSION® system-type cabinet and new System 85 cabinets for shielded cable ducts
28	Transition between older DIMENSION system-type cabinet and new System 85 cabinets for I/O cables
29	Shielded duct assembly transition from the front of an R1 cabinet to the rear of an R2 cabinet
30	I/O duct transition assembly for cross-aisle (R1 lineup to bridge an R2 lineup)
31	Shielded duct assembly transition from rear of R1 cabinet to front of R2 cabinet
32	AC power with a 4-wire twist-lock receptacle (left side viewed from the rear)
33	Ladder rack supported 86 or 88-1/2 in. from the floor
34	AC power duct with two 3-wire receptacles (250V) (right side)
35	AC power duct with one 3-wire receptacle (250V) (right side)
36	AC power duct with one 3-wire receptacle (30A, 125V) for AUDIX-M
37	AC power duct with one 3-wire receptacle (30A, 250V) for CC
38	Shielded cross-aisle ductwork (48 in. aisle)
39	I/O cross-aisle ductwork (48 in. aisle)

Install the various cable ducts in the order shown in table 6-2. Refer to the figures for detailed information.

Figure 6-2 shows an overhead view of a typical ductwork installation. Callouts indicate other figures in this part which describe the group numbers and assembly procedures in detail.

WARNING

Place cardboard or equivalent in cable ducts to catch the metal filings from the self-threading screws to prevent damage to the cabinet circuitry or cables.

TABLE 6-2. Installation Sequence

Step	Group	Figure 6-1 and Figures	Remarks
1	1	6-3 & 6-6	Install basic duct work on each cabinet
2	11	6-4	Install cross-aisle shielded duct work
3	10 or 26	6-6 or 6-7	Install I/O cross-aisle or cabinet to wall cable trough
	22-25	6-8	Install I/O cross-aisle to wall trough duct
4	8 or 9	6-9 or 6-10	Install I/O cable rack coupling to rear of cabinet or install I/O cable rack riser to end of cabinet

(continued)

TABLE 6-2. Installation Sequence *(continued)*

Step	Group	Figure 6-1 and Figures	Remarks
5	12-19, 21, 32, 34, 35, and 36	6-11	Install AC power ducts
6	27	6-12	Install shielded cable ducts between System 85 (R2) and DIMENSION System 85 (Rl)
7	28	6-13	Install I/O cable ducts between System 85 (R2) and DIMENSION System 85 (Rl)
8	29 and 31	6-14	Install shielded duct assembly from front of R1 cabinet to rear of R2 cabinet (group 29) or front of R2 cabinet to rear of R1 cabinet (group 31)
9	30	6-15	I/O transition assembly for cross-aisle (R1 to R2)
10	33	6-16	Ladder rack supported 86 or 88-1/2 in. from the floor

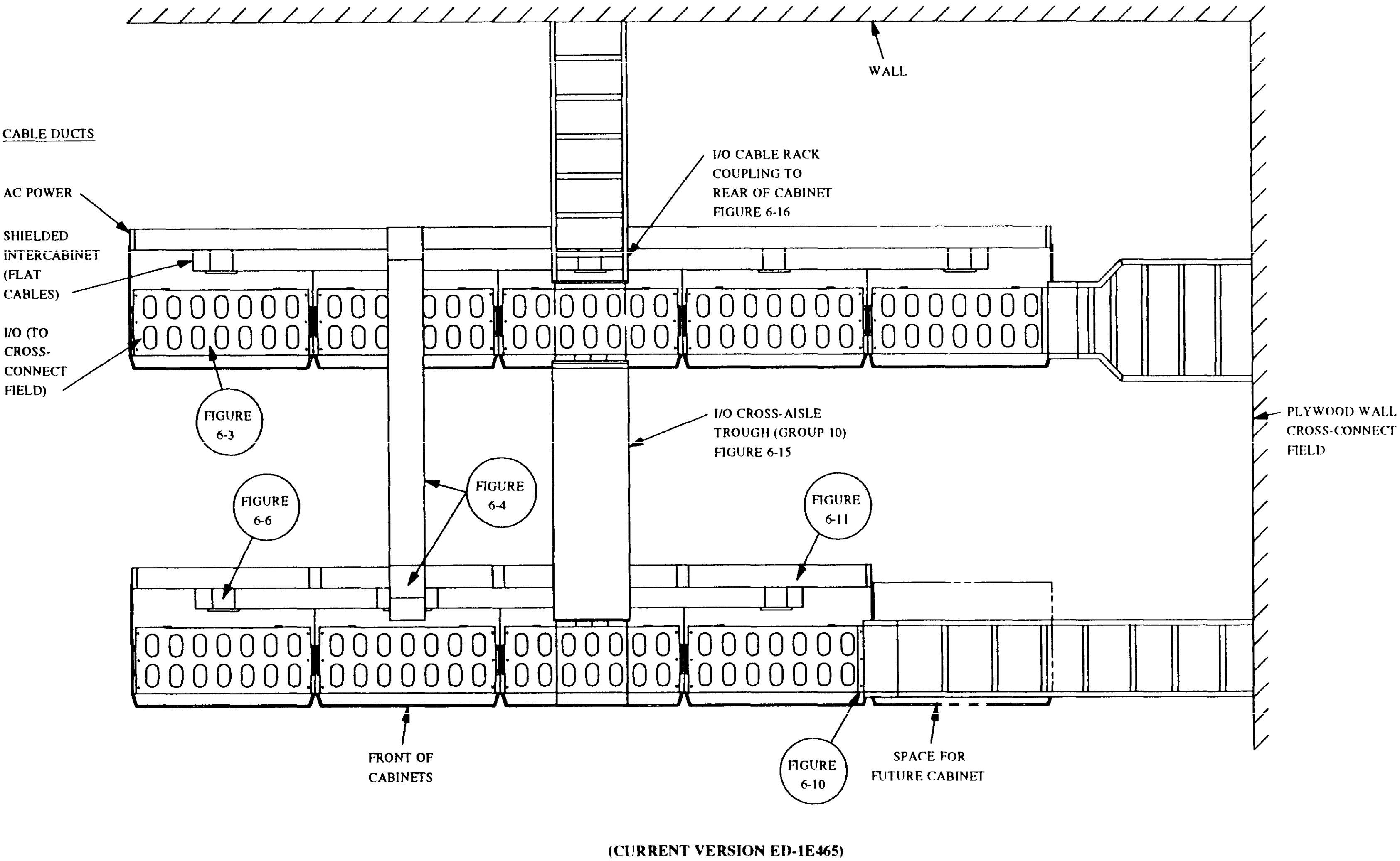
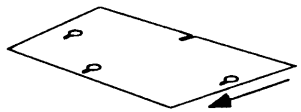


Figure 6-2. Overhead View of a Typical Ductwork Layout

Installation of Intercabinet Shielded Ducts



1. Loosen, but do not remove, the four bolts that hold the dust cover to the cable access hole in the top of the cabinet.
2. Remove the dust cover by sliding it in the direction shown by the arrow (here illustrated) Move the dust cover until it is released by the bolts. Do not remove the bolts.
3. Set the cabinet riser ("A" on figure 6-3) 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.
4. Install risers (as in 3 above) on any other cabinets that require shielded-duct connections.
5. Set a shielded trough ("B") between two cabinet risers. Push down on the trough so that 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 cabinet risers that it connects. Attach the trough to each riser with a self-tapping screw.
7. Install shielded troughs (as in 6 above) on any other pairs of cabinets that require shielded-duct connections.
8. At this time you can 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" on figure 6-4) on the cabinet riser ("A").

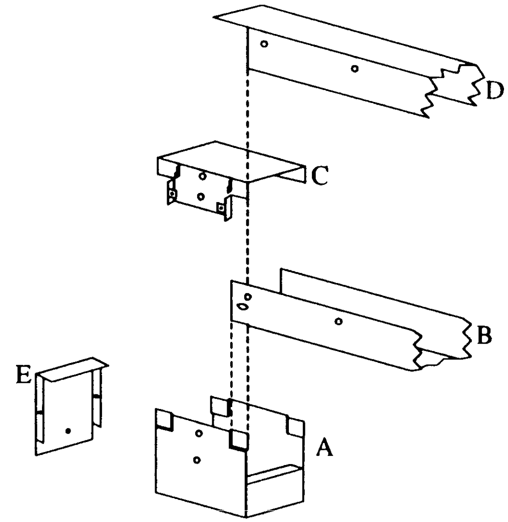


Figure 6-3. Assembly of Intercabinet Shielded Ducts

Otherwise set a shielded coupling ("C" on figure 6-3) on the cabinet riser. In either case, position the device so that 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 that the dimples on the cover engage the holes in the trough.

Installation of Cross-Aisle Shielded Ducts

1. You should have the intercabinet ducts and cross-aisle risers installed (as described above) before you start work on cross-aisle ductwork.
2. Set the tongue on the bottom of a cross-aisle trough ("G" on figure 6-4) 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.
3. Install cross-aisle troughs (as just described) on any other cabinets that require such connections.
4. If there is no trough ("G" on figure 6-4) 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 will fit 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.
5. At this time you can route the appropriate cables between the cabinets just connected.
6. Finally, 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.

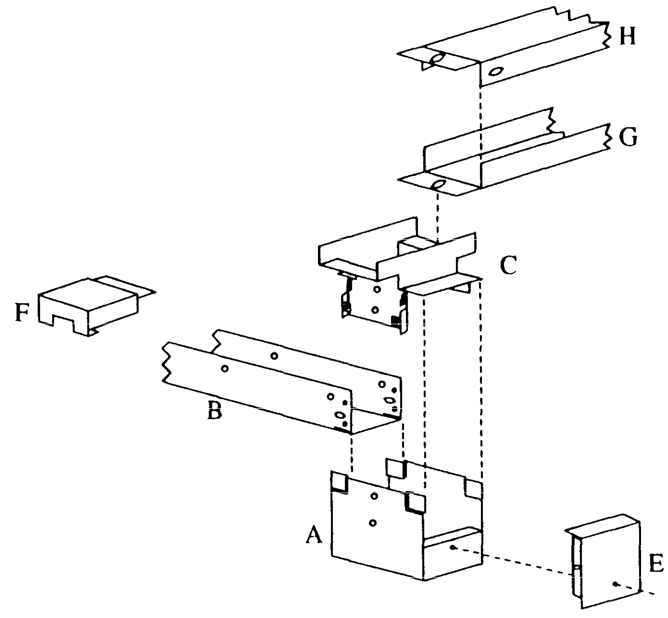


Figure 6-4. Assembly of Cross-Aisle Shielded Ducts

Mating Cross-Aisle Risers to Old Cabinet Risers

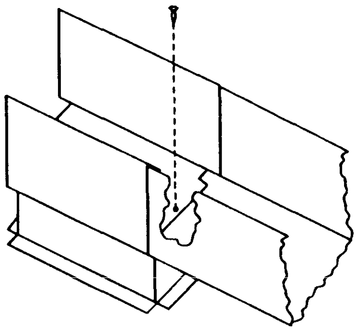
The new shielded ductwork is so constructed that cross-aisle risers can be attached to cabinet risers of the former design.

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" on figure 6-5) on the cabinet riser ("A"). Position the cross-aisle riser so that 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.
3. Assemble cross-aisle ductwork as already described.

Mating New Shielded Ducts to Older R2 Risers

The new shielded ductwork is so constructed that 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 an older R2 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 to the right, 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.



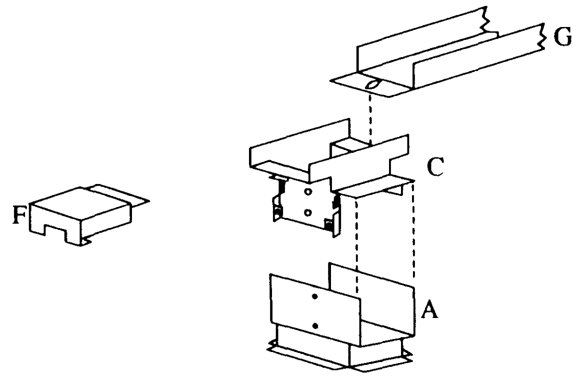
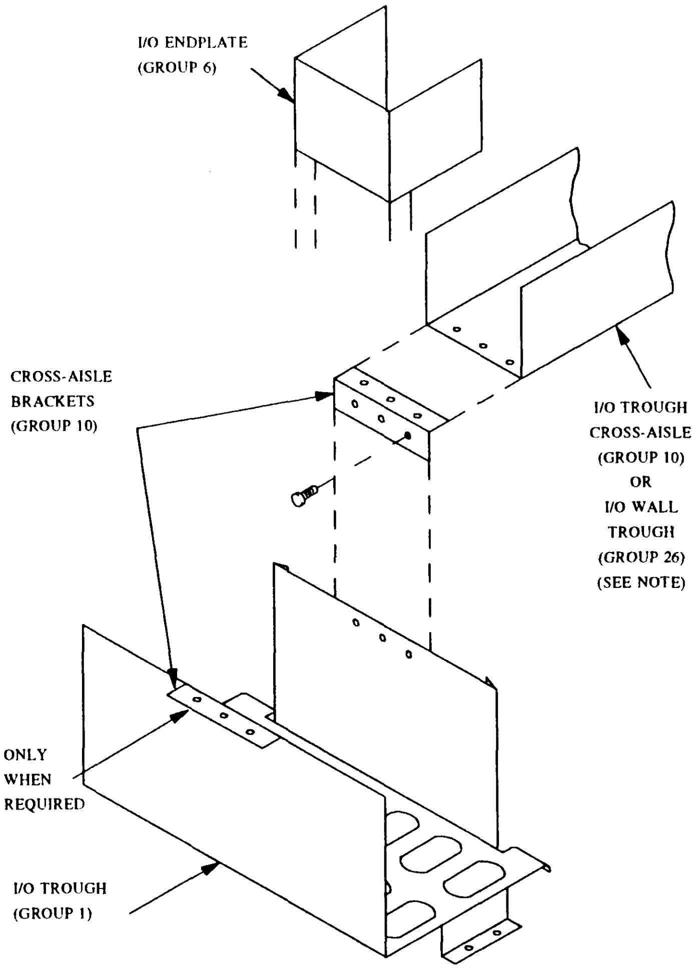


Figure 6-5. Mating Cross-Aisle Risers to Older R2 Cabinet Risers



VIEWED FROM FRONT OF CABINET

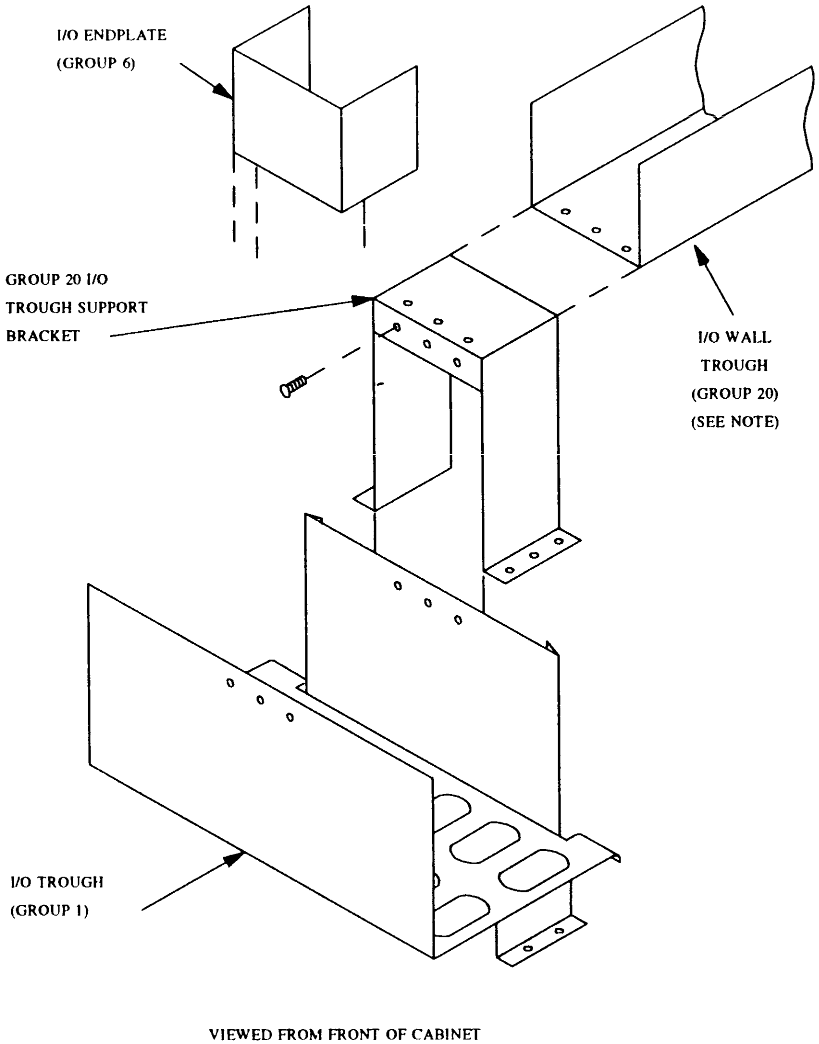
NOTE:

If wall trough is being installed, locally provided hardware is required at wall end of duct.

ASSEMBLE IN FOLLOWING ORDER:

1. If required, attach I/O endplate (group 6) to the cross-aisle brackets (group 10).
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 6-6. Installation of Cross-Aisle I/O Ductwork (Group 10) or I/O Cross-Aisle to Wall Trough (Group 26) Using Group 10 Angle Braces



NOTE:

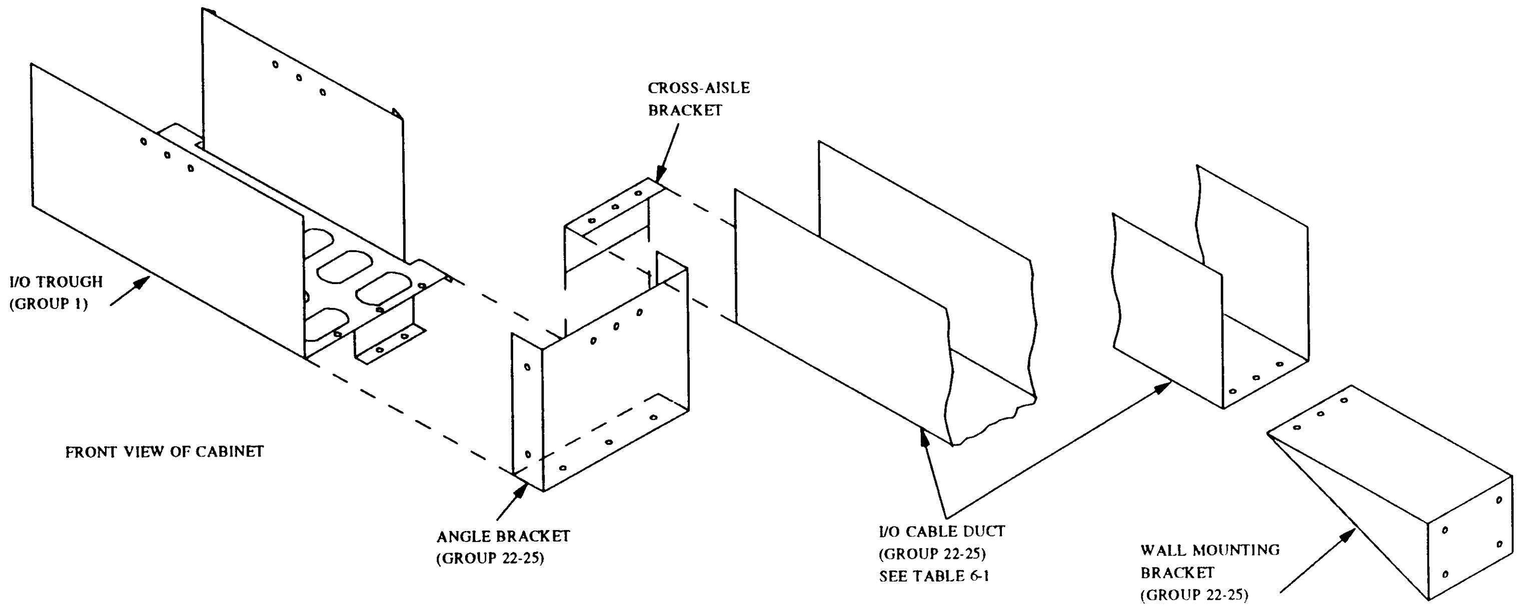
If wall trough is being installed, locally provided hardware is required at the wall end of duct.

ASSEMBLE IN THE FOLLOWING ORDER:

1. Install an I/O trough support bracket on both sides of the I/O trough where the wall trough is to be used. Secure to the cabinet and the I/O trough with the thread-forming screws.
2. If required, attach the I/O endplate (group 6) to the I/O trough support bracket.
3. Place I/O wall trough (group 20) on brackets and secure with thread-forming screws.

FOR REFERENCE ONLY. MD.

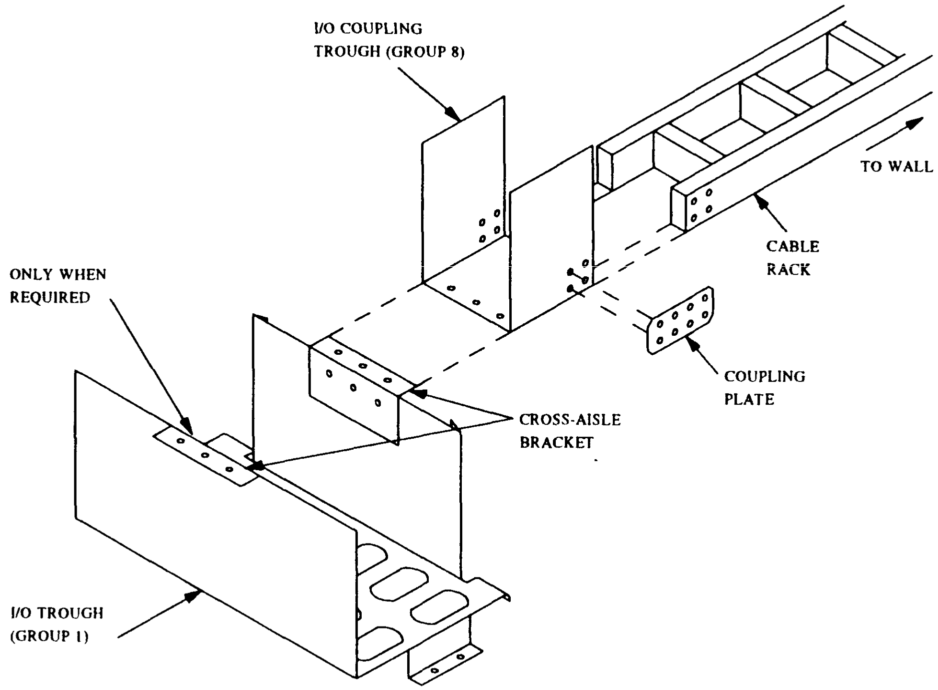
Figure 6-7. Installation of I/O Cross-Aisle to Wall Trough (Group 20) Using Group 20 I/O Trough Support



ASSEMBLE IN THE FOLLOWING ORDER:

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 in. 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 in. screws, nuts and washers.

Figure 6-8. Installation of I/O Cross-Aisle to Wall Trough (Group 22-25)



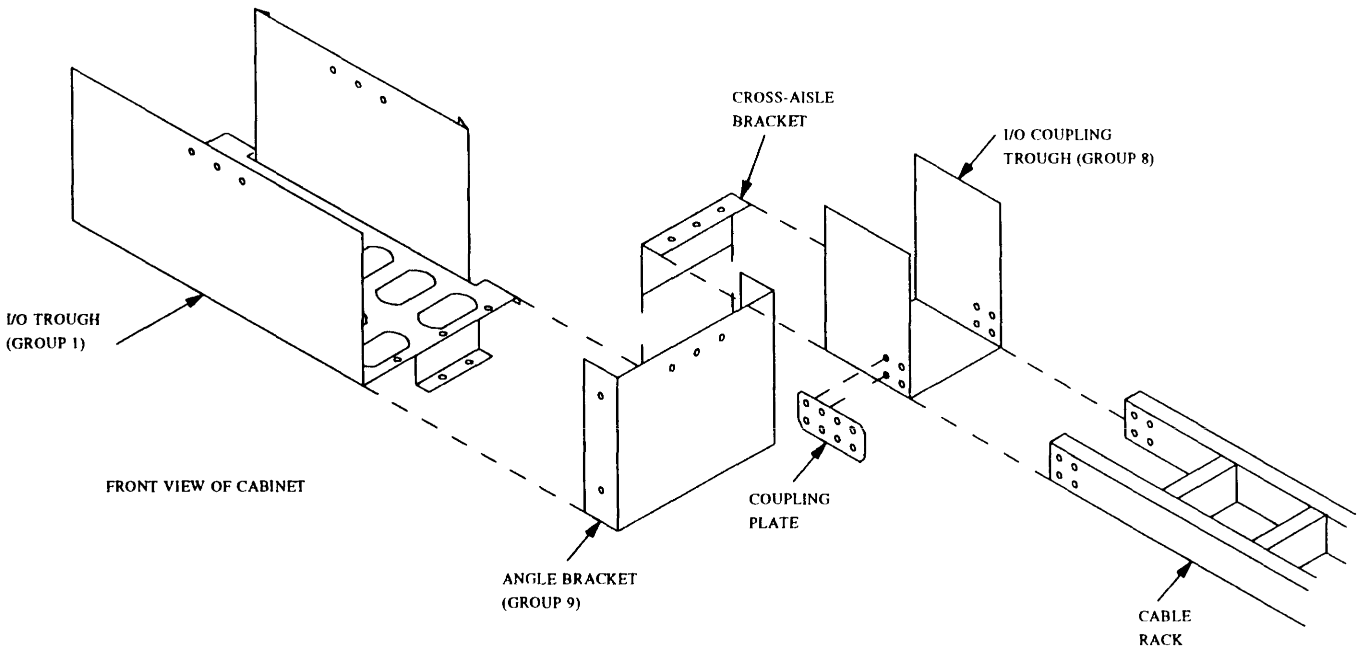
NOTE:

Cable rack and coupling plates are locally engineered and provided.

ASSEMBLE IN FOLLOWING ORDER:

1. Attach I/O trough to top of cabinet using thread-forming screws.
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 coupling plates and 3/8-18 X 1/2 in. hex head bolts with nuts.
5. Attach other end of cable rack to wall using locally provided hardware suitable to type of wall.

Figure 6-9. Installation of 1/0 Cable Rack Coupling to Rear of Cabinet (Group 8)



NOTE:

Cable rack and coupling plate should be locally engineered and provided.

ASSEMBLE IN FOLLOWING ORDER:

1. Attach angle bracket (group 9) to I/O trough using thread-forming screws.

   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.

2. Attach I/O coupling trough (group 8) to cross-aisle bracket using thread-forming screws.
3. Attach cable rack to coupling trough using coupling plates and 3/8-18 X 1/2 in. hex bolts and nuts.
4. Attach other end of cable rack to wall using locally provided hardware suitable to type of wall.

Figure 6-10. Installation of I/O Cable Rack Riser to End of Cabinet (Group 9)

ASSEMBLE IN THE FOLLOWING ORDER:

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 (P/O group 18) to center of 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.

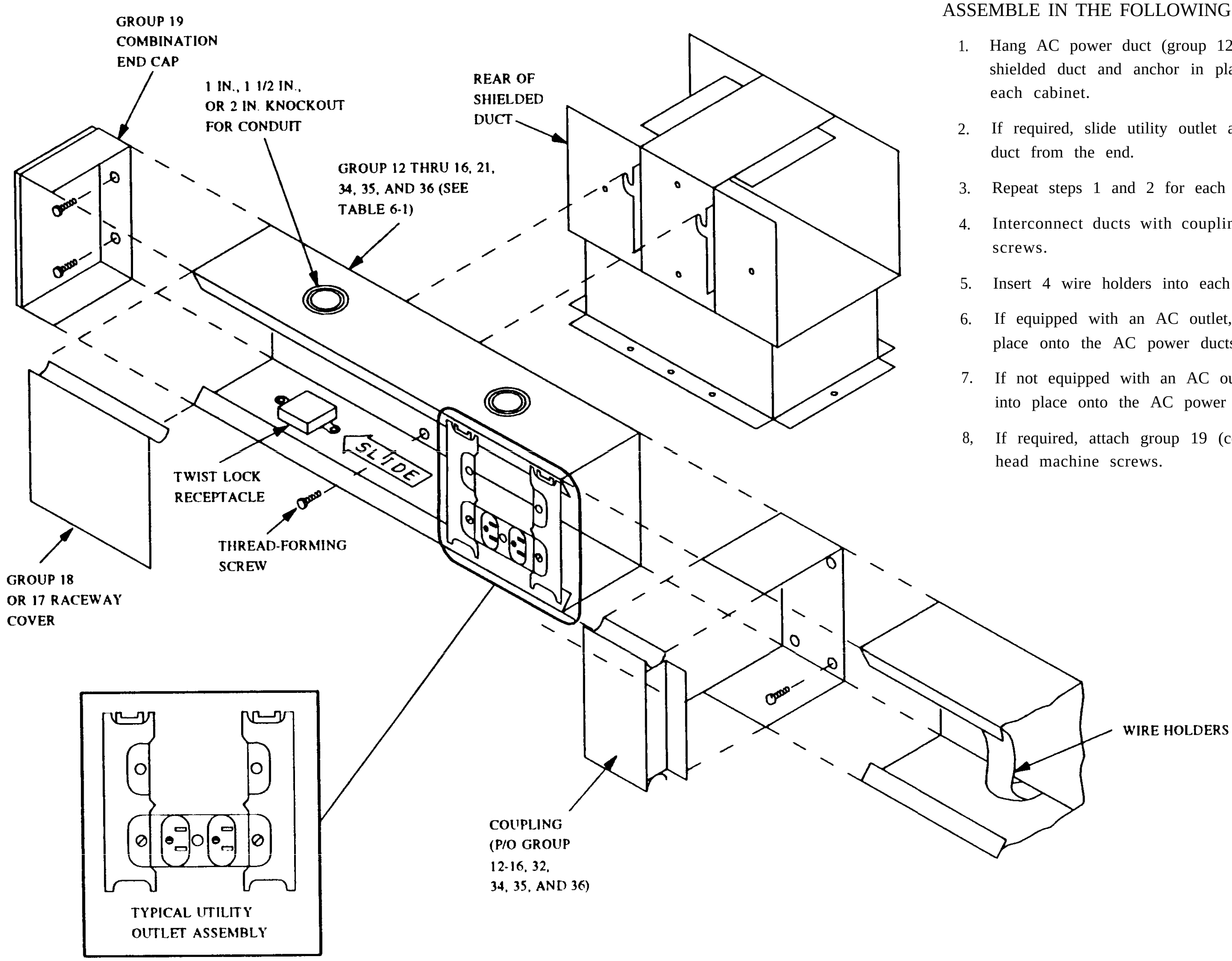
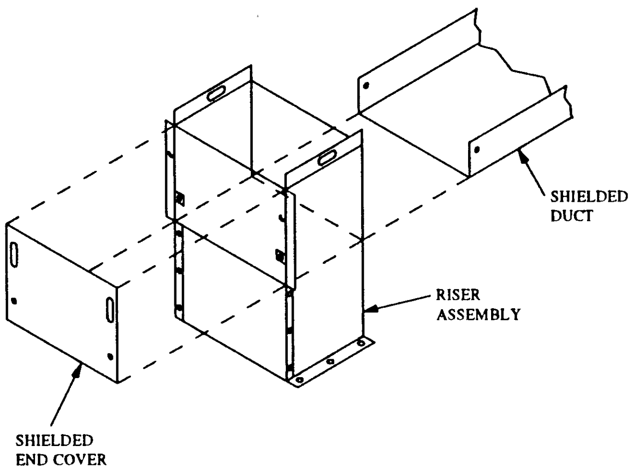


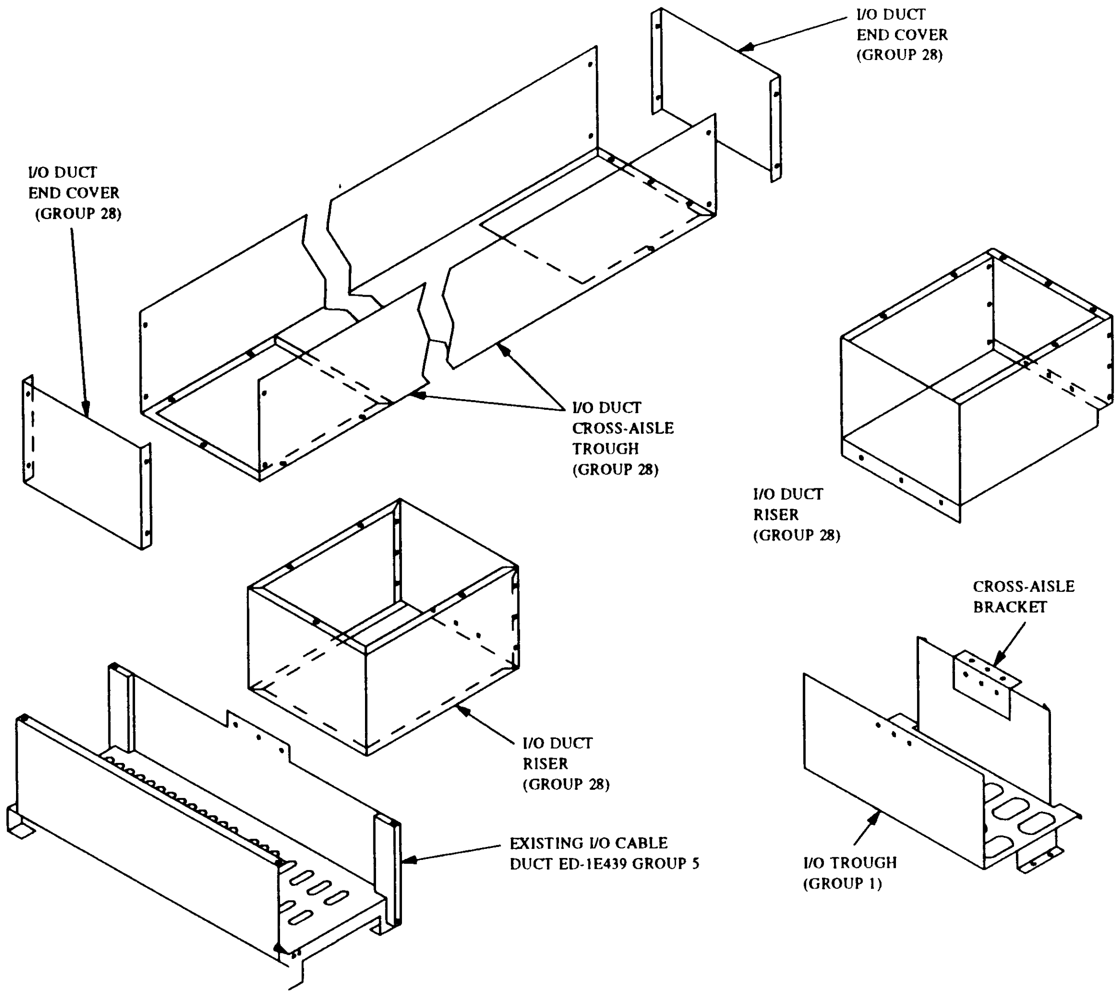
Figure 6-11. Installation of AC Power Duct



ASSEMBLE IN THE FOLLOWING ORDER:

1. Attach shielded riser assembly to top of cabinet wing 3/16-24 X 5/16 in. thread-forming screws.
2. Place one end of the shielded cable duct in the shielded riser assembly and the end in the existing ductwork on the DIMENSION System 85 R1 System.
3. Secure the shielded cable duct at both ends using 3/16-24 X 5/16 in. thread-forming screws.
4. Shielded end cover and shielded duct cover should be stored until cable installation is completed. End cover is then mounted using 3/16-24 X 5/16 in. thread-forming screws. Trough cover is mounted using 3/16-24 X 5/16 in. thread-forming screws at System 85 R2 end and 0.10-24 X 3/4 in. screws at DIMENSION System 85 R1 end.

Figure 6-12. Installation of Ducts for Transition Between System 85 Ductwork and DIMENSION System 85 Ductwork



ASSEMBLE IN THE FOLLOWING ORDER AS REQUIRED:

1. At the System 85 (R2), attach cross-aisle bracket (group 9) to the I/O trough (group 9) using 3/16 in. thread-forming screws.
2. Attach I/O duct riser (group 28) to the cross-aisle bracket and I/O trough using 3/16 in. thread-forming screws.
3. At DIMENSION System 85 (R1), attach I/O duct riser (group 28) to existing I/O cable duct (group 5 ED-1E439) using 3/16 in. thread-forming screws and 10-24 X 3/4 in. screws, nuts and washers.
4. At both ends, attach I/O cross-aisle trough (group 28) to two previously installed risers using 3/16 in. thread-forming screws.
5. Attach I/O duct end covers (group 28) to both ends of moss-aisle duct using 3/16 in. thread-forming screws.

Figure 6-13. Installation of I/O Cable Ducts for Transition Between System 85 (R2) and DIMENSION System 85 (R1)

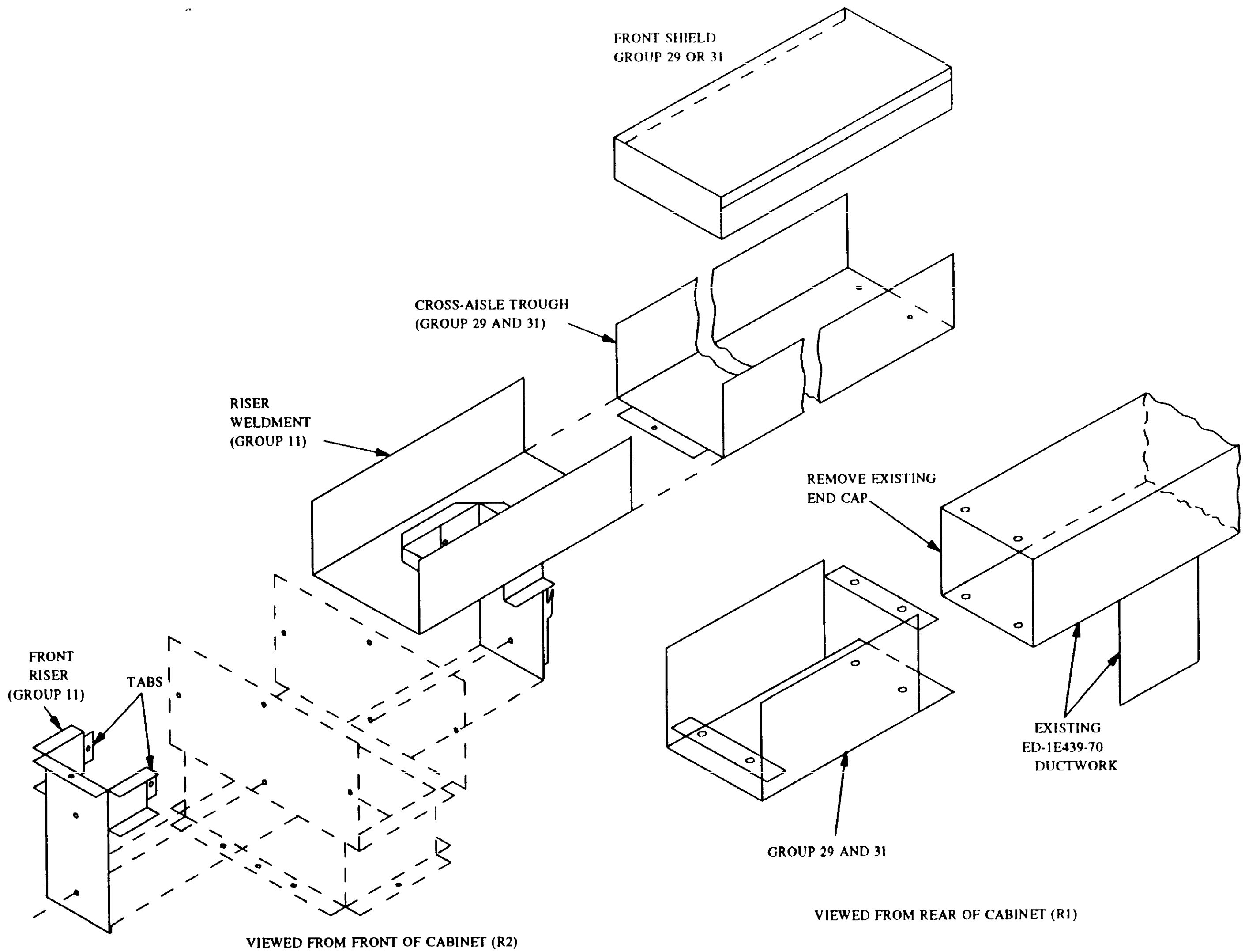


Figure 6-14. Layout of Shield Transition Ductwork from System 85 (R2) to DIMENSION System 85 (R1)

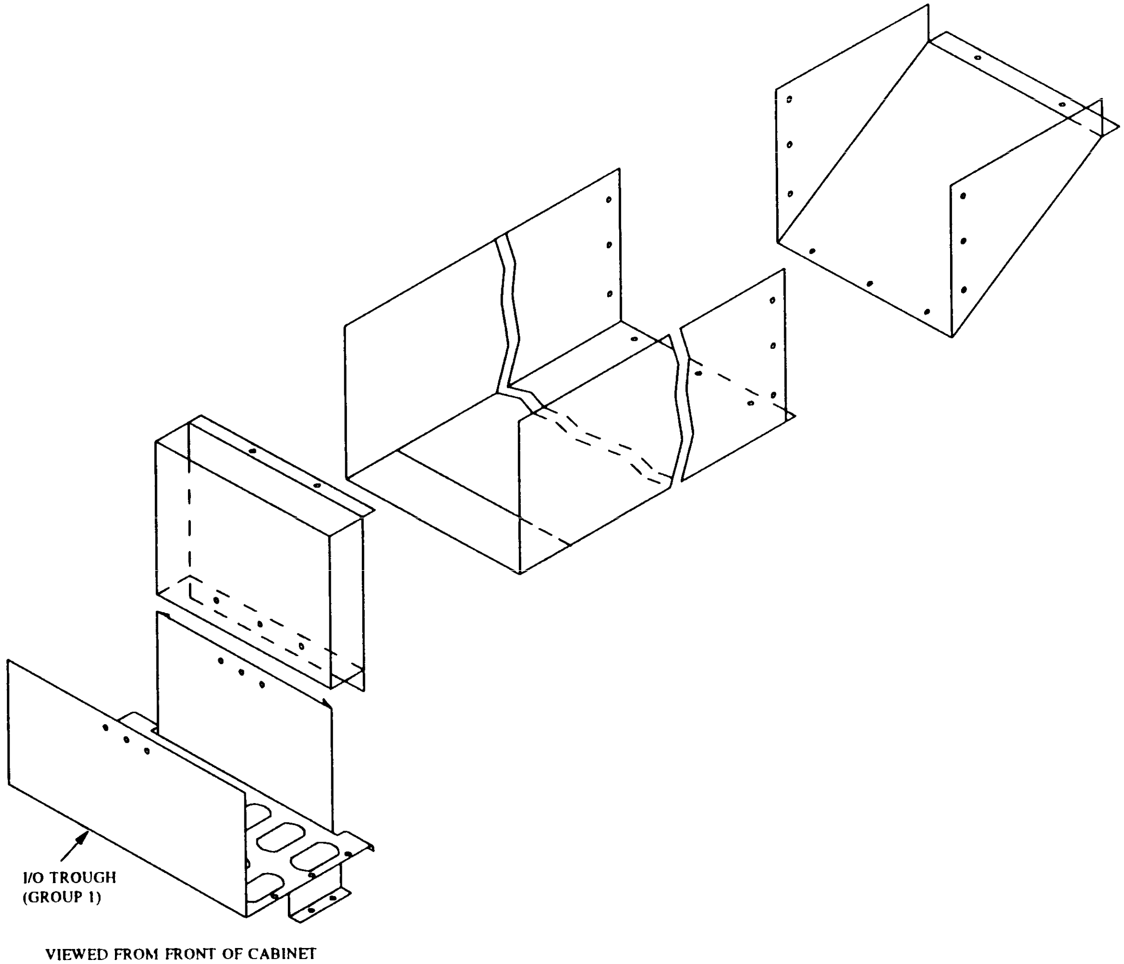
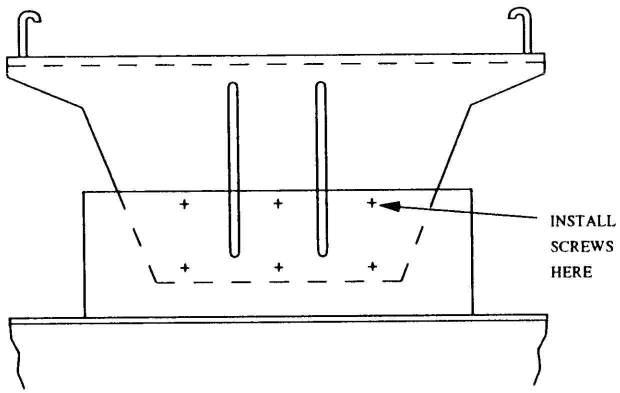
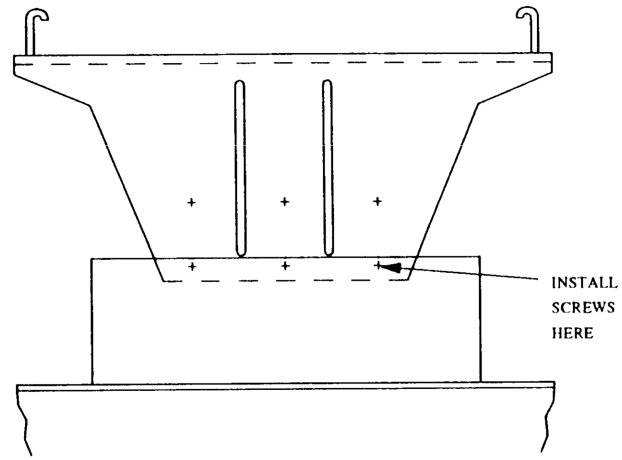


Figure 6-15. Layout of I/O Duct Transition Assembly for Cross-Aisle R1 Lineup to Bridge an R2 Lineup (GRP 30)



FOR 86-IN. LADDER HEIGHT



FOR 88-1/2 IN. LADDER HEIGHT

Figure 6-16. Assembly of Ladder Rack (Supported 86 or 88-1/2 in. from Floor) (GRP 33)

7. AC POWER DISTRIBUTION

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GENERAL

The information in this chapter only applies to AT&T Systetn 85. This information is primarily used for verification of work done by local electrical contractors. However, the information can be used for installation if you are to put in the electrical power connections for the system.

Information on AC power distribution for AT&T DEFINITY Communications Systems Generic 2 systems is in chapter 23 of this document.

The AC service to the system provides 120V and 208V rms, 60-Hz power from a 3-phase, 4-wire plus ground, grounded wye configuration (figure 7-1), or 120V and 240V rms, 60-Hz power from a single-phase, 3-wire plus ground configuration (figure 7-2). These two wiring configurations are for International Telephone and Telegraph Consultative Committee (CCITT), North American (60-Hz) Standard Feature Applications.

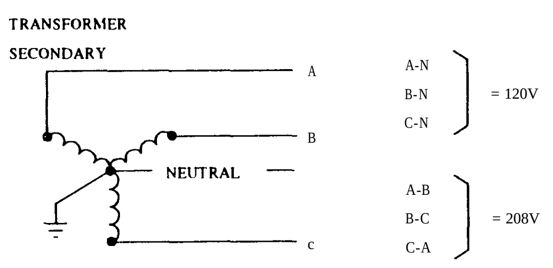


Figure 7-1. 3-Phase, 4-Wire, Grounded Wye Configuration

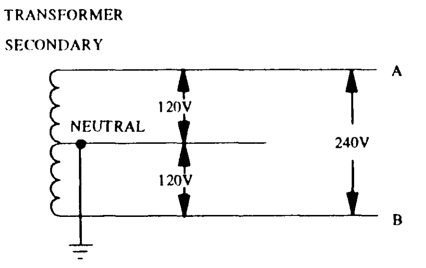


Figure 7-2. Single-Phase, 3-Wire Configuration

REQUIREMENTS

The system is powered by a dedicated AC power distribution system consisting of the following:

- nonfusible disconnect switch
- AC protector cabinet(s) with a single-point ground terminal (SPGT)
- AC load center equipped with appropriate circuit breakers
- AC duct assembly installed on top rear of cabinets
- associated power and grounding cabling
- receptacles

Power flows from the nonfusible disconnect switch to the AC protector cabinet, then to the AC load center where it branches to receptacles located on the AC duct assembly. The receptacles are of two types:

- 120 VAC utility and auxiliary cabinet power receptacles
- 208 VAC system cabinet power receptacles

Power distribution for an AC system is illustrated in figure 7-3.

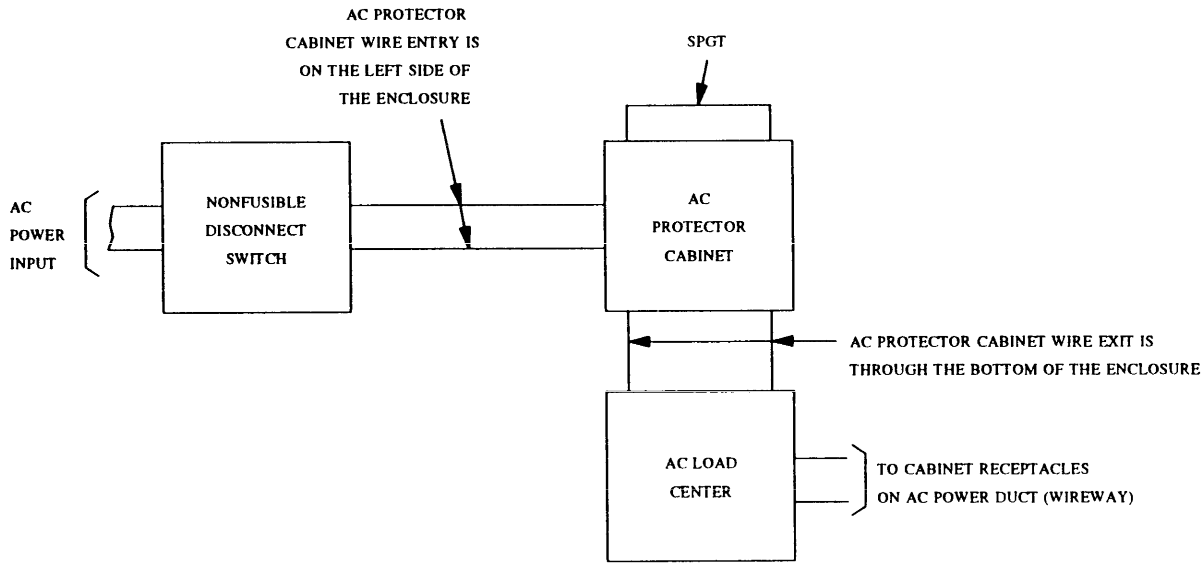
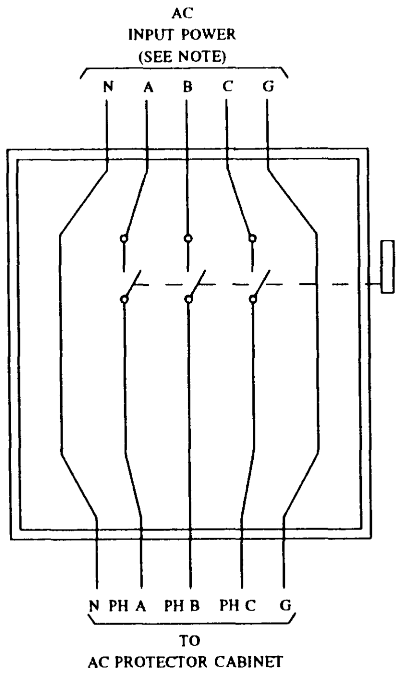


Figure 7-3. Power Distribution Block Diagram

NONFUSIBLE DISCONNECT SWITCH

The nonfusible disconnect switch provides a means to remove AC power from the system. If 3-phase power is used, the disconnect switch is a 3-pole type. If single-phase power is used, the disconnect switch can be either a double-pole type or a 3-pole type. If a 3-pole type is used, one pole (phase C) has no connection.

The nonfusible switch connections are illustrated in figure 7-4.



NOTE:
When a system is arranged for single-phase 120-VAC and 240-VAC, connect the input power to phases A and B only. Phase C has no connection.

Figure 7-4. Nonfusible Disconnect Switch Connections

AC PROTECTOR CABINET

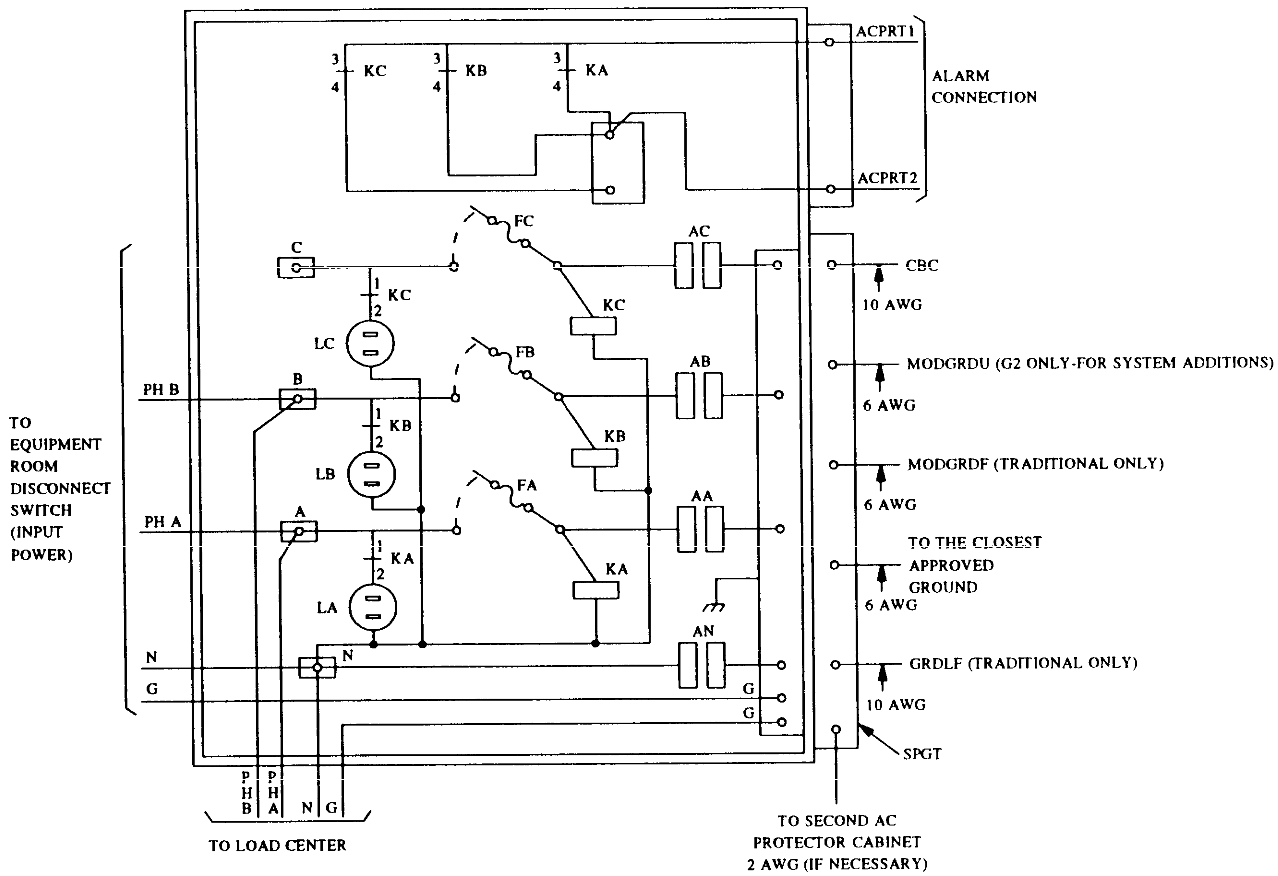
The AC protector cabinet supplies the following:

- Lightning arresters
- Fuses and alarm relays
- Alarm lamps
- SPGT

The lightning arresters protect against power surges. If the arrester fails (becomes short circuited), an associated fuse opens and a relay releases. The released relay operates an alarm light on the AC protector cabinet and signals the common control (CC). The SPGT provides the connection points for the closest approved ground and other system grounds. Connection to this terminal is covered in chapter 8 of this document.

One AC Protector Cabinet

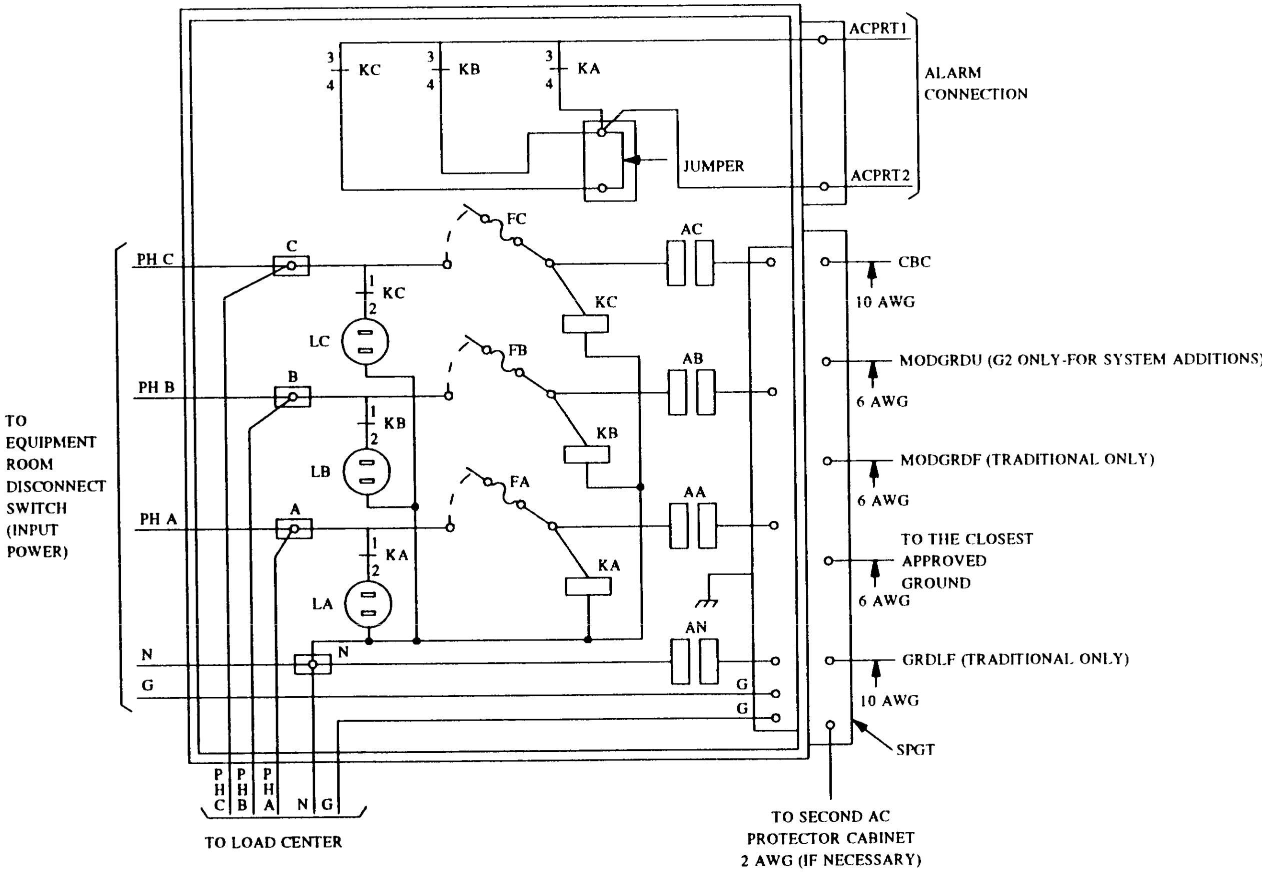
Only one AC protector cabinet is required for small systems. A typical AC protector cabinet and its wiring connections for single-phase systems is illustrated in figure 7-5. A typictal AC protector cabinet and its wiring connections for 3-phase systems is illustrated in figure 7-6.



NOTE:

Connect input power to phases A and B only. Phase C has no connection.

Figure 7-5. Typical AC Protector Cabinet Connections — Single-Phase (240 VAC)



NOTE:

Connect input power to phases A, B, and C.

Figure 7-6. Typical AC Protector Cabinet Connections — 3-Phase (208 VAC)

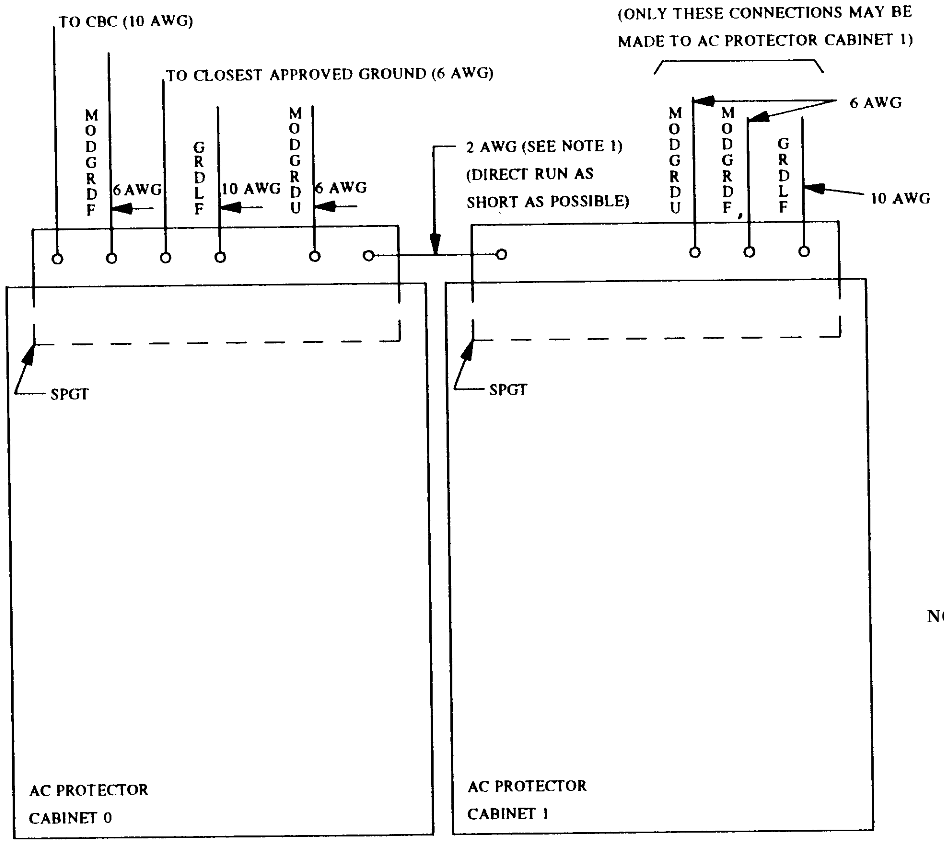
Second AC Protector Cabinet

A second AC protector cabinet is required in any of the following situations:

- When the system has more than 11 modules
- When the connection terminals (holes) in the SPGT of the first AC protector cabinet are all used
- When the total number of modules exceeds the 200A rating of the AC protector cabinet

In systems with two AC protector cabinets, internal wiring connections for both cabinets are the same. Figures 7-5 and 7-6 show the typical internal wiring for single-phase and 3-phase AC protector cabinets.

Mount multiple AC protector cabinets side-by-side or as close as possible, but not more than three ft. apart. A 2-AWG ground wire is used to connect both SPGTs of the two AC protector cabinets. Figure 7-7 shows a two AC protector cabinet arrangement.



NOTE:

1. Terminate both ends with ILSCO #SLSl25 or equivalent solderless terminal lugs and fasten to the SPGT mounting bar bolts.
2. MODGRDU is only connected to UMC and CC/TMS cabinets for system additions.
3. MODGRDF and GRDLF are only connected to traditional cabinets.

Figure 7-7. Two AC Protector Cabinet Arrangement

AC LOAD CENTER

The AC load center provides the AC power distribution and overcurrent protection through the system circuit breakers. It distributes power through cables that run in conduit from the load center to the AC duct assembly on the top rear of the cabinets. This duct assembly provides receptacles for connection to the cabinet AC power distribution units. Utility receptacles are also provided for craft use. Other 120-VAC receptacles are also provided in the ductwork for powering auxiliary (AUX) and data cabinets when necessary.

If an applications processor (AP) cabinet is in the lineup of switch cabinets, the 120-VAC power for the AP must be supplied from the same AC load center as the switch cabinets.

If the AUX cabinet is equipped with a price element code (PEC) 3947 power unit, refer to the top of the unit for the 50-Hz and 60-Hz strapping options.

SYSTEM CIRCUIT BREAKERS

In systems equipped with 309A/310A and 334A power supplies, each module requires two 20A, double-pole circuit breakers and a number of 20A, single-pole circuit breakers. The quantity of single-pole circuit breakers is dependent on the number of AUX cabinets and other peripheral equipment. A single-pole, 20A circuit breaker is always required for each AP cabinet, each Station Message Detail Recording (SMDR) cabinet, each AUX cabinet and the utility feeders. Two single-pole, 20A circuit breakers are required for each duplicated CC and time multiplexed switch (TMS) cabinet.

In systems equipped with bulk Offline Switcher (OLS) power supplies, the number of circuit breakers and feeders required by a port cabinet is dependent upon the number of equipped digital signal level 1 (DS1) carriers the traditional cabinets contain. If two or more equipped DS1 carriers are in a traditional cabinet, two power supplies are required; thus two circuit breakers and feeders are required. (It is recommended that for the sake of growth and simpler cabinet AC distribution that all feeders to these cabinets have two circuit breakers.) In systems equipped with OLS power supplies, the CC, module control (MC), and TMS cabinets require one 20A circuit breaker if unduplicated and two 20A circuit breakers if duplicated.

309A/310A VAC INPUT POWER TAPS

The 309A/310A power units contained in the traditional MC cabinet and traditional port cabinet can operate with either 208 VAC or 240 VAC input. An option panel on the 309A power unit provides taps to match the input voltage.

Access the 309A input voltage tap terminal strip by performing the following steps:

1. Set the AC INPUT CIRCUIT BREAKER to **OFF.**
2. Disconnect the AC power cord.
3. Remove the top two screws of the front panel.
4. Lower the hinged top half of the front panel.
5. Connect the wire to the proper terminal position on terminal block 2 (TB2).

Figure 7-8 illustrates the connection options for TB2 on the 309A/310A power unit.

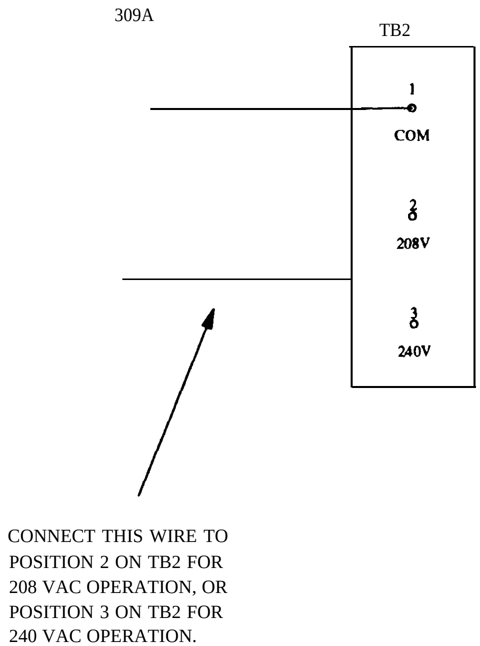


Figure 7-8. 309A/310A VAC Power Tap Input Connection

Close up and restore the 309A to service.

1. Close the hinged top half of the front panel.
2. Replace the top two screws of the front panel.
3. Reconnect the AC power cord.
4. Set the AC INPUT CIRCUIT BREAKER to ON.

POWER RECEPTACLES

Different cabinet power receptacles are used for the various types of power supplies available with System 85. The utility receptacles are the same regardless of the system configuration, as are the AP, AUX, and SMDR cabinet power receptacles.

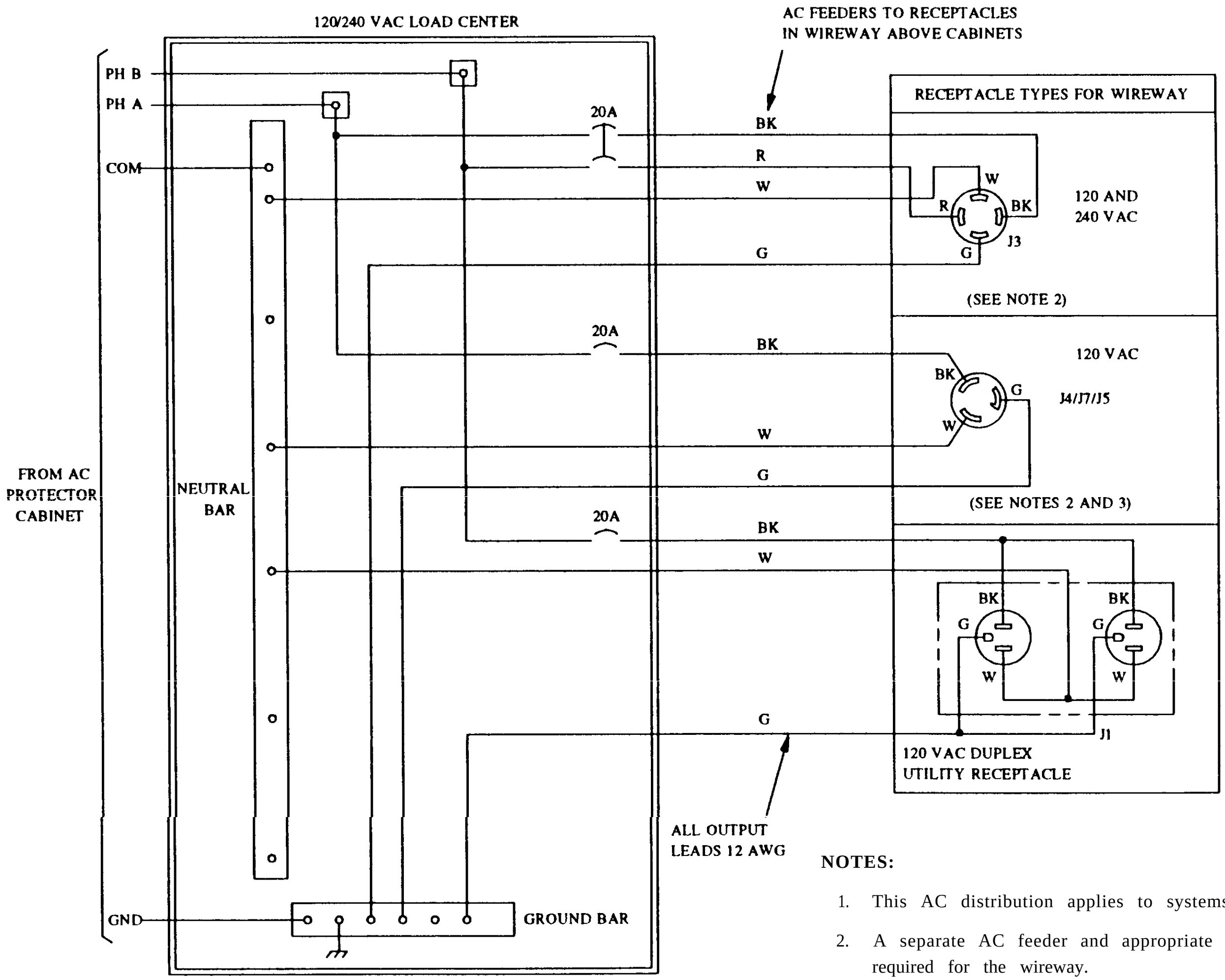
The J numbers represent a type of receptacle and are based on schematic drawings (SDs). The receptacle that corresponds to the J number is found in table 7-1. Utility receptacles are J1 numbered units and require a National Electric Manufacturers Association (NEMA) 5-20R receptacle.

309A/310A/334A Supplies

The cabinet power receptacles for these types of supplies are shown in table 7-1. The connection information for single-phase and 3-phase systems is shown in figures 7-9 and 7-10. The connection information for the receptacles is shown in figures 7-11 and 7-12.

TABLE 7-1. Cabinet Power Receptacles — 309A/310A/334A

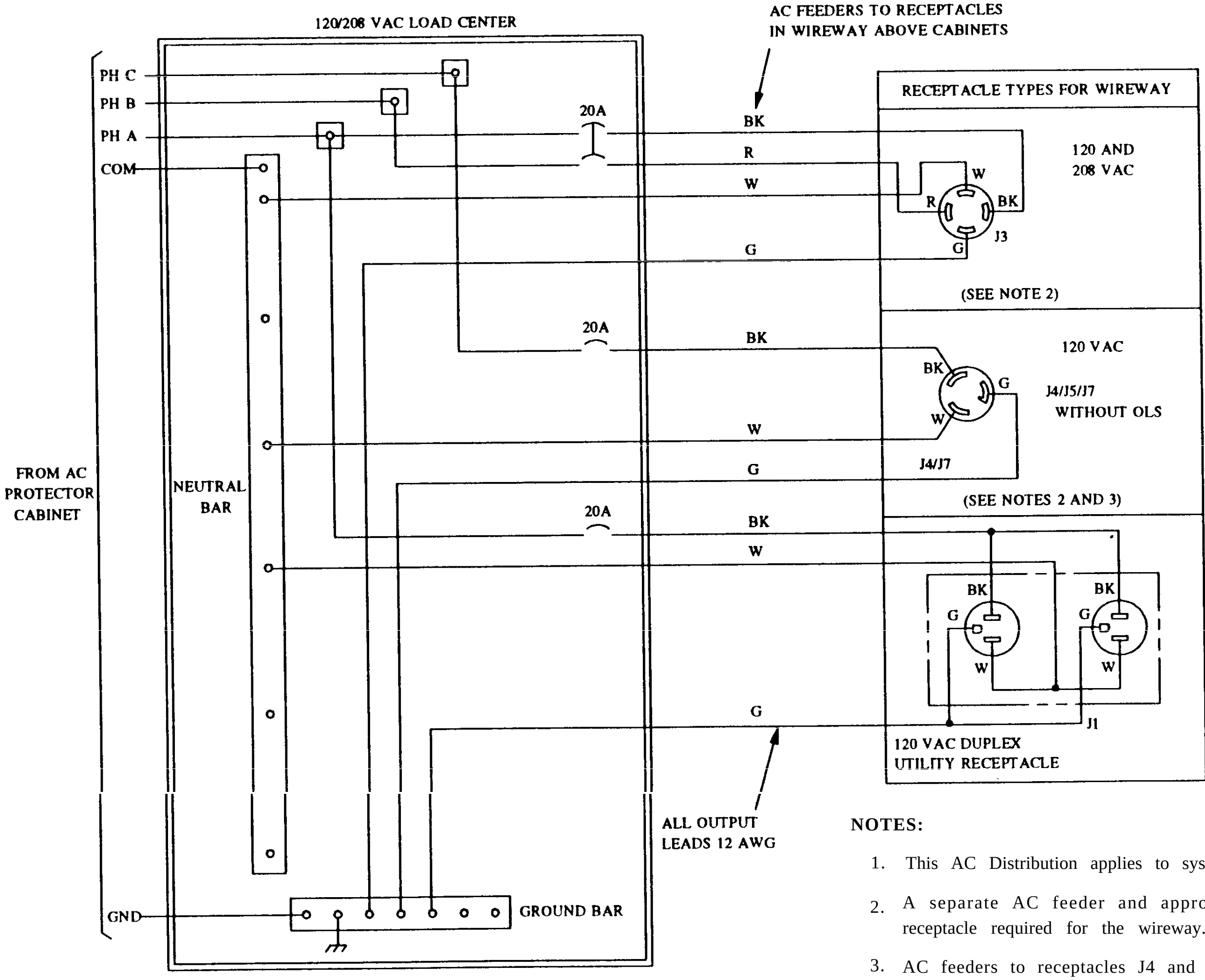
Cabinet Type	Power Supply	J Number	NEMA Code
Network	309 W310A	J3	L14-20R
CC and TMS	334A	J4, J5	L5-20R
AP, AUX, SMDR	N/A	J7	L5-20R



NOTES:

1. This AC distribution applies to systems with -48V rectifiers and nominal holdover only.
2. A separate AC feeder and appropriate circuit breaker is provided fo each cabinet receptacler required for the wireway.
3. AC feeders to receptacles J4 and J5 are provided on different phases from the AC load center for the duplicated CC cabinet.

Figure 7-9. Single-Phase Receptacle Connections (120/240 VAC) for 309A and 334A Supplies

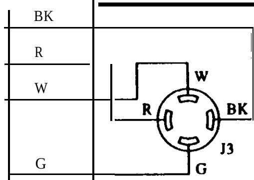
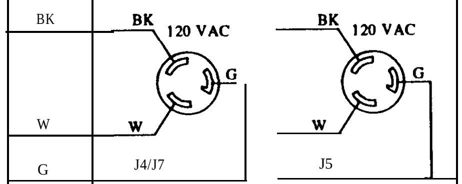
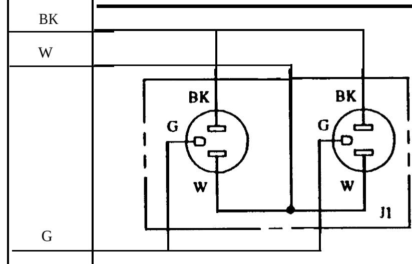


NOTES:

1. This AC Distribution applies to systems with -48V rectifiers and nominal holdover only.
2. A separate AC feeder and appropriate circuit breaker are provided for each cabinet receptacle required for the wireway.
3. AC feeders to receptacles J4 and J5 are provided on different phases from the AC load center for the duplicated CC cabinet.

Figure 7-10. 3-Phase Receptacle Connections (120/208 VAC) for 309A/310A and 334A Supplies

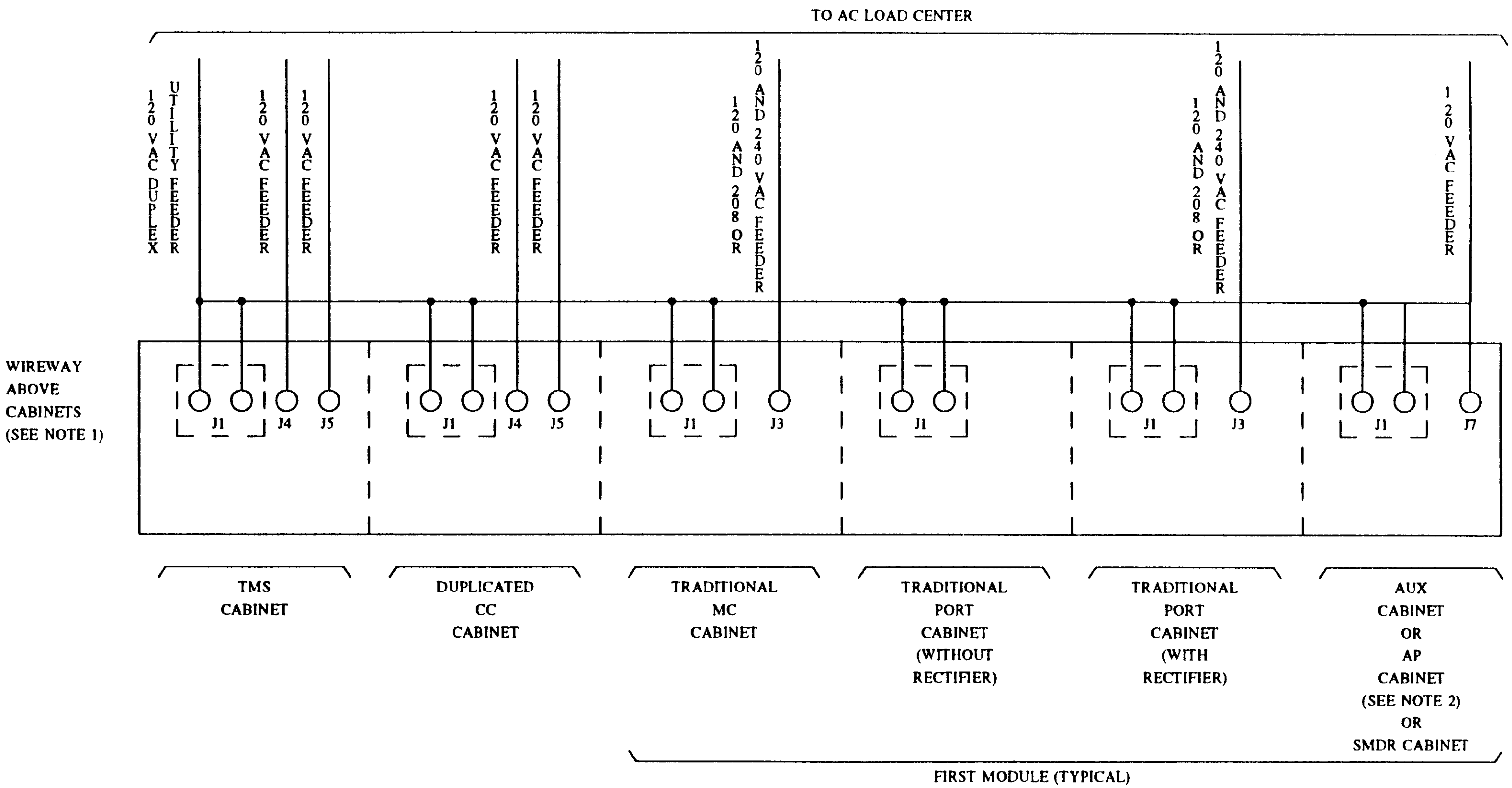
FROM AC LOAD CENTER

RECEPTACLE TYPES FOR WIREWAY	TMS	DUPLICATED CC	INDUPLICATED CC	TADITIONAL MC	TRADITIONAL PORT WITHOUT RECITFIER	TRADITIONAL PORT WITH RECTIFIER	UNIVERSAL MODULE	AUX	AP	SMDR
 120 AND 208 OR 120 AND 240 VAC			(SEE NOTE 1)	J3 (SEE NOTES 1,2)	(SEE NOTES 2, 4)	J3 (SEE NOTE 4)	(SEE CHAP 21)			
 J4/J7 J5	J4, J5 (SEE NOTE 3)	J4, J5 (SEE NOTE 5)						J7	J7	J7
 120 VAC DUPLEX UTILITY RECEPTACLE	J1	J1	J1	J1	Jl	J1		J1	J1	J1

NOTES:

1. For systems with unduplicated CC, the MC cabinet (traditional) provides -48 VDC power for the unduplicated CC cabinet.
2. For systems with duplicated CC, the MC cabinet provides DC power for the port cabinet without rectifier.
3. AC feeders and receptacles J4 and J5 for the TMS cabinet are required only for multi module systems.
4. Port cabinets with rectifiers also provide DC power for an adjacent port cabinet without rectifier.
5. AC feeders to receptacles J4 and J5 will be provided on different phases from the AC load center for the duplicated CC cabinet.

Figure 7-11. Receptacle Types for 309A/310A and 334A Power Supplies



NOTES:

1. Wireway above cabinets as viewed from the back of the cabinets.
2. The cabinet receptacle and duplex utility receptacle for the AP cabinet are interchanged in the wireway.

Figure 7-12. AC Power Distribution for Systems with 309A/310A or 334A Rectifiers

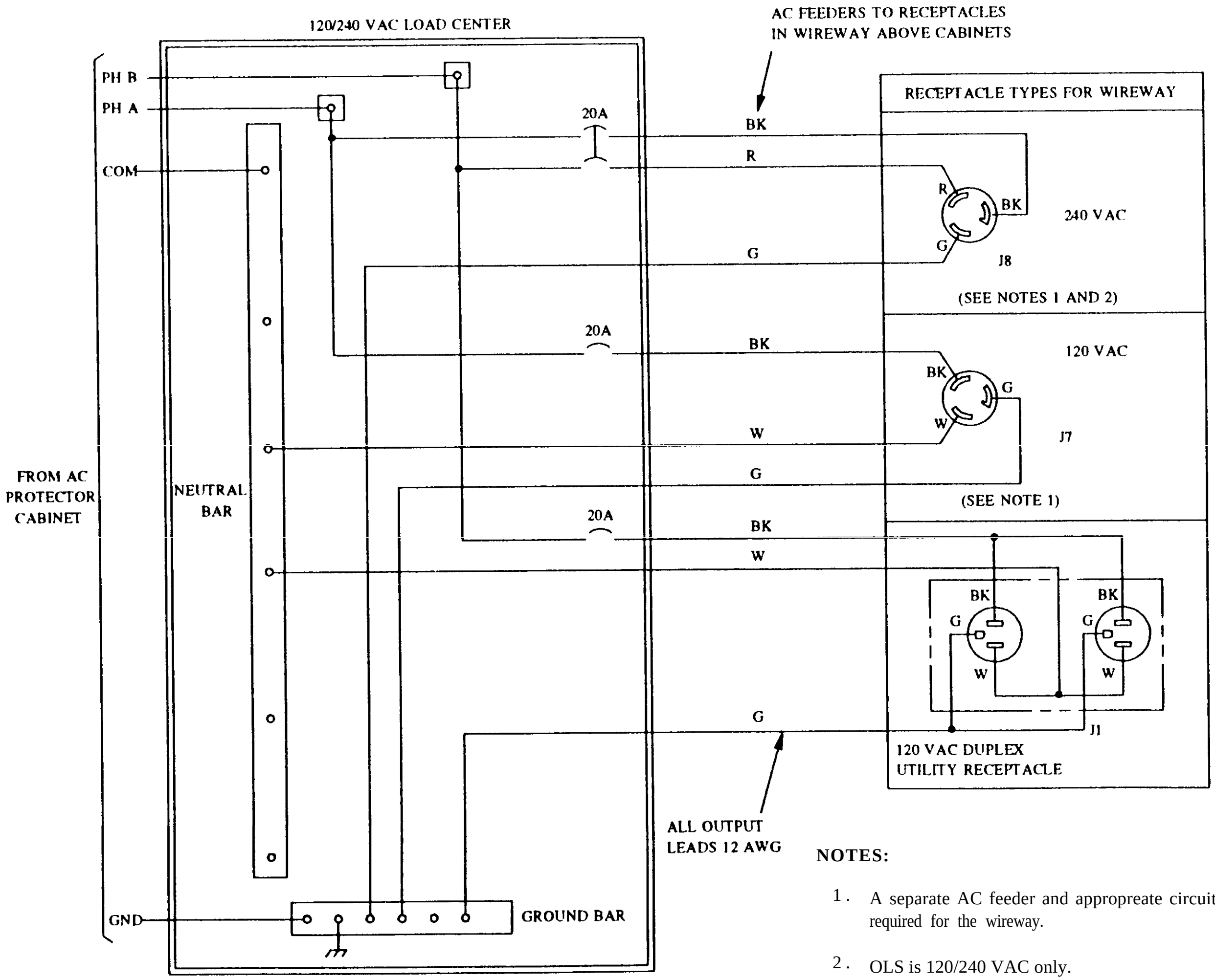
OLS Supplies

The cabinet power receptacles for the OLS supplies are shown in table 7-2. The connection information for single-phase and 3-phase systems is shown in figures 7-13 and 7-14. The connection information for the receptacles is shown in figures 7-15 and 7-16.

The J numbers represent a type of receptacle and are based on SD drawings. The receptacle that corresponds to the J number is found in table 7-2. Utility receptacles are J1 numbered units and require a NEMA 5-20R receptacle.

TABLE 7-2. Cabinet Power Receptacles — OLS

Cabinet	J Number	NEMA Code
All cabinets With OLS supplies	J8	L6-20R
AP, AUX, SMDR	J7	L5-20R

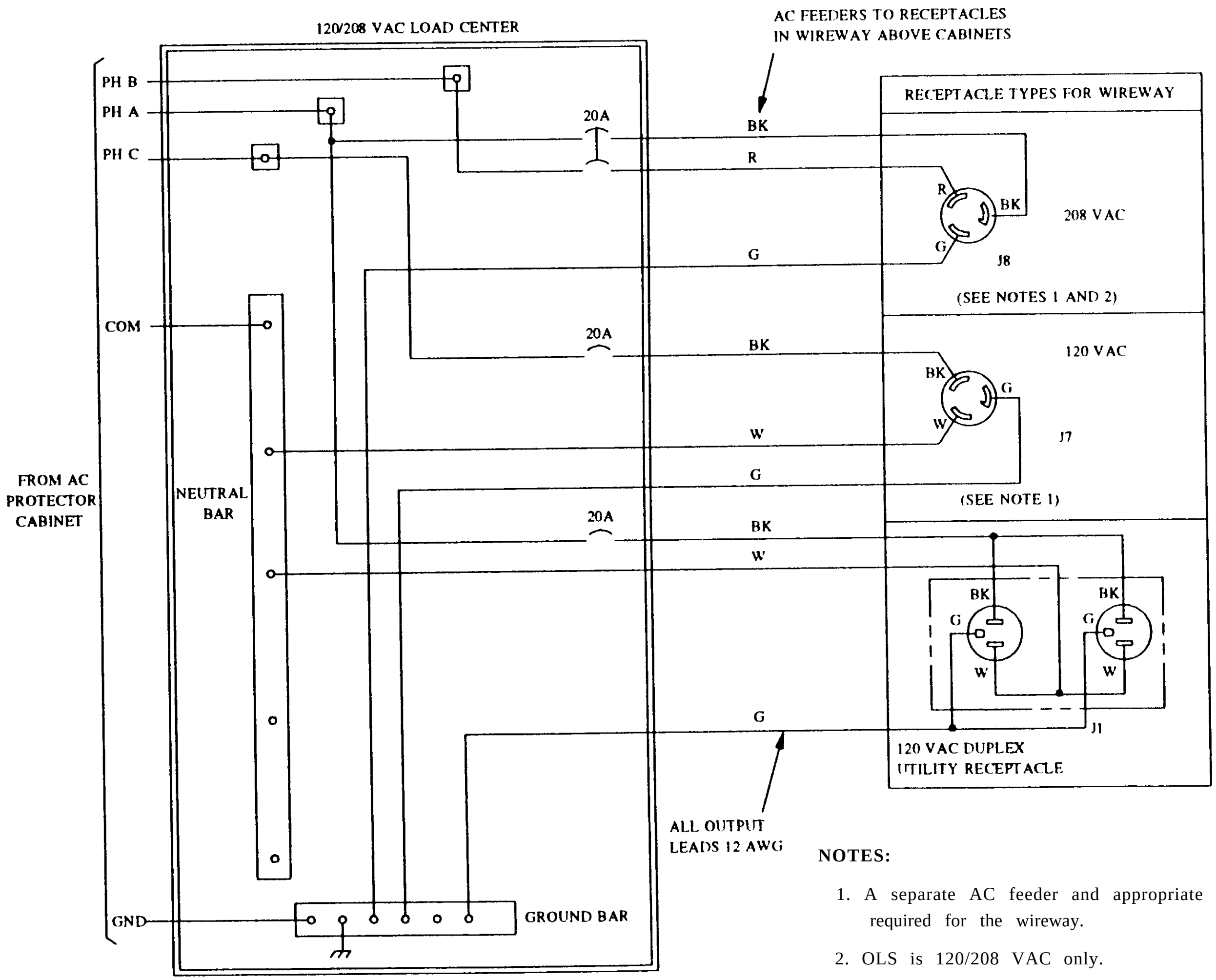


NOTES:

1. A separate AC feeder and appropreate circuit breaker is provided for each cabinet receptacle required for the wireway.

2. OLS is 120/240 VAC only.

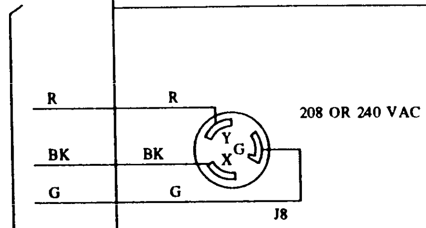
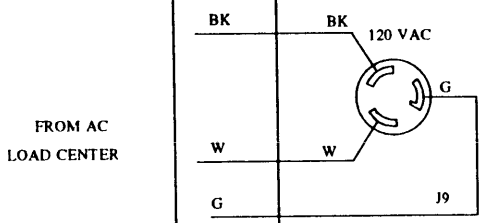
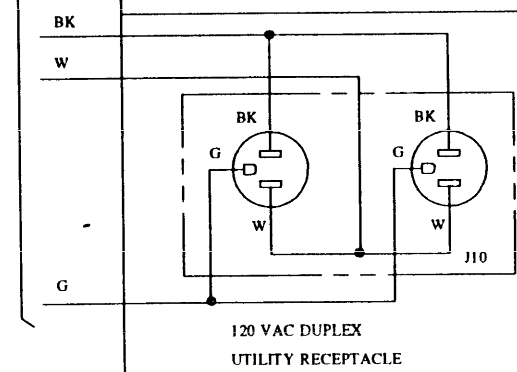
Figure 7-13. Single-Phase Receptacle Connections (120/240 VAC) for OLS Supplies



NOTES:

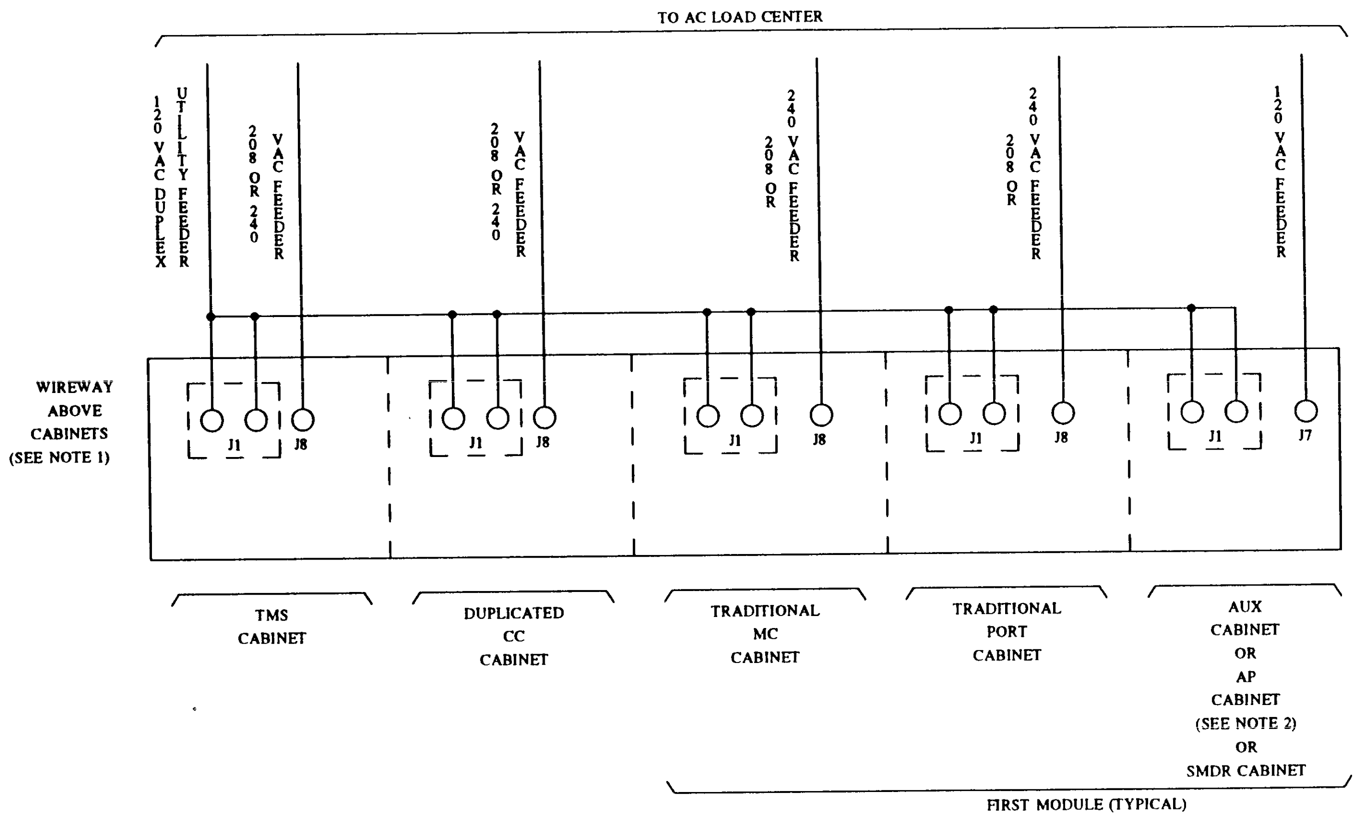
1. A separate AC feeder and appropriate circuit breaker is provided for each cabinet receptacle required for the wireway.
2. OLS is 120/208 VAC only.

Figure 7-14. 3-Phase Receptacle Connections (120/208 VAC) for OLS Supplies

RECEPTACLE TYPES FOR WIREWAY	TMS	CC	TRADITIONAL PORT CABINET	AUX	AP	SMDR
	J8	J8	J8			
				J7	J7	J7
	J1	J1	J1	J1	J1	J1

NOTE:
For duplicated CC, TMS, and traditional MCs, two J8 receptacles are required for each cabinet.

Figure 7-15. Receptacle Types for OLS Power Supplies



NOTES:

1. Wireway above cabinets as viewed from the back of the cabinets.
2. The cabinet receptacle and duplex utility receptacle for the AP cabinet are interchanged in the wireway.

Figure 7-16. AC Power Distribution for Systems with OLS Power Supplies

8. AC SYSTEM GROUNDING

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GENERAL

Chapter 8 explains grounding schemes for AC traditional systems only.

Spools of 6-gauge and 10-gauge wire are provided with the system for making ground connections.

WARNING

Any ground sources within reach of any portion of the system components that are not connected to the SPGT must be insulated or removed.

GROUNDING DEFINITIONS

The following is a list of definitions that apply to AT&T System 85 grounds:

- Single-point ground terminal (SPGT): A stainless steel block mounted on the AC protector cabinet used to tie all grounds together and to connect the system to the closest approved ground.
- Circuit ground block: A copper block mounted in all cabinets at the fan assembly level that provides a grounding point within each cabinet for all grounds except the lightning ground.
- Lightning ground (GRDL): A ground in all cabinets containing port carriers that routes lightning surges from port carriers. It is a daisy-chained 10 AWG wire in all cabinets containing port carriers that connects each port carrier in a module together via the TSGRDL in each cabinet.
- Lightning ground filtered (GRDLF): A filtered ground that connects each module and the SPGT. It is not connected to any other ground within the module.
- Module ground (MODGRD): A ground for every module that equalizes all cabinets in a module to the same ground potential. It is a daisy-chained 6 AWG wire that connects all of the cabinets within a module together at their respective circuit ground blocks and eventually connects to the MODGRD EMC filter within the module control cabinet.
- Module ground filtered (MODGRDF): A filtered ground that connects each module and the SPGT.
- Digital ground (GRDD): A low impedance ground that interconnects each carrier within a cabinet. It consists of 10 and 14 AWG wires.
- Circuit ground (CKT GRD): A ground used to interconnect cabinet pairs that share the same power rectifier in older systems. This ground puts both cabinets at the same ground potential. This ground is not used with systems that have OLS power supplies.
- Terminal Strip GRDL (TSGRDL): Terminal strip for connecting all intracabinet GRDL wires within a cabinet to one point. Also provides a connecting point for tying all GRDL wires within a module together before connecting GRDL to the EMC filter for the module.

SYSTEM GROUNDING

The system uses an SPGT. The SPGT is a stainless steel formerly copper) block in the AC protector cabinet. The system ground wire travels from the SPGT to the closest approved ground source. It is a copper 6 AWG wire and is connected using an approved ground clamp. The connection is identified with an E3013B grounding tag or equivalent.

Section 250-81 of the National Electric Code approves the following grounds:

1. Metallic cold water pipe that is continuous and electriccally connected to the street side of the water meter

- Building steel that is bonded to cold water pipes and power source ground
- Ground electrode encased by at least 2 inches of concrete and in direct contact with the earth
- A ground ring that encircles a building and is at least 2-1/2 feet below the earth's surface.

Figure 8-1 shows the system ground connection.

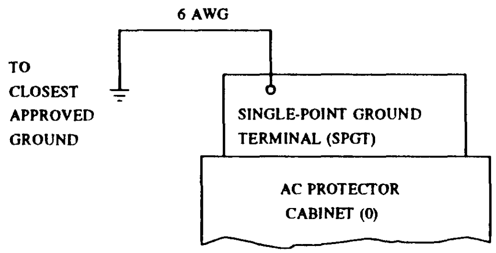


Figure 8-1. System Ground Connection

If two AC protector cabinets are required, they must be connected together as shown in figure 8-2. This connection should not be more than three feet long.

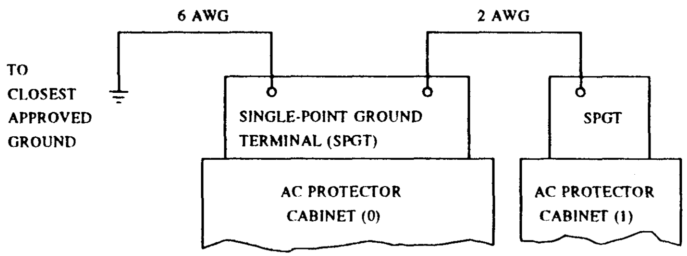


Figure 8-2. Ground Connection for Two AC Protector Cabinets

The MODGRDF, GRDL, and the coupled bonding conductor to the cross-connect field, also connect to the SPGT.

EMC FILTER

EMC filters are used for two types of grounds:

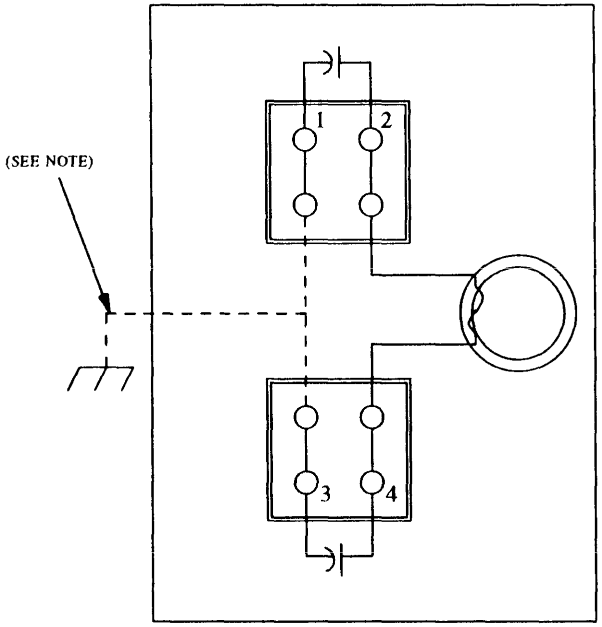
- MODGRD
- GRDL

Both grounds become filtered grounds after they are connected to an EMC filter. A separate EMC filter is needed for each of the grounds. Each module requires an EMC filter for its GRDL and another for its MODGRD. Although the two EMC filters may be located in the same cabinet (e.g., if the module only has one cabinet), it is preferable that they be located in separate cabinets. The general rule is that the MODGRD EMC filter be in the module control cabinet and the GRDL EMC filter be in a port cabinet. The only time the EMC filter for GRDL is located in the CC cabinet is when the CC is not duplicated and it contains port carriers for the first module. The remaining modules have their GRDL EMC filter in the first port cabinet within the module or within the module control cabinet if the module is a single cabinet.

The MODGRD EMC filter does not go into the CC cabinet for any module.

EMC filters are never used in TMS cabinets

Input leads to the EMC filter for both grounds are connected to terminal 2 and output leads from the EMC filter are connected to terminal 4. The output leads from terminal 4 connect to the SPGT. Figure 8-3 shows the EMC filter.



NOTE:

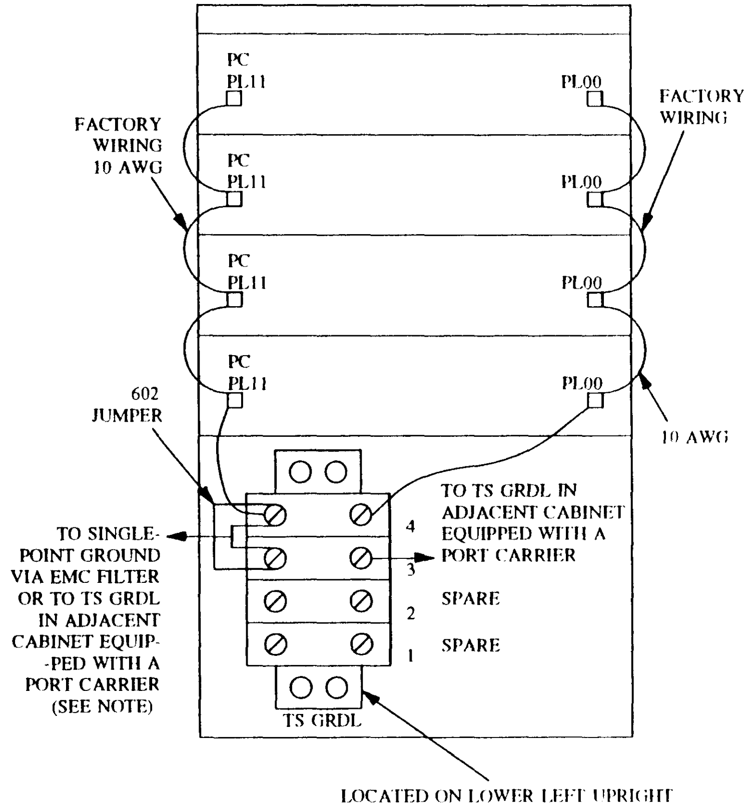
The connection represented by the dashed line between contacts 1 and 3 is on the back of the EMC filter printed circuit board and is a factory installed connection. Only the GDRL or MODGRD connections to points 2 and 4 are required during installation.

Figure 8-3. EMC Filter Connections

TSGRDL AND INTRACABINET GRDL CONNECTIONS

A TSGRDL is located in every cabinet that has port carriers. It provides a single termination point for GRDL wires within the cabinet. The 10 AWG carrier wires daisy chain from the highest carrier to the lowest carrier and then to the TSGRDL. From the TSGRDL, the wires exit the cabinet and run to the next cabinet containing port carriers within the module. When all cabinets within a module are connected, the last TSGRDL is connected to the GRDL EMC filter. From the GRDL EMC filter, the GRDLF 10 AWG wire runs to the SPGT.

Figure 8-4 shows an example of the GRDL wiring with an enlarged view of the TSGRDL.



NOTE:
The GRDL wire exits a cabinet via the bottom small duct on the lower rear

Figure 8-4. Intracabinet GRDL and TSGRDL Connections

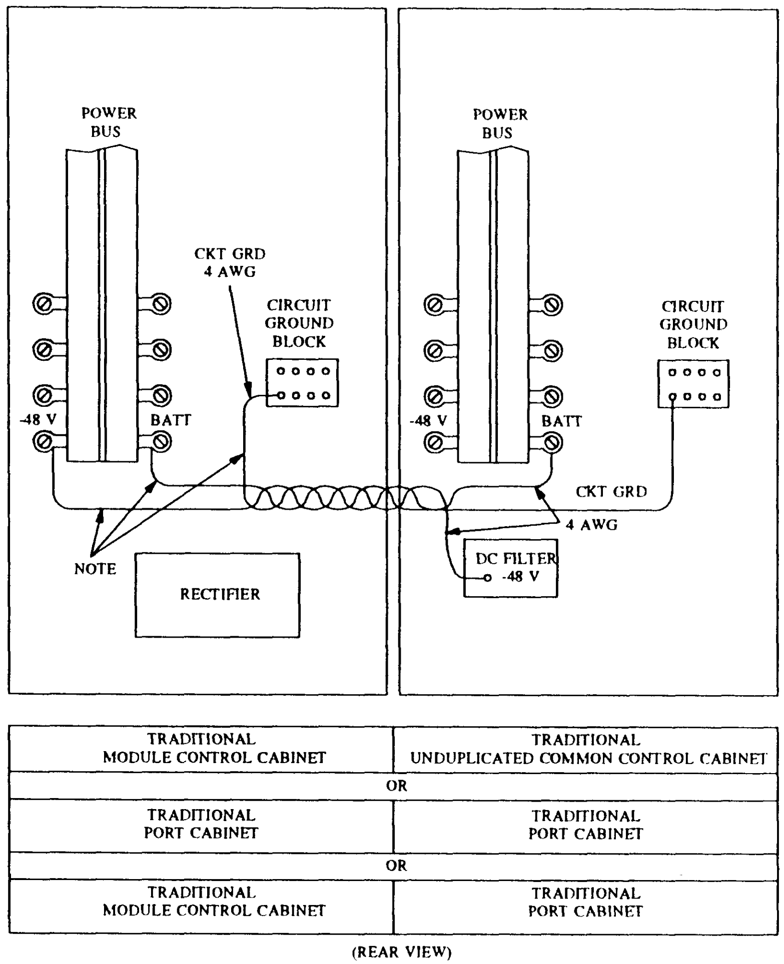
CKT GRD

Figure 8-5 shows how the CKT GRD connects the copper circuit ground blocks in two adjoining cabinets (cabinet pairs), one of which contains the rectifier needed to power both cabinets. This wire is tightly twisted with the BATT and -48V wires that connect the bus bars. The BATT and -48V wires should be connected at this time.

This connection is not used in systems equipped with OLS power supplies, since all cabinets are equipped with power supplies and there are no cabinet pairs.

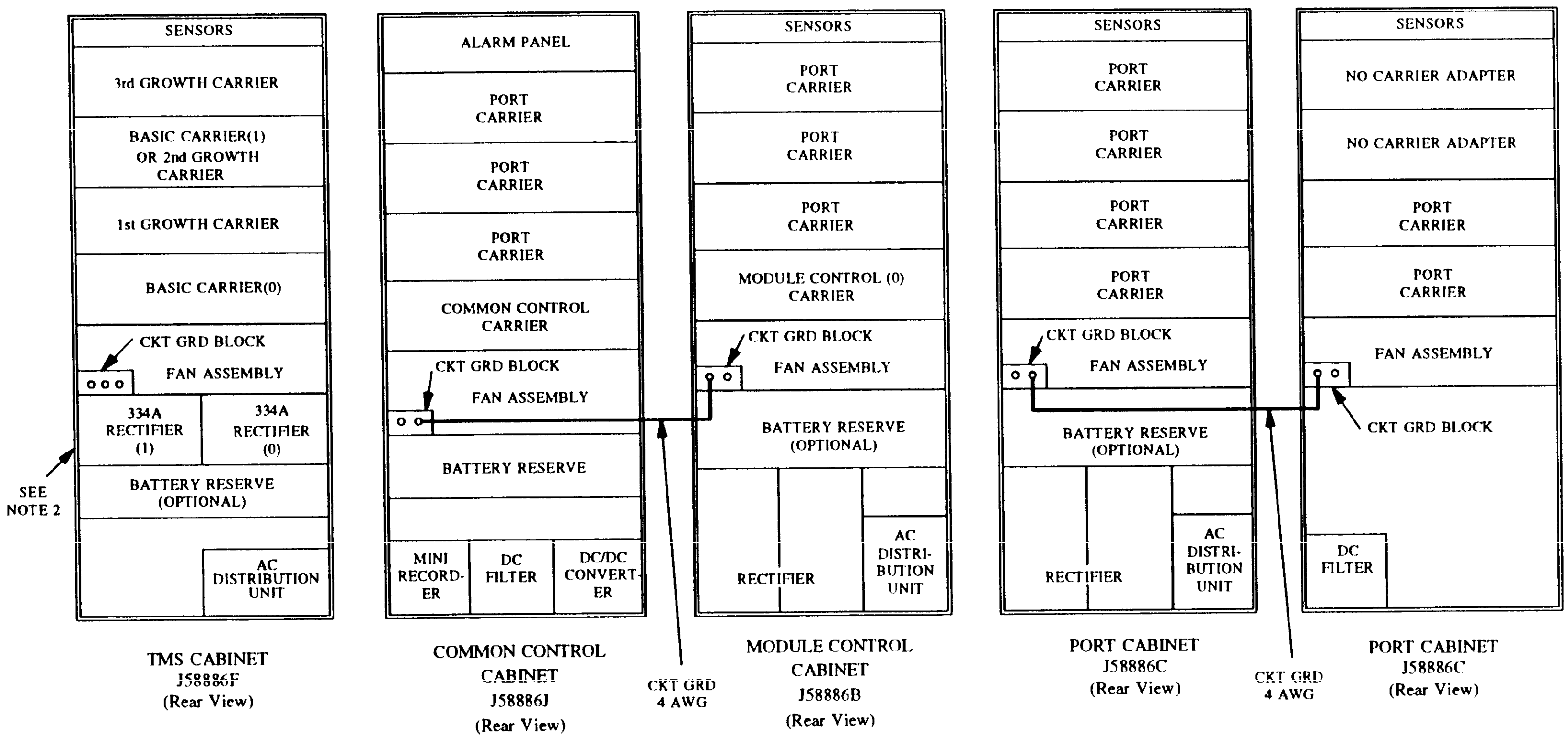
Figure 8-6 shows CKT GRD in an unduplicated system with cabinet pairs. Figure 8-7 shows the combination of CKT GRD and MODGRD in an unduplicated system with cabinet pairs.

Figure 8-8 shows CKT GRD for a duplicated system with cabinet pairs. Figure 8-9 shows the combination of CKT GRD and MODGRD in a duplicated system with cabinet pairs.



NOTE:
These wires are the same color and are marked to ensure correct termination. Route through upper duct (second hole) on lower rear of cabinets.

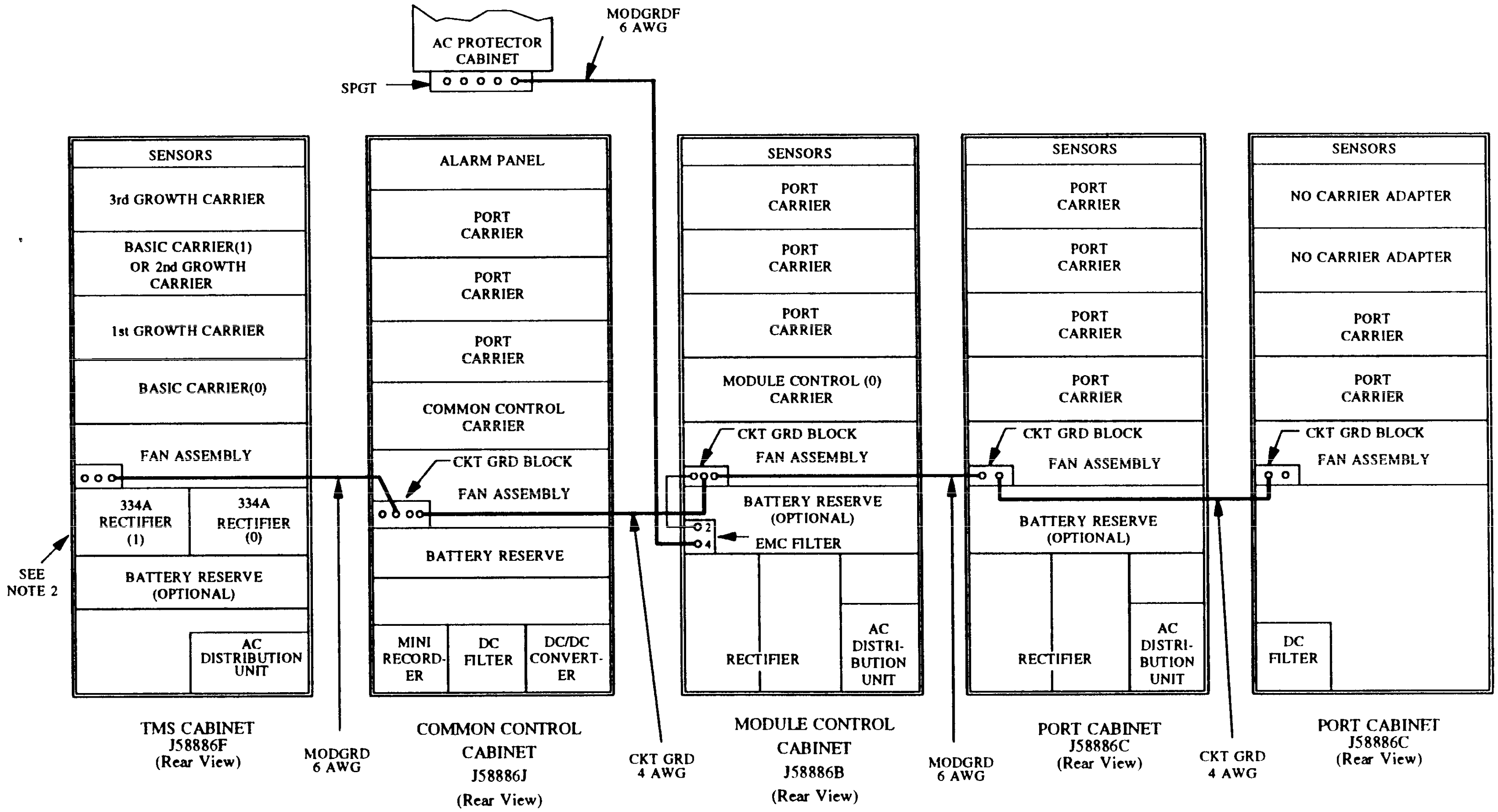
Figure 8-5. CKT GRD Connections — Cabinet Pair



NOTES:

1. The battery reserve is not optional for the common control cabinet. Battery reserve units are optional for cabinets with rectifiers in a cabinet pair configuration
2. The second 334A rectifier is only required in an unduplicated TMS cabinet if more than two TMS/RMI carriers are located in the cabinet.

Figure 8-6. CKT GRD for Cabinet Pairs — Unduplicated System



NOTES:

1. The battery reserve is not optional for the common control cabinet. Battery reserve units are optional for cabinets with rectifiers in a cabinet pair configuration.
2. The second 334A rectifier is only required in an unduplicated TMS cabinet if more than two TMS/RMI carriers are located in the cabinet.

Figure 8-7. Combined CKT GRD and MODGRD for Cabinet Pairs — Unduplicated System

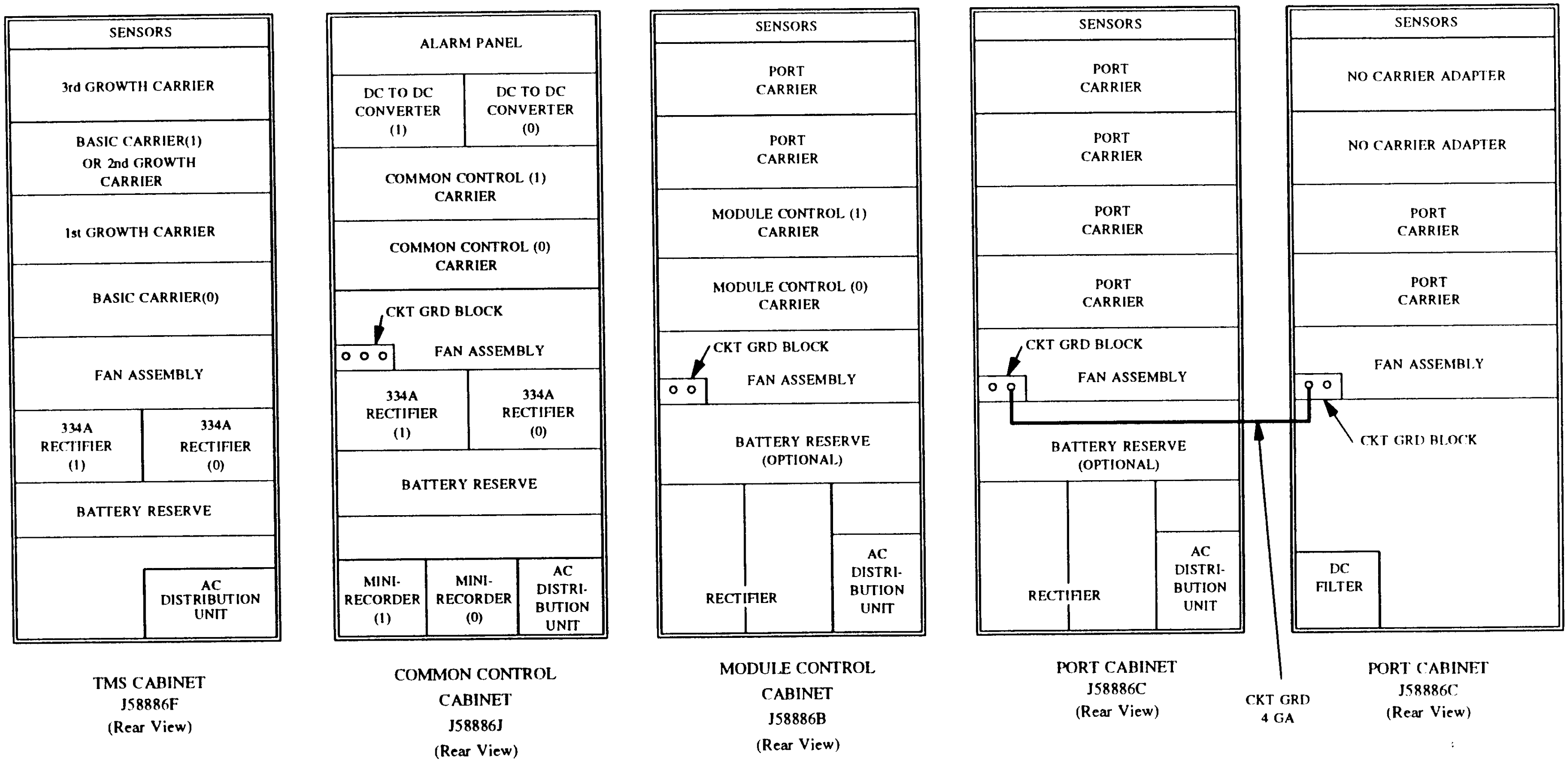


Figure 8-8. CKT GRD for Cabinet Pairs — Duplicated System

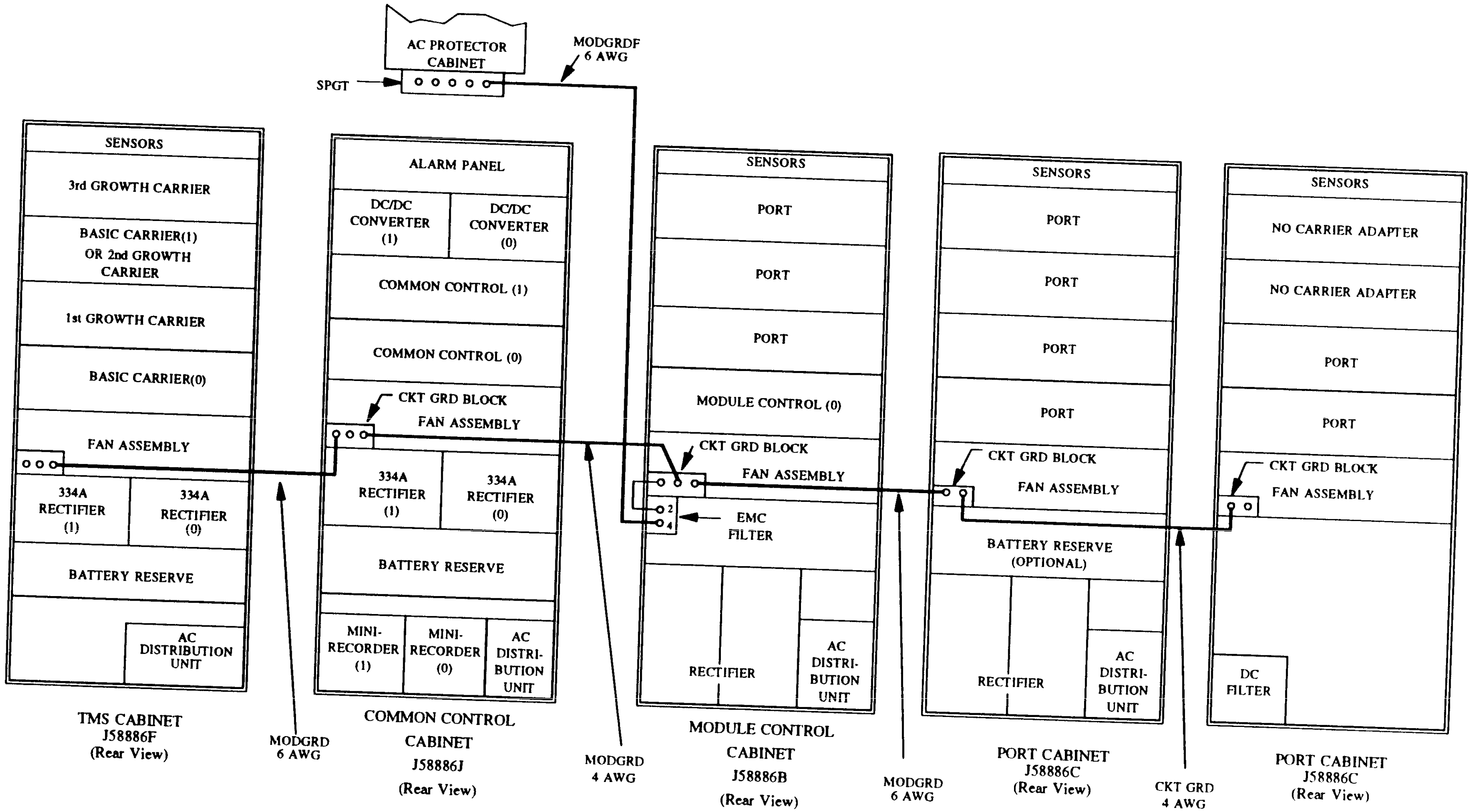
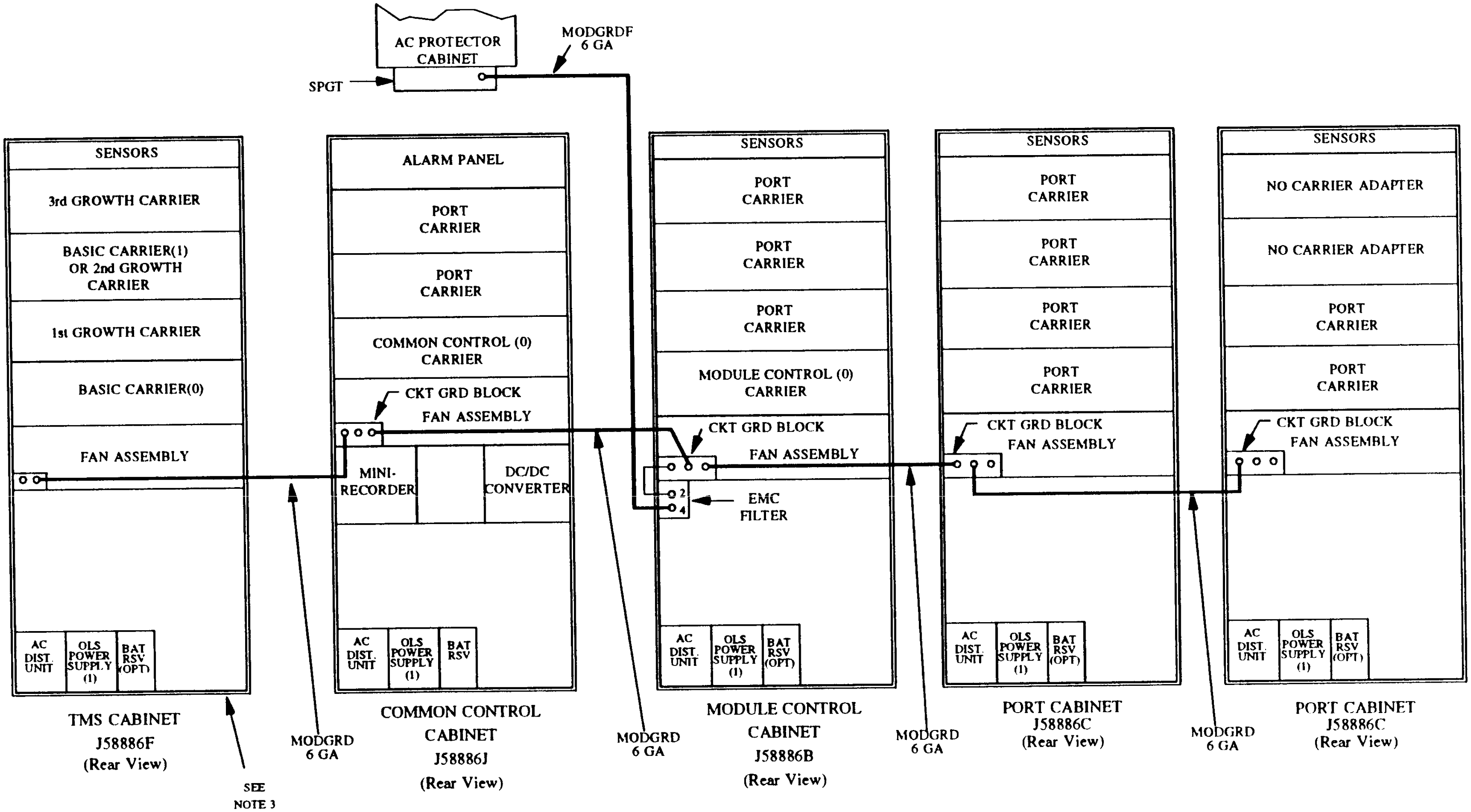


Figure 8-9. Combined CKT GRD and MODGRD for Cabinet Pairs — Duplicated System

MODULE GROUNDING

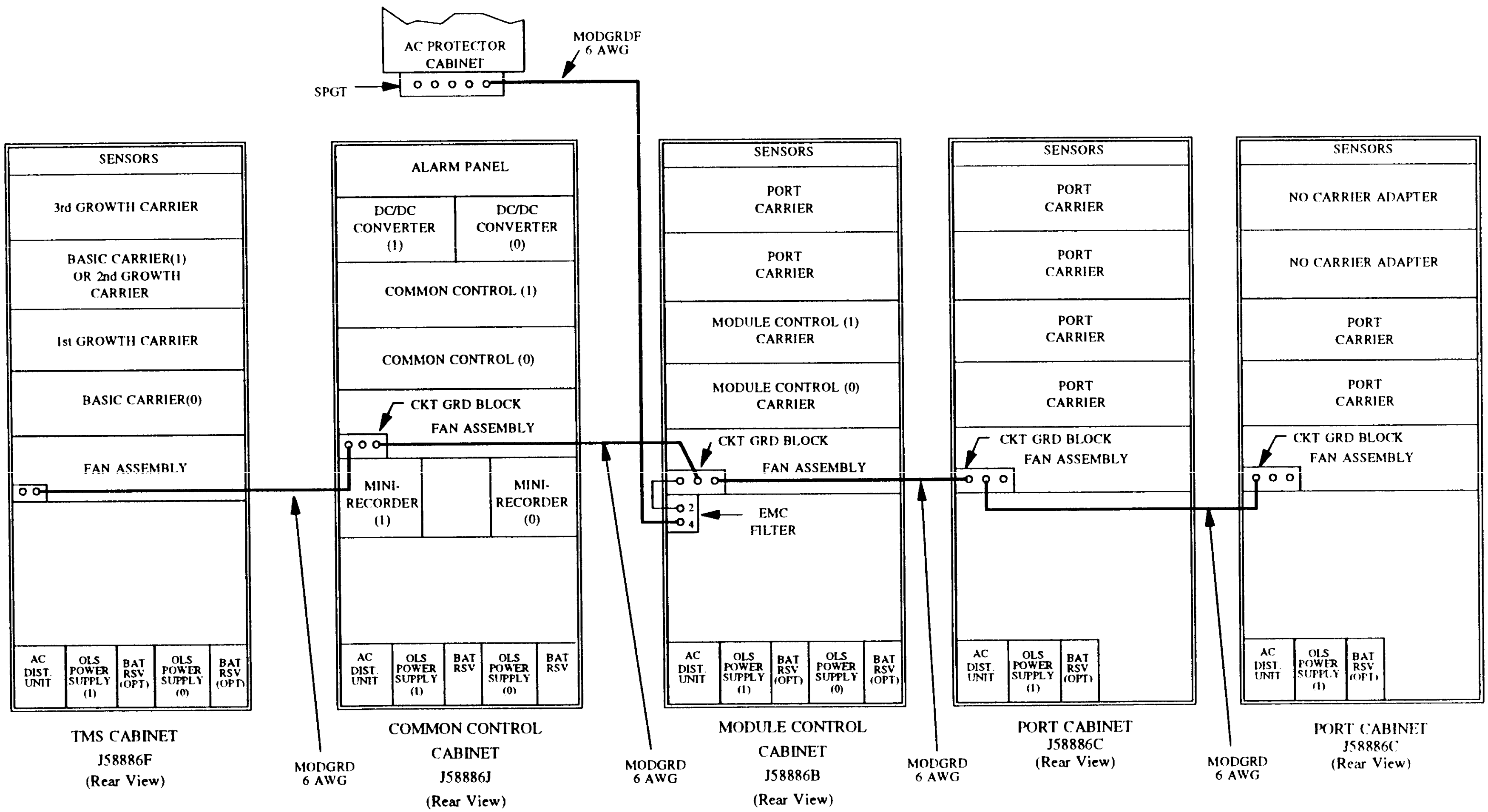
The module ground is a 6-gauge wire connected from the single-point ground to the EMC filter in the module control cabinet. The module ground goes through the filter to the cabinet's copper ground block through a factory installed lead. From this ground block, a 6-gauge wire is connected to the copper ground block in each cabinet containing a rectifier. In a multimodule system, each module must provide similar, but separate MODGRD connections from its associated control cabinet. Figures 8-10 through 8-11 show various module grounding connections.



NOTES:

1. A second OLS supply is required in any cabinet containing more than 40 ANNl7B port interface circuit packs. If it is an unduplicated common control cabinet, it also requires another battery reserve unit. If it is a network cabinet, the second battery reserve unit is optional.
2. The battery reserve in the common control cabinet is not optional. Battery reserve units are optional in all other cabinets.
3. A second OLS power supply (and optional battery reserve) are only required in the TMS cabinet if there are more than two TMS/RMI carriers located in the cabinet

Figure 8-10. MODGRD for OLS Power Supplies — Unduplicated System



NOTES:

1. A second OLS supply is required in any network cabinet containing more than 40 ANN17B port interface circuit packs. The battery reserve unit is optional for the added OLS supply.
2. The battery reserve in the common control and TMS cabinet are not optional. Battery reserve units are optional in all other cabinets

Figure 8-11. MODGRD for OLS Power Supplies — Duplicated System

TMS GROUNDING

Lightning grounding (GRDL) is used to rout lightning surges away The TMS cabinets are grounded in AC systems the same as other cabinets. The circuit ground block of the TMS is connected to the circuit ground blocks of the other cabinets within the system.

The TMS cabinet does not have any GRDL connections since it has no port carriers.

The ground connection between the TMS cabinet circuit ground block to other cabinets was formerly known as TMS ground. This ground fulfilled the same function as MODGRD. Consequently, in this issue of the document and in the future, the TMS ground is being renamed as part of the MODGRD connection. Examples of grounding of the TMS cabinet are shown in the MODGRD section of this chapter.

LIGHTNING GROUNDING

Lightning grounding (GRDL) is used to rout lightning surges away from system components in any cabinet equipped with port carriers. A 10-gauge wire (GRDLF) connects from the single point ground at the AC protector cabinet to the EMC filter in the common control cabinet (for unduplicated common control systems) or to the EMC filter in the first port cabinet (for duplicated common control systems). Lightning ground goes through the EMC filter to terminal strip GRDL on the lower left upright of the cabinet. From terminal strip GRDL, a 10-gauge wire (GRDL) is daisy-chained to terminal strip GRDL in each cabinet equipped with a port carrier. GRDL should be as short as possible and must not be connected to the cabinet frame or any other grounds. In a multimodule system, each module must provide its own similar but separate GRDLF connections from their cabinets equipped with port carriers to the single-point ground at the AC protector cabinet. The GRDLF must exit the cabinet from an EMC filter. This EMC filter shall be a separate filter and not have any other grounds connected to it. The GRDL may be chained within each module.

Port carrier equipped cabinets within the same module but placed cross aisle from other port carrier equipped cabinets must provide similar but separate GRDLF connections to the single-point ground at the AC protector cabinet. The GRDLF must exit the cabinet from an EMC filter. This EMC filter shall be a separate filter and not have any other grounds connected to it. A module control cabinet can have two EMC filters for use in a cross-aisle situation. The GRDL lead from the cross-aisle cabinet may be chained to all the adjacent cabinets.

Lightning Ground Connections

Typical lightning ground connections for unduplicated and duplicated systems with all cabinets in the same aisle are shown in figures 8-12 and 8-13 respectively.

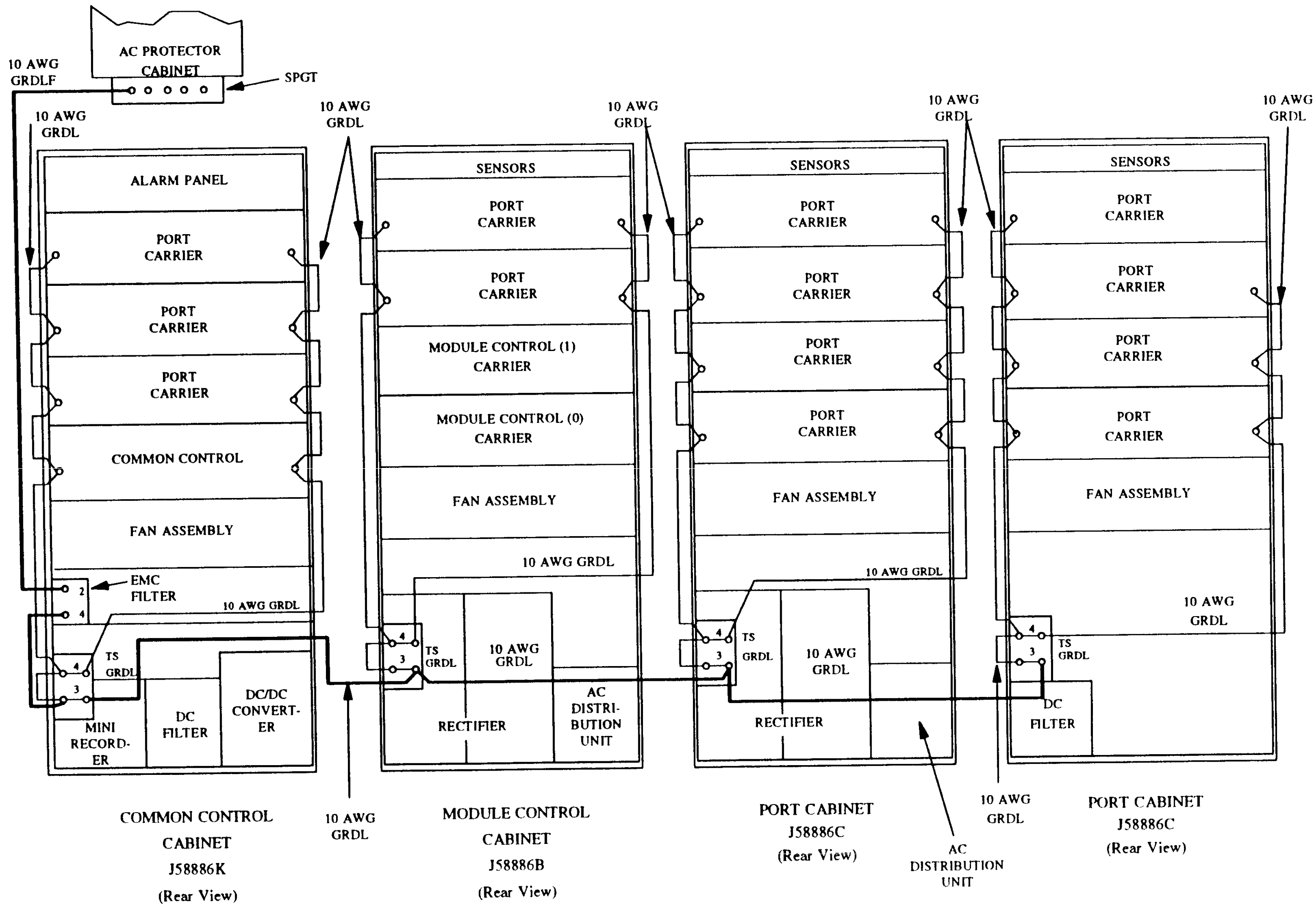


Figure 8-12. GRDLF — Unduplicated System

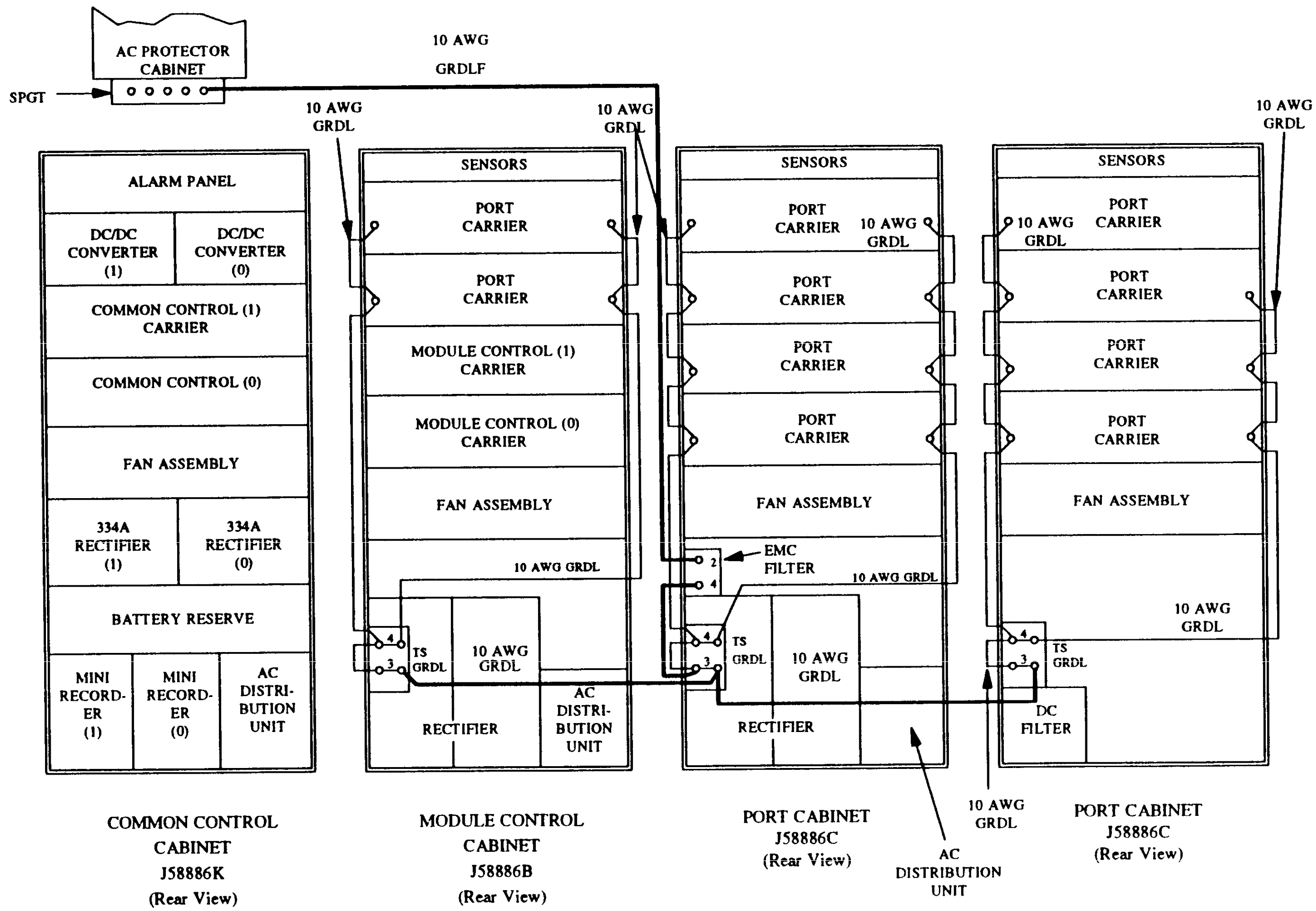


Figure 8-13. GRDLF — Duplicated System

COUPLED BONDING GROUNDING

Coupled bonding conductor (CBC) is used to reduce the difference in electrical potential between the tip and ring leads and the system ground which may result from lightning surges. It consists of a 10-gauge copper wire tie-wrapped to the tip and ring cables from the single-point ground block to the CBC terminal block located above the cross-connect field. From the CBC terminal block, the coupled bonding conductor is connected to the ground of the connecting block lightning protector where the trunk cables enter the building. Figure 8-14 displays a block diagram of coupled bonding conductor grounding.

WARNING

Fire hazards exist when building wiring trunk circuits are exposed to power exceeding 300V rms.

Sneak current protection is required to protect building wiring between the network interface and trunk circuits when exposed to power. Sneak current fuses should be used when this condition exists.

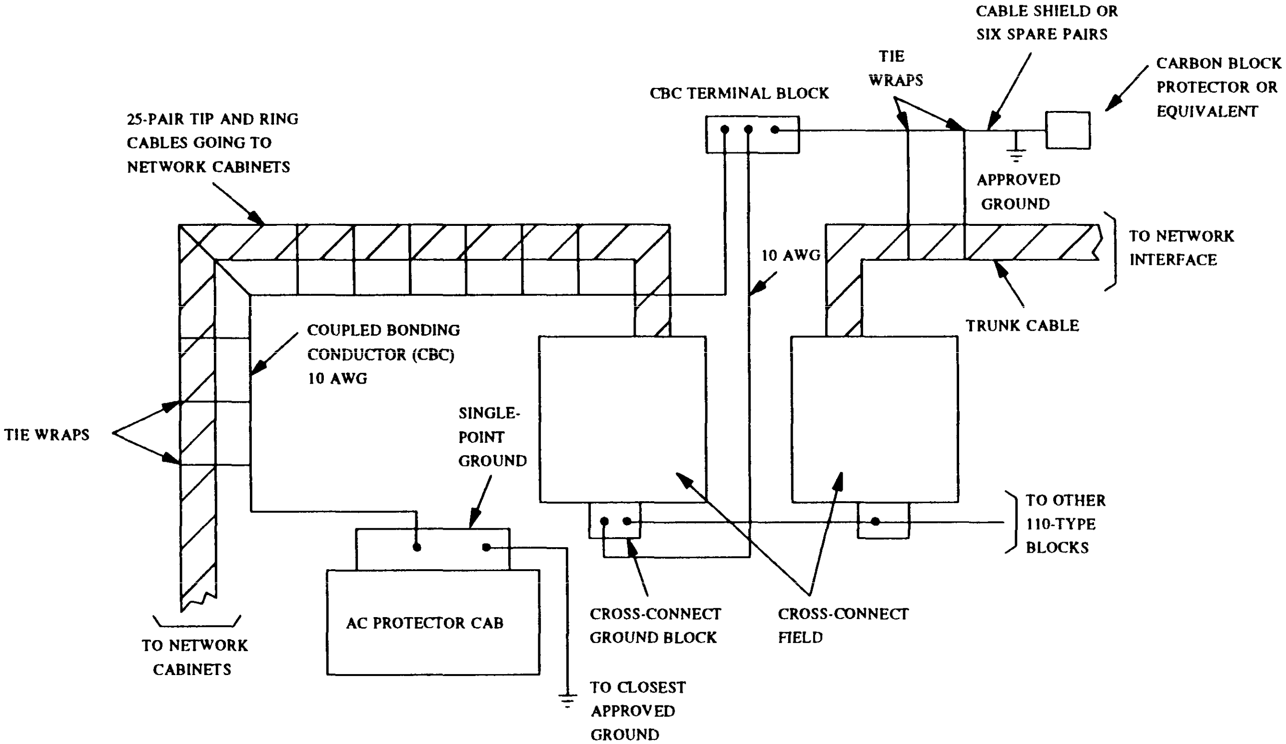


Figure 8-14. CBC Grounding

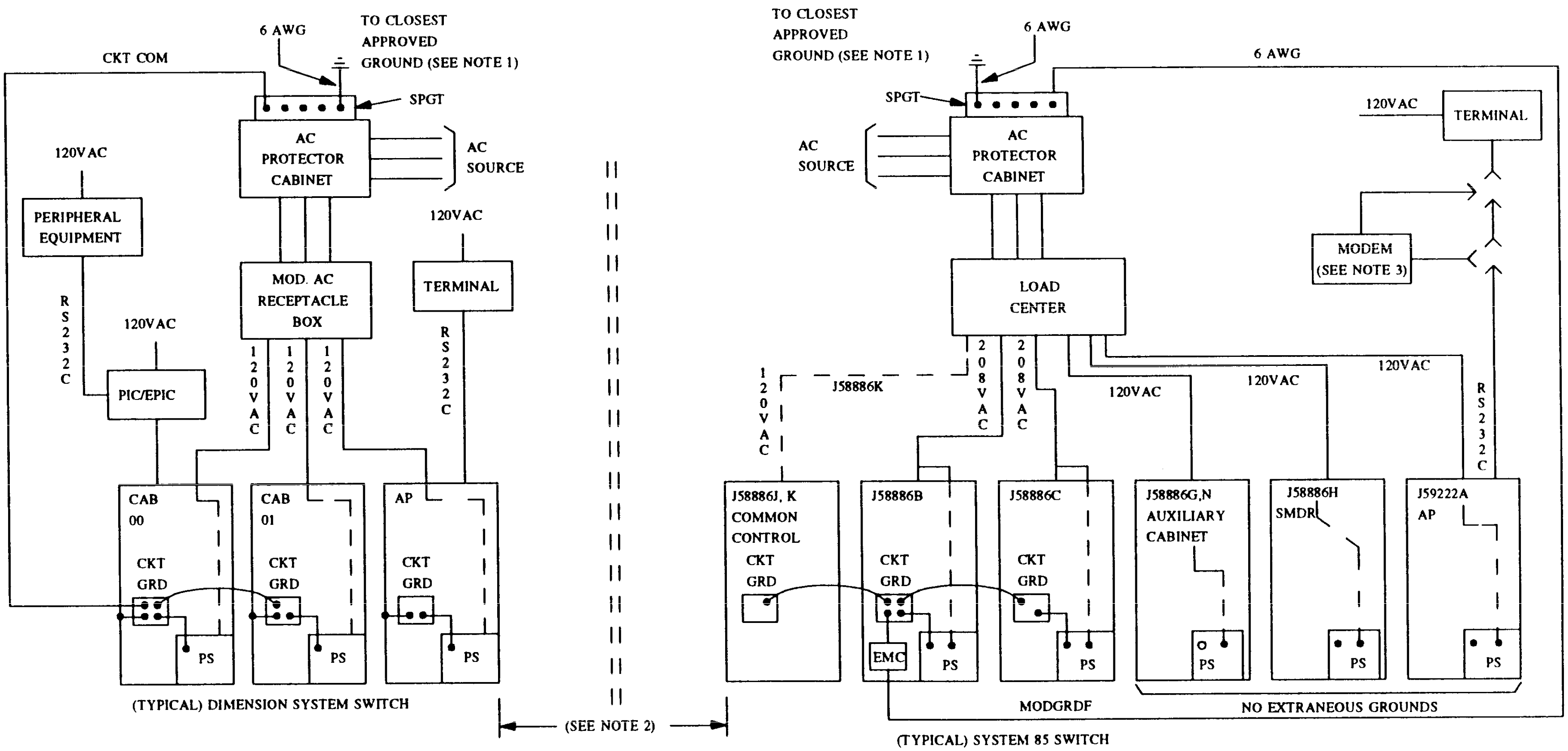
AUXILIARY CABINET, SMDR CABINET, AND AP CABINET GROUNDING

The auxiliary cabinet(s), SMDR cabinet and application processor are grounded only by green wire ground. No cabinet straps or other type of grounding should be connected to these cabinets. When either of these cabinets is colocated (in the same equipment room) with system cabinets, it must be powered by the same AC source as the system cabinets to ensure a common green wire ground.

Figure 8-15 shows an example of this configuration.

However, the SPG lead for power failure transfer should be brought to the auxiliary cabinet from the AC protector cabinet copper single-point ground or from the battery plant ground discharge bar.

GROUNDING FOR MIXED SYSTEMS



NOTES:

1. The AC protector cabinets will be located as close to each other as possible. A 6 AWG wire connects each SPGT back to the closest approved ground using the shortest route.
2. The DIMENSION system cabinets are separated from System 85 cabinets with no physical contact.
3. A modem is required if the terminal and the AP use different AC sources.

Figure 8-15. Grounding for Mixed Systems — System 85 Colocated with a DIMENSION System 85

9. DC POWER AND GROUNDING

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GENERAL INFORMATION ON STANDBY POWER SYSTEMS

Standby Power Systems were formerly known as Extended Power Reserve systems. There are two types of Standby Power systems:

- Uninterruptible Power System (UPS)
- Direct Current Standby Power Systems (DCSPS)

Configurations vary according to system requirements. Details of the battery plants, battery strings, and feeder arrangements shall be furnished to the installer. The battery plant may consist of several cabinets and/or racks. Lineage 2000® battery plants are recommended. Each system cabinet equipped for standby power has a DC frame filter for the -48V and GRD connections. A bulk inverter and an AC load center may be used to power a colocated applications processor (AP) and AC-powered equipment mounted in an auxiliary cabinet.

UPS Systems

The UPS system normally operates from a commercial AC input supply and provides AC power, rather than DC power, to the system.

The AC input supply is normally supplemented by some type of power backup, usually an AC generator or battery cabinet.

If the system has a generator, it automatically goes into operation if the commercial AC input supply is lost, providing backup AC power to the system.

If the system has a battery cabinet for backup, it provides backup DC power to a set of AC inverters that converts the DC input to AC output.

The information on UPS systems is included in this chapter because the back-up power for the system may be provided by a DC power source (battery plant). However, since the cabinet connections are AC, follow the instructions in chapters 7 and 8 for cabinet power and ground connections. Since each of the types of UPS systems have variations, to install the actual UPS and its power backup system (either the battery cabinet or generator), refer to the accompanying system documentation.

These documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-432-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

A point-to-point wiring connection check for power and ground cables, as well as for the connections to the generator or battery cabinet, is mandatory.

The remaining information in this chapter is based on the installation of a complete DCSPS.

DCSPS System

The DCSPS normally operates from a commercial AC input supply. The input supply is connected to a set of batteries. The batteries are in parallel with rectifiers that convert the AC input to a DC output.

AC inverters may be connected to the battery supply through suitable circuit breakers for cabinets that require AC power.

As long as the AC input supply is available, the system operates off the AC powered rectifiers with a DC output. If the AC input supply is not available for any reason, the system immediately begins to draw power directly from the batteries. The powered system continues to operate until the AC input supply is restored or the battery voltage falls below -43V.

These documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-432-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

BATTERY PLANT

The battery plant typically consists of the following items:

- DC control cabinet
- Battery cabinets
- Rectifier cabinets
- System controller
- Inverter cabinet (if necessary)

There are variations for each type of system, including type of equipment and terminology. Ensure that you use the correct documentation for installing the equipment at your site since the information in this chapter is only typical of a DC system.

A typical battery plant is shown in figure 9-1. Refer to this figure while reading the following sections for identifying the battery plant components.

DC Control Cabinet

The DC control cabinet contains the ground discharge bar (GRDB), the charge ground bus (which is connected to the GRDB by a shunt), the DC circuit breaker panel, the battery bus, and the AC load center (if necessary). It controls the power supplied to the cabinets. For example, if the AC input supply is available, it ensures cabinet power is supplied from the rectifier cabinets, but if the AC input supply is lost, the system switches over to the battery cabinets for power.

Battery Cabinets

The battery cabinets contain the batteries for back-up power if the AC input power supply is lost. The number of battery cabinets is dependent on the number of batteries required for the load and the amount of time that back-up power must be available.

The positive terminals of the individual batteries are connected to the charge ground bus through a DC circuit breaker. The negative terminals of the individual batteries are directly connected to the battery bus.

Rectifier Cabinets

The rectifier cabinets receive the AC input supply and convert it to a DC output.

The positive terminals of the individual rectifiers connect to the charge ground bus. The negative terminals of the individual rectifiers connect to the battery bus. The rectifiers are in parallel with the batteries.

System Controller

The AC input supply is connected to the system controller. The AC output of the controller is supplied to the inputs of the individual rectifiers.

Inverter Cabinet

The inverter cabinet is only included in a system that requires AC power for auxiliary and data cabinets.

An inverter cabinet is normally powered by the DC output of the rectifiers unless system input power is lost. If this happens, the inverter cabinet is provided with power from the batteries. In either case, the inverter input power is DC and the output power is AC.

The positive terminal of the inverter input is directly connected to the charge ground bus. The negative terminal of the inverter input is connected to the battery bus through a DC circuit breaker. The inverter is connected to the cabinet lineup through an AC load center located in the DC control cabinet.

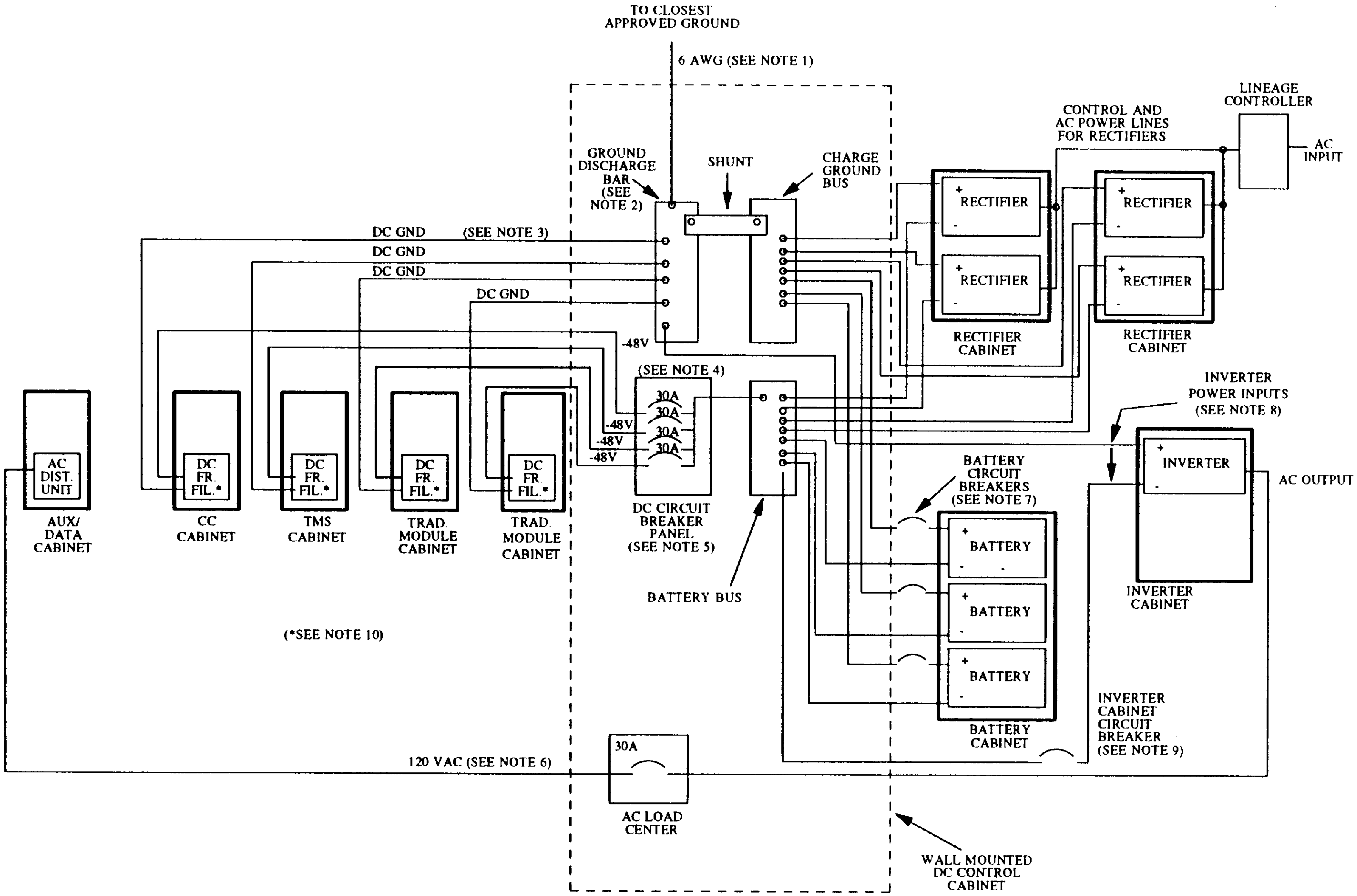


Figure 9-1. Typical Battery Plant for DC Systems

NOTES FOR FIGURE 9-1:

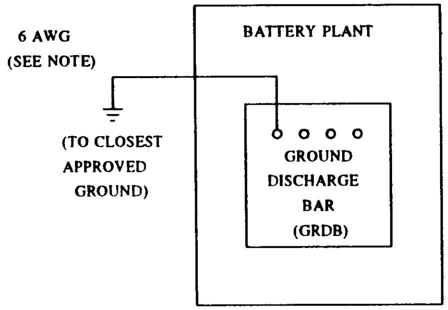
1. The size of the ground wire must be the same size as the largest conductor in the system, but no smaller than 6 AWG. For example, if the -48V power wire is a 2-AWG and that is the largest conductor in the system, then the ground wire from the ground discharge bar to the closest approved ground would be changed from 6 AWG to 2 AWG.
2. The ground discharge bar serves as the system single-point ground for DC systems.
3. There is a DC GRD wire connected to the DC frame filter in all cabinets that connects back to the ground discharge bar. The gauge of the DC GRD wire is 2 AWG for the traditional module cabinets and the CC and TMS cabinets.
4. There is a -48V power wire connected to the DC frame filter unit in each cabinet that connects to the DC circuit breaker panel. There are additional -48V power and DC GRD wires if the cabinet has a duplicated DC frame filter. The gauge of the -48V power wire is 2 AWG for the traditional module cabinets and the CC and TMS cabinets.
5. The DC circuit breaker panel consists of 30 amp circuit breakers for traditional module cabinets and the CC and TMS cabinets. For traditional modules that contain more than 40 DS1/MFAT circuit packs, a 50 amp circuit breaker is required. There is one circuit breaker for each power wire supplied to a cabinet. There is an additional breaker for cabinets with duplicated power wires.
6. The 120 VAC power wire only connects to aux/data cabinets in a DCSPS. The amperage of the AC circuit breaker is typically 30 amps, but varies depending on load requirements. The power wire connects to an AC distribution unit in the cabinet. If there are no aux/data cabinets in the system, the AC load center and the inverter are not included in the battery plant.
7. The battery circuit breakers are ganged together and their amperage varies depending on the load requirements.
8. The inverter is DC powered via the charge ground bus and the battery bus and has an AC output only for aux/data cabinets.
9. There is an inverter circuit breaker with an amperage rating that varies with load requirements.
10. DC FR. FIL. represents the DC frame filter. The DC frame filter provides the power and ground connection points in DC powered systems.

SYSTEM GROUNDING

The system ground, using copper wire, is connected from the single-point ground terminal to the closest approved ground using an approved ground clamp. The connection is identified with a 3013B grounding tag or equivalent.

Approved grounds as specified in Section 250-81 of the National Electric Code may consist of any of the following:

- Metallic cold water pipe that is continuous and electrically connected to the street side of the water meter
- Building steel that is bonded to cold water pipes and power source ground
- Ground electrode encased by at least 2 in. of concrete and in direct contact with the earth
- A ground ring that encircles a building and is at least 2-1/2 ft below the earth's surface



NOTE: The size of this wire must be as large as the largest wire in the system, but no less than 6 AWG.

Figure 9-2. System Ground Connection

The system single-point ground terminal for a DC system consists of the ground discharge bar (GRDB) in the battery plant. The GRDB is physically located within the wall mounted DC control cabinet. It is connected to the closest approved ground with a conductor no smaller than the largest conductor within the system, but never smaller than a 6 AWG wire. For example, if the -48V power wire is a 2 AWG conductor, then the wire from the GRDB to the closest approved ground must be no smaller than 2 AWG. However, that wire must never be smaller than 6 AWG if the largest conductor in the system is smaller than 6 AWG.

Figure 9-3 shows the ground wire tag that must be connected to the ground connection.

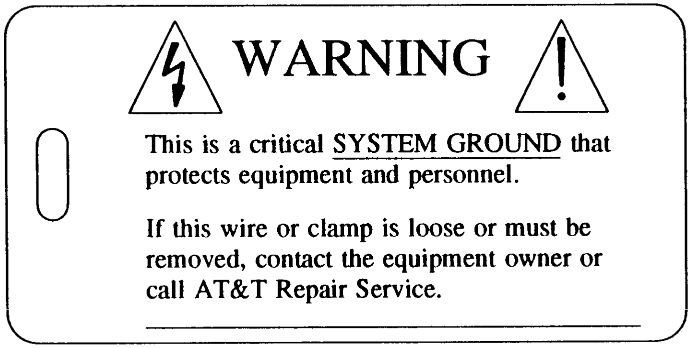


Figure 9-3. Ground Wire Tag

Each DC cabinet must be connected to the GRDB by an individual DC GRD return wire. The GRDB is connected by a shunt to the charge ground bus.

The charge ground bus is directly connected to the positive terminals of the rectifiers and to the positive terminals of the batteries through DC circuit breakers.

The GRDB is also connected to the closest approved ground. The connection wire size is dependent on size of the largest conductor within the system. For example, if the -48V power wire is the largest conductor within the system, and it is a 2 AWG wire, then the connection wire from the GRDB to the closest approved ground must be no smaller than 2 AWG. In no circumstances must the connection wire be smaller than 6 AWG, even if the largest conductor within the system is smaller than 6 AWG.

VERIFICATION OF GROUND ISOLATION

The verification of ground isolation in the cabinets must be done before you connect the -48V power wires and DC GRD return wires.

The verification is done by doing a continuity test between the circuit ground block and the frame in the cabinet. There should be an “open” reading on the ohmmeter if the system is correctly isolated.

If there is continuity between the ground blocks and the frame, do not proceed with the installation until the problem is corrected. Check with your field service representative for methods to correct this problem.

POWER AND GROUNDING WIRES

All DC cabinets have individual -48V power and DC GRD return wires. For some cabinets with high power consumption, there may be two -48V power wires and DC GRD wires.

NOTE	If the module control (MC) or port cabinets are equipped with 40 or more ANN17B MFAT circuit packs, refer to figure 9-5.

Block diagram connections from the battery plant to the MC cabinet, unduplicated TMS cabinet equipped with only one growth carrier, port cabinet, and auxiliary cabinet are shown in figure 9-4.

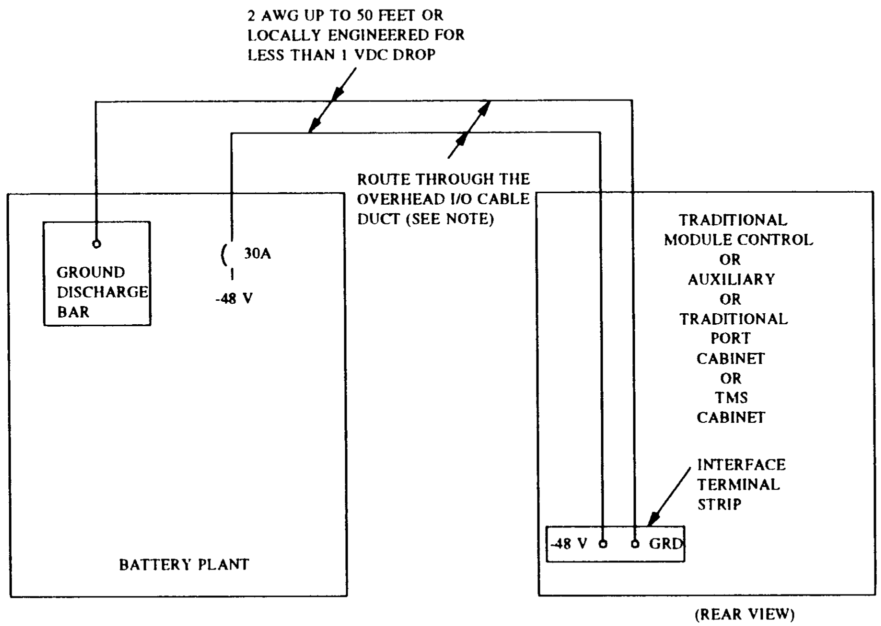
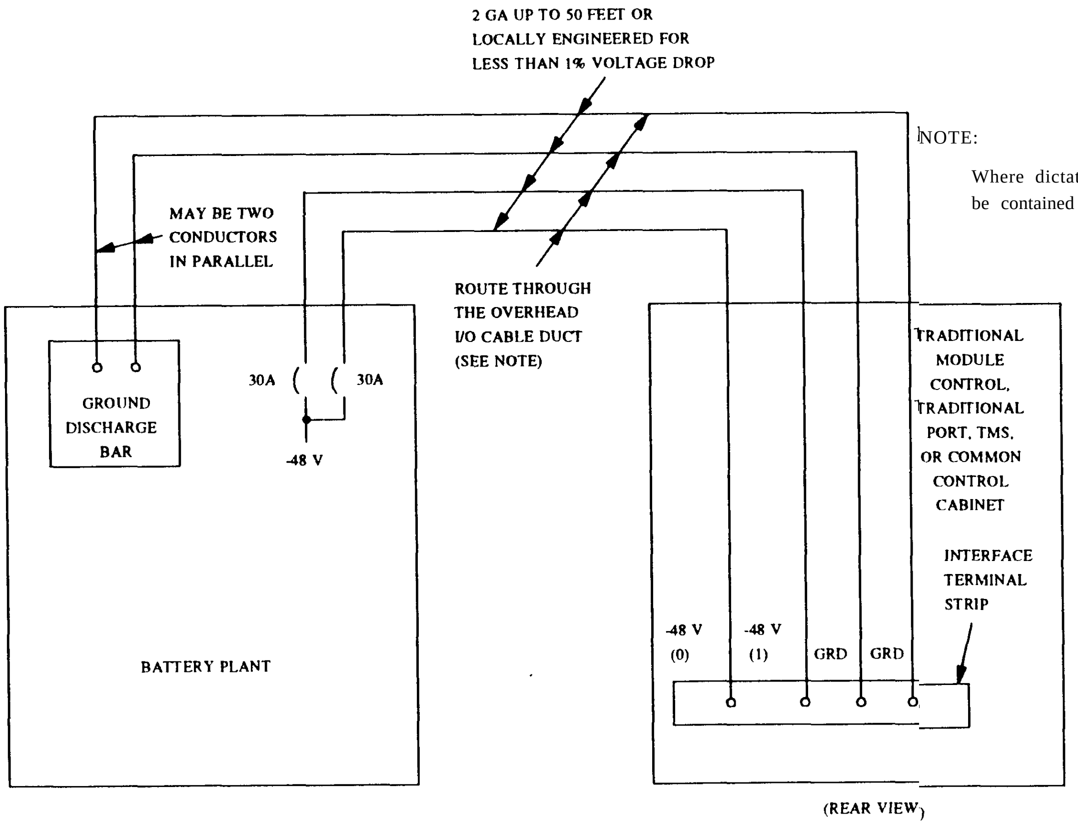


Figure 9-4. Block Diagram Connections for Single -48 VDC and DC GRD Wiring

NOTE:

Where dictated by local codes, the -48 VDC and DC GRD wires may be required to be contained in their own enclosed duct work and may be routed under a raised floor.

Connections that require two -48 VDC and DC GRD wires are shown in figure 9-5.



NOTE:

Where dictated by local codes, the -48 VDC and DC GRD wires may be required to be contained in their own enclosed duct work and may be routed under a raised floor.

Figure 9-5. Block Diagram Connections for Duplicate -48 VDC and DC GRD Wiring

DC SYSTEM GROUNDING

An equalizing ground is required between the MC cabinet and each port cabinet, including unduplicated common control (CC), within a module. Typical connections are shown in figure 9-6.

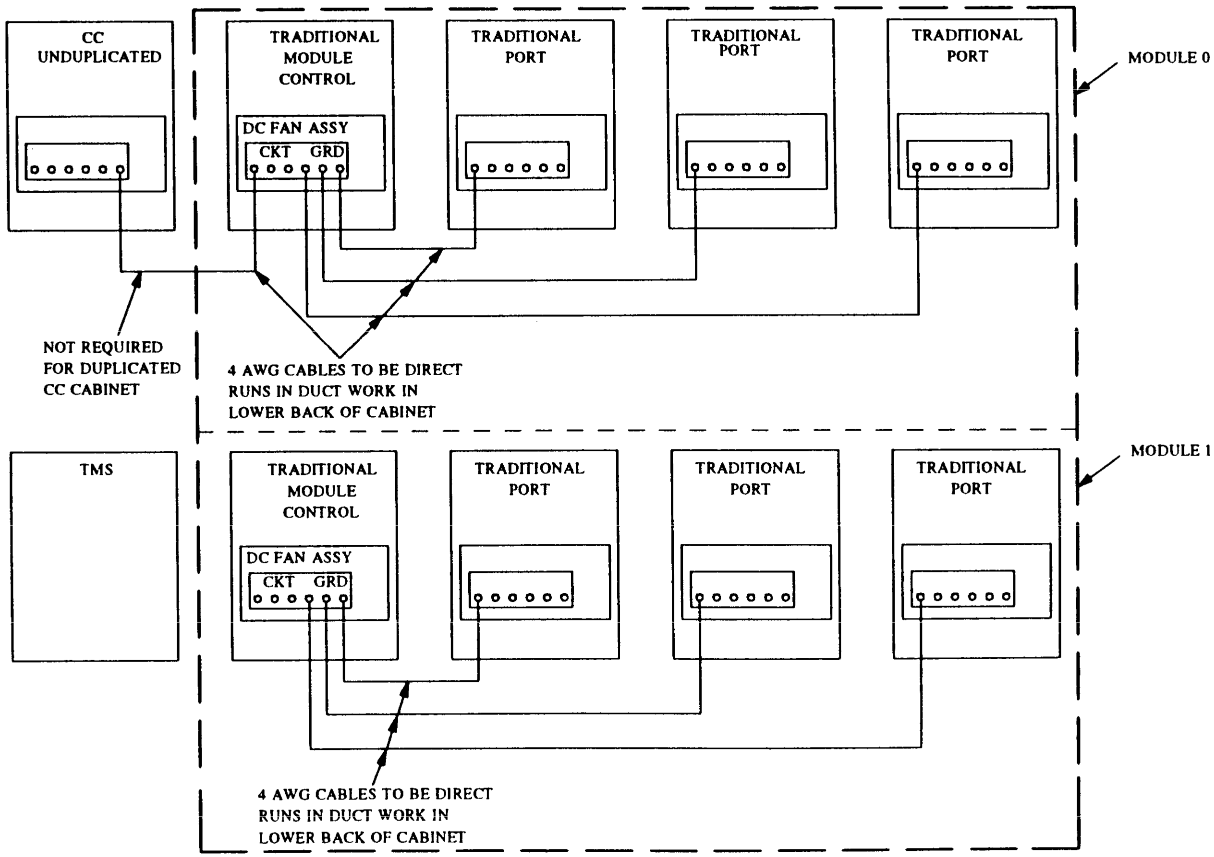
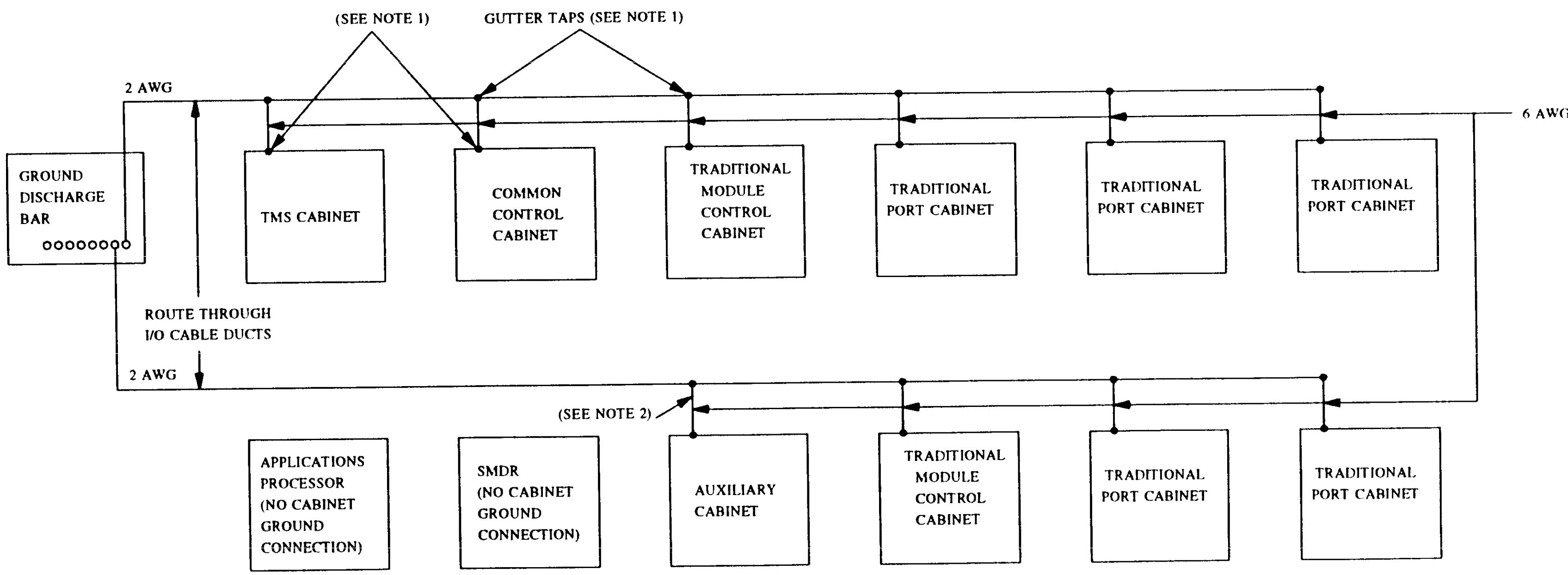


Figure 9-6. DC System Equalizing Ground Connections

FRAME GROUND

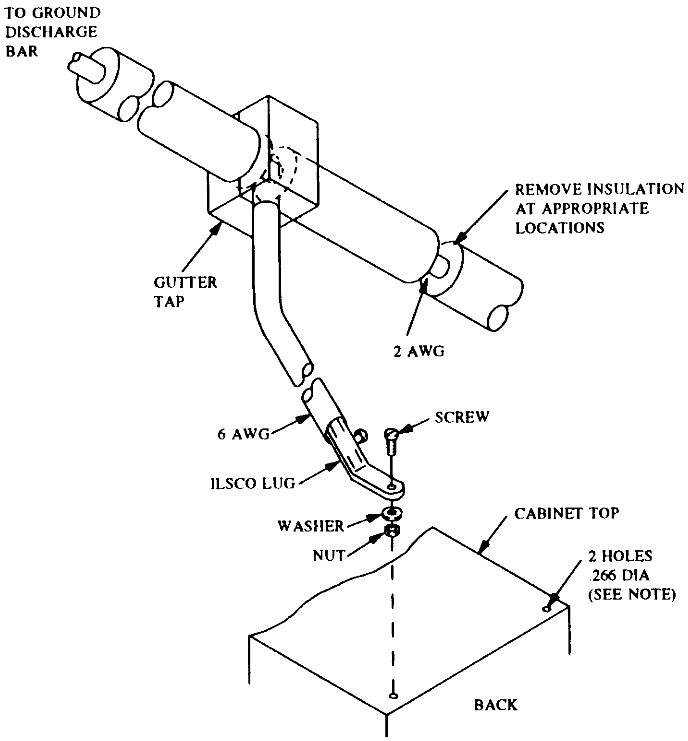
A frame ground connection is required between all of the DC cabinets and the GRDB. Figure 9-7 shows a typical frame ground system connection. Figure 9-8 shows the actual cabinet connection for the frame ground.



NOTE:

1. See figure 9-8 for these connections.
2. Required only for non-AC powered aux cabinets.

Figure 9-7. System Frame Ground Connections



NOTE: Either hole on cabinet top may be used to connect ILSCO lug.

Figure 9-8. Cabinet Frame Ground Connections

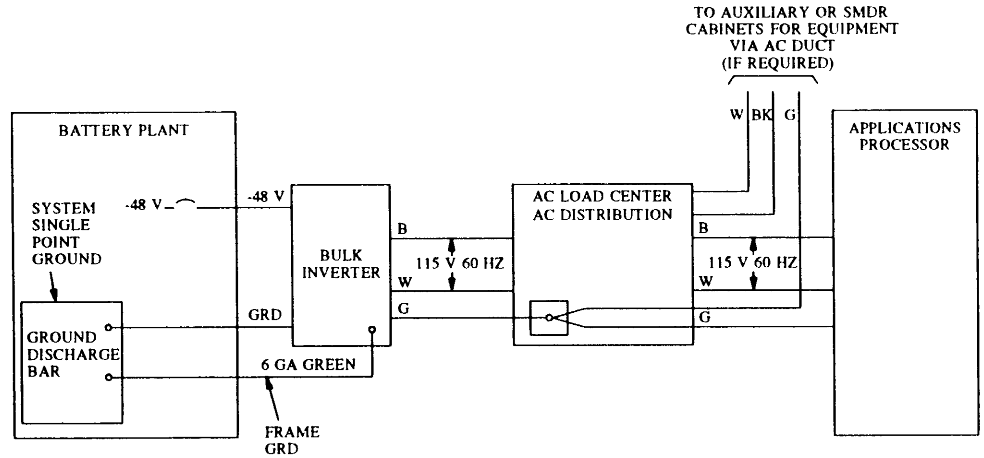


Figure 9-9. AC Distribution Using An Inverter to Supply AC for a DC System

AC DISTRIBUTION FOR DC SYSTEMS

An example of AC distribution using a bulk inverter to supply the required AC for system is shown in figure 9-9.

An AC distribution for an auxiliary cabinet without a bulk inverter is shown in figure 9-10.

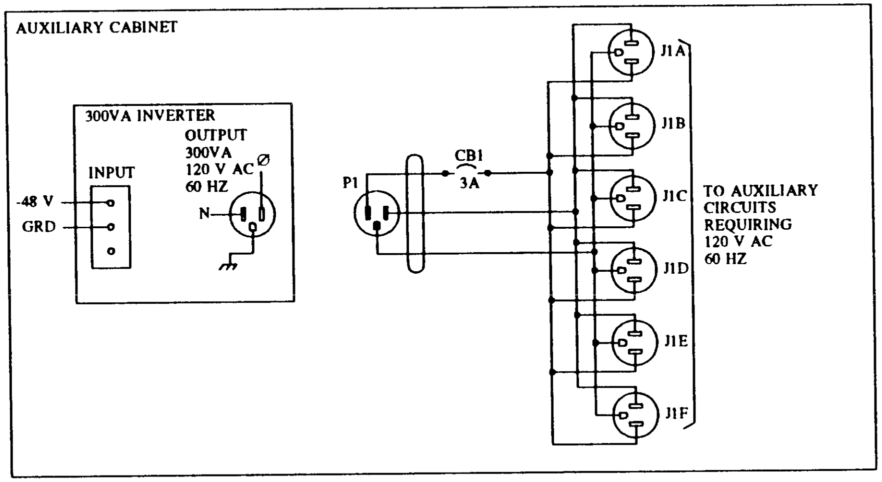
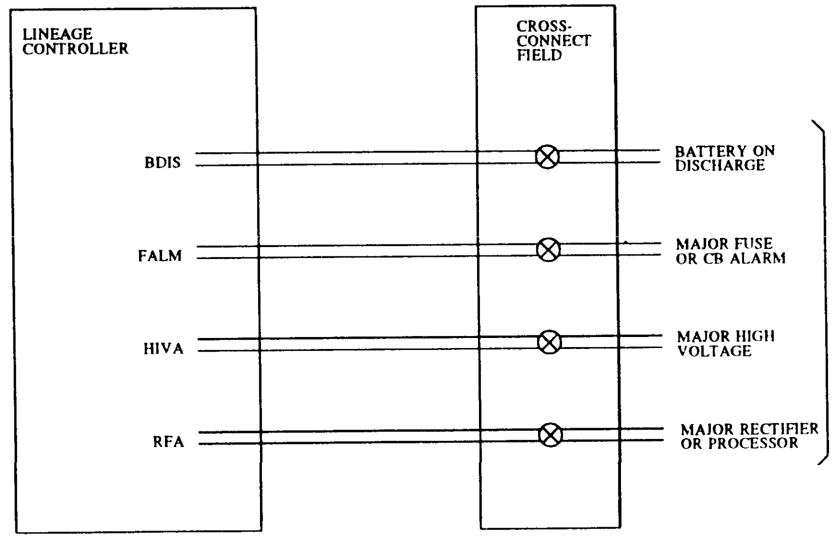


Figure 9-10. AC Distribution Without a Bulk Inverter

BATTERY PLANT ALARM CONNECTIONS

Typical alarm connections for battery plants are shown in figure 9-11.



See the “External Alarms” part of the auxiliary and data cabinet installation manual for the remote alarm connections to the TN492C remote interface circuit.

Figure 9-11. Battery Plant Alarm Connections

LIGHTNING GROUND

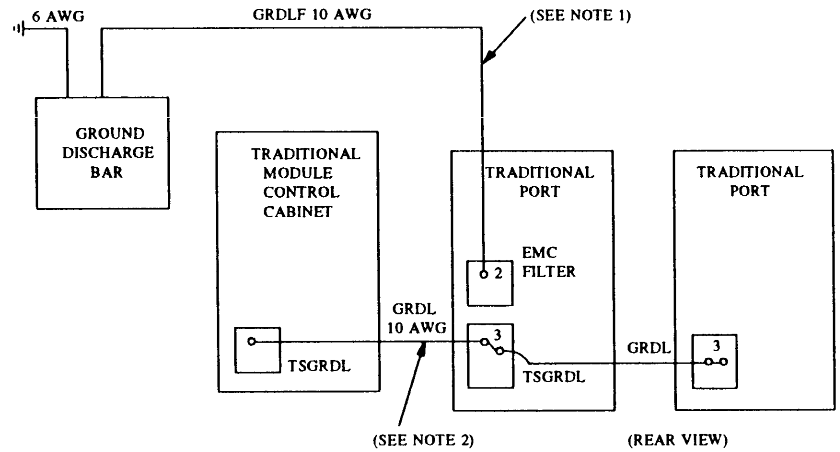
Lightning ground (GRDL) is used in any cabinet equipped with port carriers to route lightning surges away from system components.

There is a separate GRDLF for each module.

A 10-gauge wire (GRDLF) connects from the ground discharge bar to the EMC filter in the CC cabinet for unduplicated CC systems or to the EMC filter in the first port cabinet in each module for duplicated CC systems. The GRDLF also connects from the GRDB to the EMC filter in the first port cabinet of each module in unduplicated CC systems after the first module, where it connects to the EMC filter in the CC cabinet. Lightning ground goes through the EMC filter to terminal strip GRDL on the lower left upright of the EMC cabinet. From terminal strip GRDL, a 10-gauge wire (GRDL) is daisy-chained to terminal strip GRDL in each cabinet equipped with a port carrier. GRDL should be as short as possible and must not be connected to the cabinet frame or any other grounds.

Lightning Ground Connections — Duplicated CC

Typical lightning ground connections for duplicated CC, single-module, all cabinets on same aisle are shown in figure 9-12.

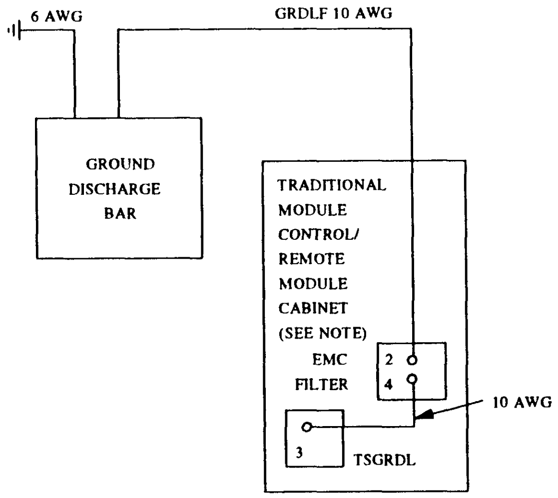


NOTES:

1. The GRDLF wire exits the cabinet using the third hole up from the bottom. It runs up the rear of the cabinet and is routed in the cabinet overhead duct which contains the tip and ring cables and should be placed against the side of the duct (inside) or ladder rack. If a ladder rack is also used for tip and ring cables, a minimum separation of 6 inches should be maintained between this wire (GRDLF) and MODGRDF which also resides in the same duct. This wire should be run by the shortest route.
2. GRDL is run through the bottom small duct on the lower rear of the cabinets.

Figure 9-12. Lightning Ground Connections for Multiple Cabinets

Typical lightning ground connections for a duplicated CC, single-module, single-cabinet switch are shown in figure 9-13.



NOTE:

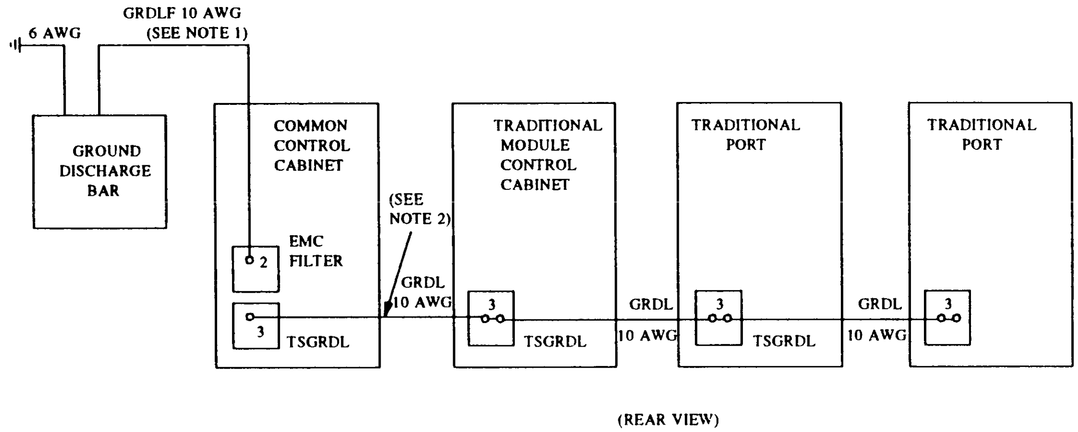
A MC/remote module cabinet in a single-cabinet module must have a second EMC filter installed in the cabinet to accommodate the GRDLF lead.

Figure 9-13. Lightning Ground Connections (for Single-Module and Cabinet)

In a multimodule system, each module must provide its own similar but separate GRDLF connections from the cabinets equipped with port carriers to the ground discharge bar. The GRDLF must exit the cabinet from an EMC filter. This EMC filter must be a separate filter and not have any other grounds connected to it. The GRDL is chained within each module as shown in figure 9-14.

Lightning Ground Connections — Unduplicated CC

Typical lightning ground connections for unduplicated CC, single-module, cabinets all on same aisle are shown in figure 9-14.



NOTES:

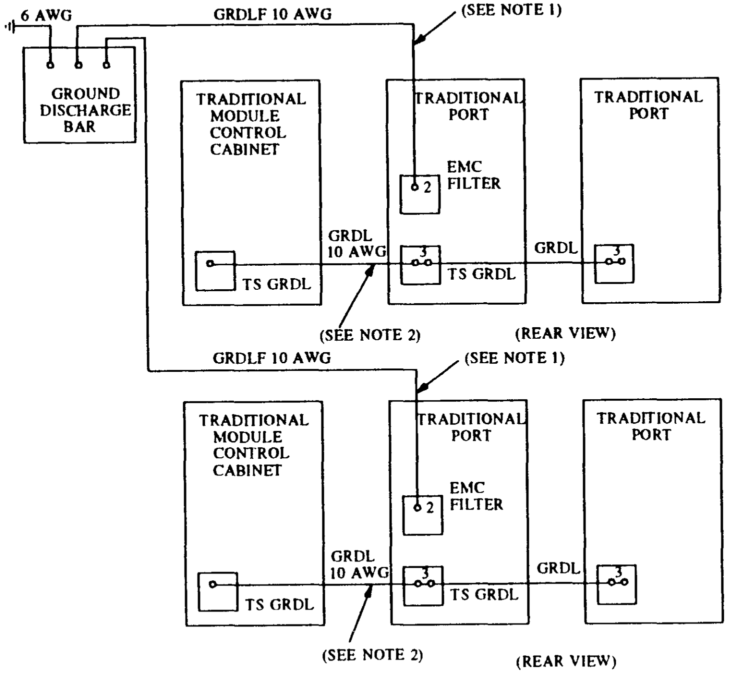
1. The GRDLF wire exits the cabinet using the third hole up from the bottom. It runs up the rear of the cabinet and is routed in the cabinet overhead duct which contains the tip and ring cables and should be placed against the side of the duct (inside) or ladder rack. If a ladder rack is also used for tip and ring cables, a minimum separation of 6 inches should be maintained between this wire (GRDLF) and MODGRDF which also resides in the same duct. This wire should be run by the shortest route.

2. GRDL is run through the bottom small duct on the lower rear of the cabinets.

Figure 9-14. Lightning Ground Connections (for Single-Module in Multiple Cabinets)

Port carrier equipped cabinets within the same module but placed cross-aisle from other port carrier equipped cabinets, must provide similar but separate GRDLF connections to the ground discharge bar. The GRDLF must exit the cabinet from an EMC filter. This EMC filter must be a separate filter and not have any other grounds connected to it. The GRDL lead in the cross-aisle cabinet line up is chained to all the adjacent cabinets as shown in figure 9-15.

Typical lightning ground connections for unduplicated CC, multimodule all Cabinets within a module on the same aisle, modules are on the same or different aisles is shown in figure 9-15.

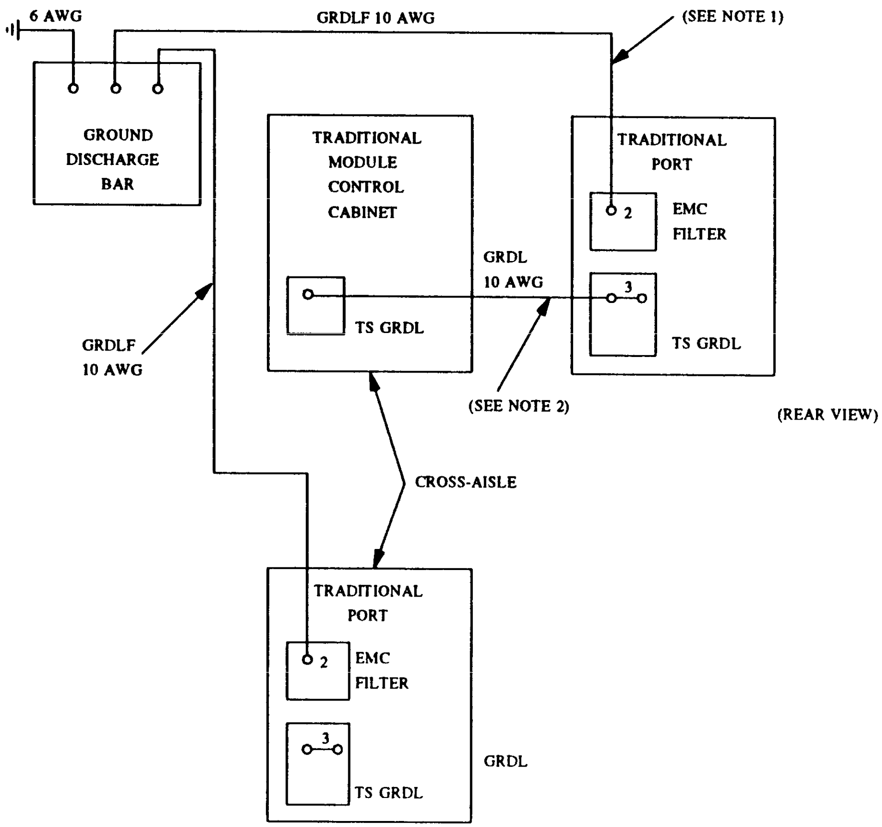


NOTES:

1. The GRDLF wire exits the cabinet using the third hole up from the bottom. It runs up the rear of the cabinet and is routed in the cabinet overhead duct which contains the tip and ring cables and should be placed against the side of the duct (inside) or ladder rack. If a ladder rack is also used for tip and ring cables, a minimum separation of 6 inches should be maintained between this wire (GRDLF) and MODGRDF which also resides in the same duct. This wire should be run by the shortest route.
2. GRDL is run through the bottom small duct on the lower rear of the cabinets.

Figure 9-15. Lightning Ground Connections (for Multimodule in Multiple Cabinets)

Typical lightning ground connections for unduplicated CC, single-module, port equipped cabinets cross-aisle from a MC cabinet are shown in figure 9-16.



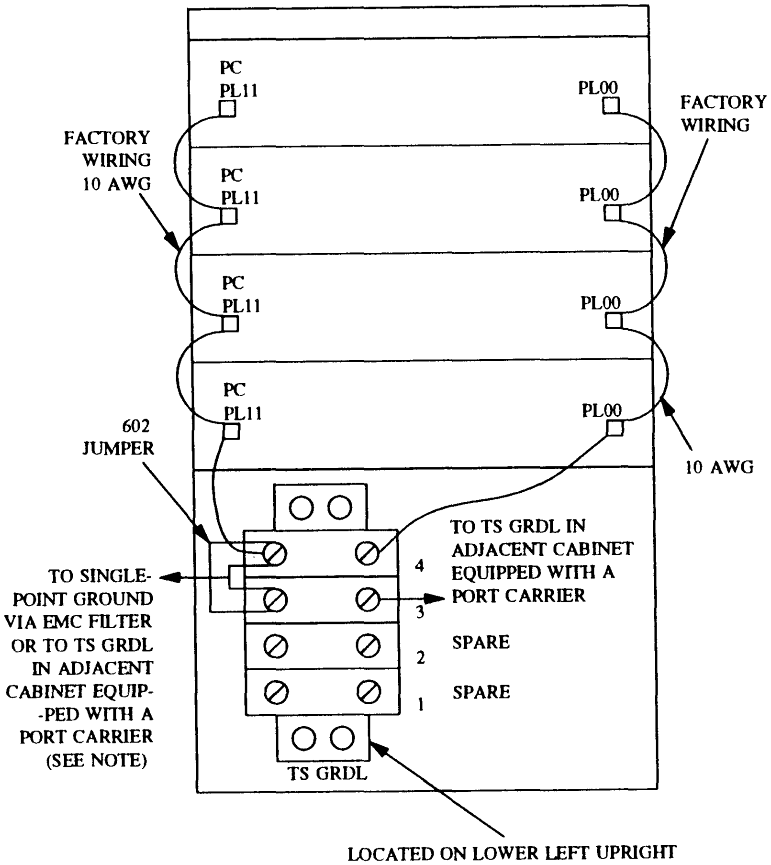
NOTES:

1. The GRDLF wire exits the cabinet using the third hole up from the bottom. It runs up the rear of the cabinet and is routed in the cabinet overhead duct which contains the tip and ring cables and should be placed against the side of the duct (inside) or ladder rack. If a ladder rack is also used for tip and ring cables, a minimum separation of 6 inches should be maintained between this wire (GRDLF) and MODGRDF which also resides in the same duct. This wire should be run by the shortest route.

2. GRDL is run through the bottom small duct on the lower rear of the cabinets. If port cabinets of a module are placed cross-aisle from the MC cabinet, another GRDLF for the cross-aisle cabinets is connected to the single-point ground from the EMC filter in port cabinet using the shortest route,

Figure 9-16. Lightning Ground Connections (for Single-Module Cross-Aisle from MC Cabinet)

Lightning ground (GRDL) connections for cabinet equipped with port carriers are shown in figure 9-17.



NOTE:
The GRDL wire exits a cabinet via the bottom small duct on the lower rear to interconnect to adjacent cabinets.

Figure 9-17. Intracabinet GRDL Connections — Cabinets with Port Carriers

COUPLED BONDING CONDUCTOR GROUNDING

Coupled bonding conductor (CBC) is used to reduce the difference in electrical potential between the tip and ring leads and the system ground which may result from lightning surges. It consists of a 10-gauge copper wire tie-wrapped to the tip and ring cables from the single-point ground block to the CBC terminal block located above the cross-connect field. From the CBC terminal ground, the coupled bonding conductor is connected to the ground of the connecting block lightning protector where the trunk cables enter the building.

WARNING

Fire hazards exist when building wiring trunk circuits are exposed to power exceeding 300V rms.

Sneak current protection is required to protect building wiring between the network interface and trunk circuits when exposed to power. Sneak current fuses should be used when this condition exists.

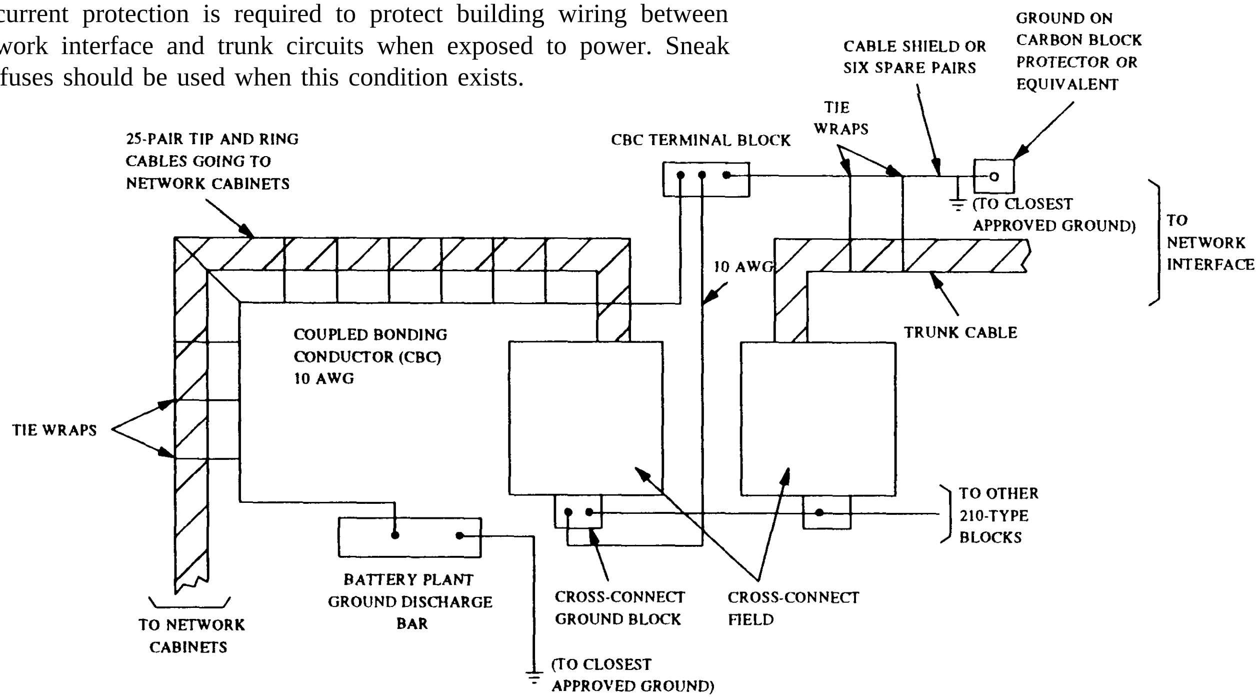


Figure 9-18. Grounding Using Coupled Bonding Conductor

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GENERAL

Chapter 10 applies to AT&T System 85 and describes the 25-pair shielded cabling from the system cabinets to the cross-connect field. If the harness of the system's 25-pair cables is equipped with ferrite cores, there is no minimum length for the shielded 25-pair connector cables. If the system is not equipped with the ferrite cores, a 50-foot minimum length is in effect. Cable terminations and connections required for each type of circuit pack are described.

The connectors on the rear of the cabinet are equipped with a metal shield for protection during transit. This shield can be removed by removing one screw. The shield should then be discarded or stored locally according to the customer's wishes.

Installation of system features, i.e., attendant console, ANI, etc., are covered in other sections of this manual.

NOTE

See chapter 25 for pinouts for AT&T DEFINITY™ Communications System Generic 2.

REQUIREMENTS

Port carriers, DS1/MFAT carriers, common control carriers, and other units are cabled to the cross-connect field by ED-1E434-11 group 300 cables or group 340 cables. Group 300 cables are 24-gauge with hooded connectors at each end. Group 340 cables are 24-gauge "Y" type cables with hooded connectors at each end for use with duplicated common controls, The metal hooded connector attaches to the cabinet and the plastic hooded connector attaches to the cross-connect field. The cables are dressed up the rear of the cabinet and placed in the I/O cable duct to the cross-connect field.

Each port carrier requires eight 25-pair cables; one cable for two circuit pack slots. Port carriers can accept any SN-type circuit pack in slots 0-3, 5-8, 13-16, and 18-21.

ANN17B circuit packs can be placed in slots 0-3, 6-8, 13-16, and 19-21; however, only the even numbered ports, (00, 02, 04, and 06) can be used.

Each DS1/MFAT carrier requires sixteen 25-pair cables. DS1/MFAT carriers may have ANN17B circuit packs in slots 0-3, 5-8, 13-16, and 18-21 unless the carrier is equipped with an ANN11E or ANN35. Due to time slot requirements, slots 0-2, 6, and 7 must be vacant when an ANN11E or ANN35 is in slot 5; slots 13-15, 19, and 20 must be vacant when an ANN11E or ANN35 is in slot 18. If slots 5 and 18 are equipped with an ANN11E or ANN35, slots 3, 8, 16, and 20 can be used for an ANN17B or any SN-type port circuit pack.

Labels that identify the physical location of a circuit pack are installed on each connector hood as shown in figure 10-1.

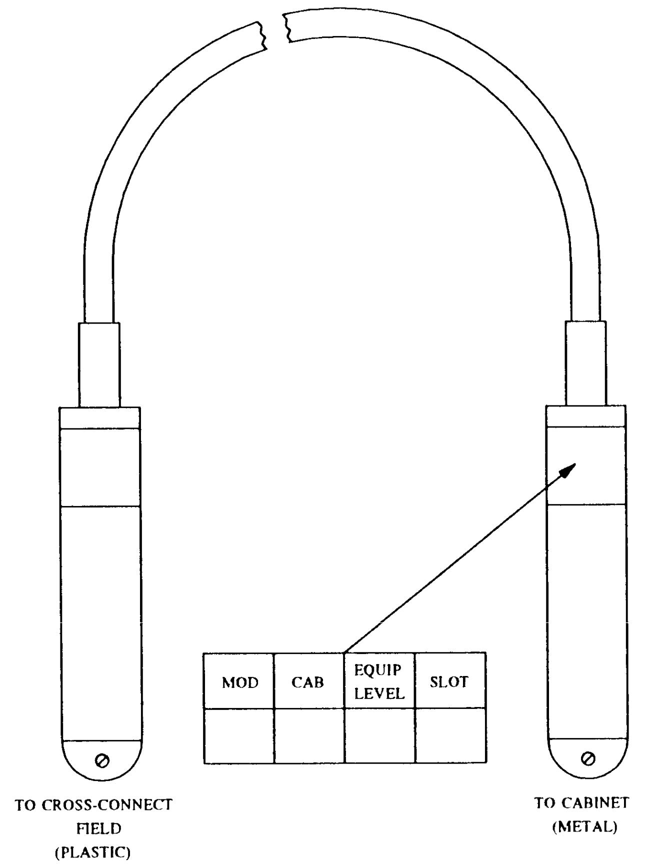


Figure 10-1. Circuit Pack Location Label on Connector Hood

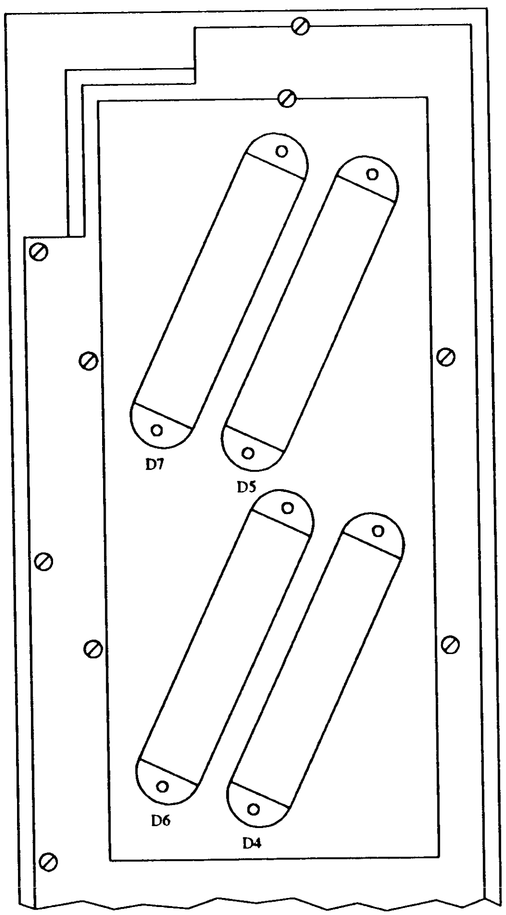


Figure 10-2. D4-D7 Connector Locations (Old Cabinets)

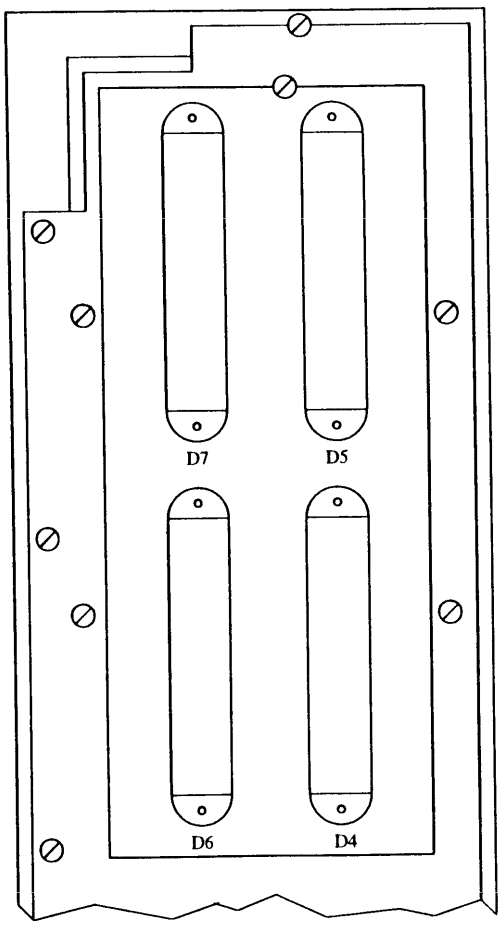


Figure 10-3. D4-D7 Connector Locations (New Cabinets)

SN-type circuit packs have four circuits with the exception of SN221B, SN222B, SN228B, SN229, and SN241 which have eight. The cross-connect field is arranged to accept eight circuits on each 25-pair cable. Since each cable serves two slots, an SN221B, SN222B, SN228B, SN229, or SN241 produces more than eight circuits on a 25-pair cable. Therefore, when a cable serves an SN221B, SN222B, SN228B, SN229, or SN241, wye cables (ED-1E434-11, Group 71) must be connected to the 25-pair cables at the cross-connect field.

The data channels and remote interface alarms of the common control carrier are cabled to the cross-connect field by seven 25-pair cables (ED-1E434-11, group 300 for single common control, groups 340 and 300 duplicated common control).

The ANN17B circuit pack has eight ports. The ANN17B cannot be used in slots 05 and 18 of the port carrier. If the ANN17B is located in a port carrier, only four ports may be used. If the ANN17B is located in the DS1/MFAT carrier, all eight ports are used.

The ANN11E, ANN15B, or ANN35 can be located only in a DS1/MFAT carrier. Several restrictions apply to the placement of these circuit packs in the carrier. An ANN11E or ANN35 and ANN15B cannot be located in the same carrier half. Each of the circuit packs require that adjacent slots be vacant. These restrictions are shown in table 10-1. An ANN11E can be used only in slots 05 and 18 in the Line and Trunk Mode. It can be used in slots 00, 05, 13, and 18 in a Line Only Mode. An option strap must be added to the DS1/MFAT carrier for Line Only use in slots 05 and 18. See chapter 31.

TABLE 10-1. Circuit Pack Location Restrictions

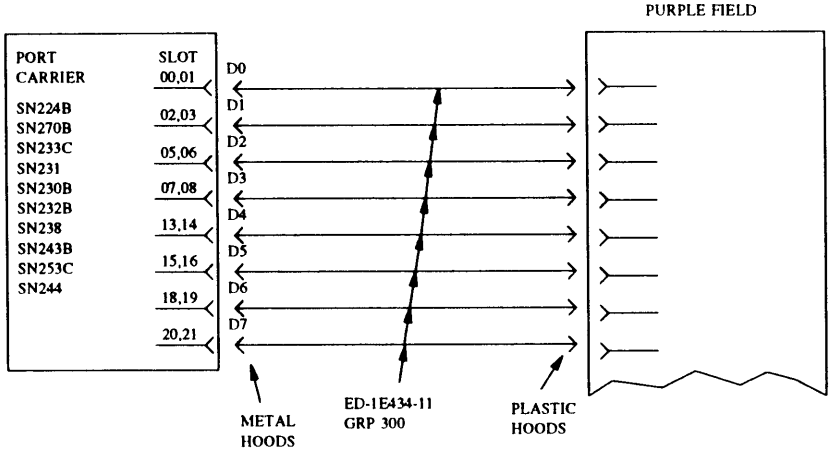
CIRCUIT PACK	SLOT	MODE	RESTRICTION
ANN11E	00	Line Only	Slots 01 and 02 must be vacant
	05	Line Only	Slots 06 and 07 must be vacant
	05	Line/Trunk	Slots 00, 01, 02, 06, and 07 must be vacant
	13	Line Only	Slots 14 and 15 must be vacant
	18	Line Only	Slots 19 and 20 must be vacant
	18	Line/Trunk	Slots 13, 14, 15, 19, and 20 must be vacant
ANN15B	00	N/A	Slots 01 and 02 mush be vacant
	05	N/A	Slots 06 and 07 must be vacant
	13	N/A	Slots 14 and 15 must be vacant
	18	N/A	Slots 19 and 20 must be vacant
ANN35	05	Double Group	Slots 00, 01, 02, 06, and 07 must be vacant
	18	Double Group	Slots 13, 14, 15, 19, and 20 must be vacant

TABLE 10-2. The Connections and Terminations for Circuit Packs

CIRCUIT PACK	CARRIER	CONNECTION FIGURE	TERMINATION TABLE
SN-TYPE	PORT	10-3	10-4
SN-TYPE	PORT	104	10-5
SN-TYPE	DS-1/MFAT	10-5	10-6
TN403 TN492C	UNDUPLICATED COM CONTROL	10-6	10-7 10-8
TN403 TN492C	DUPLICATED COM CONTROL	10-7	10-7 10-8
TN474B	UNDUPLICATED COM CONTROL	10-8	10-14
TN474B	DUPLICATED COM CONTROL	10-9	10-14
ANN17B	PORT	10-10	10-11
ANN17B	DS-1/MFAT	10-11	10-9 10-10
ANN11E	DS-1/MFAT	10-12	10-12
ANN15B	DS-1/MFAT	10-13	10-12
ANN35	DS-1/MFAT	10-14	10-12

CONNECTIONS

Connectors, slots, and cables for various SN-type circuit packs located in port carriers are shown in figure 10-4.



NOTE:
SN244 can only be in slots 00, 01, and 02.

Figure 10-4. Port Carrier Connections for SN-Type Circuit Packs

Figure 10-5 shows connector slots, and cables for SN221B, SN222B, SN228B, SN229, and SN241 circuit packs located in port carriers.

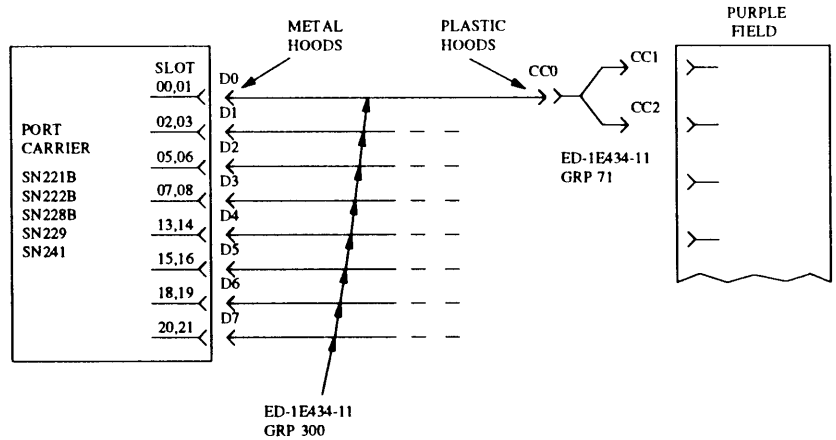
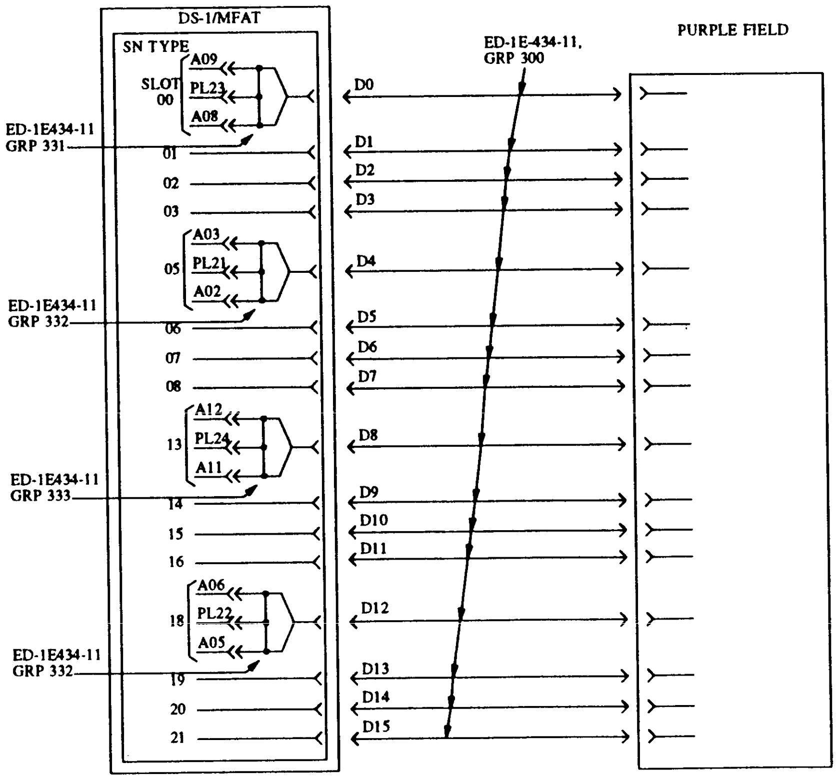


Figure 10-5. Port Carrier Connections for SN-Type Circuit Packs

Figure 10-6 shows connectors, slots and cables for SN22lB, SN222B, SN224B, SN228B, SN229, SN230B, SN231, SN232B, SN233C, SN238, SN241, SN243B, SN244, SN253C, or SN270B circuit pack located in the DS1/MFAT carrier.



NOTE:
SN244 can only be in slots 00, 01, or 02.

Figure 10-6. DS-1/MFAT Carrier Connections for SN-Type Circuit Packs

Figure 10-7 shows connectors, slots, and cables for TN403 data channel circuit packs and TN492C remote interface circuit pack for unduplicated common control.

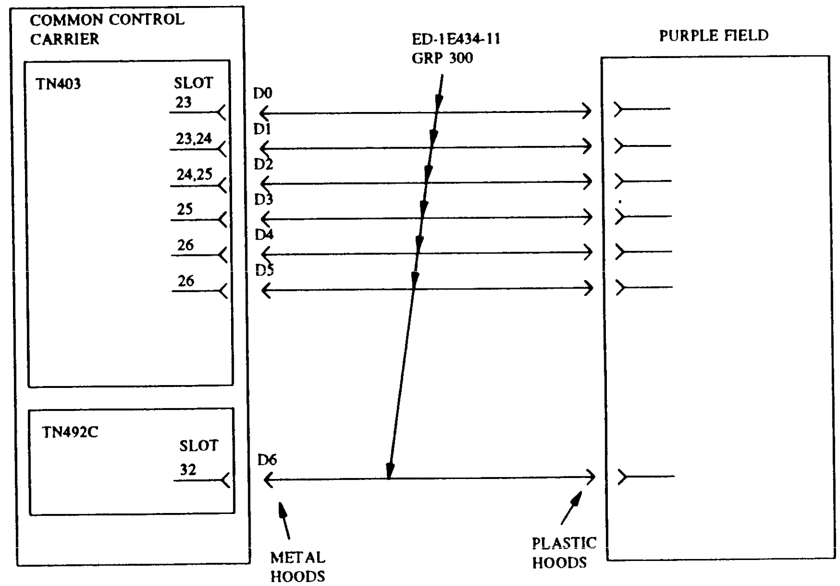


Figure 10-7. Common Control Carrier Connections for Unduplicated Common Control

Figure 10-8 shows connectors, slots, and cables for TN403 data channel circuit packs and TN492C remote interface circuit pack for duplicated common control.

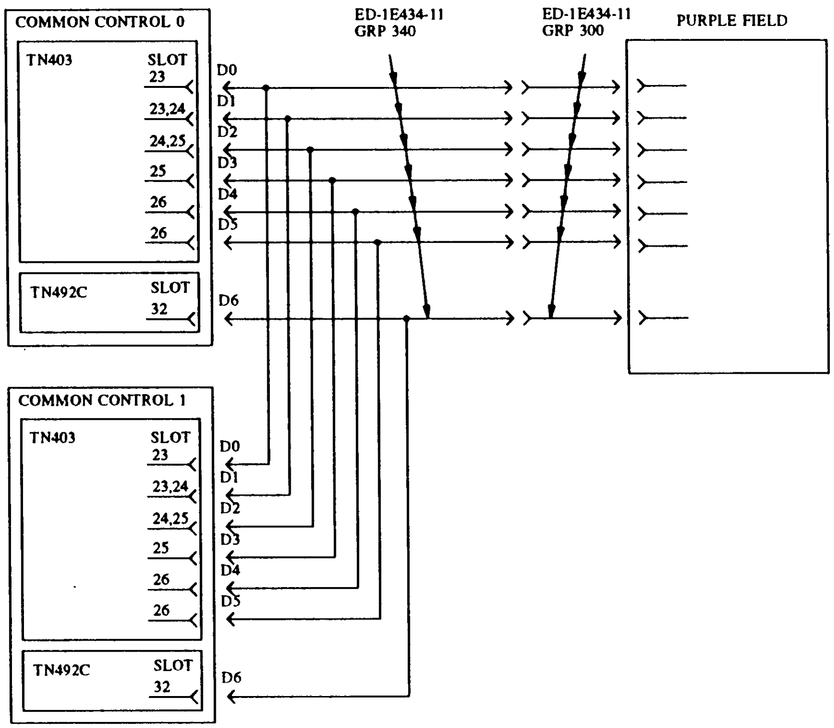


Figure 10-8. Common Control Carrier Connections for Duplicated Common Control

Connections for Multifunctional Analog Terminal

Port Carrier

Figure 10-9 shows connectors, slots, and cables for ANN17B multifunctional analog terminal located in the port carrier.

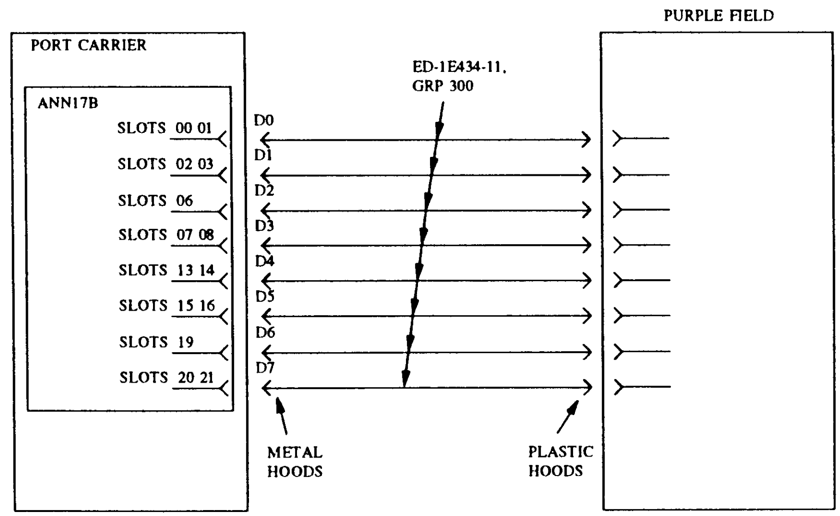


Figure 10-9. Multifunctional Analog Terminal Connections for ANN17B in Port Carrier

Figure 10-10 shows DS-1/MFAT Carrier connectors, slots, and cables for ANN17B multifunctional analog terminal located in the DS-1/MFAT carrier.

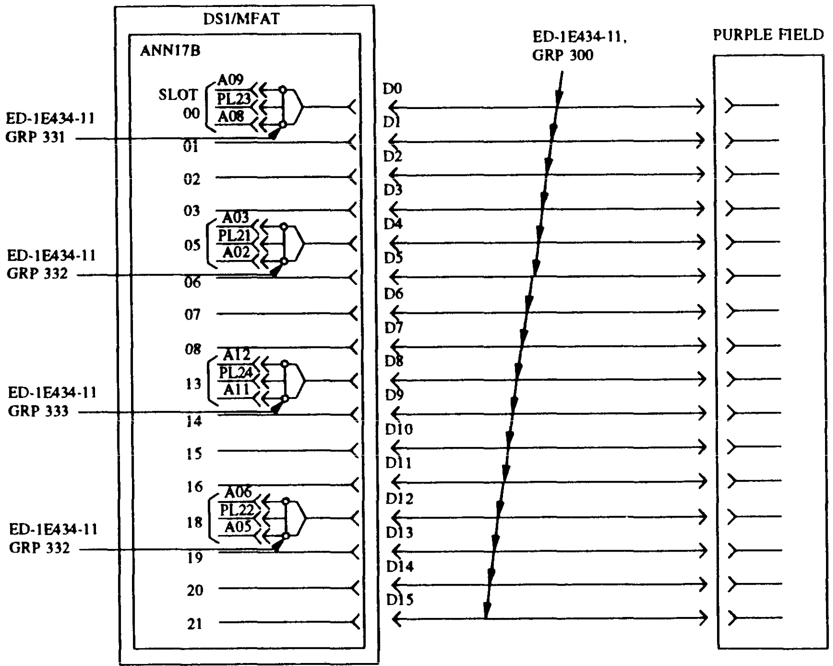


Figure 10-10. Multifunctional Analog Terminal Connections for ANN17B in DS-1/MFAT Carrier

Connections for ANN11E DS1 Trunk Port — DS1/MFAT Carrier

Figure 10-11 shows connections, slots, and cables for ANN11E DS1 trunk port located in DS1/MFAT carrier.

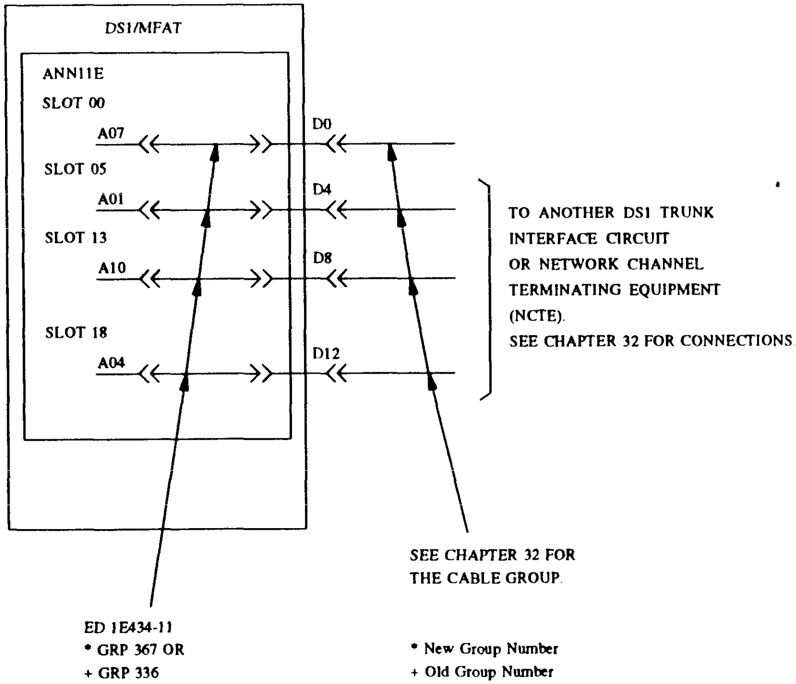
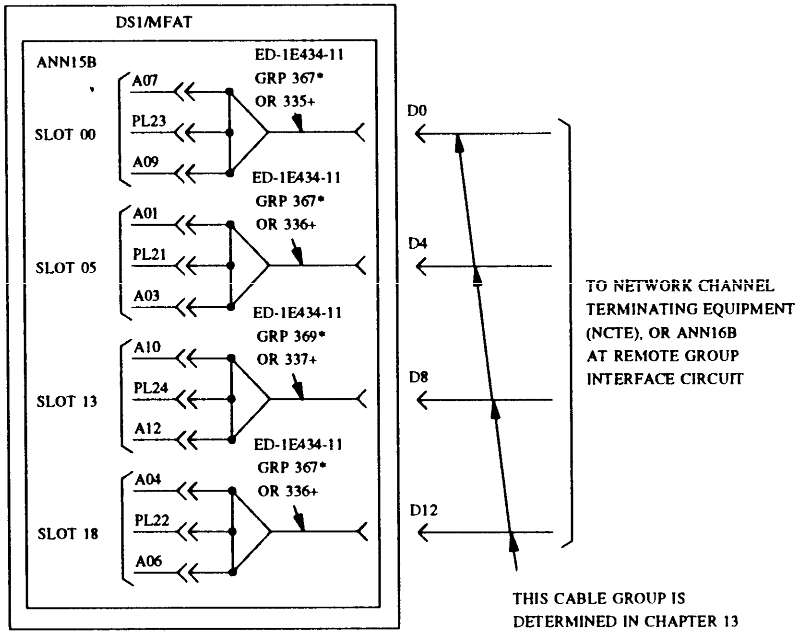


Figure 10-11. ANN11E Trunk Port Connections

Connections for ANN15B Remote Carrier Local — DS1/MFAT Carrier

Figure 10-12 shows connections, slots, and cables for ANN15B Remote Carrier Local located in a DS1/MFAT carrier.



* New Group Number
\+ Old Group Number

Figure 10-12. Local Connections for ANN15B Remote Carrier (Located in DS1/MFAT Carrier)

Connections for TN474B Processor Communication Circuits

Unduplicated Common Control

Figure 10-13 shows connectors, slots, and cables for TN474B Processor Communications Circuit circuit pack for unduplicated common control.

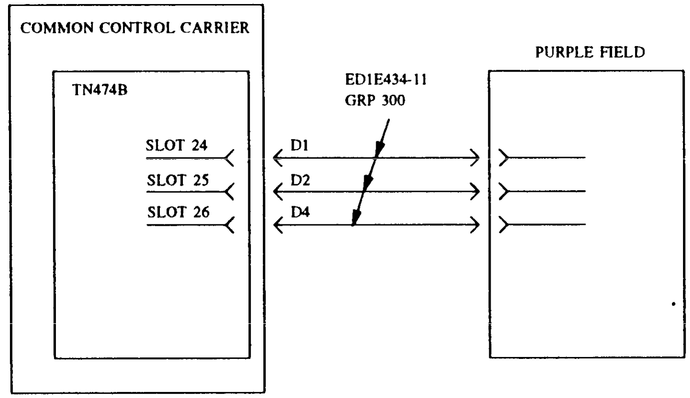


Figure 10-13. TN474B Processor Communication Circuit Connections for Unduplicated Common Control

Duplicated Common Control

Figure 10-14 shows connectors, slots, and cables for TN474B Processor Communications Circuit circuit pack for duplicated common control.

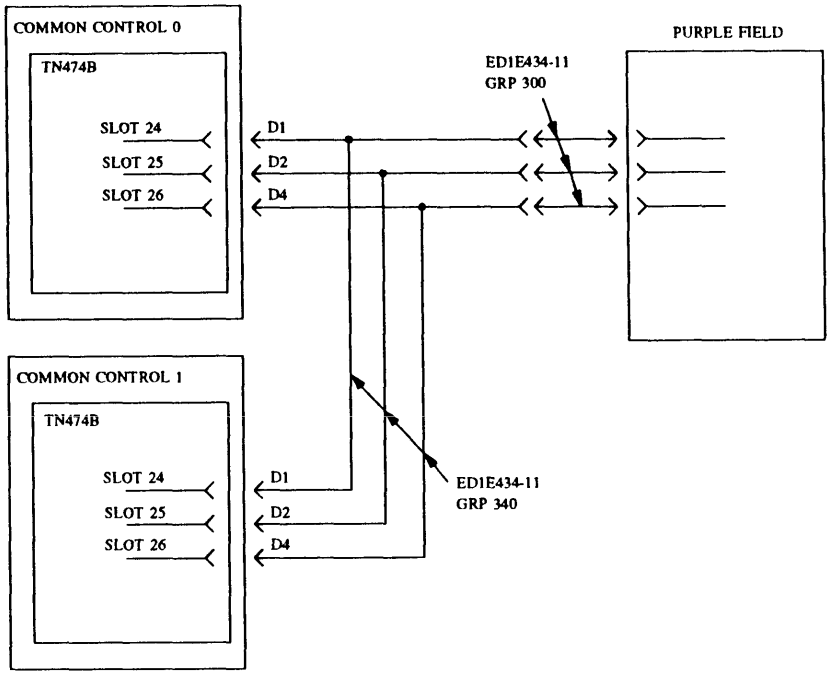
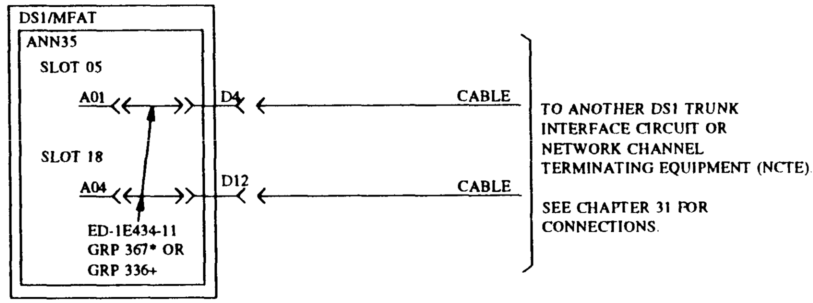


Figure 10-14. TN474B Processor Communication Circuit Connections for Duplicated Common Control

Connections for ANN35 ISDN Primary Rate Port — DS1/MFAT Carrier

Figure 10-15 shows connections, slots, and cables for ANN35 ISDN Primary Rate Port located in DS1/MFAT carrier.



* New Group Number
\+ Old Group Number

Figure 10-15. ANN35 ISDN Primary Rate Port Located in DS1/MFAT

TERMINATIONS FOR 25-PAIR CONNECTOR CABLES

Table 10-3 shows the relationship between the 50-pin connector on the cabinet, the 25-pair connector cable, and the 110-type connector block terminals.

TABLE 10-3. 25-Pair Connector Cable Pinout

50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL
26	W-BL	1	13	GR-BK	26
1	BL-W	2	39	BK-BR	27
27	W-O	3	14	BR-BK	28
2	O-W	4	40	BK-SL	29
28	W-GR	5	15	SL-BK	30
3	GR-W	6	41	Y-BL	31
29	W-BR	7	16	BL-Y	32
4	BR-W	8	42	Y-O	33
30	W-SL	9	17	O-Y	34
5	SL-W	10	43	Y-GR	35
31	R-BL	11	18	GR-Y	36
6	BL-R	12	44	Y-BR	37
32	R-O	13	19	BR-Y	38
7	O-R	14	45	Y-SL	39
33	R-GR	15	20	SL-Y	40
8	GR-R	16	46	V-BL	41
34	R-BR	17	21	BL-V	42
9	BR-R	18	47	V-O	43
35	R-SL	19	22	O-V	44
10	SL-R	20	48	V-GR	45
36	BK-BL	21	23	GR-V	46
11	BL-BK	22	49	V-BR	47
37	BK-O	23	24	BR-V	48
12	O-BK	24	50	V-SL	49
38	BK-GR	25	25	SL-V	50

Table 10-4 shows 25-pair shielded connector cable terminations for selected SN-type circuit packs in port carrier slots 00, 02, 05, 07, 13, 15, 18, and 20.

TABLE 10-4. 25-Pair Connector Cable for Selected Port Carrier Circuit Packs — Slots 00, 02, 05, 07, 13, 15, 18, and 20

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK GROUP	SN224B MFET LINE	SN270B GENERAL PURPOSE PORT	SN233C TIE TRUNK	SN231 AUXILIARY TRUNK	SN230B CO TRUNK	SN232B DID TRUNK	SN238 EIA INTERFACE	SN243B DATA PORT	SN253C AUXILIARY TONES	SN244 AUTOMATIC NUMBER IDENTIFICATION
W-BL	1	1	TT0		T0	T0	T0	T0		T0	DIAL1	T0
BL-W	2		TR0		R0	R0	R0	R0		R0	DIAL2	R0
W-O	3		BT0	RT0	T10				R10			
O-W	4		BR0	RR0	R10				R20			
W-GR	5		LT0	TT0	E0	AL0			S10		ARING1	
GR-W	6		LR0	TR0	M0	S0			S20		ARING2	
W-BR	7	2	TT2		T1	T1	T1	T1		T1	PABSY1	T1
BR-W	8		TR2		R1	R1	R1	R1		R1	PABSY2	R1
W-SL	9		BT2	RT2	T11				R12			
SL-W	10		BR2	RR2	R11				R22			
R-BL	11		LT2	TT2	E1	AL1			S12			
BL-R	12		LR2	TR2	M1	S1			S22			
R-O	13	3	TT4		T2	T2	T2	T2		T2	PASEZ1	
O-R	14		TR4		R2	R2	R2	R2		R2	PASEZ2	
R-GR	15		BT4	RT4	T12				R14			
GR-R	16		BR4	RR4	R12				R24			
R-BR	17		LT4	TT4	E2	AL2			S14			
BR-R	18		LR4	TR4	M2	S2			S24			
R-SL	19	4	TT6		T3	T3	T3	T3		T3	ECR1	
SL-R	20		TR6		R3	R3	R3	R3		R3	ECR2	
BK-BL	21		BT6	RT6	T13				R16			
BL-BK	22		BR6	RR6	R13				R26			
BK-O	23		LT6	TT6	E3	AL3			S16		CHIME1	
O-BK	24		LR6	TR6	M3	S3			S26		CHIME2	

Table 10-5 shows 25-pair shielded connector cable terminations for selected SN-type circuit packs in port carrier slots 01, 03, 06, 08, 14, 16, 19, and 21.

TABLE 10-5. 25-Pair Connector Cable for Selected Port Carrier Circuit Packs — Slots 01, 03, 06, 08, 14, 16, 19, and 21

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK GROUP	SN224B MFET LINE	SN270B GENERAL PURPOSE PORT	SN233C TIE TRUNK	SN231 AUXILIARY TRUNK	SN230B CO TRUNK	SN232B DID TRUNK	SN238 EIA INTERFACE	SN243R DATA PORT	SN253C AUXILIARY TONES	SN244 AUTOMATIC NUMBER IDENTIFICATION
BK-GR	25	5	TT0		T0	T0	T0	T0		T0	DIAL1	T0
GR-BK	26		TR0		R0	R0	R0	R0		R0	DIAL2	R0
BK-BR	27		BT0	RT0	TI0				R10			
BR-BK	28		BR0	RR0	R10				R20			
BK-SL	29		LT0	TT0	E0	AL0			S10		ARING1	
SL-BK	30		LR0	TR0	M0	S0			S20		ARING2	
Y-BL	31	6	TT2					T1		T1	PABSY1	R1
BL-Y	32		TR2					R1		R1	PABSY2	R2
Y-O	33		BT2	RT2	T11				R12			
O-Y	34		BR2	RR2	R11				R22			
Y-GR	35		LT2	TT2	E1	AL1			S12			
GR-Y	36		LR2	TR2	M1	S1			S22			
Y-BR	37	7			T2	T2	T2	T2		T2	PASEZ1	
BR-Y	38		TT4		R2	R2	R2	R2		R2	PASEZ2	
Y-SL	39		BT4	RT4	T12				R14			
SL-Y	40		BR4	RR4	R12				R24			
V-BL	41		LT4	TT4	E2	AL2			S14			
BL-V	42		LR4	TR4	M2	S2			S24			
V-O	43	8	TT6		T3	T3	T3	T3		T3	ECR1	
O-V	44		TR6		R3	R3	R3	R3		R3	ECR2	
V-GR	45		BT6	RT6	T13				R16			
GR-V	46		BR6	RR6	R13				R26			
V-BR	47		LT6	TT6	E3	AL3			S16		CHIME1	
BR-V	48		LR6	TR6	M3	S3			S26		CHIME2	
V-SL	49		GRDD	GRDD	GRDD	GRDD	GRDD	GRDD		GRDD	GRDD	GRDD
SL-V	50		GRDD	GRDD	GRDD	GRDD	GRDD	GRDD		GRDD	GRDD	GRDD

Table 10-6 shows 25-pair shielded connector cable terminations for SN221B, SN228B, SN222B, SN229, and SN241 circuit packs in port carrier slots 00, 02, 05, 07, 13, 15, 18, and 20.

TABLE 10-6. 25-Pair Connector Cable for Additional Port Carrier Circuit Packs — Slots 00, 02, 05, 07, 13, 15, 18 and 20

CONNECTOR CC0			CONNECTOR CC1			CONNECTOR CC1		
SN221B, SN223B, SN222B, SN229 STA. LINE	SN241 CONTACT INTERFACE	CONNECTING BLOCK TERIMAL	SN221B, SN228B, SN222B, SN229 STA. LINE	SN241 CONTACT INTERFACE	CONNECTING BLOCK TERIMAL	SN221B, SN228B, SN222B, SN229 STA. LINE	SN241 CONTACT INTERFACE	CONNECTING BLOCK TERIMAL
T0	CID0	1	T0	CID0	1	R4	CIG4	26
R0	CIG0	2	R0	CIG0	2			27
T1	CID1	3			3			28
R1	CIG1	4			4			29
T2	CID2	5			5			30
R2	DIG2	6			6	T5	CID5	31
T3	CID3	7	T1	CID1	7	R5	CIG5	32
R3	DIG3	8	R1	CIG1	8			33
		9			9			34
		10			10			35
		11			11			36
		12			12	T6	CID6	37
		13	T2	CID2	13	R6	CIG6	38
		14	R2	CIG2	14			39
		15			15			40
		16			16			41
T4	CID4	17			17			42
R4	CIG4	18			18	T7	CID7	43
T5	CID5	19	T3	CID3	19	R7	CIG7	44
R5	CIG5	20	R3	CIG3	20			45
T6	CID6	21			21			46
R6	CIG6	22			22			47
T7	CID7	23			23			48
R7	CIG7	24			24			49
T0	CID0	25	T4	CID4	25			50

Table 10-7 shielded 25-pair connector cable terminations for SN221B, SN222B, SN228B, SN229, and SN241 circuit packs in port carrier slots 01, 03, 06, 08, 14, 16, 19, and 21.

TABLE 10-7. 25-Pair Connector Cable for Additional Port Carrier Circuit Packs — Slots 01, 03, 06, 08, 14, 16, 19, and 21

CONNECTOR CC0			CONNECTOR CC2			CONNECTOR CC2		
SN221B, SN228B, SN222B, SN229 STA. LINE	**SN241 CONTACT INTERFACE**	**CONNECTING BLOCK TERIMAL**	**SN221B, SN228B, SN222B, SN229 STA. LINE**	**SN241 CONTACT INTERFACE**	**CONNECTING BLOCK TERIMAL**	**SN221B, SN228B, SN222B, SN229 STA. LINE**	**SN241 CONTACT INTERFACE**	**CONNECTING BLOCK TERIMAL**
R0	CIG0	26	T0	CID0	1	R4	CIG4	26
T1	CID1	27	R0	CIG0	2			27
R1	CIG1	28			3			28
T2	CID2	29			4			29
R2	CIG2	30			5			30
T3	CID3	31			6	T5	CID5	31
R3	CIG3	32	T1	CID1	7	R5	CIG5	32
		33	R1	CIG1	8			33
		34			9			34
		35			10			35
		36			11			36
		37			12	T6	CID6	37
		38	T2	CID2	13	R6	CIG6	38
		39	R2	CIG2	14			39
		40			15			40
T4	CID4	41			16			41
R4	CIG4	42			17			42
T5	CID5	43			18	T7	CID7	43
R5	CIG5	44	T3	CID3	19	R7	CIG7	44
T6	CID6	45	R3	CIG3	20			45
R6	CIG6	46			21			46
T7	CID7	47			22			47
R7	CIG7	48			23			48
		49			24			49
		50	T4	CID4	25			50

Table 10-8 shows 25-pair shielded connector cable terminations for selected SN-type circuit packs for DS1/MFAT carrier slots 00-03,05-08, 13-16, and 18-21.

TABLE 10-8. 25-Pair Connector Cable Terminations for Selected SN-Type DS1/MFAT Circuit Packs — Slots 00-03, 05-08, 13-16, and 18-21 (Part 1 of 2)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK GROUP	SN224B MFET LINE	SN270B GENERAL PURPOSE PORT	SN233C TIE TRUNK	SN231 AUXILIARY TRUNK	SN230B CO TRUNK	SN232B DID TRUNK	SN238 EIA INTERFACE	SN243B DATA PORT	SN253C AUXILIARY TONES	SN221, SN22SB SN222B, SN229 STA. LINE	SN241 CONTACT INTERFACE	SN244 AUTOMATIC NUMBER IDENTIFICATION
W-BL	1	1	TT0		T0	T0	T0	T0		T0	DIAL1	T0	CID0	T0
BL-W	2		TR0		R0	R0	R0	R0		R0	DIAL2	R0	CIG0	R0
W-O	3		BT0	RT0	T10				R10			T1	CIDl	
O-W	4		BT0	RR0	R10				R20			R1	CIG1	
W-OR	5		BT0	TT0	E0	AL0			Sl0		ARING1	T2	CID2	
GR-W	6		LR0	TR0	M0	S0			S20		ARING2	R2	CIG2	
W-BR	7	2	TT2		T1	T1	T1	T1		T1	PABSY1	T3	CID3	T1
BR-W	8		TR2		R1	R1	R1	R1		R1	PABSY2	R3	CIG3	R1
W-SL	9		BT2	RT2	T11				R12					
SL-W	10		BR2	RR2	R11				R22					
R-BL	11		LT2	TT2	El	AL1			S12					
BL-R	12		LR2	TR2	Ml	S1			S22					
R-O	13	3	TT4		T2	T2	T2	T2		T2	PASEZ1			
O-R	14		TR4		R2	R2	R2	R2		R2	PASEZ2			
R-GR	15		BT4	RT4	T12				R14					
GR-R	16		BR4	RR4	R12				R24					
R-BR	17		LT4	TT4	E2	AL2			S14			T4	CID4	
BR-R	18		LR4	TR4	M2	S2			S24			R4	CIG4	
R-SL	19	4	TT6		T3	T3	T3	T3		T3	ECR1	T5	CID5	
SL-R	20		TR6		R3	R3	R3	R3		R3	ECR2	R5	CIG5	
BK-BL	21		BT6	RT6	T13				R16			T6	CID6	
BL-BK	22		BR6	RR6	R13				R26			R6	ClG6	
BK-O	23		LT6	TT6	E3	AL3			S16		CHIME1	T7	CID7	
O-BK	24		LR6	TR6	M3	S3			S26		CHIME2	R7	CIG7	

TABLE 10-8. 25-Pair Connector Cable Terminations for Selected SN-Type DS1/MFAT Circuit Packs — Slots 00-03,05-08,13-16, and 18-21 (Part 2 of 2)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK GROUP	SN224B MFET LINE	SN270B GENERAL PURPOSE PORT	SN233C TIE TRUNK	SN231 AUXILIARY TRUNK	SN230B CO TRUNK	SN232B DID TRUNK	SN238 EIA INTERFACE	SN243B DATA PORT	SN253C AUXILIARY TONES	SN221B, SN228B SN222B, SN229 STA. LINE	SN241 CONTACT INTERFACE	SN244 AUTOMATIC NUMBER IDENTIFICATION
BK-GR	25													
GR-BK	26													
BK-BR	2-1	5												
BR-BK	28													
BK-SL	29													
SL-BK	30													
Y-BL	31													
BL-Y	32													
Y-O	33	6												
O-Y	34													
Y-GR	35													
GR-Y	36													
Y-BR	37													
BR-Y	38													
Y-SL	39	7												
SL-Y	40													
V-BL	41													
BL-V	42													
V-O	43													
O-V	44													
V-GR	45	8												
GR-V	46													
V-BR	47													
BR-V	48													
V-SL	49		GRDD	GRDD	GRDD	GRDD	GRDD	GRDD		GRDD	GRDD			GRDD
SL-V	50		GRDD	GRDD	GRDD	GRDD	GRDD	GRDD		GRDD	GRDD			GRDD

Table 10-9 shows 25-pair connector cable terminations for TN403 circuit pack (data channels).

TABLE 10-9. TN403 Circuit Pack Terminations (Part 1 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
		IOXB01		W-BL	1			IOXB07		BK-G	25
		IOXA01		BL-W	2			IOXA07		G-BK	26
	1	IORB01		W-O	3		7	IORB07		BK-BR	27
		IORA01		O-W	4			IORA07		BR-BK	28
		IOXB02		W-G	5			IOXB08		BK-S	29
		IOXA02		G-W	6			IOXA08		S-BK	30
	2	10RB02		W-BR	7		8	IORB08		Y-BL	31
		10RA02		BR-W	8			IORA08		BL-Y	32
		10XB03		W-S	9			IOXB09		Y-O	33
		IOXA03		S-W	10			IOXA09		O-Y	34
	3	IORB03		R-BL	11		9	IORB09		Y-G	35
23		IORA03	DO	BL-R	12	23		IORA09	DO	G-Y	36
		IOXB04		R-O	13			IOXB10		Y-BR	37
		IOXA04		O-R	14			IOXA10		BR-Y	38
	4	IORB04		R-G	15		10	IORB10		Y-S	39
		IORA04		G-R	16			IORA10		S-Y	40
		IOXB05		R-BR	17			IOXB11		V-BL	41
		IOXA05		BR-R	18			I0XA11		BL-V	42
	5	IORB05		R-S	19		11	I0RB11		V-O	43
		IORA05		S-R	20			IORA11		O-V	44
		IOXB06		BK-BL	21					V-G	45
		IOXA06		BL-BK	22					G-V	46
	6	IORB06		BK-O	23					V-BR	47
		I0RA06		O-BK	24					BR-V	48
										V-S	49
										S-V	50

TABLE 10-9. TN403 Circuit Pack Terminations (Part 2 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
23	12	IOXB12	D1	W-BL	1
		IOXA12		BL-W	2
		1ORB12		W-O	3
		IORA12		O-W	4
	13	IOXB13		W-G	5
		IOXA13		G-W	6
		1ORB13		W-BR	7
		IORA13		BR-W	8
				W-S	9
				S-W	10
				R-BL	11
				BL-R	12
				R-O	13
				O-R	14
				R-G	15
				G-R	16
24	16	IOXB16		R-BR	17
		IOXA16		BR-R	18
		IORB16		R-S	19
		IORA16		S-R	20
	17	IOXB17		BK-BL	21
		IOXA17		BL-BK	22
		IORB17		BK-O	23
		IORA17		O-BK	24

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
24	18	IOXB18	D1	BK-G	25
		IOXA18		G-BK	26
		IORB18		BK-BR	27
		IORA18		BR-BK	28
	19	IOXB19		BK-S	29
		IOXA19		S-BK	30
		IORB19		Y-BL	31
		IORA19		BL-Y	32
	20	IOXB20		Y-O	33
		IOXA20		O-Y	34
		IORB20		Y-G	35
		IORA20		G-Y	36
	21	IOXB21		Y-BR	37
		IOXA21		BR-Y	38
		IORB21		Y-S	39
		IORA21		S-Y	40
	22	IOXB22		V-BL	41
		IOXA22		BL-V	42
		IORB22		V-O	43
		IORA22		O-V	44
	23	IOXB23		V-G	45
		IOXA23		G-V	46
		IORB23		V-BR	47
		IORA23		BR-V	48
				V-S	49
				S-V	50

TABLE 10-9. TN403 Circuit Pack Terminations (Part 3 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNETOR	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
24	24	IOXB24	D2	W-BL	1	24	30	IOXB30	D2	BK-G	25
		IOXA24		BL-W	2			IOXA3O		G-BK	26
		IORB24		W-O	3			IORB30		BK-BR	27
		IORA24		O-W	4			IORA3O		BR-BK	28
	25	IOXB25		W-G	5		31	IOXB31		BK-S	29
		IOXA25		G-W	6			IOXA31		S-BK	30
		IORB25		W-BR	7			IORB31		Y-BL	31
		IORA25		BR-W	8			IORA31		BL-Y	32
	26	IOXB26		W-S	9	25	32	IOXB32		Y-O	33
		IOXA26		S-W	10			IOXA32		O-Y	34
		IORB26		R-BL	11			IORB32		Y-G	35
		IORA26		BL-R	12			IORA32		G-Y	36
	27	IOXB27		R-O	13		33	IOXB33		Y-BR	37
		IOXA27		O-R	14			IOXA33		BR-Y	38
		IORB27		R-G	15			IORB33		Y-S	39
		IORA27		G-R	16			IORA33		S-Y	40
	28	IOXB28		R-BR	17		34	IOXB34		V-BL	41
		IOXA28		BR-R	18			IOXA34		BL-V	42
		IORB28		R-S	19			IORB34		V-O	43
		IORA28		S-R	20			IORA34		O-V	44
	29	IOXB29		BK-BL	21		35	IOXB35		V-G	45
		IOXA29		BL-BK	22			IOXA35		G-V	46
		IORB29		BK-O	23			IORB35		V-BR	47
		IORA29		O-BK	24			IORA35		BR-V	48
										V-S	49
										S-V	50

TABLE 10-9. TN403 Circuit Pack Terminations (Part 4 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
25	36	IOXB36	D3	W-BL	1	25	42	IOXB42	D3	BK-G	25
		IOXA36		BL-W	2			IOXA42		G-BK	26
		IORB36		W-O	3			IORB24		BK-BR	27
		IORA36		O-W	4			IORA42		BR-BK	28
	37	IOXB37		W-G	5		43	IOXB43		BK-S	29
		IOXA37		G-W	6			IOXA43		S-BK	30
		IORB37		W-BR	7			IORB43		Y-BL	31
		IORA37		BR-W	8			IORA43		BL-Y	32
	38	IOXB38		W-S	9		44	IOXB44		Y-O	33
		IOXA38		S-W	10			IOXA44		O-Y	34
		IORB38		R-BL	11			IORB44		Y-G	35
		IORA38		BL-R	12			IORA44		G-Y	36
	39	IOXB39		R-O	13		45	IOXB45		Y-BR	37
		IOXA39		O-R	14			IOXA45		BR-Y	38
		IORB39		R-G	15			IORB45		Y-S	39
		IORA39		G-R	16			IORA45		S-Y	40
	40	IOXB40		R-BR	17		46	IOXB46		V-BL	41
		IOXA40		BR-R	18			IOXA46		BL-V	42
		IORB40		R-S	19			IORB46		V-O	43
		IORA40		S-R	20			IORA46		O-V	44
	41	IOXB41		BK-BL	21		47	IOXB47		V-G	45
		IOXA41		BL-BK	22			IOXA47		G-V	46
		IORB41		BK-O	23			IORB47		V-B R	47
		IORA41		O-BK	24			IORA47		BR-V	48
										V-S	49
										S-V	50

TABLE 10-9. TN403 Circuit Pack Terminations (Part 5 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
		IOXB48		W-BL	1			IOXB54		BK-G	25
		IOXA48		BL-W	2			IOXA54		G-BK	26
	48	IORB48		W-O	3		54	IORB54		BK-BR	27
		IORA48		O-W	4			IORA54		BR-BK	28
		IOXB49		W-G	5			IOXB55		BK-S	29
		IOXA49		G-W	6			IOXA55		S-BK	30
	49	IORB49		W-BR	7		55	IORB55		Y-BL	31
		IORA49		BR-W	8			IORA55		BL-Y	32
		IOXB50		W-S	9			IOXB56		Y-O	33
		IOXA50		S-W	10			IOXA56		O-Y	34
	50	IORB50		R-BL	11		56	IORB56		Y-G	35
26		IORA50	D4	BL-R	12	26		IORA56	D4	G-Y	36
		IOXB51		R-O	13			IOXB57		Y-BR	37
		IOXA51		O-R	14			IOXA57		BR-Y	38
	51	IORB51		R-G	15		57	IORB57		Y-S	39
		IORA51		G-R	16			IORA57		S-Y	40
		IOXB52		R-BR	17			IOXB58		V-BL	41
		IOXA52		BR-R	18			IOXA58		BL-V	42
	52	IORB52		R-S	19		58	IORB58		V-O	43
		IORA52		S-R	20			IORA58		O-V	44
		IOXB53		BK-BL	21			IOXB59		V-G	45
		IOXA53		BL-BK	22			IOXA59		G-V	46
	53	IORB53		BK-O	23		59	IORB59		V-BR	47
		IORA53		O-BK	24			IORA59		BR-V	48
										V-S	49
										S-V	50

TABLE 10-9. TN403 Circuit Pack Terminations (Part 6 of 6)

SLOT	DATA CHANNEL NUMBER	LEAD DESIGNATION	CONNECTOR	LEAD COLOR	CONNECTING BLOCK TERMINAL
26	60	IOXB60	D5	W-BL	1
		IOXA60		BL-W	2
		IORB60		W-O	3
		IORA60		O-W	4
	61	IOXB61		W-G	5
		IOXA61		G-W	6
		IORB61		W-BR	7
		IORA61		BR-W	8
	62	IOXB62		W-S	9
		IOXA62		S-W	10
		IORB62		R-BL	11
		IORA62		BL-R	12
	63	IOXB63		R-O	13
		IOXA63		O-R	14
		IORB63		R-G	15
		IORA63		G-R	16

Table 10-10 shows 25-pair connector cable terminations for the TN492C circuit pack (slot 32 — alarms).

TABLE 10-10. TN492C Circuit Pack Terminations (Slot 32 — Alarms) (Part 1 of 2)

CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL	CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL
	UNIT20	W-BL	1		TIP0	N-BL	1
	UNIT19	BL-W	2		RING0	BL-W	2
	UNIT22	W-O	3		TIP1	W-O	3
	UNIT21	O-W	4		RING1	O-W	4
	UNIT24	W-G	5			W-G	5
	UNIT23	G-W	6			G-W	6
		W-BR	7			W-BR	7
	UNIT25	BR-W	8			BR-W	8
	UNIT27	W-S	9			W-S	9
	UNIT26	S-W	10			S-W	10
	UNIT29	R-BL	11			R-BL	11
D6	UNIT28	BL-R	12	D7		BL-R	12
	UNIT31	R-O	13			R-O	13
	UNIT30	O-R	14			O-R	14
	AUXCTMP	R-G	15			R-G	15
	UNIT32	G-R	16			G-R	16
	EXTEQMN	R-BR	17			R-BR	17
	EXTEQMJ	BR-R	18			BR-R	18
	AUXCRCT	R-S	19			R-S	19
	AUXCHO	S-R	20			S-R	20
	AUXCCB	BK-BL	21			BK-BL	21
	AUXFRQ	BL-BK	22			BL-BK	22
	AUXCFAN	BK-O	23			BK-O	23
		O-BK	24			O-BK	24

TABLE 10-10. TN492C Circuit Pack Terminations (Slot 32 — Alarms) (Part 2 of 2)

CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL	CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL
	EXTPRMJ	BK-G	25			BK-G	25
	EXTPRMN	G-BK	26			G-BK	26
	UNIT2	BK-BR	27			BK-BR	27
	UNIT1	BR-BK	28			BR-BK	28
	UNIT4	BK-S	29			BK-S	29
	UNIT3	S-BK	30			S-BK	30
	UNIT6	Y-BL	31			Y-BL	31
	UNIT5	EL-Y	32			BL-Y	32
	UNIT8	Y-O	33			Y-O	33
	UNIT7	O-Y	34			O-Y	34
	UNIT10	Y-G	35			Y-G	35
	UNIT9	G-Y	36			G-Y	36
D6		Y-BR	37	D7		Y-BR	37
	UNIT11	BR-Y	38			BR-Y	38
	UNIT13	Y-S	39			Y-S	39
	UNIT12	S-Y	40			S-Y	40
	UNIT15	V-BL	41			V-EL	41
	UNIT14	BL-V	42			BL-V	42
	UNIT17	V-O	43			V-O	43
	UNIT16	O-V	44			O-V	44
		V-G	45		C	V-G	45
	UNIT18	G-V	46		D1	G-V	46
	RING0	V-BR	47			V-GR	47
	TIP0	BR-V	48		AB0	BR-V	48
	RING1	V-S	49			V-S	49
	TIP1	S-V	50			S-V	50

Table 10-11 shows 25-pair connector cable terminations for ANN17B circuit pack in DS1/MFAT carrier slots 00, 05, 13, and 18 only.

WARNING

The ANN17B uses a solid state power feed device to power the associated terminal. Care should be taken at the cross-connect field as voltages greater than -48 VDC or ringing voltage will damage the ANN17B.

NOTE

If an ANN11E or ANN35 is in slot 5, an ANN17B cannot be in slots 00, 01, 02, 06, or 07. If ANN11E or ANN35 is in slot 18, an ANN17B cannot be in slots 13-15 or 18-20.

TABLE 10-11. ANN17B Circuit Pack Terminations — Slots 00, 05, 13, and 18

CIRCUIT PACK LEAD DESIG	CONNECTOR LEAD DESIG	BACKPLANE CONNECTOR PIN NO.	CABLE CONN PIN NO.	COLOR	CIRCUIT PACK LEAD DESIG	CONNECTOR LEAD DESIG	BACKPLANE CONNECTOR PIN NO.	CABLE CONN PIN NO.	COLOR
V1R4	R06	24	7	O-R	V1R0	R00	24	1	BL-W
V1T4	T06	12	32	R-O	V1T0	T00	12	26	W-BL
CR4	R07	23	8	G-R	CR0	R01	23	2	O-W
CT4	T07	11	33	R-G	CT0	T01	11	27	W-O
P+4	R08	22	9	BR-R	P+0	R02	22	3	G-W
P-4	T08	10	34	R-BR	P-0	T02	10	28	W-G
V1R6	R09	21	10	S-R	V1R2	R03	21	4	GR-W
V1T6	T09	9	35	R-S	V1T2	T03	9	29	W-GR
CR6	R10	20	11	BL-BK	CR2	R04	20	5	S-W
CT6	T10	8	36	BK-BL	CT2	T04	8	30	W-S
P+6	R11	19	12	O-BK	P+2	R05	19	6	BL-R
P-6	T11	7	37	BK-O	P-2	T05	7	31	R-BL
V1R5	R18	18	19	BR-Y	V1R1	R12	18	13	G-BK
V1T5	T18	6	44	Y-BR	V1T1	T12	6	38	BK-G
CR5	R19	17	20	S-Y	CR1	R13	17	14	BR-BK
CT5	T19	5	45	Y-S	CR2	T13	5	39	BK-BR
P+5	R20	16	21	BL-V	P+1	R14	16	15	S-BK
P-5	T20	4	46	V-BL	P-1	T14	4	40	BK-S
V1R7	R21	15	22	O-V	V1R3	R15	15	16	BL-Y
V1T7	T21	3	47	V-O	V1T3	T15	3	41	Y-BL
CR7	R22	14	23	G-V	CR3	R16	14	17	O-Y
CT7	T22	2	48	V-G	CT3	T16	2	42	Y-O
P+7	R23	13	24	BR-V	P+3	R17	13	18	G-Y
P-7	T23	1	49	V-BR	P-3	T17	1	43	Y-G

Table 10-12 shows 25-pair connector cable terminations for ANN17B circuit pack in DS1/MFAT carrier slots 01-03, 06-08, 14-16, and 19-21 only.

WARNING

The ANN17B uses a solid state power feed device to power the associated terminal. Care should be taken when wiring the cross-connect field since voltages greater than -48 VDC or ringing voltage will damage the ANN17B.

NOTE

Because of time slot limitations, if an ANN1lE or ANN35 is in slot 05, slots 00, 01, 02, 06, and 07 must be unoccupied. If an ANN1lE or ANN35 is in slot 18, slots 13-15, and 18-20 must be left unoccupied.

TABLE 10-12. ANN17B Circuit Pack Terminations — Slots 01-03, 06-08, 14-16, and 19-21

CIRCUIT PACK LEAD DESIG	CONNECTOR LEAD DESIG	PIN NO.	COLOR	CIRCUIT PACK LEAD DESIG	CONNECTOR LEAD DESIG	PIN NO.	COLOR
VIT0	T00	26	W-BL	CTl	T13	39	BK-BR
VIR0	R00	1	BL-W	CR1	R13	14	BR-BK
CTO	T01	27	W-O	P-1	T14	40	BK-S
CR0	R01	2	O-W	P+l	R14	15	S-BK
P-0	T02	28	W-G	V1T3	T15	41	Y-BL
P+0	R02	3	G-W	V1R3	R15	16	BL-Y
V1T2	T03	29	W-BR	CT3	T16	42	Y-O
V1R2	R03	4	BR-W	CR3	R16	17	O-Y
CT2	T04	30	W-S	P-3	T17	43	Y-G
CR2	R04	5	S-W	P+3	R17	18	G-Y
P-2	T05	31	R-BL	V1T5	T18	44	Y-BR
P+2	R05	6	BL-R	V1R5	R18	19	BR-Y
V1T4	T06	32	R-O	CT5	T19	45	Y-S
V1R4	R06	7	O-R	CR5	R19	20	S-Y
CT4	T07	33	R-G	P - 5	T20	46	V-BL
CR4	R07	8	G-R	P+5	R20	21	BL-V
P - 4	T08	34	R-BR	V1T7	T21	47	V-O
P+4	R08	9	BR-R	V1R7	R21	22	O-V
V1T6	T09	35	R-S	CT7	T22	48	V-G
V1R6	R09	10	S-R	CR7	R22	23	G-V
CT6	T10	36	BK-BL	P-7	T23	49	V-BR
CR6	R10	11	BL-BK	P + 7	R23	24	BR-V
P-6	T1l	37	BK-O	GRD	GRDCOM	50	V-S
P + 6	R11	12	O-BK	GRD	GRDCOM	25	S-V
V1T1	T12	38	BK-G				
V1R1	R12	13	G-BK				

Table 10-13 shows 25-pair connector cable terminations for ANN17B circuit pack in port carrier slots 00-03, 06-08, 13-16, and 19-21.

NOTE

An ANN17B cannot be located in slots 05 or 18 because of carrier stiffener interference.

WARNING

The ANN17B uses a solid state power feed device to power the associated terminal. Care should be taken when wiring the cross-connect field since voltages greater than -48 VDC or ringing voltage will damage the ANN17B.

TABLE 10-13. ANN17B Circuit Pack Terminations -Slots 00-03, 06-08, 13-16, and 19-21

CONN LEAD DESIG	CKT	CIRCUIT PACK LEAD DESIGNATION	PIN NO.	COLOR	CONN LEAD DESIG	CKT	CIRCUIT PACK LEAD DESIGNATION	PIN No.	COLOR
T00		V1TO	26	W-BL	T00		V1T0	38	BK-G
ROO		V1RO	1	BL-W	R00		V1R0	13	G-BK
T01	0	CT0	27	W-O	T01	0	CT0	39	BK-BR
R01		CR0	2	O-W	R01		CR0	14	BR-BK
T02		P-0	28	W-G	T02		P-0	40	BK-S
R02		P+0	3	G-W	R02		P+0	15	S-BK
T03		V1T2		W-BR	T03		V1T2	41	Y-BL
R03		V1R2	4	BR-W	R03		V1R2	16	BL-Y
T04	2	CT2	30	W-S	T04	2	CT2	42	Y-O
R04		CR2	5	S-W	R04		CR2	17	O-Y
T05		P-2	31	R-BL	T05		P-2	43	Y-G
R05		P+2	6	BL-R	R05		P+2	18	G-Y
T06		V1T4	32	R-O	T06		V1T4	44	BR-Y
R06		V1R4	7	O-R	R06		V1R4	19	Y-BR
T07	4	CT4	33	R-G	T07	4	CT4	45	Y-S
R07		CR4	18	G-R	R07		CR4	20	S-Y
T08		P-4	34	R-BR	T08		P-4	46	Y-BL
R08		P+4	9	BR-R	R08		P+4	21	BL-Y
T09		V1T6	35	R-S	T09		V1T6	47	V-O
R09		V1R6	10	S-R	R09		V1R6	22	O-V
T10	6	CT6	36	BK-BL	TI0	6	CT6	48	V-G
R10		CR6	11	BL-BK	R10		CR6	23	G-V
T11		P-6	37	BK-O	T11		P-6	49	V-BR
R11		P+6	12	O-BK	R11		P+6	24	BR-V
					GRD D		GRDD	50	V-S
					GRD D		GRDD	25	S-V

Tables 10-14 and 10-15 show 25-pair connector cable terminations for ANN1lE, ANN15B, and ANN35 in the DS1/MFAT carrier. This is the ED-1E434-11 Group 367 cable. The information in tables 10-14 and 10-15 only applies to the ED-1E434-11 Group 367 cable. It does not apply to the ED-1E434-11 Group 336 cable.

NOTE	Several limitations and restrictions exists on the placement of ANN-type circuit packs. See tables 10-11, 10-12, and 10-13.

TABLE 10-14. Leads and Pin Number Assignment

SLOT	LEAD DESIGNATIONS	CONNECTOR	CONNECTOR PIN NUMBER
See TABLE 10-13	LIN	See TABLE 10-13	47
	LIP		22
	LOP 120		23
	LON		48
	LBACK2		49
	LBACK1		24

TABLE 10-15. Cable Terminations

SLOT		CONNECTOR
ANN35	ANN11E or ANN15B	
N/A	00	DO
05	05	D4
N/A	13	D8
18	18	D12

Table 10-16 shows 25-pair connector terminations for TN474B circuit pack (Processor Communications Circuit).

NOTE	TN474B is a dual port circuit pack, at this time, R2V4 software will support only one port.

TABLE 10-16. TN474B Circuit Pack Terminations (Part 1 of 3)

SLOT	LEAD DESIGNATION	CONN	SO-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	LEAD DESIGNATION	CONN	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK
			26	W-BL	1		S11		38	BK-GR	25
			1	BL-W	2		S21		13	GR-BK	26
			27	W-O	3		R11		39	BK-BR	27
			2	O-W	4		R21		14	BR-BK	28
			28	W-GR	5		S31		40	BK-SL	29
			3	GR-W	6		S41		15	SL-BK	30
			29	W-BR	7		R31		41	Y-BL	31
			4	BR-W	8		R41		16	BL-Y	32
			30	W-SL	9				42	Y-O	33
			5	SL-W	10				17	O-Y	34
			31	R-BL	11				43	Y-GR	35
24		D1	6	BL-R	12	24		D1	18	GR-Y	36
			32	R-O	13				44	Y-BR	37
			7	O-R	14				19	BR-Y	38
			33	R-GR	15				45	Y-SL	39
			8	GR-R	16				20	SL-Y	40
	S10		34	R-BR	17				46	V-BL	41
	S20		9	BR-R	18				21	BL-V	42
	R10		35	R-SL	19				47	V-O	43
	R20		10	SL-R	20				22	O-V	44
	S30		36	BK-BL	21				48	V-GR	45
	S40		11	BL-BK	22				23	GR-V	46
	R30		37	BK-O	23				49	V-BR	47
	R40		12	O-BK	24				24	BR-V	48
									50	V-SL	49
									25	SL-V	50

TABLE 10-16. TN474B Circuit Pack Terminations (Part 2 of 3)

SLOT	LEAD DESIGNATION	CONN	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	LEAD DESIGNATION	CONN	SO-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL
			26	W-BL	1				13	GR-BK	26
			1	B L - W	2				39	BK-BR	27
			27	W - O					14	BR-BK	28
			2	O-W	4				40	BK-SL	29
			28	W-GR	5				15	SL-BK	30
			3	GR-W	6				41	Y-BL	31
			29	W-BR	7				16	BL-Y	32
			4	BR-W	8		S10		42	Y-O	33
			30	W-SL	9		S20		17	O-Y	34
			5	SL-W	10		R10		43	Y-GR	35
			31	R-BL	11		R20		18	GR-Y	36
25		D2	6	BL-R	12	25	S30	D2	44	Y-BR	37
			32	R-O	13		S40		19	BR-Y	38
			7	O-R	14		R30		45	Y-SL	39
			33	R-GR	15		R40		20	SL-Y	40
			8	GR-R	16		Sll		46	V-BL	41
			34	R-BR	17		S21		21	BL-V	42
			9	BR-R	18		R11		47	V-O	43
			35	R-SL	19		R21		22	O-V	44
			10	SL-R	20		S31		48	V-GR	45
			36	BK-BL	21		S41		23	GR-V	46
			11	BL-BK	22		R31		49	V-BR	47
			37	BK-O	23		R41		24	BR-V	48
			12	O-BK	24				50	V-SL	49
			38	BK-GR	25				25	SL-V	50

TABLE 10-16. TN474B Circuit Pack Terminations (Part 3 of 3)

SLOT	LEAD DESIGNATION	CONN	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL	SLOT	LEAD DESIGNATION	CONN	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL
	S10		26	W-BL	1				13	GR-BK	26
	S20		1	BL-W	2				39	BK-BR	27
	R10		27	W-O	3				14	BR-BK	28
	R20		2	O-W	4				40	BK-SL	29
	S30		28	W-OR	5				15	SL-BK	30
	S40		3	GR-W	6				41	Y-BL	31
	R30		29	W-BR	7				16	BL-Y	32
	R40		4	BR-W	8				42	Y-O	33
	S11		30	W-SL	9				17	O-Y	34
	S21		5	SL-W	10				43	Y-GR	35
	R11		31	R-BL	11				18	GR-Y	36
26	R21	D4	6	BLR	12	26			44	Y-BR	37
	S31		32	R-O	13				19	BR-Y	38
	S41		7	O-R	14				45	Y-SL	39
	R31		33	R-GR	15				20	SL-Y	40
	R41		8	GR-R	16				46	V-BL	41
			34	R-BR	17				21	BL-V	42
			9	BR-R	18				47	V-O	43
			35	R-SL	19				22	O-V	44
			10	SL-R	20				48	V-GR	45
			36	BK-BL	21				23	GR-V	46
			11	BL-BK	22				49	V-BR	47
			37	BK-O	23				24	BR-V	48
			12	O-BK	24				50	V-SL	49
			38	BK-GR	25				25	SL-V	50

11. INTRACABINET AND INTERCABINET CABLING

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GENERAL INFORMATION ABOUT CABLING

NOTE

Chapter 11 applies to cabling associated with traditional modules only. For AT&T DEFINITY Communication System Generic 2 cabling, see chapter 25.

Cabling within AT&T System 85 is provided by various group numbers of ED-1E434-11. The two basic cable types are 902A flat ribbon and 4-MHz channel coaxial. Other cables include 25-pair connectorized, shielded cables, and discrete wires terminated with connectors or spade lugs.

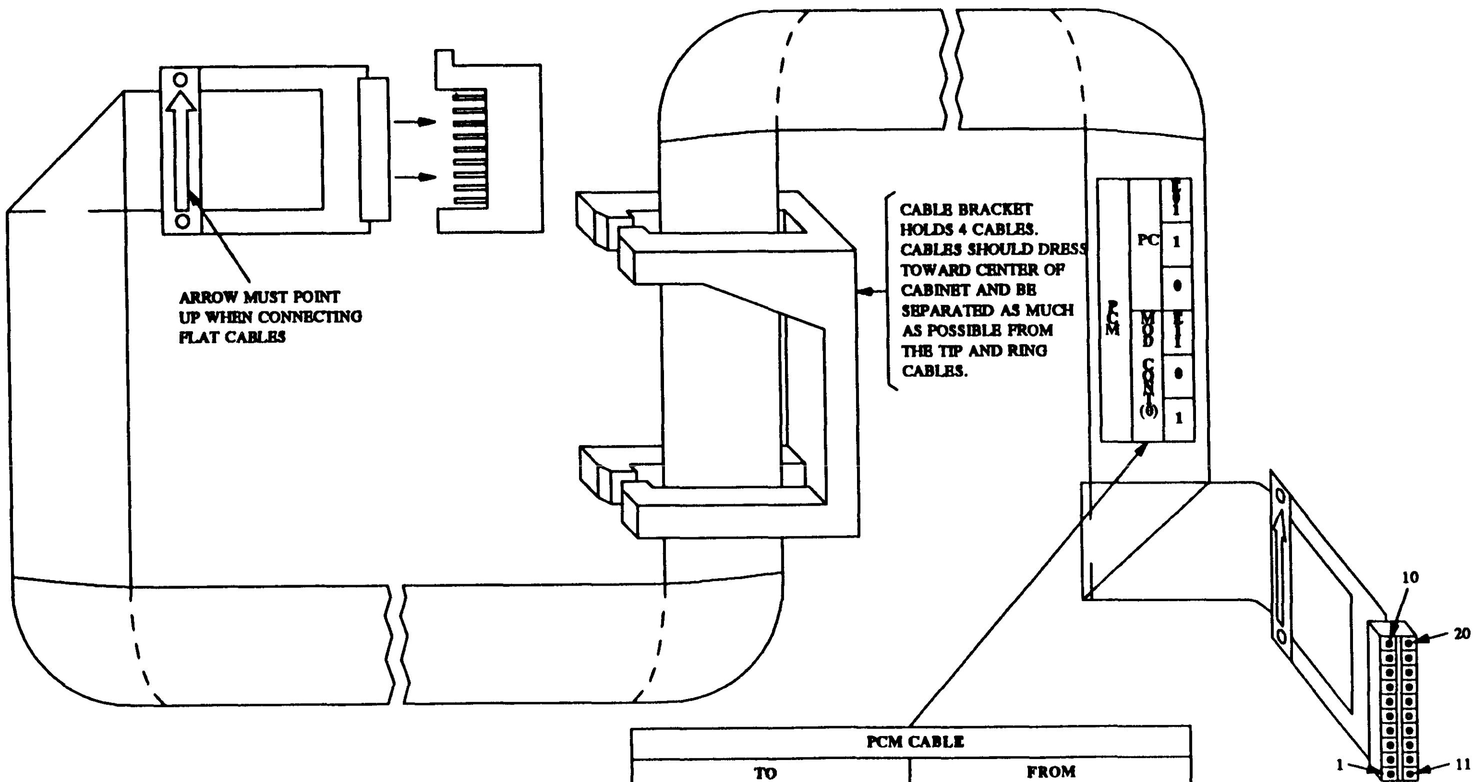
If 25-pair cables of the system's cable harness are equipped with ferrite cores, there is no minimum length for the shielded 25 pair. If the system is not equipped with the ferrite cores, there is a 50-foot minimum length for the cables. Broken ferrite cores must be replaced. They cannot be repaired.

This chapter is made up of tables that provide point-to-point wiring in the system. Cable types and group numbers are used to identify cable locations. Connectors are identified at each point to which the cable connects. Intracabinet cabling is contained in the front of this chapter followed by intercabinet cabling.

After a cable is removed from the bundle, it is dressed toward the center of the cabinet using the plastic cable brackets shown in figure 11-1. One simple method of installing the flat cables is to connect the cables to the "E" connectors starting with the lowest "E" number and work from the right (looking from the rear) to the left. Then the intercabinet cables are placed in the shielded duct and routed to their destination. Any fiber optic cable in the duct should be placed on top of the other cables.

Differences in floor layouts affect the lengths and group numbers of PCM, I/O, and alarm cables. The following intercabinet cabling is based on the typical cabinet lineups shown in figures 11-2 through 11-5. Figures 11-6 through 11-10 show the various backplane carrier connector locations.

Figure 11-1 shows a typical flat cable setup.



PCM CABLE					
TO			FROM		
MOD CONTROL CARRIER(0)			PORT CARRIER		
Cabinet Number	Carrier Physical Location	Connector Desig-nation	Cabinet Number	Carrier Physical Location	Connector Desig-nation
1	0	B11	0	1	E01

Figure 11-1. Flat Cable Label, Dress, and Connectors

Single Module System Cabinet Layout — Traditional

Figures 11-2 and 11-3 show layouts for typical single module system cabinets, both unduplicated and duplicated common control.

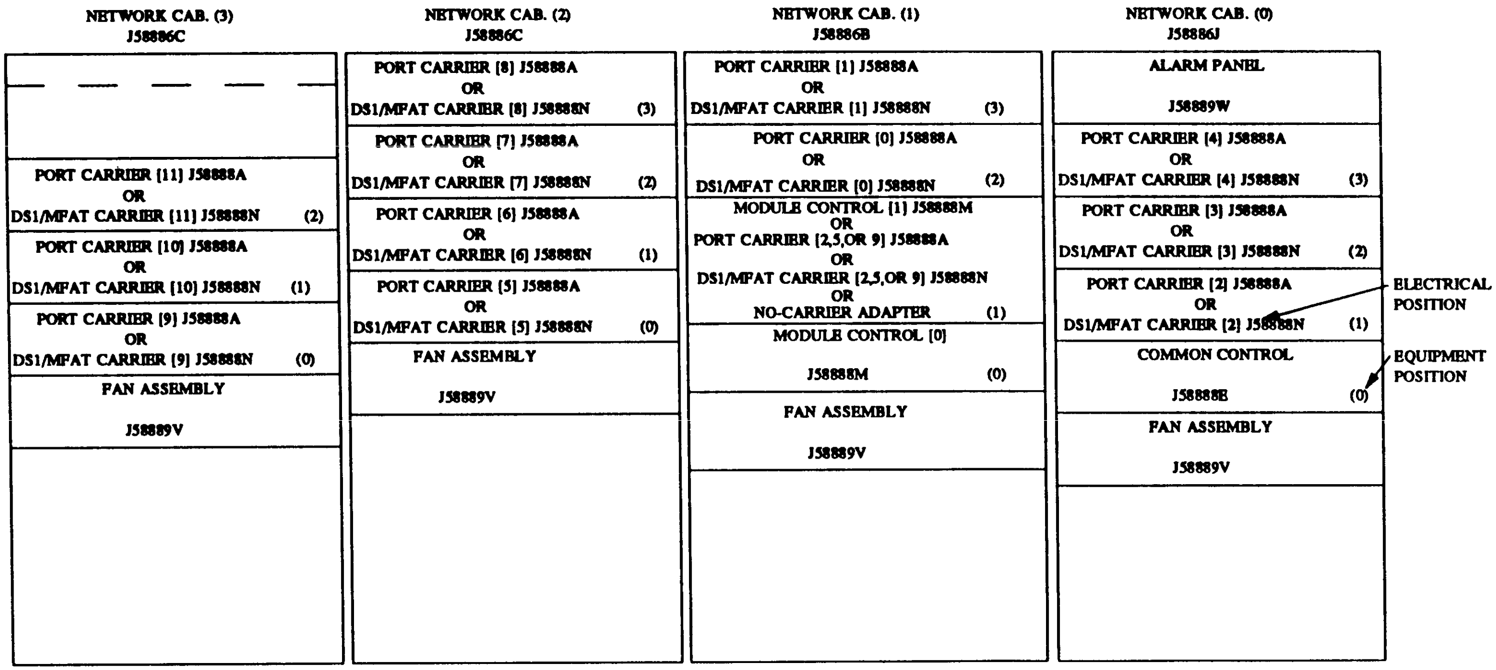


Figure 11-2. Typical Single Module System Cabinet Layout — Unduplicated Common Control

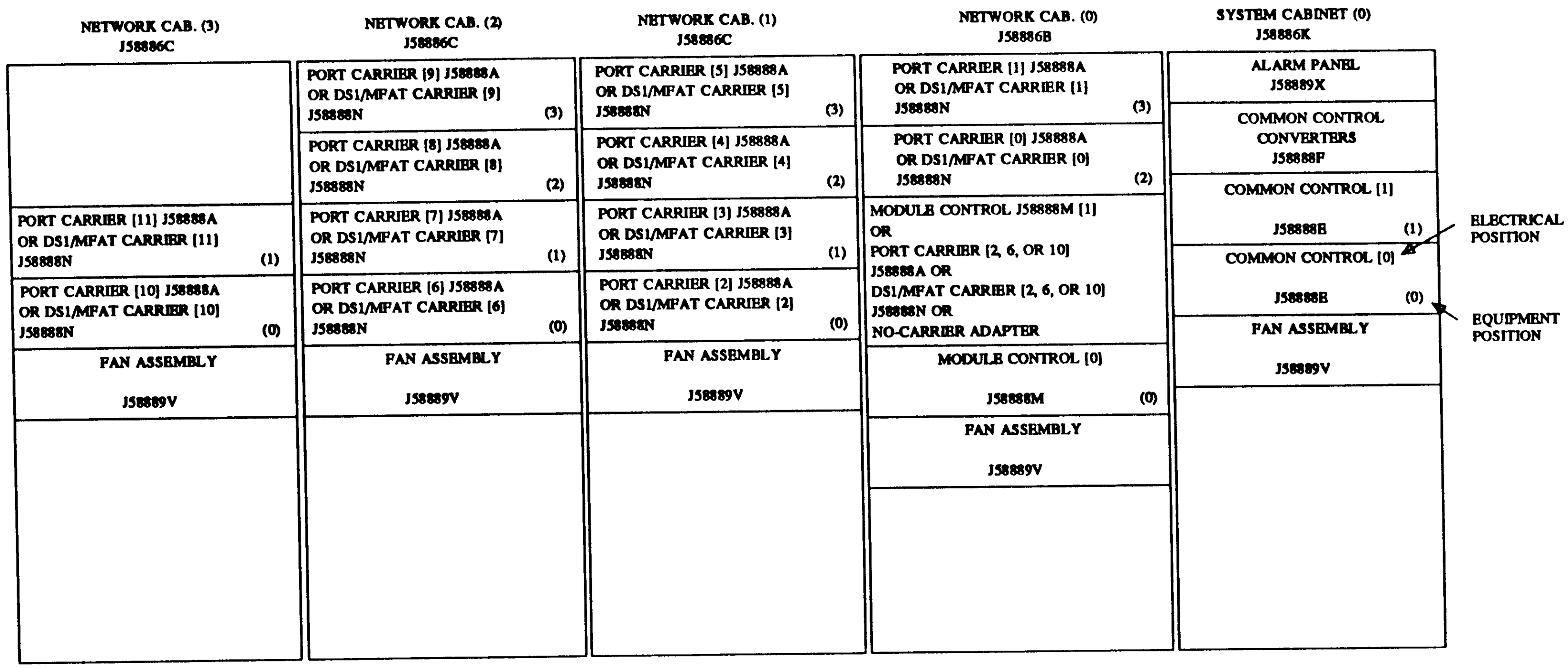


Figure 11-3. Typical Single Module System Cabinet Layout — Duplicated Common Control

Multimodule System Cabinet Layout — Traditional

Figures 11-4 and 11-5 show layouts for typical multimodule system cabinet layouts. The layouts are for duplicated TMS/Module Control, both 15 and 31 module maximum.

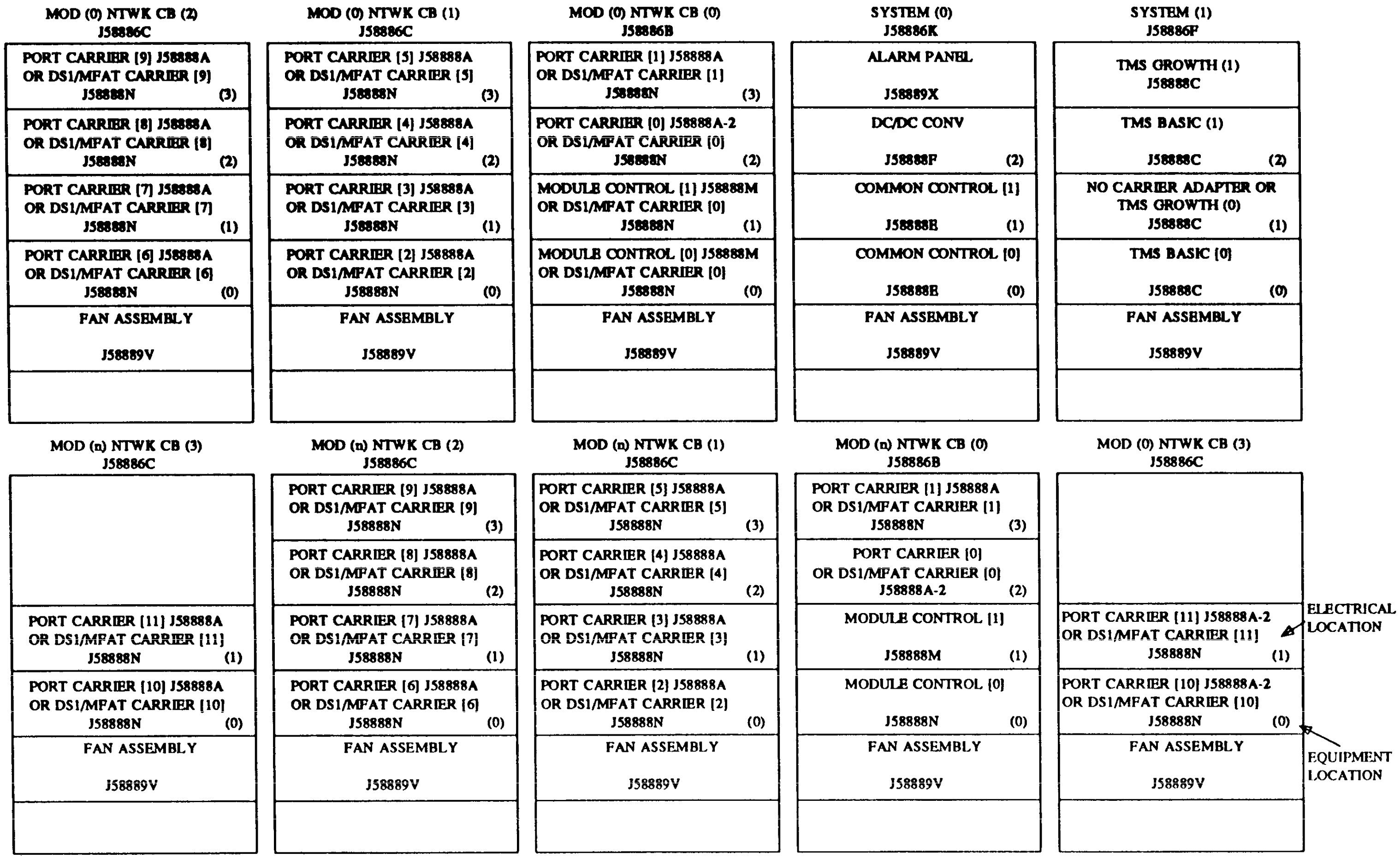


Figure 11-4. Typical Multimodule System Cabinet Layout [Duplicated TMS and Duplicated Module Control for Maximum of 15 Modules (n = 0-14)]

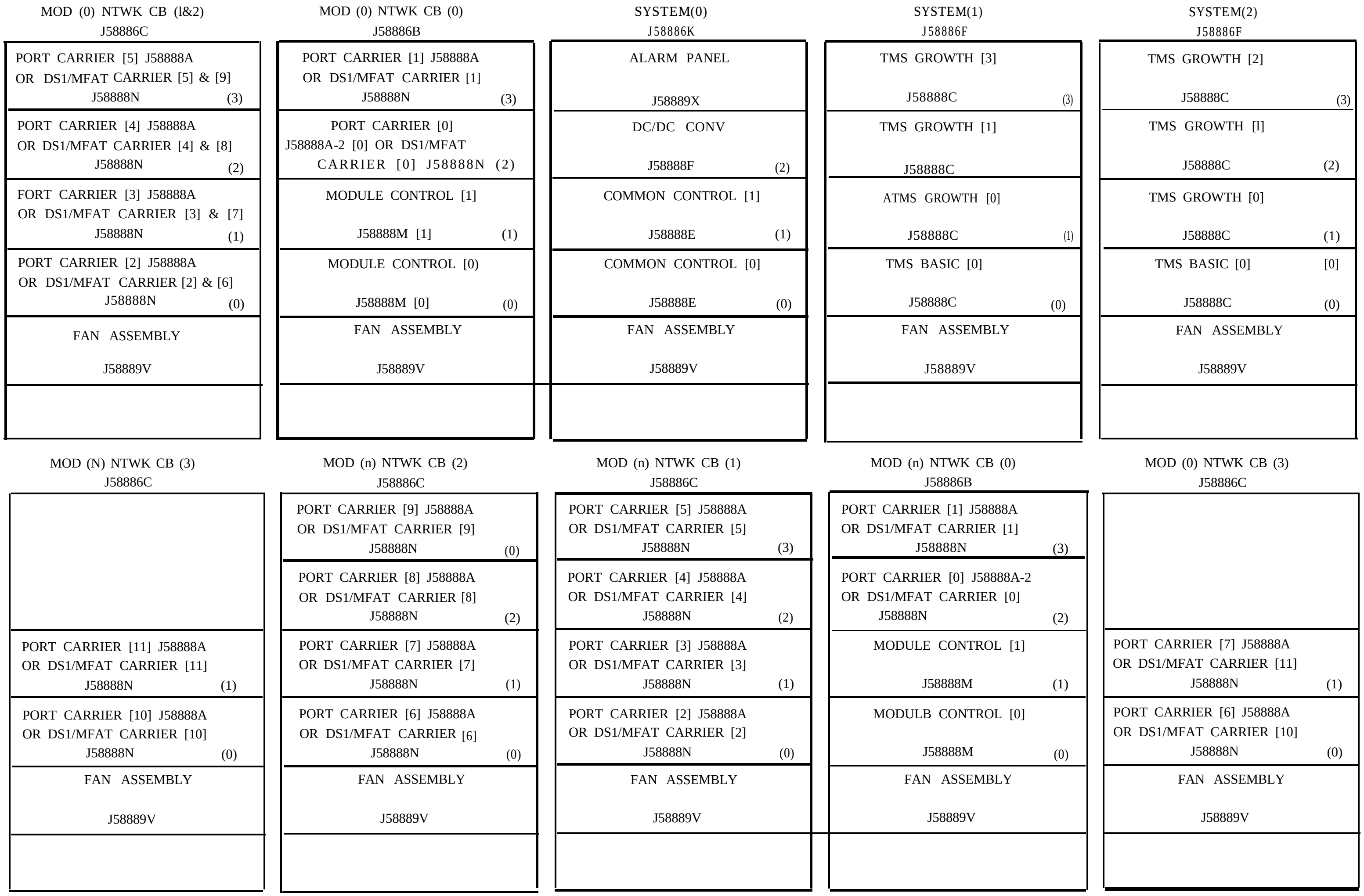


Figure 11-5. Typical Multimodule System Cabinet Layout [Duplicated TMS and Duplicated Module Control for a Maximum of 31 Modules (n = 0-30)]

Carrier Connector Locations

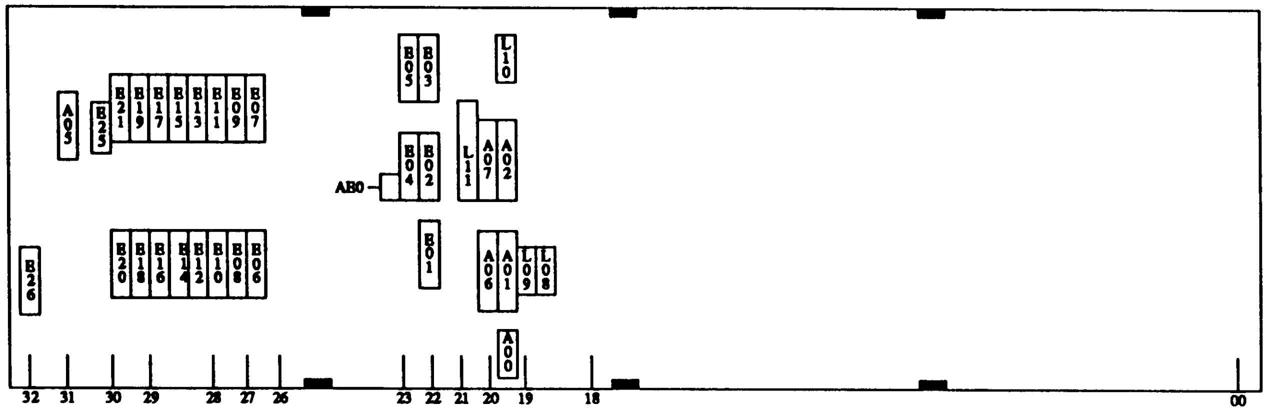


Figure 11-6. J58888E Common Control Carrier Connector Locations (Backplane)

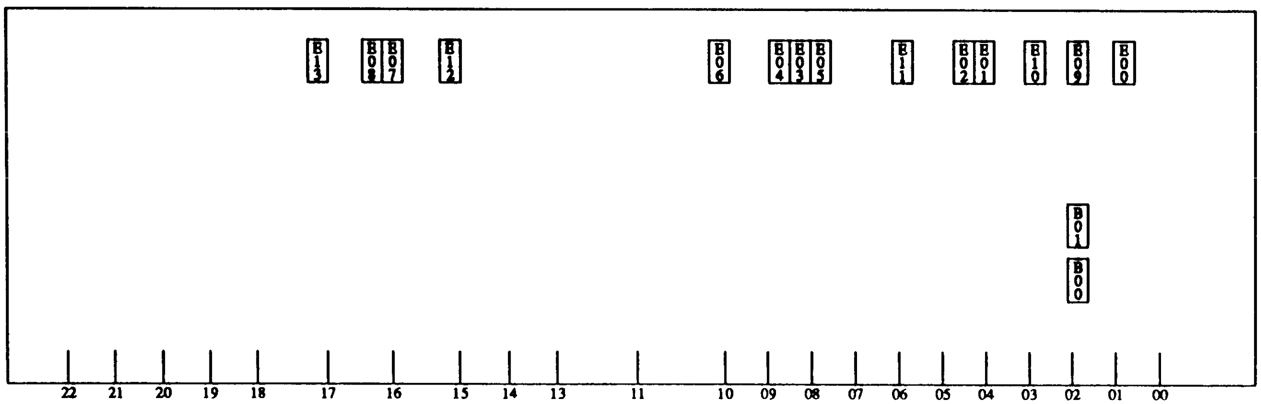


Figure 11-7. J58888A-2 Traditional Port Carrier Connector Locations (Backplane)

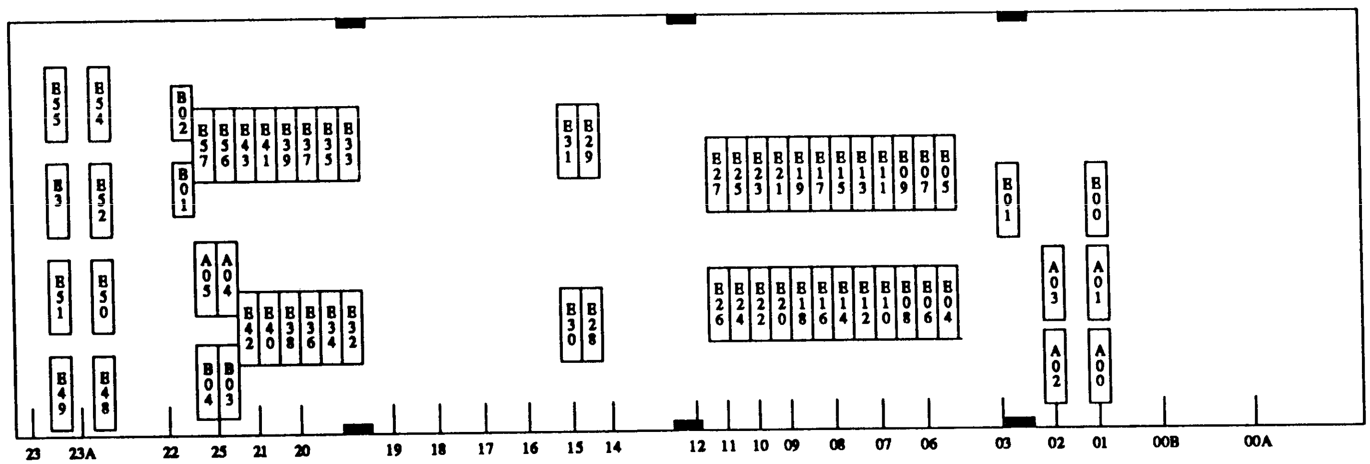


Figure 11-8. J58888M Traditional Module Control Carrier Connector Locations (Backplane)

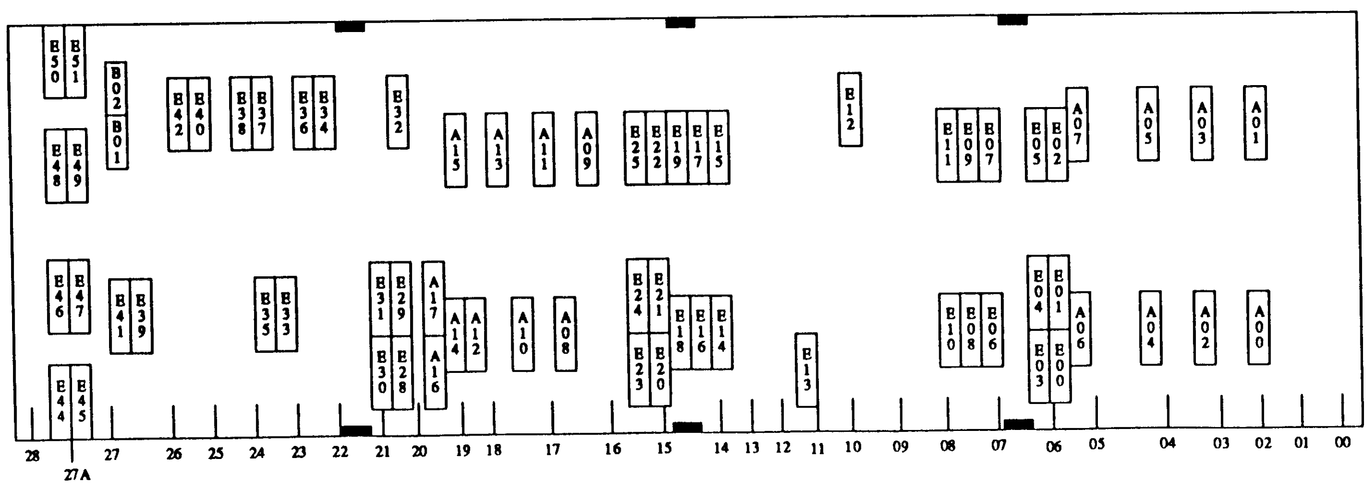


Figure 11-9. J58888C Time Multiplex Switch Carrier Connector Locations (Backplane)

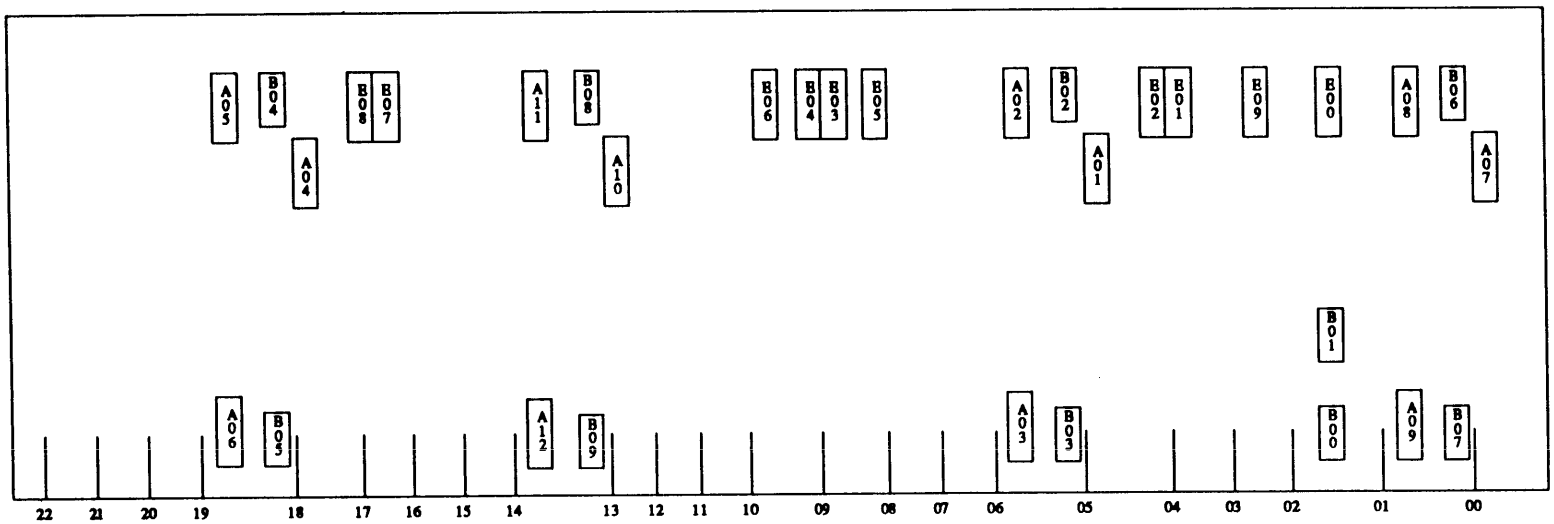


Figure 11-10. J58888N Traditional DS1/MFAT Carrier Connector Locations (Backplane)

INTRACABINET CABLING

Common Control Carrier Connections

Tables 11-1 through 11-6 show duplicated and unduplicated common control connectors.

TABLE 11-1. Duplicated Common Control Connections

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG	TO	CONN DESIG
COMMON CONTROL (0)	FLAT	36	A0	COMMON CONTROL (1)	A0
COMMON CONTROL (0)	FLAT	36	Al	COMMON CONTROL (1)	Al
COMMON CONTROL (0)	FLAT	36	A2	COMMON CONTROL (1)	A2
COMMON CONTROL (0)	FLAT	38	L8	COMMON CONTROL (1)	L9
COMMON CONTROL (0)	FLAT	32	E26	COMMON CONTROL (1)	E26
COMMON CONTROL (0)	FLAT	38	L9	COMMON CONTROL (1)	L8
COMMON CONTROL (0)	FLAT	38	L10	COMMON CONTROL (1)	L10
COMMON CONTROL (0)	WOVEN	43	A5	DC/DC CONVERTER	AI
COMMON CONTROL (1)	WOVEN	42	A5	DC/DC CONVERTER	A2

TABLE 11-2. Alarm Panel Connections — Unduplicated Common Control

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN. DESIG.	TO	CONN. DESIG.
REAR CONNECTOR PANEL	12-PAIR	106	D 1	ALARM PANEL	E2
REAR CONNECTOR PANEL	12-PAIR	107	D 5	ALARM PANEL	E1
REAR CONNECTOR PANEL	12-PAIR	108	D6	ALARM PANEL	E3
COMMON CONTROL (0)	FLAT	26	E2	ALARM PANEL	
COMMON CONTROL (0)	FLAT	26	E3	ALARM PANEL	
COMMON CONTROL (0)	FLAT	26	E4	ALARM PANEL	
COMMON CONTROL (0)	FLAT	26	E5	ALARM PANEL	
COMMON CONTROL (0)	FLAT	26	E25	ALARM PANEL	

TABLE 11-3. Alarm Panel Connections — Duplicated Common Controls

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG.	TO	CONN. DESIG.
REAR CONNECTOR PANEL	12-PAIR	124	D1	ALARM PANEL	E2
REAR CONNECTOR PANEL	12-PAIR	125	D5	ALARM PANEL	El
REAR CONNECTOR PANEL	12-PAIR	126	D6	ALARM PANEL	E3
COMMON CONTROL (0)	FLAT	146	E2	ALARM PANEL	E4
COMMON CONTROL (0)	FLAT	146	E3	ALARM PANEL	E5
COMMON CONTROL (0)	FLAT	151	E4	ALARM PANEL	E6
COMMON CONTROL (0)	FLAT	148	E5	ALARM PANEL	E10
COMMON CONTROL (0)	FLAT	150	E25	ALARM PANEL	E12
COMMON CONTROL (1)	FLAT	149	E2	ALARM PANEL	E11
COMMON CONTROL (1)	FLAT	147	E3	ALARM PANEL	E9
COMMON CONTROL (1)	FLAT	147	E4	ALARM PANEL	E7
COMMON CONTROL (1)	FLAT	147	E5	ALARM PANEL	E8
COMMON CONTROL (1)	FLAT	146	E25	ALARM PANEL	E13

TABLE 11-4. Minirecorder Connections

UNDUPLICATED COMMON CONTROL					
FROM	**CABLE TYPE**	**ED-1E434-11 GROUP NUMBER**	**CONN. DESIG.**	**TO**	**CONN. DESIG.**
COMMON CONTROL	FLAT	99	A6	MINIRECORDER	P2
COMMON CONTROL	FLAT	100	A7	MINIRECORDER	P1
DUPLICATED COMMON CONTROL					
FROM	**CABLE TYPE**	**ED-1E434-11 GROUP NUMBER**	**CONN. DESIG.**	**TO**	**CONN. DESIG.**
COMMON CONTROL (0)	FLAT	37	A6	MINIRECORDER (0)	P2
COMMON CONTROL (0)	FLAT	39	A7	MINIRECORDER (0)	P1
COMMON CONTROL (1)	FLAT	40	A6	MINIRECORDER (1)	P2
COMMON CONTROL (1)	FLAT	41	A7	MINIRECORDER (1)	P1

TABLE 11-5. CC Fan Connections

UNDUPLICATED COMMON CONTROL					
FROM	**CABLE TYPE**	**ED-1E434-11 GROUP NUMBER**	**CONN. DESIG.**	**TO**	**CONN. DESIG.**
COMMON CONTROL (0)	FLAT	2	El	FAN (AEH4 CP)	E3
DUPLICATED COMMON CONTROL					
FROM	**CABLE TYPE**	**ED-1E434-11 GROUP NUMBER**	**CONN. DESIG.**	**TO**	**CONN. DESIG.**
COMMON CONTROL (0)	FLAT	2	El	FAN (AEH4 CP)	E3
COMMON CONTROL (1)	FLAT	4	E1	FAN (AEH4 CP)	E4

TABLE 11-6. Duplicated Module Control Carrier Cabling Connections

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN. DESIG.	TO	CONN. DESIG.
MOD. CONTROL (0)	902A	1	E00	MOD. CONTROL (1)	E01
MOD. CONTROL (0)	902A	2	E01	MOD. CONTROL (1)	E00
MOD. CONTROL (0)	902A	1	E24	MOD. CONTROL (1)	E28
MOD. CONTROL (0)	902A	1	E29	MOD. CONTROL (1)	E29
MOD. CONTROL (0)	902A	1	E30	MOD. CONTROL (1)	E30
MOD. CONTROL (0) (SEE NOTE)	902A	14	E31	MOD CONTROL (1)	E31

NOTE: The connector on this cable is inverted on the module control (1) end. The arrow will point upward.

Port or DS1/MFAT Carrier Cabling

Figure 11-11 shows typical ring lead cabling to port or DS1/MFAT carriers (any cabinet with port or DS1/MFAT carriers).

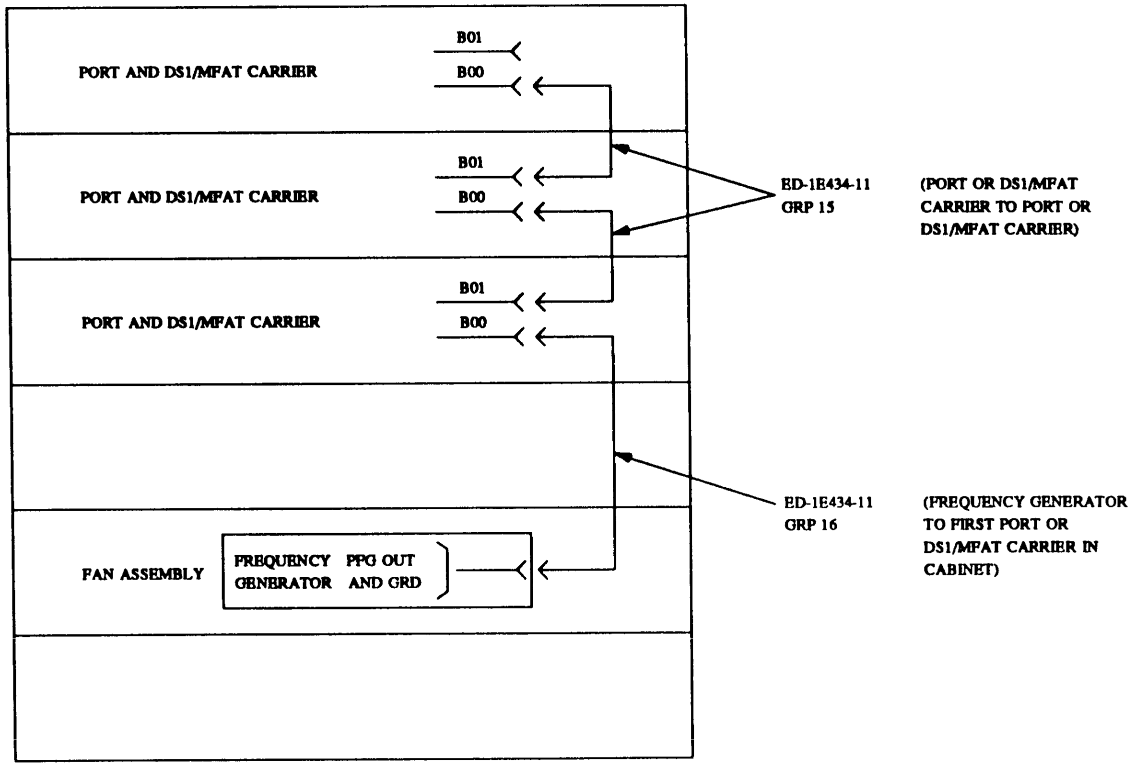


Figure 11-11. Port or DS1/MFAT Carrier Cabling — Traditional

TMS Intracabinet Cabling

Table 11-7 shows TMS intrcabinet cabling for duplicated basic carriers +1 growth carrier each (maximum of 15 modules).

TABLE 11-7. TMS Intracabinet Connections — Duplicated Basic Carrier

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER	SLOT	CONN			CARRIER	SLOT	CONN
00 BASIC 0)	06	E00	FLAT	401	01 (GROWTH 0)	07	E06
		E03	FLAT	402	01 (GROWTH 0)	07	E07
	07	E06	FLAT	401	01 (GROWTH 0)	06	E00
		E07	FLAT	400	01 (GROWTH 0)	06	E03
	10	E12	902A	29	00 (BASIC 0)	26	E40
	11	E13	FLAT	404	00 (BASIC 0)	21	E28
	14	E14	FLAT	401	01 (GROWTH 0)	15	E20
		E15	FLAT	400	01 (GROWTH 0)	15	E23
	15	E20	FLAT	401	01 (GROWTH 0)	14	E14
		E23	FLAT	402	01 (GROWTH 0)	14	E15
	21	E30	FLAT	404	01 (GROWTH 0)	11	E13
		E32	902A	45	02 (BASIC 1)	21	E32
	23	E33	902A	44	02 (BASIC 1)	23	E33
		E34	902A	44	02 (BASIC 1)	23	E34
		E35	902A	44	02 (BASIC 1)	23	E35
		E36	902A	45	02 (BASIC 1)	23	E36
	26	E42	902A	27	01 (GROWTH 0)	10	E12
	27A	E44	902A	2	FAN ASSY	AEH4	El

PROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER	SLOT	CONN			CARRIER	SLOT	CONN
02 (BASIC 1)	06	E00	FLAT	401	03 (GROWTH 1)	07	E06
		E03	FLAT	402	03 (GROWTH 1)	07	E07
	07	E06	FLAT	401	03 (GROWTH 1)	06	E00
		E07	FLAT	400	03 (GROWTH 1)	06	E03
	10	E12	902A	29	02 (BASIC 1)	26	E40
	11	E13	FLAT	404	02 (BASIC 1)	21	E28
	14	E14	FLAT	401	03 (GROWTH 1)	15	E20
		E15	FLAT	400	03 (GROWTH 1)	15	E23
	15	E20	FLAT	401	03 (GROWTH 1)	14	E14
		E23	FLAT	402	03 (GROWTH 1)	14	E15
	21	E30	FLAT	404	03 (GROWTH 1)	11	E13
	26	E42	902A	27	03 (GROWTH 1)	10	E12
	27A	E44	902A	26	FAN ASSY	AEH4	E2

Table 11-8 shows TMS intracabinet cabling for duplicated (2-cabinet system) or unduplicated (1-cabinet system) — single basic carrier +3 growth carriers (maximum of 31 modules). (For duplicated TMS cabinets, see table 11-14 for intercabinet interface cabling.)

TABLE 11-8. TMS Intracabinet Connections — Duplicated 2-Cabinet or Unduplicated 1-Cabinet Systems (Part 1 of 2)

FROM			CABLE TYPE	ED-1E434 -11 GROUP NUMBER	TO		
CARRIER*	**SLOT**	**CONN**			**CARRIER***	**SLOT**	**CONN**
00	06	E00	FLAT	401	01	07	E06
		E01	FLAT	404	02	07	E06
		E02	FLAT	403	03	07	E06
		E03	FLAT	402	01	07	E07
		E04	FLAT	404	02	07	E07
		E05	FLAT	406	03	07	E07
	07	E06	FLAT	401	01	06	E00
		E07	FLAT	400	01	06	E03
		E08	FLAT	403	02	06	E00
		E09	FLAT	403	02	06	E03
		E10	FLAT	406	03	06	E00
		E11	FLAT	405	03	06	E03
	10	E12	902A	29	00	26	E40
	11	E13	FLAT	411	00	21	E28
	14	E14	FLAT	401	01	15	E20
		E15	FLAT	400	01	15	E23
		E16	FLAT	403	02	15	E20
		E17	FLAT	402	02	15	E23
		E18	FLAT	415	03	15	E20
		E19	FLAT	405	03	15	E23

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER*	**SLOT**	**CONN**			**CARRIER***	**SLOT**	**CONN**
00	15	E20	FLAT	401	01	14	E14
		E21	FLAT	404	02	14	E14
		E22	FLAT	405	03	14	E14
		E23	FLAT	402	01	14	E15
		E24	FLAT	405	02	14	E15
		E25	FLAT	406	03	14	E15
	21	E29	FLAT	408	02	11	E13
		E30	FLAT	408	01	11	E13
		E31	FLAT	408	03	11	E13
	26	E39	902A	23	02	10	E12
		E41	902A	28	03	10	E12
		E42	902A	27	01	10	E12
	27A†	E44	902A	2	FAN ASSY	AEH4	E1
	27A†	E47	902A	2	FAN ASSY	AEH4	E1
01	06	E01	FLAT	401	02	07	E08
		E02	FLAT	403	03	07	E08
		E04	FLAT	401	02	07	E09
		E05	FLAT	404	03	07	E09
	07	E08	FLAT	413	02	06	E01
		E09	FLAT	400	02	06	E04
		E10	FLAT	404	03	06	E01
		E11	FLAT	403	03	06	E04

* Carrier 00 - Basic carrier 0
Carrier 01 - Growth Carrier 0
Carrier 02 - Growth carrier 1
Carrier 03 - Growth carrier 2

† For System cabinet 1 make toE44 to E1 connection.
For System cabinet 2 make E47 to E1 connection.

TABLE 11-8. TMS Intracabinet Connections — Duplicated 2-Cabinet or Unduplicated 1-Cabinet Systems (Part 2 of 2)

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER*	SLOT				CARRIER*	SLOT	CONN
01	14	E16	FLAT	401	02	15	E21
		E17	FLAT	414	02	15	E24
		E18	FLAT	404	03	15	E21
		E19	FLAT	403	03	15	E24
	15	E21	FLAT	401	02	14	E16
		E22	FLAT	412	03	14	E16
		E24	FLAT	402	02	14	E17
		E25	FLAT	404	03	14	E17
02	06	E02	FLAT	400	03	07	E10
		E05	FLAT	401	03	07	E11
	07	E10	FLAT	402	03	06	E02
		El1	FLAT	401	03	06	E05
	14	E18	FLAT	403	03	15	E22
			FLAT	401	03	15	E25
	15	E22	FLAT	400	03	14	El 8
			FLAT	401	03	14	E19

* Carrier 00 - Basic carrier 0
Carrier 01 - Growth carrier 0
Carrier 02 - Growth carrier 1
Carrier 03 - Growth carrier 2

Figure 11-12 shows alarm leads for traditional port carrier and/or the DS1/MFAT carrier.

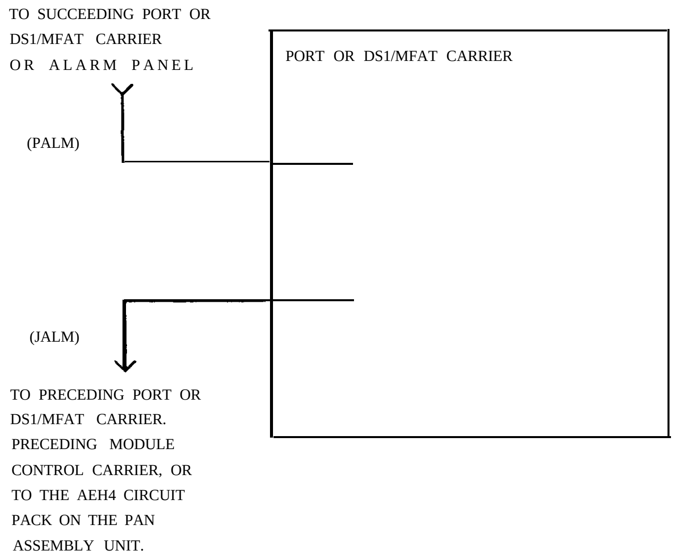


Figure 11-12. Port or DS1/MFAT Carrier Alarm Leads

DS1 SIGNALING SYNCHRONIZATION CABLING IN TRADITIONAL MODULE CONTROL CARRIER

Figures 11-13 through 11-18 show DS1 signaling synchronization cabling with DS1/MFAT carrier used for synchronization located in the module control cabinet. DS1 synchronization cabling for a system with the DS1 carrier used for synchronization in a network cabinet is shown in figures 11-25 through 11-30. (See CSD for translation assignment of primary and secondary timing board to determine proper connection.)

Traditional Module Control

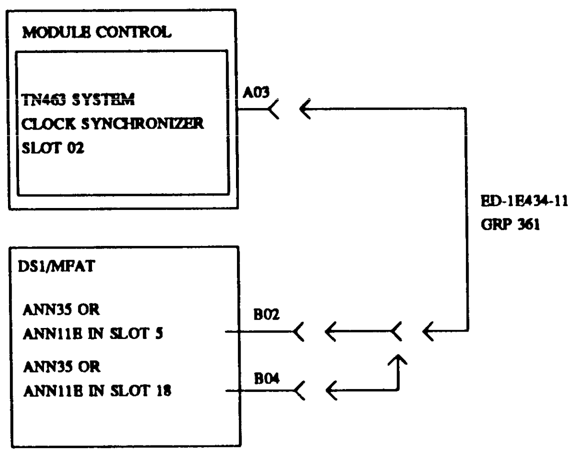


Figure 11-13. Synchronization Cabling — Primary Reference

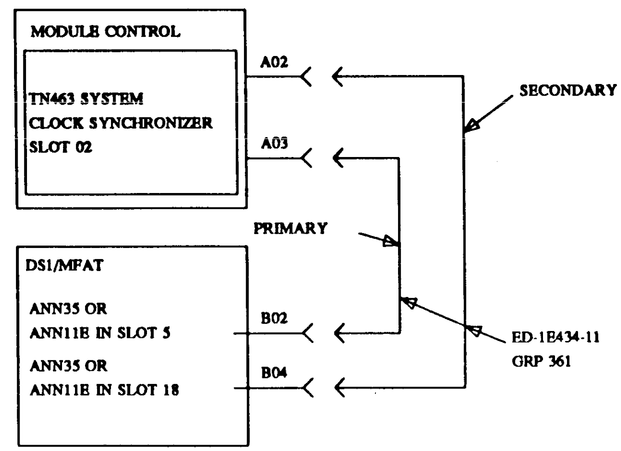


Figure 11-14. Synchronization Cabling — Primary and Secondary Reference — Same Carrier

NOTE

The connections at the DS1 MFAT carriers may be reversed as long as primary and secondary references remain in different slots in different carriers.

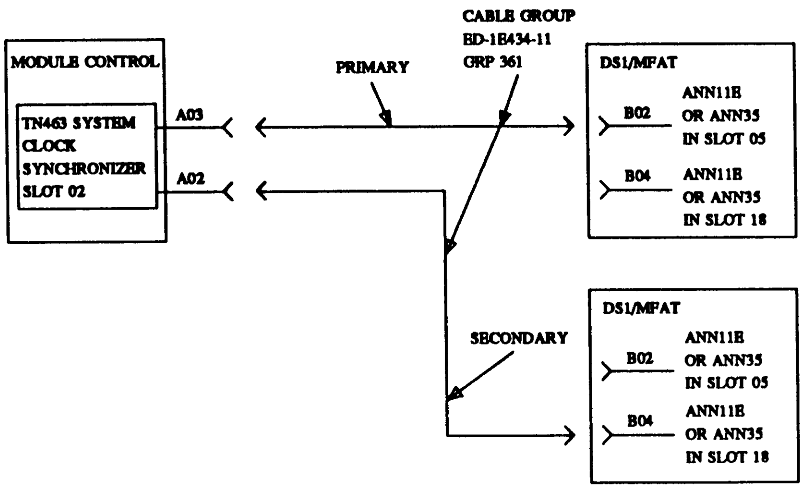
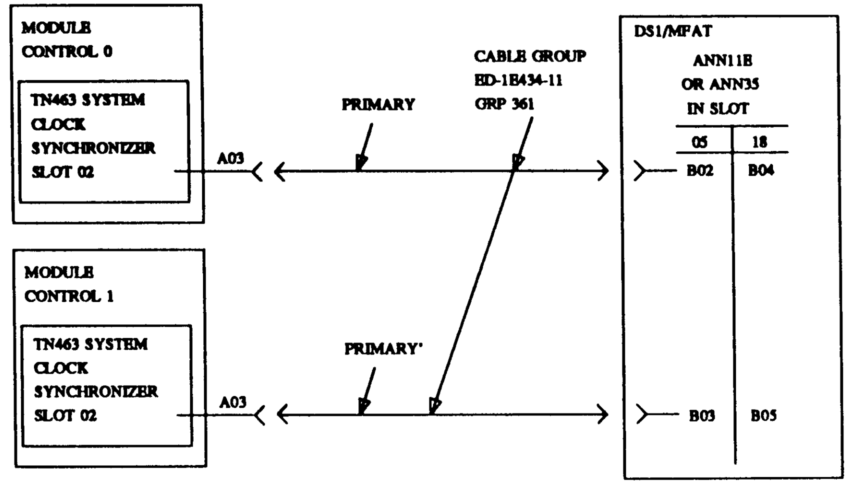


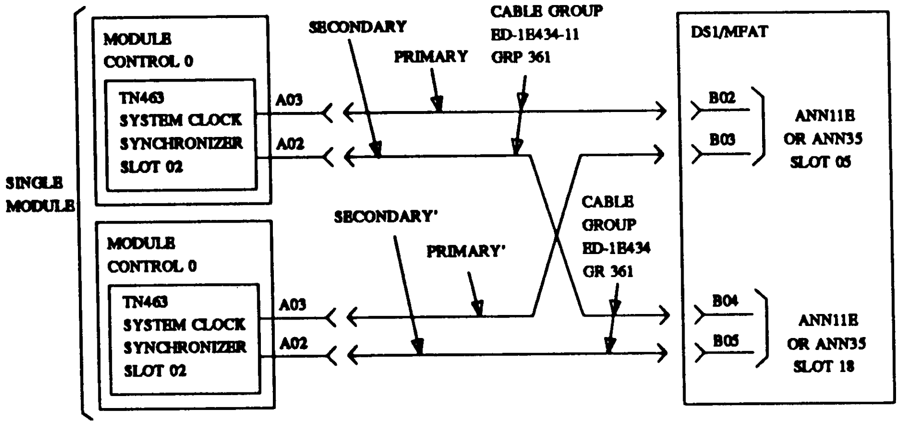
Figure 11-15. Synchronization Cabling — Primary and Secondary Reference — Different Carriers

Duplicated Traditional Module Control



NOTE: See CSD for translation assignment for primary l and secondary timing board to determine proper connections.

Figure 11-16. Synchronization Cabling — Primary and Secondary Carrier



NOTE: The primary synchronization cables can come from either ANN11E; however, they must come from the same ANN11E.

Figure 11-17. Synchronization Cabling — Primary and Secondary References — Same Carrier

Primary synchronization cables can come from either ANN11E; however, they must come from the same ANN11E.

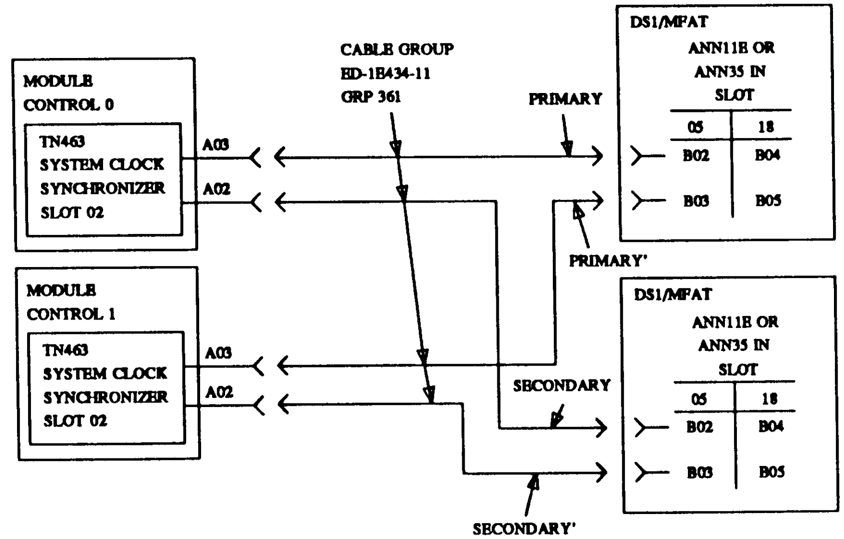


Figure 11-18. Synchronization Cabling — Primary and Secondary References — Different Carrier

INTERCABINET CABLING

Traditional Module Control PCM Cabling to Port or DS1/MFAT Carriers

Table 11-9 shows PCM cabling of module control to port or DS1/MFAT carriers for all modules of duplicated common controls and modules 1 through n of unduplicated common control.

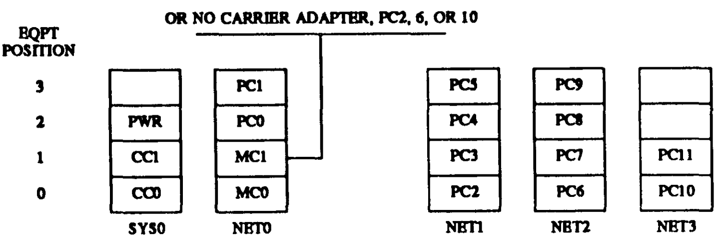


Figure 11-19. Carrier Configuration

TABLE 11-9. Cabling For All Modules Except Module 0 of Unduplicated System (Part 1 of 3)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIGN	PORT OR DS1/MFAT CARRIER: ELECTRICAL NUMBER	PORT OR DS1/MFAT CARRIER: EQUIPMENT POSITION	CABINET	CONN DESIG
0 *	902A	24	E09	2	1	0	E07
* 0	902A	27	E11	2	1	0	E01
† 0	902A	24	E17	6	1	0	E07
† 0	902A	27	E19	6	1	0	E01
† 0	902A	24	E25	10	1	0	E07
† 0	902A	27	E27	10	1	0	E01
0	902A	23	E05	0	2	0	E07
0	902A	23	E07	0	2	0	E01
0	902A	25	E04	1	3	0	E07
0	902A	25	E06	1	3	0	E01
0	902A	59	E09	2	0	1	E07
0	902A	58	E11	2	0	1	E01
0	902A	58	E08	3	1	1	E07
0	902A	57	E10	3	1	1	E01
0	902A	55	E13	4	2	1	E07
0	902A	55	E15	4	2	1	E01
0	902A	55	E12	5	3	1	E07
0	902A	54	E14	5	3	1	E01
0	902A	65	E17	6	0	2	E07
0	902A	64	E19	6	0	2	E01
0	902A	64	E16	7	1	2	E07
0	902A	63	E18	7	1	2	E01

* If carrier position 1 in Network Cabinet 0 is equipped with port or DS1/MFAT carrier electrical position 2, make these connections.

† If carrier position 1 in Network Cabinet 0 is equipped with port or DS1/MFAT carrier electrical position 6, make these connections.

‡ If carrier position 1 in Network Cabinet 0 is equipped with port or DS1/MFAT carrier electrical position 10, make these connections.

TABLE 11-9. Cabling For All Except Module 0 of Unduplicated System (Part 2 of 3)

				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER ELECTRICAL NUMBER	PORT OR DS1/MFAT CARRIER EQUIPMENT POSITION	CABINET	CONN DESIG
0	902A	62	E21	8	2	2	E07
0	902A	61	E23	8	2	2	E01
0	902A	61	E20	9	3	2	E07
0	902A	60	E22	9	3	2	E01
0	902A	69	E25	10	0	3	E07
0	902A	69	E27	10	0	3	E01
0	902A	68	E24	11	1	3	E07
0	902A	68	E26	11	1	3	E01
1	902A	24	E05	0	2	0	E08
1	902A	27	E07	0	2	0	E02
1	902A	28	E04	1	3	0	E08
1	902A	28	E06	1	3	0	E02
1	902A	57	E09	2	0	1	E08
1	902A	56	E11	2	0	1	E02
1	902A	56	E08	3	1	1	E08
1	902A	55	E10	3	1	1	E02
1	902A	54	E13	4	2	1	E08
1	902A	53	E15	4	2	1	E02
1	902A	53	E12	5	3	1	E08
1	902A	52	E14	5	3	1	E02

TABLE 11-9. Cabling For All Except Module 0 of Unduplicated System (Part 3 of 3)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11 GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER ELECTRICAL NUMBER	PORT OR DS1/MFAT CARRIER EQUIPMENT POSITION	CABINET	CONN DESIG
1	902A	63	E17	6	0	2	E08
1	902A	62	E19	6	0	2	E02
1	902A	62	E16	7	1	2	E08
1	902A	62	El 8	7	1	2	E02
1	902A	60	E21	8	2	2	E08
1	902A	60	E23	8	2	2	E02
1	902A	60	E20	9	3	2	E08
1	902A	58	E22	9	3	2	E02
1	902A	68	E25	10	0	3	E08
1	902A	67	E27	10	0	3	E02
1	902A	67	E24	11	1	3	E08
1	902A	67	E26	11	1	3	E02

Table 11-10 shows PCM cabling of module control to port or DS1/MFAT carrier for module 0 of unduplicated common controls. Figure 11-20 shows the cabinet configuration.

NOTE

For modules 1 through n of unduplicated common control system, see table 11-9.

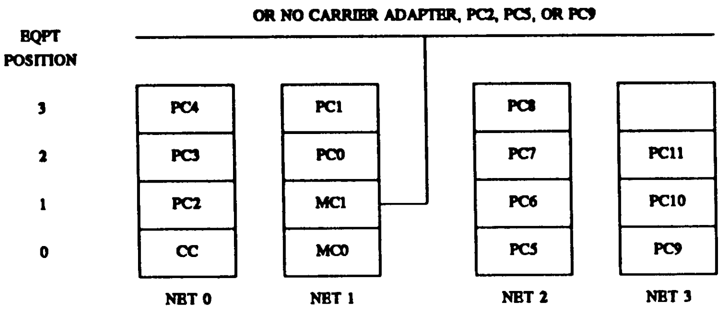


Figure 11-20. Unduplicated Common Control System

TABLE 11-10. PCM Cabling For Module 0 — Unduplicated System (Part 1 of 3)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER		CABINET	CONN DESIG
				ELECTRICAL NUMBER	EQUIPMENT POSITION		
* 0	902A	24	E09	2	1	1	E07
* 0	902A	27	E11	2	1	1	E01
† 0	902A	24	E12	5	1	1	E07
† 0	902A	27	E14	5	1	1	E01
‡ 0	902A	24	E20	9	1	1	E07
‡ 0	902A	27	E22	9	1	1	E01
0	902A	23	E05	0	2	1	E07
0	902A	23	E07	0	2	1	E01
0	902A	25	E04	1	3	1	E07
0	902A	25	E06	1	3	1	E01
0	902A	58	E09	2	1	0	E07
0	902A	57	E11	2	1	0	E01
0	902A	55	E08	3	2	0	E07
0	902A	55	E10	3	2	0	E01
0	902A	55	E13	4	3	0	E07
0	902A	54	E15	4	3	0	E01
0	902A	59	E12	5	0	2	E07
0	902A	58	E14	5	0	2	E01

* If carrier position 1 in Network Cabinet 1 is equipped with Port or DS1/MFAT carrier 2, make these connections.

† If carrier position 1 in Network Cabinet 1 is equipped with Port or DS1/MFAT carrier 5, make these connections.

‡ If carrier position 1 in Network Cabinet 1 is equipped with Port or DS1/MFAT carrier 9, make these connections.

TABLE 11-10. PCM Cabling For Module 0 — Unduplicated System (Part 2 of 3)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER		CABINET	CONN DESIG
				ELECTRICAL NUMBER	EQUIPMENT POSITION		
0	902A	58	E17	6	1	2	E07
0	902A	57	E19	6	1	2	E01
0	902A	55	E16	7	2	2	E07
0	902A	55	E18	7	2	2	E01
0	902A	55	E21	8	3	2	E07
0	902A	54	E23	8	3	2	E01
0	902A	65	E20	9	0	3	E07
0	902A	64	E22	9	0	3	E01
0	902A	64	E25	10	1	3	E07
0	902A	63	E27	10	1	3	E01
0	902A	62	E24	11	2	3	E07
0	902A	61	E26	11	2	3	E01
1	902A	24	E05	0	2	1	E08
1	902A	27	E07	0	2	1	E02
1	902A	28	E04	1	3	1	E08
1	902A	28	E06	1	3	1	E02
1	902A	55	E09	2	1	0	E08
1	902A	54	E11	2	1	0	E02
1	902A	54	E08	3	2	0	E08
1	902A	53	E10	3	2	0	E02

TABLE 11-10. PCM Cabling For Module 0 — Unduplicated System (Part 3 of 3)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER		CABINET	CONN DESIG
				ELECTRICAL NUMBER	EQUIPMENT POSITION		
1	902A	53	E13	4	3	0	E08
1	902A	52	E15	4	3	0	E02
1	902A	57	E12	5	0	2	E08
1	902A	56	E14	5	0	2	E02
1	902A	56	E17	6	1	2	E08
1	902A	55	E19	6	1	2	E02
1	902A	54	E16	7	2	2	E08
1	902A	53	E18	7	2	2	E02
1	902A	53	E21	8	3	2	E08
1	902A	52	E23	8	3	2	E02
1	902A	63	E20	9	0	0	E08
1	902A	62	E22	9	0	0	E02
1	902A	62	E25	10	1	1	E08
1	902A	62	E27	10	1	1	E02
1	902A	60	E24	11	2	2	E08
1	902A	60	E26	11	2	2	E02

Network Cabinet Alarms to Module Control

Table 11-11 shows module control to alarm field (AEH4) cabling for duplicated and unduplicated common control. Figures 11-21 and 11-22 show the cabinet configurations.

NOTE

All connections that have been made by the factory before shipping should be checked and verified against the CSD since the cabling differs for different cabinet configurations.

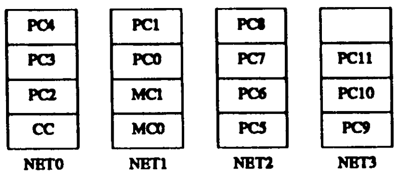


Figure 11-21. Unduplicated Common Control

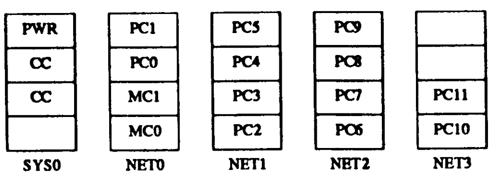


Figure 11-22. Duplicated Common Control

TABLE 11-11. Traditional Module Control Alarm Connections

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN. DESIG.	TO	CABINET	CONN. DESIG.
MODULE CONTROL (0)	902A	61	E48	ALARM FIELD (AEH4 CP)	NET. (1)	E1
MODULE CONTROL (0)	902A	2	E49	ALARM FIELD (AEH4 CP)	NET. (0)	E1
MODULE CONTROL (0)	902A	70	E50	ALARM FIELD (AEH4 CP)	NET. (3)	E1
MODULE CONTROL (0)	902A	66	E5l	ALARM FIELD (AEH4 CP)	NET. (2)	E1
MODULE CONTROL (1)	902A	60	E48	ALARM FIELD (AEH4 CP)	NET. (1)	E2
MODULE CONTROL (1)	902A	4	E49	ALARM FIELD (AEH4 CP)	NET. (0)	E2
MODULE CONTROL (1)	902A	70	E50	ALARM FIELD (AEH4 CP)	NET. (3)	E2
MODULE CONTROL (1)	902A	66	E5l	ALARM FIELD (AEH4 CP)	NET. (2)	E2

Traditional Module Control I/O Cabling to Port or DS1/MFAT Carriers

Table 11-12 shows I/O cabling module control to port or DS1/MFAT carriers, duplicated common control. Figure 11-23 shows the cabinet configuration.

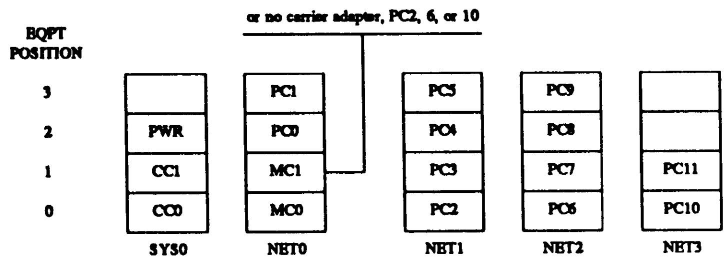


Figure 11-23. Duplicated Common Control

TABLE 11-12. Traditional Module Control I/O Connections (Part 1 of 2)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER: ELECTRICAL NUMBER	PORT OR DS1/MFAT CARRIER: EQUIPMENT POSITION	NETWORK CABINET	CONN DESIG
* 0	902A	29	E32	2	1	0	E03
† 0	902A	29	E36	6	1	0	E03
* 0	902A	29	E40	10	1	0	E03
0	902A	23	E33	0	2	0	E03
0	902A	26	E35	1	3	0	E03
0	902A	59	E32	2	0	1	E03
0	902A	57	E34	3	1	1	E03
0	902A	54	E37	4	2	1	E03
0	902A	53	E39	s	3	1	E03
0	902A	65	E36	6	0	2	E03
0	902A	63	E38	7	1	2	E03
0	902A	61	E41	8	2	2	E03
0	902A	59	E43	9	3	2	E03
0	902A	69	E40	10	0	3	E03
0	902A	68	E42	11	1	3	E03

* If equipment level 1 in Network Cabinet 0 contains a port or DS1/MFAT carrier with electrical position 2, make this connection.

† If equipment level 1 in Network Cabinet 0 contains l port or DS1/MFAT carrier with electrical position 6, make this connection.

‡ If equipment level 1 in Network Cabinet 0 contains a port or DS1/MFAT carrier with electrical position 10, make this connection.

TABLE 11-12. Traditional Module Control I/O Connections (Part 2 of 2)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	FORT OR DS1/MFAT CARRIER ELECTRICAL NUMBER	FORT OR DS1/MFAT CARRIER EQUIPMENT POSITION	CABINET	CONN DESIG
1		29	E33	0	2	0	E04
1		23	E35	1	3	0	E04
1		57	E32	2	0	1	E04
1		56	E34	3	1	1	E04
1		53	E37	4	2	1	E04
1		52	E39	5	3	1	E04
1		63	E36	6	0	2	E04
1		62	E38	7	1	2	E04
1		59	E41	8	2	2	E04
1		58	E43	9	3	2	E04
1		68	E40	10	0	3	E04
1		68	E42	11	1	3	E04

Traditional Module Control Cabling to Port or DS1/MFAT Carriers

Table 11-13 shows module control cabling to port or DS1/MFAT carriers for unduplicated common control. Figure 11-24 shows the cabinet configurations.

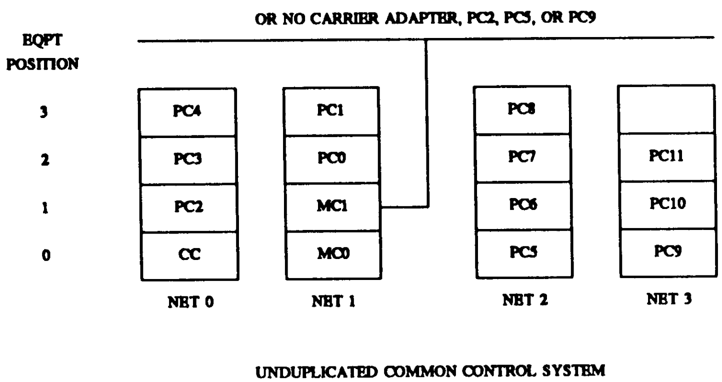


Figure 11-24. Unduplicated Common Control System

TABLE 11-13. Traditional Module Control Cabling (Part 1 of 2)

FROM				TO			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	PORT OR DS1/MFAT CARRIER: ELECTRICAL NUMBER	PORT OR DS1/MFAT CARRIER: EQUIPMENT POSITION	NETWORK CABINET	CONN DESIG
				2	1	1	E03
0†	902A	29	E39	5	1	1	E03
0‡	902A	29	E43	9	1	1	E03
0	902A	23	E33	0	2	1	E03
0	902A	26	E35	1	3	1	E03
0	902A	57	E32	2	1	0	E03
0	902A	54	E34	3	2	0	E03
0	902A	53	E37	4	3	0	E03
0	902A	59	E39	5	0	2	E03
0	902A	57	E36	6	1	2	E03
0	902A	54	E38	7	2	2	E03
0	902A	53	E41	8	3	2	E03
0	902A	65	E43	9	0	3	E03
0	902A	63	E40	10	1	3	E03
0	902A	61	E42	11	2	3	E03

* If equipment level 1 in Network cabinet 1 contains a port or DS1/MFAT carrier with electrical position 2, make this connection.

† If equipment level 1 in Network Cabinet 1 contains a port or DS1/MFAT carrier with electrical position 5, make this connection.

‡ If equipment level 1 in Network Cabinet 1 contains 1 port or DS1/MFAT carrier with electrical position 9, make this connection.

TABLE 11-13. Traditional Module Control Cabling (Part 2 of 2)

FROM				TO			
				FORT OR DS1/MFAT CARRIER			
MOD CONTROL CARRIER NUMBER	CABLE TYPE	ED-1E434 -11, GROUP NUMBER	CONN DESIG	ELECTRICAL NUMBER	EQUIPMENT POSITION	CABINET	CONN DESIG
1	902A	29	E33	0	2	1	E04
1	902A	23	E35	1	3	1	E04
1	902A	56	E32	2	1	0	E04
1	902A	53	E34	3	2	0	E04
1	902A	52	E37	4	3	0	E04
1	902A	57	E39	5	0	2	E04
1	902A	56	E36	6	1	2	E04
1	902A	53	E38	7	2	2	E04
1	902A	52	E41	8	3	2	E04
1	902A	63	E43	9	0	3	E04
1	902A	62	E40	10	1	3	E04
1	902A	59	E42	11	2	3	E04

DS1 SIGNALING SYNCHRONIZATION CABLING IN NETWORK CABINET

Unduplicated Traditional Module Control

See chapter 25 for Synchronization of DS1 Signaling in the Universal Module.

The cabling for a system with DS1/MFAT carrier used for synchronization in the module control carrier is shown in figures 11-25 through 11-30. (See CSD for translation assignment of primary and secondary timing board to determine proper connection.)

The connections at the DS1/MFAT carriers may be reversed as long as primary and secondary references remain in different slots in different carriers.

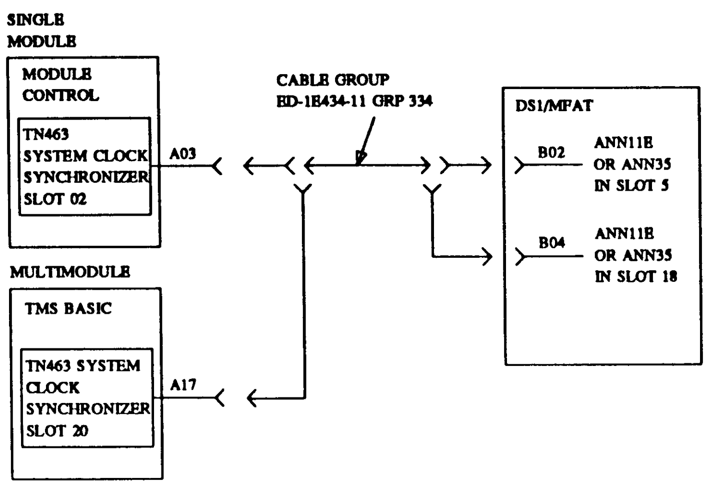


Figure 11-25. Synchronization Cabling — Primary Reference

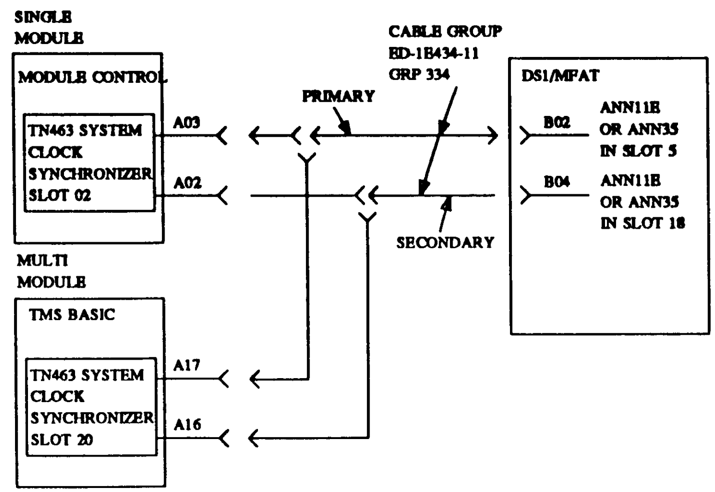


Figure 11-26. Synchronization Cabling — Primary and Secondary Reference — Same Carrier

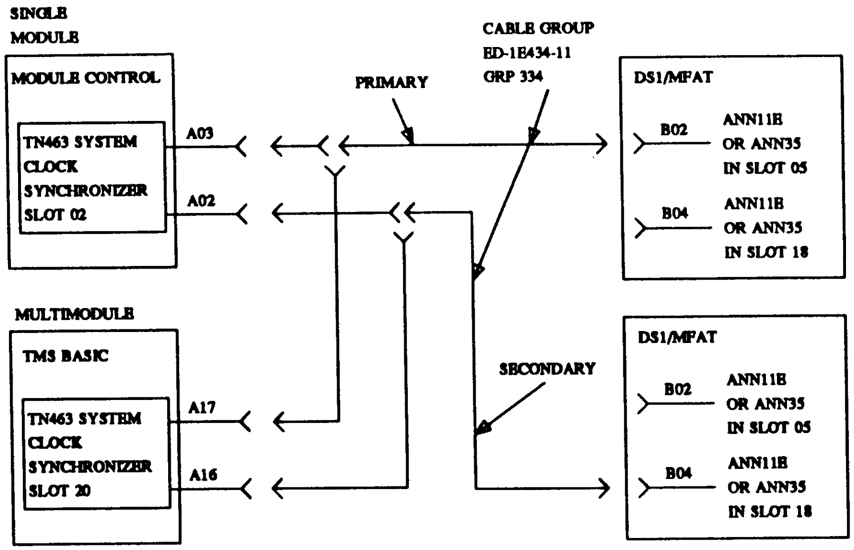


Figure 11-27. Synchronization Cabling — Primary and Secondary Reference — Different Carriers

Duplicated Traditional Module Control

The cabling for a system with DS1/MFAT carrier used for synchronization in the module control carrier is shown in figures 11-28 through 11-30. (See CSD for translation assignment for primary and secondary timing board to determine proper connections.)

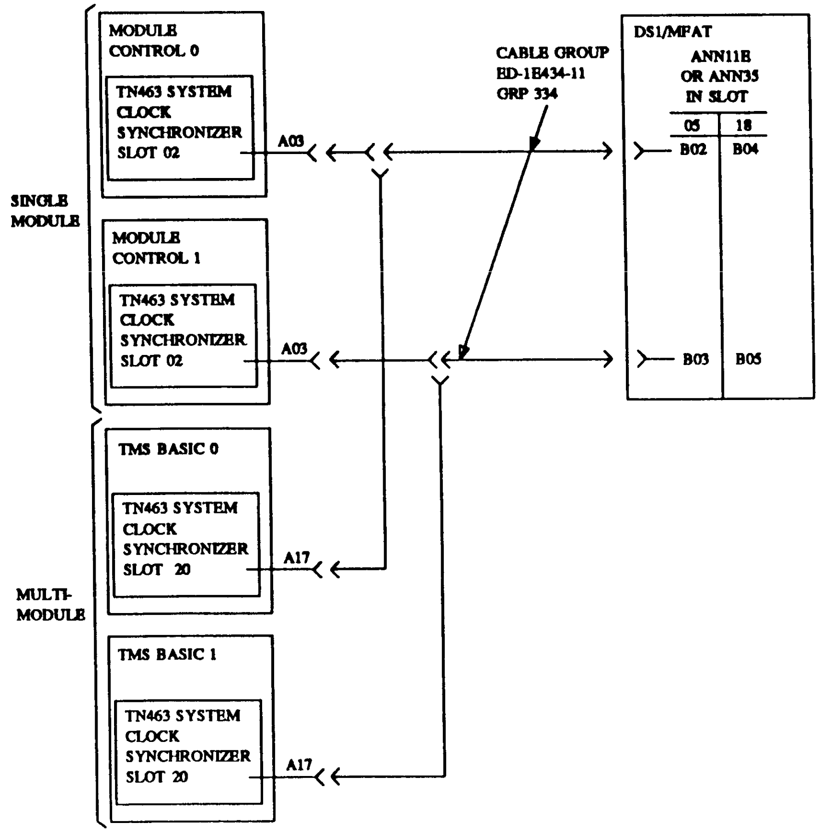


Figure 11-28. Synchronization Cabling — Primary Reference — Same Carrier

The primary and secondary synchronization cables can come from either ANN11E, however, they must come from the same carrier.

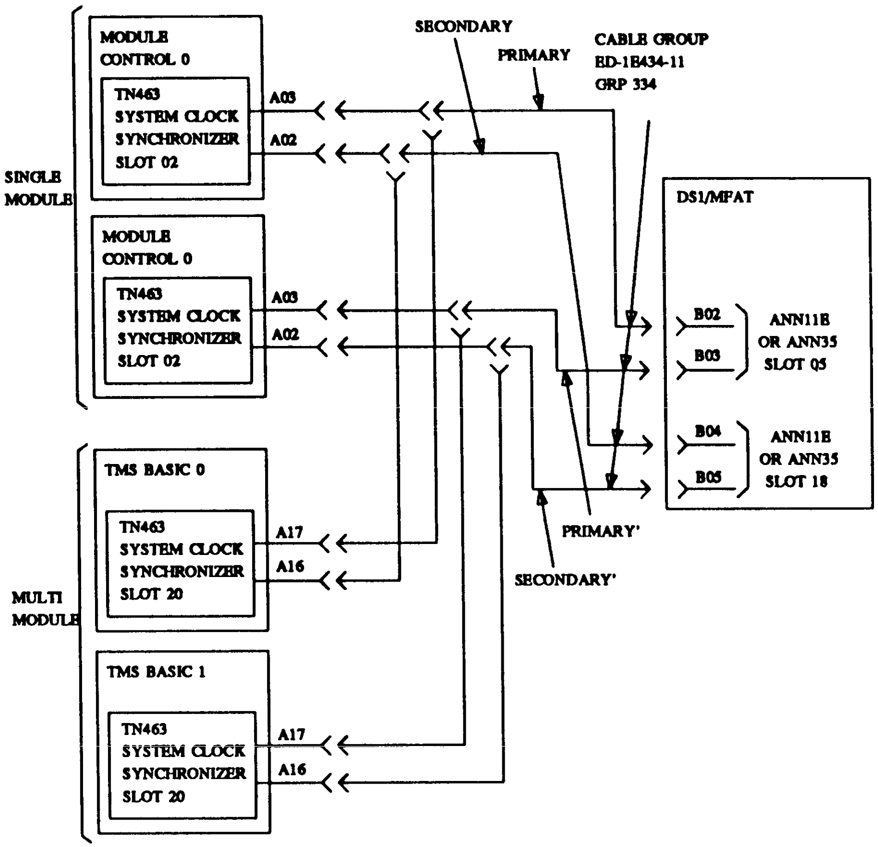


Figure 11-29. Synchronization Cabling — Primary and Secondary References — Same Carrier

Primary and secondary synchronization ables can come from either ANN11E; however, they must come from the same ANN11E.

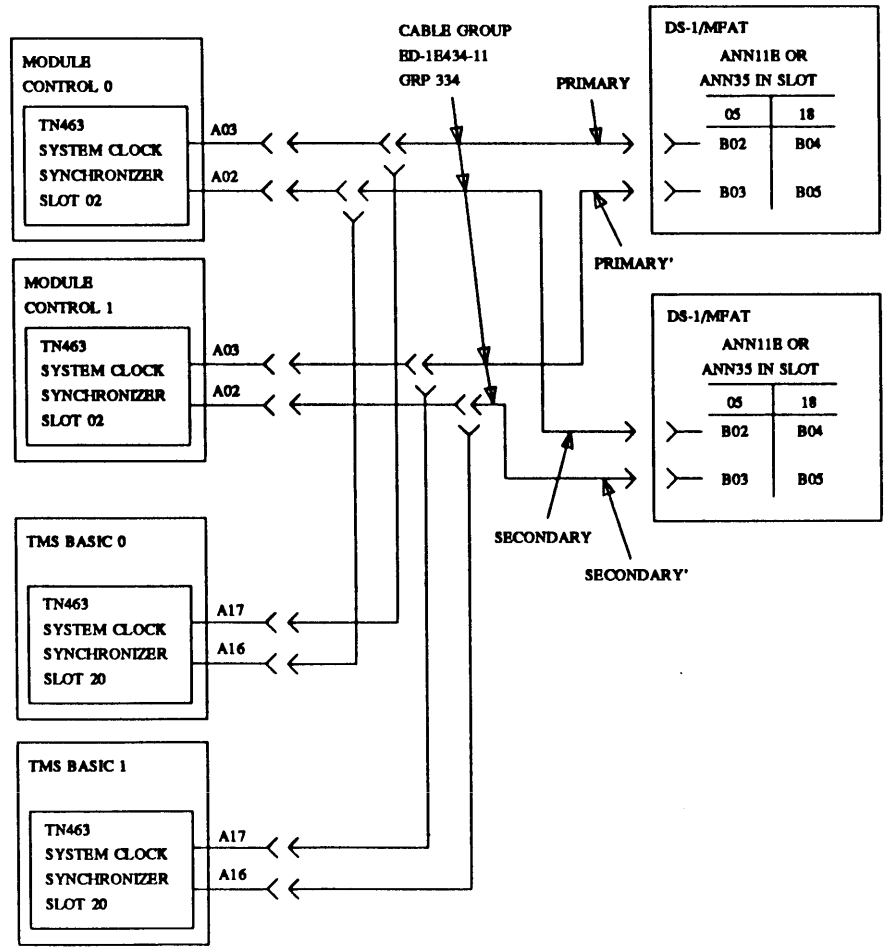


Figure 11-30. Synchronization Cabling — Primary and Secondary References — Different Carrier

TMS CABINET CABLING

Interface Cables

Table 11-14 shows interface cables for duplicated TMS cabinets. Figure 11-31 shows the cabinet configuration.

TABLE 11-14 TMS Cabinet Interface Connections

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO			
CABINET	CARRIER	SLOT	CONN			CABINET	CARRIER	SLOT	CONN
SYSTEM 2	00	21	E32	902A		SYSTEM 1	00	21	E32
SYSTEM 2	00	23	E33	902A	200	SYSTEM 1	00	23	E33
SYSTEM 2	00	23	E34	902A	200	SYSTEM 1	00	23	E34
SYSTEM 2	00	23	E35	902A	200	SYSTEM 1	00	23	E35
SYSTEM 2	00	23	E36	902A	85	SYSTEM 1	00	23	E36
SYSTEM 2	00	27A	E44	902A	62	SYSTEM 1	00	27A	E2
SYSTEM 2	00	27A	E2	902A	62	SYSTEM 1	00	27A	E47

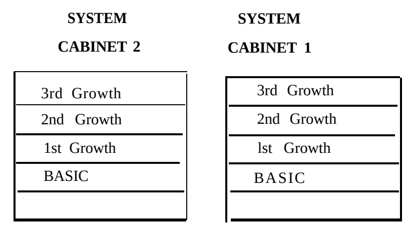


Figure 11-31. Duplicated TMS Cabinet Arrangement

4-MHz CABLES

Duplicated CC Cabling to Duplicated Traditional MC and TMS

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

Table 11-15 shows 4-MHz cabling for duplicated common control to duplicated module control and duplicated TMS for a maximum of 31 modules.

TABLE 11-15. 4-MHz Connections to Duplicated Module Control and Duplicated TMS (Part 1 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					TABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL 0)	27	E 9	COAX	84		System 1	00	27	B02	A
							System 1/2*	02/00	27	B02	B
						0	0	00	22	B02	C
						0	0	01	22	B02	D
			E7	COAX	84	1	0	00	22	B02	A
						1	0	01	22	B02	B
						2	0	00	22	B02	C
						2	0	01	22	B02	D
			E8	COAX	84	3	0	00	22	B02	A
						3	0	01	22	B02	B
						4	0	00	22	B02	C
						4	0	01	22	B02	D
			E6	COAX	64	5	o	00	22	B02	A
						5	0	01	22	B02	B
						6	0	00	22	B02	C
						6	0	01	22	B02	D
		2 8	E13	COAX	84	7	0	00	22	B02	A
						7	0	01	22	B02	B
						8	0	00	22	B02	c
						8	0	01	22	B02	D
			El 1	COAX	84	9	0	00	22	B02	A
						9	0	01	22	B02	B
						10	0	00	22	B02	C
						10	0	01	22	B02	D
			E12	COAX	84	11	0	00	22	B02	A
						11	0	01	22	B02	B
						12	0	00	22	B02	C
						12	0	01	22	B02	D
			E10	COAX	84	13	0	00	22	B02	A
						13	0	01	22	B02	B
						14	0	00	22	B02	C
						14	0	01	22	B02	D

* For 15 modules or less, terminate cable at System cabinet 1, carrier 02.
For more than 15 modules, terminate cable at System cabinet 2, carrier 00.

† To use l 501 cable a MOLEX H-600-217, Group 1, connector panel is required at the TMS or MC end of the connection.

TABLE 11-15. 4-MHz Connections to Duplicated Module Control and Duplicated TMS (Part 2 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL 0)	29	E17	COAX	84	15	0	00	22	B02	A
						15	0	01	22	B02	B
						16	0	00	22	B02	C
						16	0	01	22	B02	D
			E15	COAX	84	17	0	00	22	B02	A
						17	0	01	22	B02	B
						18	0	00	22	B02	C
						18	0	01	22	B02	D
			E16	COAX	84	19	0	00	22	B02	A
						19	0	01	22	B02	B
						20	0	00	22	B02	C
						20	0	01	22	B02	D
			E14	COAX	84	21	0	00	22	B02	A
						21	0	01	22	B02	B
						22	0	00	22	B02	C
						22	0	01	22	B02	D
		30	E21	COAX	84	23	0	00	22	B02	A
						23	0	01	22	B02	B
						24	0	00	22	B02	C
						24	0	01	22	B02	D
			El 9	COAX	84	25	0	00	22	B02	A
						25	0	01	22	B02	B
						26	0	00	22	B02	C
						26	0	01	22	B02	D
			E20	COAX	84	27	0	00	22	B02	A
						27	0	01	22	B02	B
						28	0	00	22	B02	C
						28	0	01	22	B02	D
			E18	COAX	84	29	0	00	22	B02	A
						29	0	01	22	B02	B
						30	0	00	22	B02	C
						30	0	01	22	B02	D

TABLE 11-15. 4-MHz Connections to Duplicated Module Control and Duplicated TMS (Part 3 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01	27	E9	COAX	64		System 1	00	27	B0l	A
	(COMMON						System 1/2†	02/00	27	B01	B
	CONTROL					0	o	00	22	B01	C
	1)					0	0	01	22	B01	D
			E7	COAX	84	1	0	00	22	B01	A
						1	0	01	22	B01	B
						2	0	00	22	B01	C
						2	0	01	22	B01	D
			E8	COAX	84	3	0	00	22	B01	A
						3	0	01	22	B01	B
						4	0	00	22	B01	C
						4	0	01	22	B01	D
			E6	COAX	84	5	0	00	22	B01	A
						5	0	01	22	B01	B
						6	0	00	22	B01	C
						6	0	01	22	B01	D
		28	E13	COAX	84	7	0	00	22	B01	A
						7	0	01	22	B01	B
						8	0	00	22	B01	C
						8	0	01	22	B01	D
			El 1	COAX	84	9	0	00	22	B01	A
						9	0	01	22	B01	B
						10	0	00	22	B01	C
						10	0	01	22	B01	D
			E12	COAX	84	11	0	00	22	B01	A
						11	0	01	22	B01	B
						12	0	00	22	B01	C
						12	0	01	22	B01	D
			E10	COAX	84	13	0	00	22	B01	A
						13	0	01	22	B01	B
						14	0	00	22	B01	C
						14	0	01	22	B01	D

* To use a 501 cable a MOLEX H-600-217, Group 1, connector panel is required l at the TMS or MC end of the connector.
† For 15 modules or less, terminate cable l at System cabinet 1, carrier 02
For more than 15 modules, terminate cable at System cabinet 2, carrier 00.

TABLE 11-15. 4-MHz Connections to Duplicated Module Control and Duplicated TMS (Part 4 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYSO	01				84	15	0	00	22	B01	A
	(COMMON					15	0	01	22	B01	B
	CONTROL					16	0	00	22	B01	C
	1)					16	0	01	22	B01	D
					84	17	0	00	22	B01	A
						17	0	01	22	B01	B
						18	0	00	22	B01	C
						18	0	01	22	B01	D
					84	19	0	00	22	B01	A
						19	0	01	22	B01	B
						20	0	00	22	B01	C
						20	0	01	22	B01	D
					84	21	0	00	22	B01	A
						21	0	01	22	B01	B
						22	0	00	22	B01	C
						22	0	01	22	B01	D
					84	23	0	00	22	B01	A
						23	0	01	22	B01	B
						24	0	00	22	B01	C
						24	0	01	22	B01	D
					84	25	0	00	22	B01	A
						25	0	01	22	B01	B
						26	0	00	22	B0I	C
						26	0	01	22	B01	D
					84	27	0	00	22	B01	A
						27	0	01	22	B01	B
						28	0	00	22	B01	C
						28	0	01	22	B01	D
					84	29	0	00	22	B01	A
						29	0	01	22	B01	B
						30	0	00	22	B01	C
						30	0	01	22	B01	D

Duplicated CC Cabling to Unduplicated Traditional MC and TMS

Table 11-16 shows 4-MHz cabling for duplicated common control to unduplicated module control and unduplicated TMS for a maximum of 31 modules.

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

TABLE 11-16. 4-MHz Connections to Unduplicated Module Control and TMS (Part 1 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL 0)	27	E9	COAX	84		System 1†	00	27	B02	A
						0	0	00	22	B02	C
			E7	COAX	84	1	0	00	22	B02	A
						2	0	00	22	B02	C
			E8	COAX	84	3	0	00	22	B02	A
						4	0	00	22	B02	C
			E6	COAX	84	5	0	00	22	B02	A
						6	0	00	22	B02	C
		23	E13	COAX	84	7	0	00	22	B02	A
						8	0	00	22	B02	C
			El 1	COAX	84	9	0	00	22	B02	A
						10	0	00	22	B02	C
			E12	COAX	84	11	0	00	22	B02	A
						12	0	00	22	B02	C
			E10	COAX	84	13	0	00	22	B02	A
						14	0	00	22	B02	C

* To use a 501 cable l MOLEX H-600-217, Group 1, connector panel is required at the TMS or MC end of the connector.

† For 15 modules or less, terminate cable at system cabinet 1, carrier 02.
For more than 15 modules, terminate cable at system cabinet 1, carrier 00.

TABLE 11-16. 4-MHz Connections to Unduplicated Module Control and TMS (Part 2 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	(COMMON CONTROL 0)	29	E17	COAX	84	15 16	0 0	00 00	22 22	B02 B02	
			E15	COAX	84	17 18	0 0	00 00	22 22	B02 B02	
			E16	COAX	84	19 20	0 0	00 00	22 22	B02 B02	
			E14	COAX	84	21 22	0 0	00 00	22 22	B02 B02	
		30	E21	COAX	84	23 24	0 0	00 00	22 22	B02 B02	
			E19	COAX	84	25 26	0 0	00 00	22 22	B02 B02	
			E20	COAX	84	27 28	0 0	00 00	22 22	B02 B02	
			E18	COAX	84	29 30	0 0	00 00	22 22	B02 B02	

TABLE 11-16. 4-MHz Connections to Unduplicated Module Control and TMS (Part 3 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	27	E9	COAX	84		System 1†	00	27	B01	A
						0	0	00	22	B01	C
				COAX	84	1	0	00	22	B01	A
						2	0	00	22	B01	C
				COAX	84	3	0	00	22	B01	A
						4	0	00	22	B01	C
				COAX	84	5	0	00	22	B01	A
						6	0	00	22	B01	C
		28	E13	COAX	84	7	0	00	22	B01	A
						8	0	00	22	B01	C
			El 1	COAX	84	9	0	00	22	B01	A
						10	0	00	22	B01	C
			E12	COAX	84	11	0	00	22	B01	A
						12	0	00	22	B0l	C
			E10	COAX	84	13	0	00	22	B01	A
						14	0	00	22	B01	C

* To use 1 501 able a MOLEX H-600-217, Group 1, connector panel is required at the TMS or MC end of the connector.
† For 15 modules or less, terminate cable at system cabinet 1, carrier 02.
For more than 15 module, terminate cable at system cabinet 1, carrier 00.

TABLE 11-16. 4-MHz Connections to Unduplicated Module Control and TMS (Part 4 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	29	E17	COAX	84	15	0	00	22	B01	A
						16	0	00	22	B01	C
			E15	COAX	84	17	0	00	22	B01	A
						18	0	00	22	B01	C
			E16	COAX	84	19	0	00	22	B01	A
						20	0	00	22	B01	C
			E14	COAX	84	21	0	00	22	B01	A
						22	0	00	22	B01	C
		30	E21	COAX	84	23	0	00	22	B01	A
						24	0	00	22	B01	C
			E19	COAX	84	25	o	00	22	B01	A
						24	0	00	22	B01	C
			E20	COAX	84	27	0	00	22	B01	A
						28	0	00	22	B01	C
			E18	COAX	84	29	0	00	22	B01	A
						30	0	00	22	B01	C

Unduplicated CC Cabling to Unduplicated Traditional MC and TMS

Table 11-17 shows 4-MHz cabling for unduplicated common control to unduplicated module control and unduplicated TMS for a maximum of 31 modules.

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

TABLE 11-17. 4-MHz Connections to Unduplicated Module Control and TMS (Part 1 of 2)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET				
NET 1	00 (COMMON CONTROL 0)	27	E9	COAX	84		System 0†	00	27	B02	A
						0	0	00	22	B02	C
			E7	COAX	84	1	0	00	22	B02	A
						2	0	00	22	B02	C
			E8	COAX	84	3	0	00	22	B02	A
						4	0	00	22	B02	C
			E6	COAX	84	5	0	00	22	B02	A
						6	0	00	22	B02	C
		28	E13	COAX	84	7	0	00	22	B02	A
						8	0	00	22	B02	C
			E11	COAX	84	9	0	00	22	B02	A
						10	0	00	22	B02	C
			E12	COAX	84	11	0	00	22	B02	A
								00	22	B02	C
			E10	COAX	84	13	0	00	22	B02	A
								00	22	B02	C

* To use a 501 cable a MOLEX H-600-217, Group 1, connector panel is required at the TMS or MC end of the connector.

† For 15 modules or less, terminate cable at TMS cabinet 0, carrier 02

TABLE 11-17. 4-MHz Connections to Unduplicated Module Control and TMS (Part 2 of 2)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
NET 1	00 (COMMON CONTROL o)	29	E17	COAX	84	15 16	0 0	00 00	22 22	B02 B02	A C
			E15	COAX	84	17 18	0 0	00 00	22 22	B02 B02	A C
			E16	COAX	84	19 20	0 0	00 00	22 22	B02 B02	A C
			E14	COAX	84	21 22	o 0	00 00	22 22	B02 B02	A C
		30	E21	COAX	84	23 24	0 0	00 00	22 22	B02 B02	A C
			E19	COAX	84	25 26	0 0	00 00	22 22	B02 B02	A C
			E20	COAX	84	27 28	0 0	00 00	22 22	B02 B02	A C
			E18	COAX	84	29 30	0 0	00 00	22 22	B02 B02	A C

TMS FIBER OPTIC INTERFACE CABLING

Duplicated TMS — One Cabinet

Table 11-18 shows TMS module interface cabling (duplicated TMS one cabinet) for a maximum of 15 modules.

WARNING

This fiber optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 11-18. TMS Interface Connections — One Cabinet (Part 1 of 2)

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS 1)					TRADITIONAL MODULE	NET CABINET	NETWORK CARRIER	SLOT	CONN*
CARRIER	SLOT	CONN*							
00	18	A12(T) A13(R)	451	1 2	00	0	00	01	A01(R) A00(T)
	17	Al0(T) All(R)	451	1 2	01	0	00	01	A01(R) A00(T)
	16	A08(T) A09(R)	451	1 2	02	0	00	01	A01(R) A00(T)
	02	A00(T) A01(R)	451	1 2	03	0	00	01	A01(R) A00(T)
	03	A02(T) A03(R)	451	1 2	04	0	00	01	A01(R) A00(T)
	04	A04(T) A05(R)	451	1 2	05	0	00	01	A01(R) A00(T)
	05	A06(T) A07(R)	451	1 2	06	0	00	01	A01(R) A00(T)
01	19	A14(T) A15(R)	451	1 2	07	0	00	01	A01(R) A00(T)
	18	A12(T) A13(R)	451	1 2	08	0	00	01	A01(R) A00(T)
	17	A1O(T) All(R)	451	1 2	09	0	00	01	A01(R) A00(T)
	16	A08(T) A09(R)	451	1 2	10	0	00	01	A01(R) A00(T)
	02	A00(T) A01(R)	451	1 2	11	0	00	01	A01(R) A00(T)
	03	A02(T) A03(R)	451	1 2	12	0	00	01	A01(R) A00(T)
	04	A04(T) A05(R)	451	1 2	13	0	00	01	A01(R) A00(T)
	05	A06(T) A07(R)	451	1 2	14	0	00	01	A01(R) A00(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use-paddleboard receiver connectors Z982B (R2V1-V4).

TABLE 11-18. TMS Interface Connections — One Cabinet (Part 2 of 2)

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS 1)					TRADITIONAL MODULE	NET CABINET	NETWORK CARRIER	SLOT	CONN*
CARRIER	SLOT	CONN*							
02	18	A12(T) A13(R)	451	1 2	00	0	01	01	A01(R) AOO(T)
	17	A10(T) All(R)	451	1 2	01	0	01	01	A01(R) A00(T)
	16	A08(T) A09(R)	451	1 2	02	0	01	01	A01(R) A00(T)
	02	A00(T) A01(R)	451	1 2	03	0	01	01	A01(R) A00(T)
	03	A02(T) A03(R)	451	1 2	04	0	01	01	A01(R) A00(T)
	04	A04(T) A05(R)	451	1 2	05	0	01	01	A01(R) A00(T)
	05	A06(T) A07(R)	451	1 2	06	0	01	01	A01(R) A00(T)
03	19	A14(T) A15(R)	451	1 2	07	0	01	01	A01(R) A00(T)
	18	A12(T) A13(R)	451	1 2	08	0	01	01	A01(R) A00(T)
	17	A10(T) All(R)	451	1 2	09	0	01	01	A01(R) A00(T)
	16	A08(T) A09(R)	451	1 2	10	0	01	01	A01(R) A00(T)
	02	A00(T) A01(R)	451	1 2	11	0	01	01	A01(R) A00(T)
	03	A02(T) A03(R)	451	1 2	12	0	01	01	A01(R) A00(T)
	04	A04(T) A05(R)	451	1 2	13	0	01	01	A01(R) A00(T)
	05	A06(T) A07(R)	451	1 2	14	0	01	01	A01(R) A00(T)

* Connectors designated "T" use paddleboard tranmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

Duplicated TMS — Two Cabinets

Table 11-19 shows TMS module interrace cabling (duplicated TMS, two cabinets) for a maximum of 31 modules.

WARNING

This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 11-19. TMS Interface Connections — Two Cabinets (Part 1 of 4)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
1	00	18	Al2(T) A13(R)	451	1 2	00	0	00	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	01	0	00	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	02	0	00	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	03	0	00	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	04	0	00	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	05	0	00	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	06	0	00	01	A01(R) A00(T)
1	01	19	A14(T) A15(R)	451	1 2	07	0	00	01	A01(R) A00(T)
		18	A12(T) A13(R)	451	1 2	08	0	00	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	09	0	00	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	10	0	00	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	11	0	00	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	12	0	00	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	13	0	00	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	14	0	00	01	A01(R) A00(T)

* Connectors designated “T” use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated “R” use paddleboard receiver connectors Z982B (R2V1-V4).

TABLE 11-19. TMS Interface Connections — Two Cabinets (Part 2 of 4)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
1	02	19	A14(T) A15(R)	451	1 2	15	0	00	01	A01(R) A00(T)
		18	A12(T) A13(R)	451	1 2	16	0	00	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	17	0	00	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	18	0	00	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	19	0	00	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	20	0	00	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	21	0	00	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	22	0	00	01	A01(R) A00(T)
1	03	19	A14(T) Al5(R)	451	1 2	23	0	00	01	A01(R) A00(T)
		18	A12(T) A13(R)	451	1 2	24	0	00	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	25	0	00	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	26	0	00	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	27	0	00	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	28	0	00	01	A01(R) A00(T)
		04	A04(R) A05(R)	451	1 2	29	0	00	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	30	0	00	01	A01(R) A00(T)

*Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

TABLE 11-19. TMS Interface Connections — Two Cabinets (Part 3 of 4)

FROM				ED-1E434-11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
2	00	18	A12(T) A13(R)	451	1 2	00	0	01	01	A01(R) A00(T)
		17	A10(T) A11(R)	451	1 2	01	0	01	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	02	0	01	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	03	0	01	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	04	0	01	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	05	0	01	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	06	0	01	01	A01(R) A00(T)
2	01	19	A14(T) A15(R)	451	1 2	07	0	01	01	A01(R) A00(T)
		18	A12(T) A13(R)	451	1 2	08	0	01	01	A01(R) A00(T)
		17	A10(T) A11(R)	451	1 2	09	0	01	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	10	0	01	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	11	0	01	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	12	0	01	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	13	0	01	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	14	0	01	01	A01(R) A00(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

TABLE 11-19. TMS Interface Connections — Two Cabinets (Part 4 of 4)

FROM				ED-1E434-11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
2	02	19	A14(T) A15(R)	451	1 2	15	0	01	01	A01(R) A00(T)
		18	A12(T) A13(R)	451	1 2	16	0	01	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	17	0	01	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	18	0	01	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	19	0	01	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	20	0	01	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	21	0	01	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	22	0	01	01	A01(R) A00(T)
2	03	19	A14(T) A15(R)	451	1 2	23	0	01	01	A01OR) A00(T)
		18	A12(T) A13(R)	451	1 2	24	0	01	01	A01(R) A00(T)
		17	A10(T) All(R)	451	1 2	25	0	01	01	A01(R) A00(T)
		16	A08(T) A09(R)	451	1 2	26	0	01	01	A01(R) A00(T)
		02	A00(T) A01(R)	451	1 2	27	0	01	01	A01(R) A00(T)
		03	A02(T) A03(R)	451	1 2	28	0	01	01	A01(R) A00(T)
		04	A04(T) A05(R)	451	1 2	29	0	01	01	A01(R) A00(T)
		05	A06(T) A07(R)	451	1 2	30	0	01	01	A01(R) A00(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

Unduplicated TMS — One Cabinet

Table 11-20 shows TMS module interface cabling (unduplicated TMS, one cabinet) for a maximum of 15 modules.

WARNING This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 11-20. TMS Interface Connections — One Cabinet — for up to 15 Modules

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET (SYS 1)					TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
CARRIER	SLOT	CONN*							
00	18	A12(T) A13(R)	451	1 2	00	0	00	02	A03(R) A02(T)
	17	A10(T) A11(R)	451	1 2	01	0	00	02	A03(R) A02(T)
	16	A08(T) A09(R)	451	1 2	02	0	00	02	A03(R) A02(T)
	02	A00(T) A01(R)	451	1 2	03	0	00	02	A03(R) A02(T)
	03	A02(T) A03(R)	451	1 2	04	0	00	02	A03(R) A02(T)
	04	A04(T) A05(R)	451	1 2	05	0	00	02	A03(R) A02(T)
	05	A06(T) A07(R)	451	1 2	06	0	00	02	A03(R) A02(T)
01	19	A14(T) A15(R)	451	1 2	07	0	00	02	A03(R) A02(T)
	18	A12(T) A13(R)	451	1 2	08	0	00	02	A03(R) A02(T)
	17	A10(T) A11(R)	451	1 2	09	0	00	02	A03(R) A02(T)
	16	A08(T) A09(R)	451	1 2	10	0	00	02	A03(R) A02(T)
	02	A00(T) A01(R)	451	1 2	11	0	00	02	A03(R) A02(T)
	03	A02(T) A03(R)	451	1 2	12	0	00	02	A03(R) A02(T)
	04	A04(T) A05(R)	451	1 2	13	0	00	02	A03(R) A02(T)
	05	A06(T) A07(R)	451	1 2	14	0	00	02	A03(R) A02(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

Table 11-21 SHOWS TMS module interface cabling (unduplicated TMS. one cabinet) for a maximum or 31 modules.

WARNING

This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 11-21. TMS Interface Connections — One Cabinet for up to 31 Modules (Part 1 of 2)

FROM				ED-1E434-11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET SYS	CARRIER	SLOT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
1	00	18	A12(T) A13(R)	451	1 2	00	0	00	02	A03(R) A02(T)
		17	A10(T) All(R)	451	1 2	01	0	00	02	A03(R) A02(T)
		16	A08(T) A09(R)	451	1 2	02	0	00	02	A03(R) A02(T)
		02	A00(T) A01(R)	451	1 2	03	0	00	02	A03(R) A02(T)
		03	A02(T) A03(R)	451	1 2	04	0	00	02	A03(R) A02(T)
		04	A04(T) A05(R)	451	1 2	05	0	00	02	A03OR) A02(T)
		05	A06(T) A07(R)	451	1 2	06	0	00	02	A03(R) A02(T)
1	01	19	A14(T) A15(R)	451	1 2	07	0	00	02	A03(R) A02(T)
		18	A12(T) A13(R)	451	1 2	08	0	00	02	A03(R) A02(T)
		17	A10(T) A11(R)	451	1 2	09	0	00	02	A03(R) A02(T)
		16	A08(T) A09(R)	451	1 2	10	0	00	02	A03(R) A02(T)
		02	A00(T) A01(R)	451	1 2	11	0	00	02	A03(R) A02(T)
		03	A02(T) A03(R)	451	1 2	12	0	00	02	A03(R) A02(T)
		04	A04(T) A05(R)	451	1 2	13	0	00	02	A03(R) A02(T)
		05	A06(T) A07(R)	451	1 2	14	0	00	02	A03(R) A02(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4),
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

TABLE 11-21. TMS Interface Connections — One Cabinet for up to 31 Modules (Part 2 of 2)

FROM				ED-lE434-11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET SYS	CARRIER	SUIT	CONN*			TRADITIONAL MODULE	NET CABINET	CARRIER	SLOT	CONN*
1	02	19	A14(T) A15(R)	451	1 2	15	0	00	02	A03(R) A02(T)
		18	A12(T) A13(R)	451	1 2	16	0	00	02	A03(R) A02(T)
		17	A10(T) All(R)	451	1 2	17	0	00	02	A03(R) A02(T)
		16	A08(T) A09(R)	451	1 2	18	0	00	02	A03(R) A02(T)
		02	A00(T) A01(R)	451	1 2	19	0	00	02	A03(R) A02(T)
		03	A02(T) A03(R)	451	1 2	20	0	00	02	A03(R) A02(T)
		04	A04(T) A05(R)	451	1 2	21	0	00	02	A03(R) A02(T)
		05	A06(T) A07(R)	451	1 2	22	0	00	02	A03(R) A02(T)
1	03	19	A14(T) A15(R)	451	1 2	23	0	00	02	A03(r) A02(T)
		18	A12(T) A13(R)	451	1 2	24	0	00	02	A03(R) A02(T)
		17	A10(T) All(R)	451	1 2	25	0	00	02	A03(R) A02(T)
		16	A08(T) A09(R)	451	1 2	26	0	00	02	A03(R) A02(T)
		02	A00OT) A01(R)	451	1 2	27	0	00	02	A03(R) A02(T)
		03	A02(T) A03(R)	451	1 2	28	0	00	02	A03(R) A02(T)
		04	A04(T) A05(R)	451	1 2	29	0	00	02	A03(R) A02(T)
		05	A06(T) A07(R)	451	1 2	30	0	00	02	A03(R) A02(T)

* Connectors designated "T" use paddleboard transmitter connectors Z982A (R2V1-V4).
Connectors designated "R" use paddleboard receiver connectors Z982B (R2V1-V4).

MISCELLANEOUS INTERCABINET CABLING FOR MODULE CONTROL AND COMMON CONTROL

Figure 11-32 shows alarm cabling.

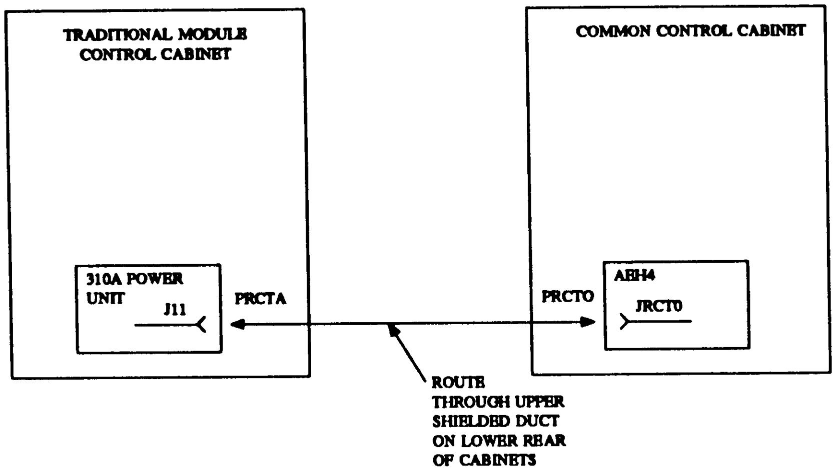


Figure 11-32. Alarm Cable — Unduplicated Common Control

A cable must be run connecting the MAAP connecting block from the common control cabinet to each module control cabinet in a multimodule system. This cable should be a shielded 25-pair cable (ED-1E434-11 Group 300). This cable should be run through the cable ducts. It should have a maximum length of 500 feet. The last module control cabinet should be equipped with an ED-1E434-11 Group 344 terminating plug. Figure 11-33 shows extended MAAP cabling.

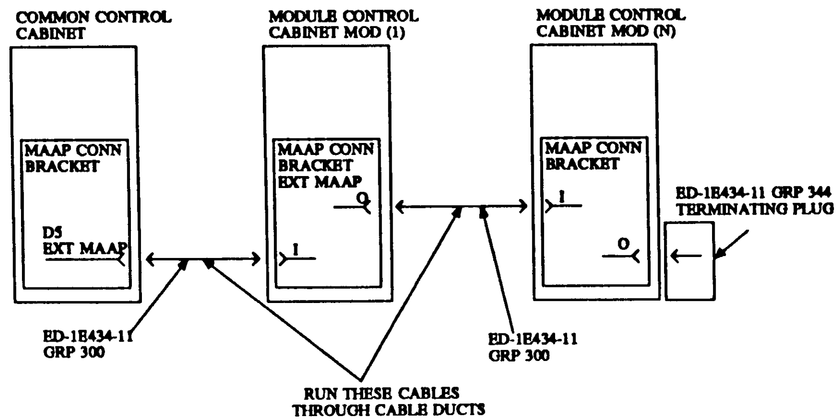


Figure 11-33. Extended MAAP Cabling

SNS Leads

Figures 11-34 and 11-35 show the module control cabinet equipped without and with nominal holdover, respectively.

NOTE There is no SNS lead on systems equipped with bulk OLS power supplies.

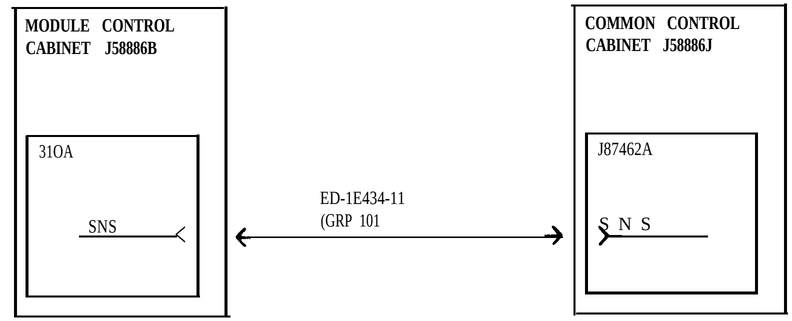


Figure 11-34. Module Control Cabinet Equipped without nominal Holdover

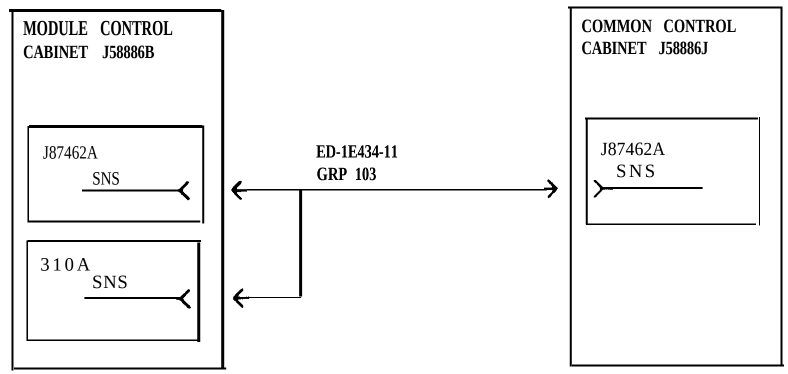


Figure 11-35. Module Control Cabinet Equipped with Nominal Holdover

12. REMOTE MODULE INSTALLATION

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REMOTE MODULE INTERFACE (RMI) SYSTEM INSTALLATION

This section contains instructions for installing RMI hardware in an unduplicated and duplicated system. Figures 12-1 and 12-2 are basic block diagrams showing the connections necessary to add Phase 1 RMI to an existing unduplicated or duplicated AT&T System 85. Figures 12-3 and 12-4 are basic block diagrams showing the connections necessary to add Phase 2 RMI to an existing unduplicated or duplicated system. Figures 12-5 and 12-6 are for duplicated and unduplicated Phase 3 systems. The duplicated systems shown in Figures 12-2, 12-4, and 12-6 are for fully duplicated control functions (common control), module control, and Time-Multiplexed Switch [TMS]). It is possible to have other combinations of duplication. The actual connections for these configurations are shown later in this document.

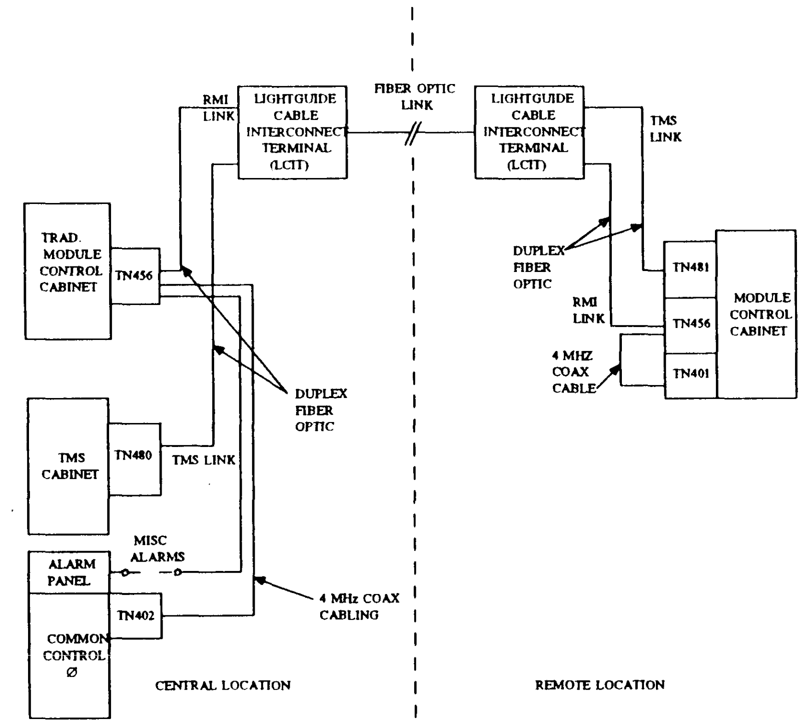


Figure 12-1. Unduplicated RMI System (Phase 1) Block Diagram

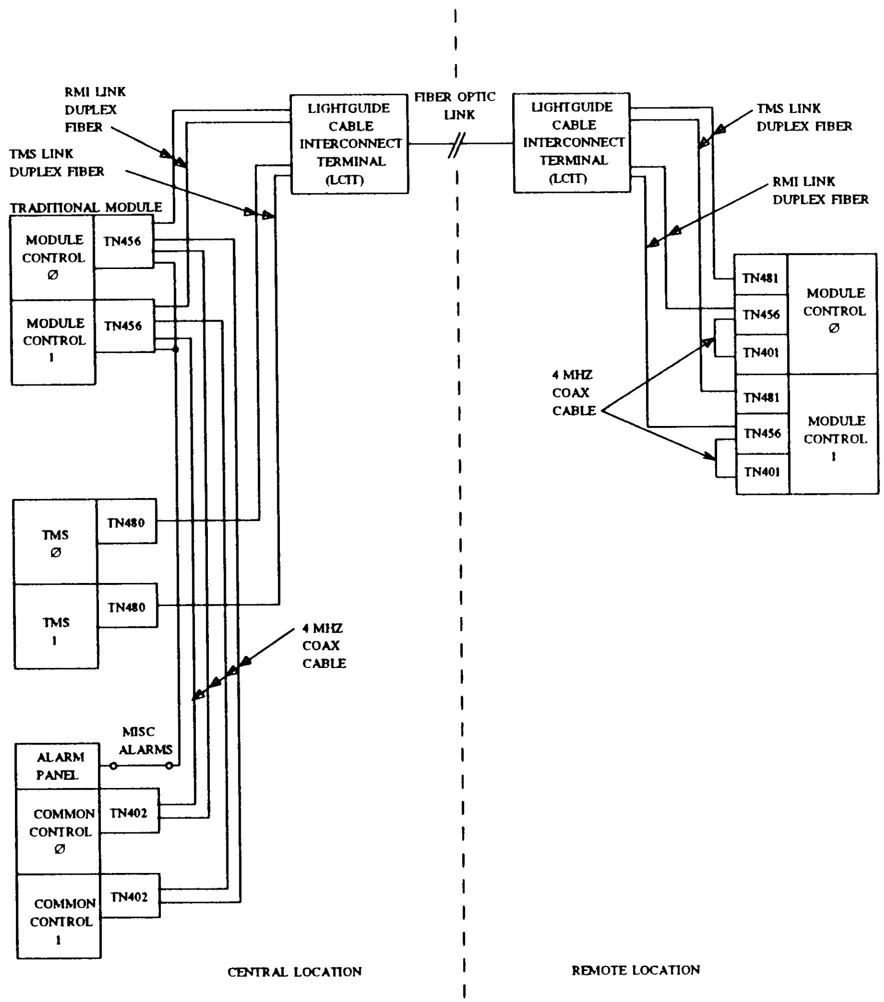


Figure 12-2. Duplicated RMI System (Phase 1) Block Diagram

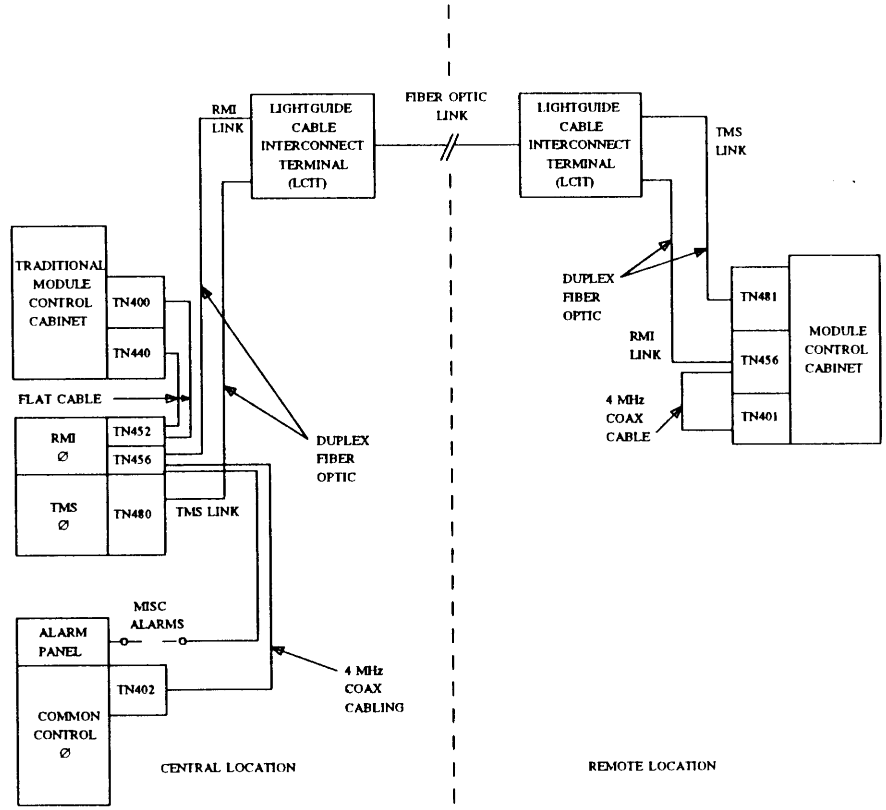
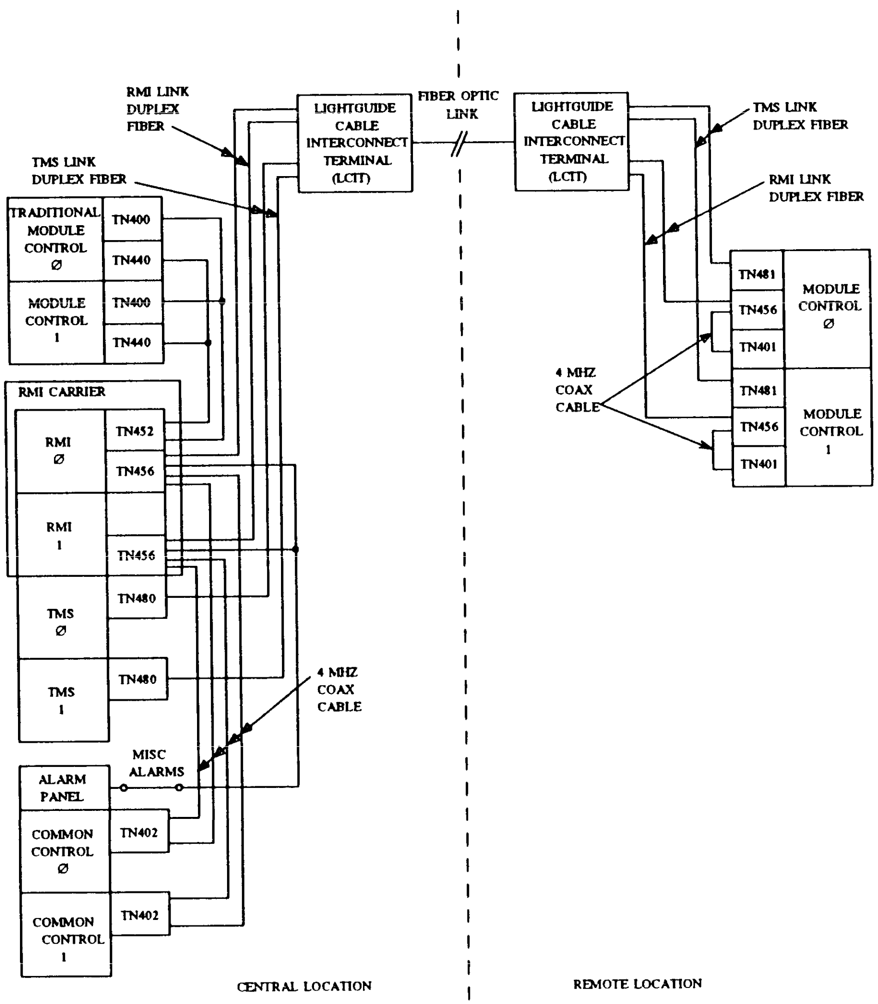


Figure 12-3. Unduplicated RMI System (Phase 2) Block Diagram



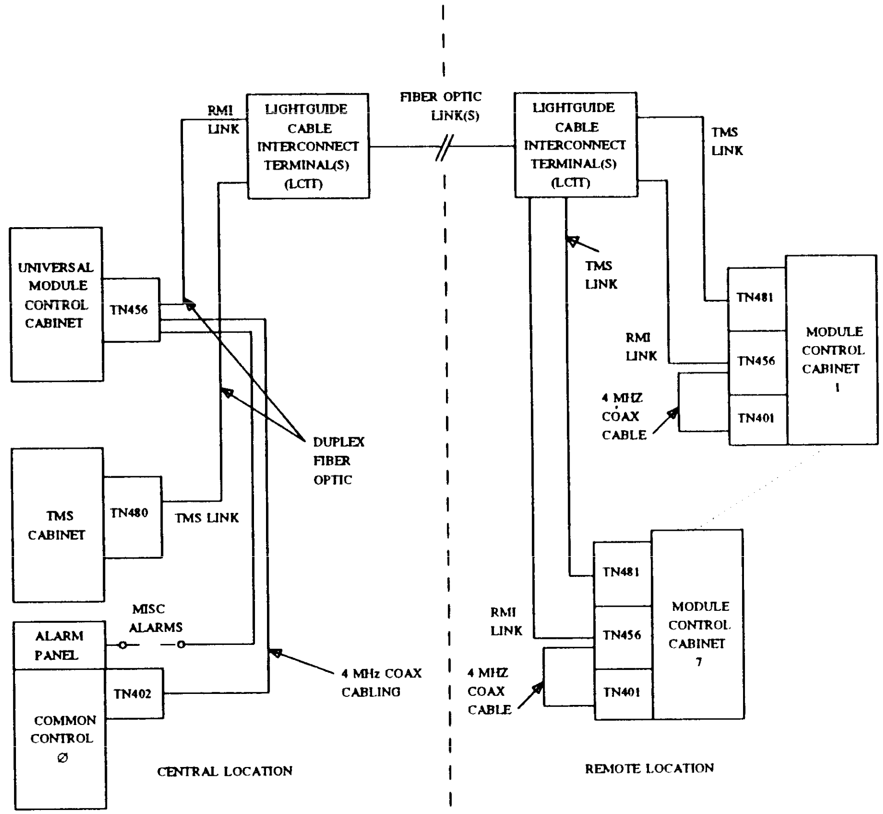


Figure 12-5. Unduplicated RMI System (Phase 3) Block Diagram

Figure 12-4. Duplicated RMI System (Phase 2) Block Diagram

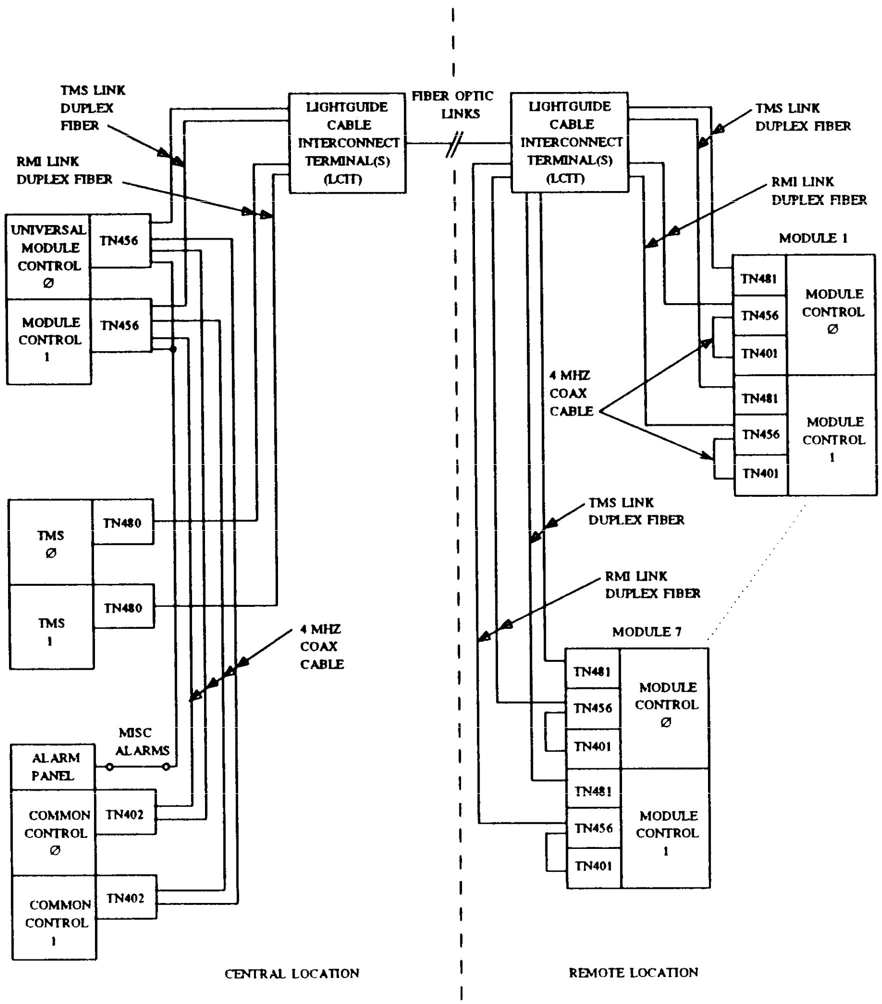


Figure 12-6. Duplicated RMI System (Phase 3) Block Diagram

RMI Cabinet Installation

Any System 85 Common Control, Traditional Module Control, or Time-Multiplexed Switch (TMS)/Remote Module Interface (RMI) cabinet(s) required by the addition of RMI should be installed according to the *System 85 Installation and Test Manual* (555-104-104).

RMI Carrier Installation (Phase 2)

Each RMI carrier provides up to 16 unduplicated remote modules or *8* duplicated remote modules using the TN456 circuit packs. The system has a capacity of two RMI carriers for unduplicated systems and four RMI carriers for duplicated systems. Each RMI carriers should be mounted in the proper carrier location as determined by the Customer System Document (CSD). Install the RMI carrier(s) as shown in figure 12-7.

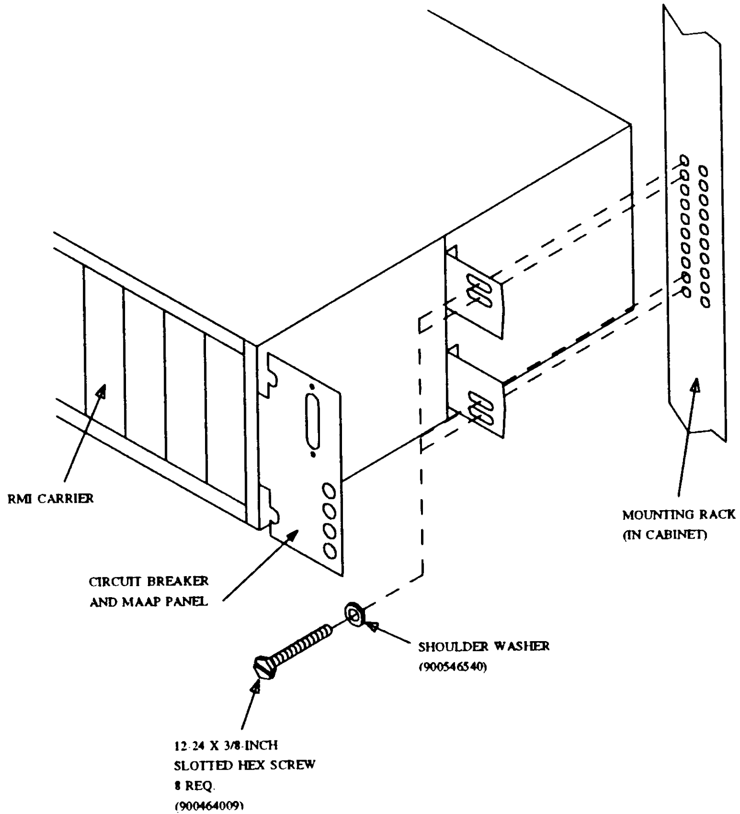


Figure 12-7. RMI Carrier (Phase 2) Installation

The power, ground, and alarm connections for the RMI carrier are made from a unit cable connected to the backplane of the RMI carrier, as shown in table 12-1. These connections are made to the 334A cabinet rectifiers through the power bus in the TMS/RMI cabinet. The right half (slots 00 through 10) of each RMI carrier is powered by the 334A-0 or OLS(0) rectifier, and the left half (slots 11 through 22) is powered by the 334A-1 or OLS(1) rectifier. For systems with only one unduplicated RMI carrier (located in position 3) in a TMS/RMI cabinet with three TMS carriers, both sides of the RMI carrier must be powered by the 334A-1 or OLS(1) rectifier.

TABLE 12-1. Power, Ground, and Alarm Connections for the RMI Carrier

ORIGINATION	DESTINATION	CONNECTOR (WIRE COLOR)
RMI CARRIER (0-3) Backplane	Bus Bar -48 (334A-0 or OLS(0))	Red-Blue
	Bus Bar GRD (334A-0 or OLS(0))	Black-Blue
	Bus Bar -48 (334A-1 or OLS(1))	Red-White
	Bus Bar GRD (334A-1 or OLS(l))	Black-White
	PALM of Succeeding RMI Carrier (if applicable)	JALM (Blue)
	JALM of Preceding RMI Carrier or J1 of AEH4 (if RMI carrier 00)	PALM (Black)

LIGHTGUIDE CABLE INTERCONNECT TERMINAL (LCIT) INSTALLATION

The LCIT must be installed within 100 feet of related module control and TMS cabinets at the central and remote locations. A 1/2-inch plywood backboard and mounting hardware must be provided locally. The LCIT is 12 inches deep. Choose a location so that the LCIT will be out of the way of traffic.

Install the LCIT (figure 12-8) as follows:

1. Mark the location of the 134A mounting bracket holes on the l/2-inch plywood backboard.
2. Make sure that the plywood backboard is mounted on the wall so that it will not interfere with the 134A hole locations. Mount this

backboard using standard procedures for the type of wall used.

3. Mount the 134A mounting bracket (using hardware provided with the 134A) to the plywood backboard in the location marked in Step 1.

4. Mount the LCIT to the 134A mounting bracket with hardware provided.

5. Attach ED-1E466 Group 212 label, and write the LCIT number on the LCIT Number label (factory attached to the LCIT) in the locations shown in figure 12-8.

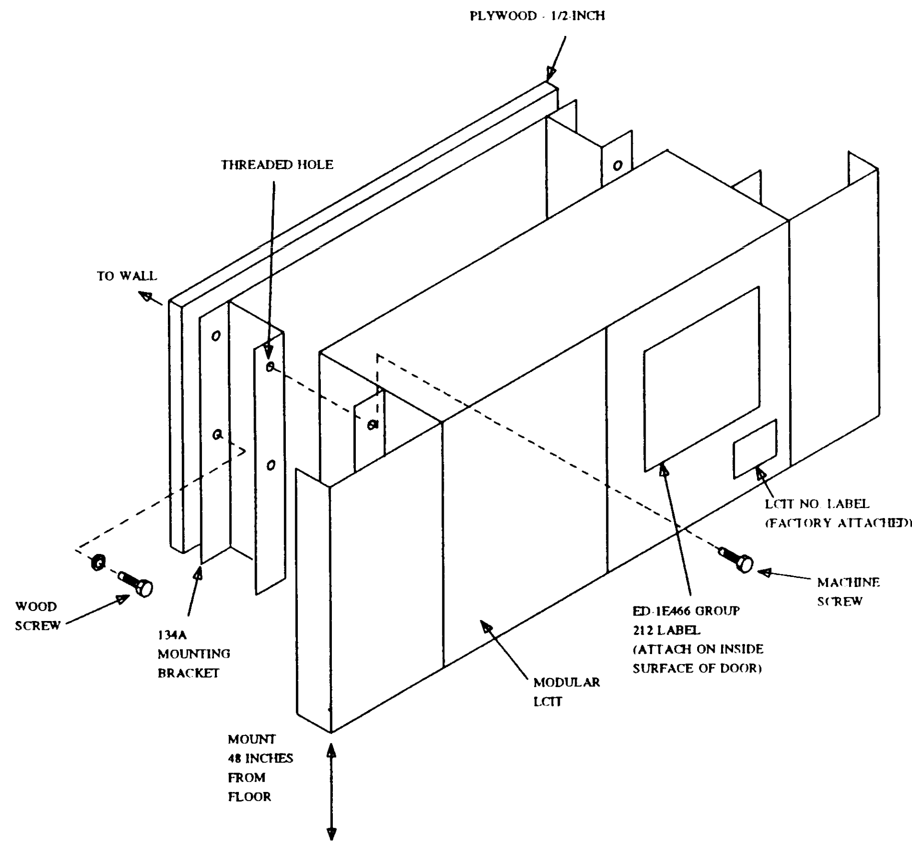


Figure 12-8. LCIT Installation on Wall

CENTRAL AND REMOTE MODULE CONTROL CARRIER PAIRING

Phase 1

Assign module numbers to the central and remote modules. Module numbers are first assigned at the central location (Module N+1, Module 1, . . ., Module N) and then at the remote location (Module N+1, Module N+2, . . .).

Each remote module control carrier must be paired with a central traditional module control carrier equipped with a TN456 circuit pack. At least as many traditional module control carriers must be at the central location as there are at the remote location(s). Only **one** remote module control carrier with a TN456 circuit pack can be assigned to a central module control carrier with a TN456 circuit pack. The remote module can be either a traditional or universal one.

Unduplicated System

The first (Module 0) module control carrier at the central location is paired with the first (Module N+1) module control carrier at a remote location. The second (Module 1) module control carrier at the central location is paired with the second (Module N+2) module control carrier at a remote location. Repeat the pairings until all remote module control carriers are assigned to central module control carriers. Figure 12-9 is an example of how the module control carriers should be assigned.

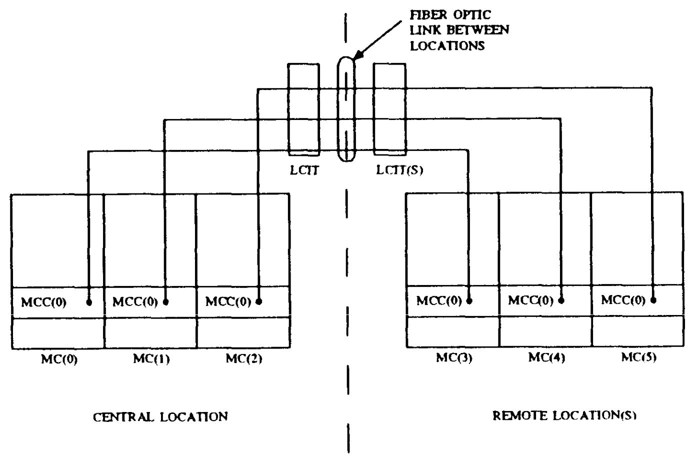


Figure 12-9. Assigned MC Carriers for Unduplicated System (Phase 1)

Duplicated System

For a duplicated system, carriers for remote modules should be paired with central module control carriers that are located in different cabinets.

This pairing allows the RMI (TN456) circuit packs to be powered by different rectifiers. If your system only has one central and one remote module, then it is not possible to have the remote module control carriers paired to central module control carriers that are in different cabinets.

Figure 12-10 is an example of how the module control carriers should be paired for a 2-module system. Figures 12-11 and 12-12 are examples of two possible configurations of how modules may be paired for two typical systems.

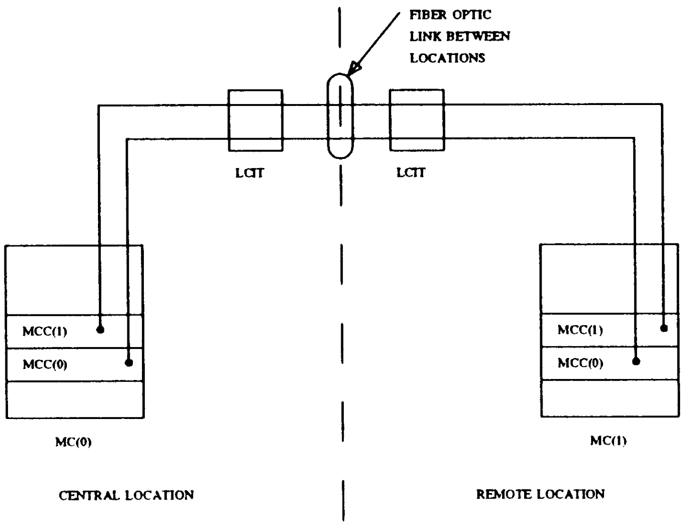


Figure 12-10. Assigned Module Control Carriers for a Duplicated System With One Central and One Remote Module (Phase 1)

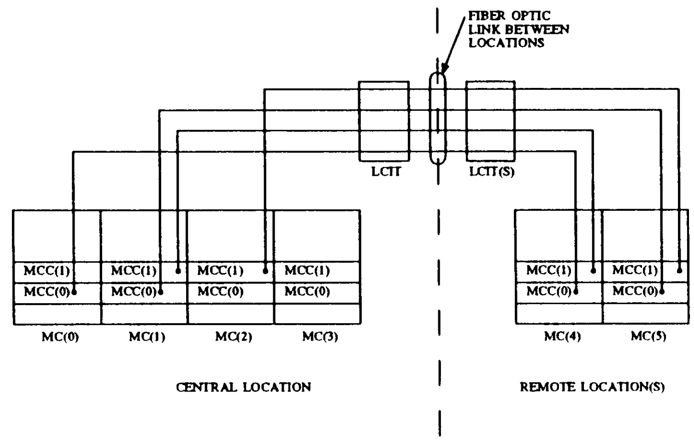


Figure 12-11. Assigned MC Carriers for a Duplicated System with Four Central and Two Remote Modules (Phase 1)

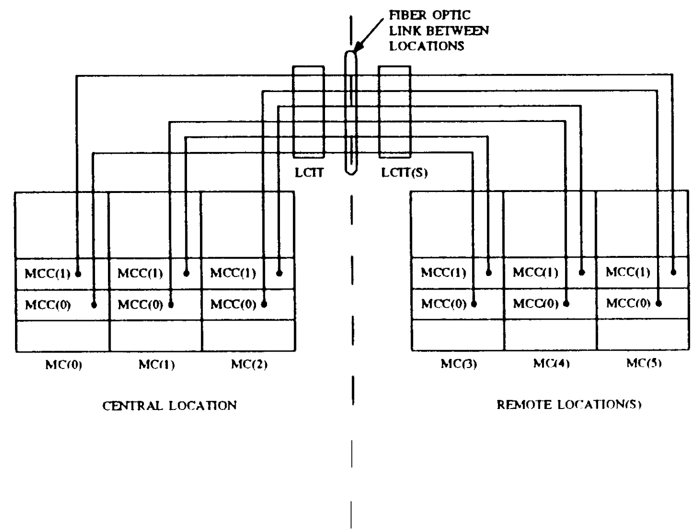


Figure 12-12. Assigned MC Carriers for a Duplicated System with Three Central and Remote Modules (Phase 1)

Phase 2

Each remotely located module control carrier must be assigned to a TN456 circuit pack located in an RMI carrier at the central location.

Unduplicated System

The unduplicated remote module control carriers are assigned TN456 circuit packs for the RMI carrier(s) in the following order to achieve a balanced load on the DC/DC converters: slot 00, 13, 01, 14, etc. Refer to table 12-2 for the assignment order.

TABLE 12-2. Assignment Order of TN456 Circuit Packs (Unduplicated Phase 2)

REMOTE MODULE NUMBER (NOTE)	RMI CARRIER	RMI SLOT NUMBER FOR MCC(00)
1	0	00
2	0	13
3	0	01
4	0	14
5	0	02
6	0	15
7	0	03
8	0	16
9	0	05
10	0	18
11	0	06
12	0	19
13	0	07
14	0	20
15	0	08
16	0	21
17	1	00
18	1	13
19	1	01
20	1	14
21	1	02
22	1	15
23	1	03
24	1	16
25	1	05
26	1	18
27	1	06
28	1	19
29	1	07
30	1	20

This is the number of the module at the remote locale, not the actual module number within the system.

Duplicated System

The duplicated remote module control carriers are assigned TN456 circuit packs for the RMI carrier(s) in the following order to achieve a balanced load on the DC/DC converters: slot 00, 13, 01, 14, etc. Refer to table 12-3 for the assignment order.

TABLE 12-3. Assignment Order of TN456 Circuit Packs (Duplicated Phase 2)

REMOTE MODULE NUMBER (NOTE)	RMI CARRIER	RMI SLOT NUMBER FOR MCC(00)	RMI SLOT NUMBER FOR MCC(01)
1	0	00	13
2	0	01	14
3	0	02	15
4	0	03	16
5	0	05	18
6	0	06	19
7	0	07	20
8	0	08	21
9	1	00	13
10	1	01	14
11	1	02	15
12	1	03	16
13	1	05	18
14	1	06	19
15	1	07	20
16	1	08	21
17	2	00	13
18	2	01	14
19	2	02	15
20	2	03	16
21	2	05	18
22	2	06	19
23	2	07	20
24	2	08	21
25	3	00	13
26	3	01	14
27	3	02	15
28	3	03	16
29	3	05	18
30	3	06	19

This is the number of the module at the remote locale, not the actual module number within the system.

Phase 3

Assign module numbers to the central and remote modules. Module numbers are first assigned at the central location (Module 0, Module 1, Module N) and then at the remote locate (Module N+1, Module N+2, etc.)

Each central module control carrier can support up to 7 remote modules. Remote modules can be either traditional or universal; the central module must be a universal type. Note that this configuration requires an AT&T DEFINITY Communications System Generic 2 version of the Common Control.

REMOTE MODULE INTERFACE (RMI) CABLING

Power down the common control, module control, and TMS cabinets that are associated with the RMI while the cabling and hardware additions are made to the central and remote locations. Become familiar with this section and the material that is needed to install the equipment. This effort will provide the shortest possible downtime. It is recommended that the cabling and hardware additions be done during low traffic times for minimum disruption to the customer, as the system will be down when power is removed.

Cable Connector Plates

Central Location Rear Connector Plates (Phases 1 and 2)

At the rear of the central traditional module control cabinet(s) associated with RMI, remove the original blank plate(s) (844172304). Install the new rear connector plate(s) (845416585). The connector plate(s) is required in the central module control cabinet for Phase 1 systems only.

Figure 12-13 is an example of the plate(s) and location(s). Two plates must be added for a duplicated system, and only one plate (lower) is added for an unduplicated system. The 845416585 plate mounts only on R2 cabinet frames. It will be necessary to loosen several connector plates in order to remove the blank plate(s) and install the new one(s). All plates should be secured to cabinet after the new plates are in place.

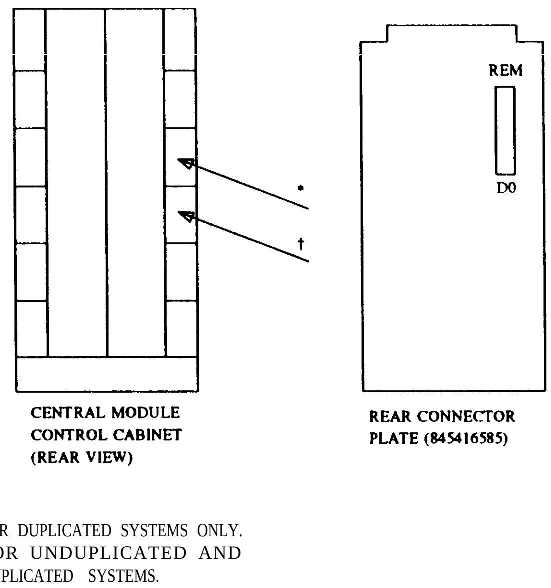


Figure 12-13. Rear Connector Plate (845416585) and Locations (Phase 1)

At the rear of the central TMS/RMI cabinet(s) associated with RMI, remove the original blank plate(s) (844172304). Install the new rear connector plate(s) (845416585). The connector plate(s) is required in the TMS/RMI cabinet for Phase 2 systems only. Figure 12-14 is an example of the plate(s) and location(s). One plate must be added for each RMI carrier in the TMS/RMI cabinet. The 845416585 plate mounts only on R2 cabinet frames. It will be necessary to loosen several connector plates in order to remove the blank plate(s) and install the new one(s). All plates should be secured to cabinet after the new plates are in place.

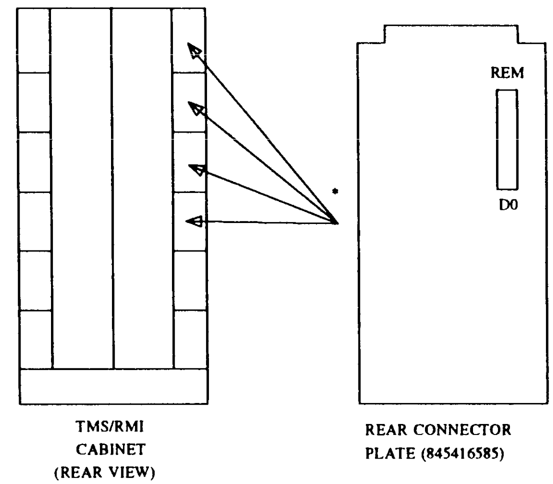


Figure 12-14. Rear Connector Plate (845416585) and Locations (Phase 2)

At the rear of the central module control cabinet(s) associated with RMI, remove the original blank plate(s) (844172304). Install a new rear connector plate (845416577). These connector plates are required for Phase 1 and Phase 2 systems. This plate is located near the level of the assembly unit. Figure 12-15 is an example of the plate and location. The 845416577 plate mounts only on R2 cabinet frames. It will be necessary to loosen several connector plates in order to remove the blank plate and install the new one. All plates should be secured to cabinet after the new plate is in place.

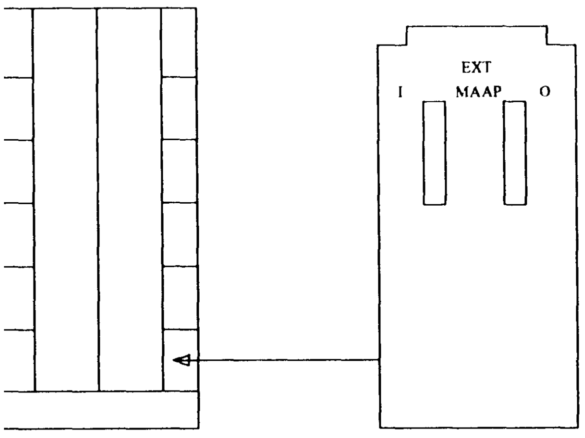


Figure 12-15. Rear Connector Plate (8454 16577) and Location (Phases 1 and 2)

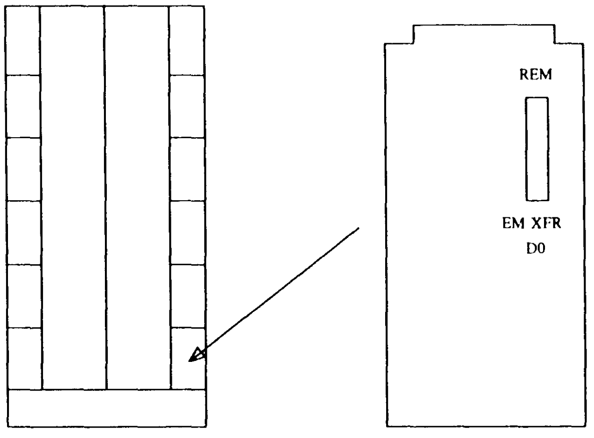


Figure 12-16. Rear Connector Plate (845417229) and Location (Phases 1 and 2)

Remote Location Rear Connector Plate (Emergency Transfer Phase 1 and 2)

If the new system has the option Remote Emergency Transfer, replace existing plate (844172420) at the rear of the remote module control cabinet(s) with connector plate(s) 845417229 in the location shown in figure 12-16. The connector plate(s) is required for Phase 1 and Phase 2 systems. The 845417229 plate mounts only on R2 cabinet frames. It will be necessary to loosen several connector plates to remove the blank plate and install the new one. All plates should be secured to the cabinet after the new plate is in place.

ED-1E469 Extended MAAP Brackets

Group 4 Central Extended MAAP Bracket (Phase 2-pre DEFINITY Generic 2)

Install ED-1E469, Group 4 Extended MAAP Bracket (figure 12-17) in each Phase 2 TMS/RMI cabinet equipped with an RMI carrier. When viewed from the rear of the cabinet, the bracket is mounted to the right of J58889V fan assembly shelf using the hardware provided.

The ED-1E469, Group 4 Extended MAAP Bracket has a circuit pack mounted on the back that is designated **ZAEY2.** This bracket and the circuit pack connections are described in the *Central Location Cabling* section.

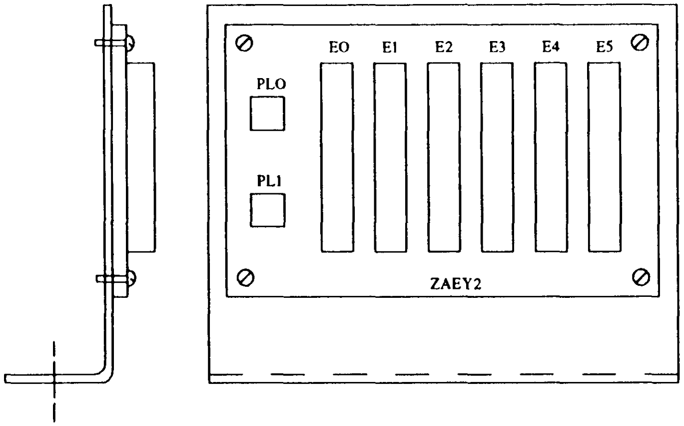


Figure 12-17. ED-1E469, Group 4 Central Extended MAAP Bracket (Phase 2)

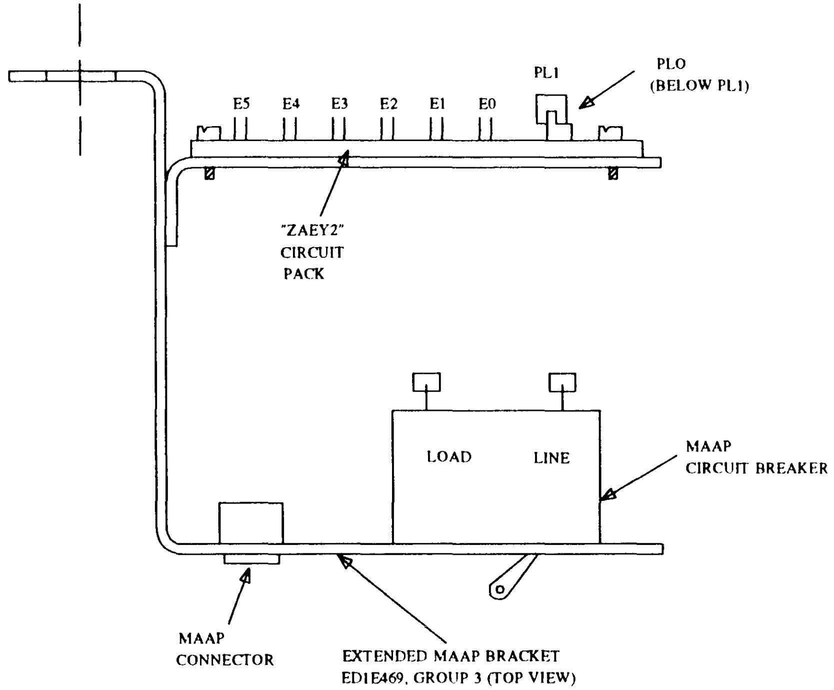


Figure 12-18. ED-1E469, Group 3 Central Extended MAAP Bracket (Phases 1 and 2)

Group 3 Central Extended MAAP Bracket (Phases 1 and 2 - pre DEFINITY Generic 2)

Install ED-1E469, Group 3 Extended MAAP Bracket (figure 12-18) in each Phase 1 central module control cabinet associated with RMI.

For Phase 2, this bracket is only required when a Phase 2 system is used in combination with a Phase 1 system. The bracket is placed in the Phase 1 central module control cabinets that have extended MAAP.

When viewed from the front of the cabinet, this bracket is mounted on the left cabinet upright as shown in figure 12-19 using the hardware provided.

The ED-1E469, Group 3 Extended MAAP Bracket has a circuit pack mounted on the back that is designated **ZAEY2.** This bracket and circuit pack connections are described in the *Central Location Cabling* section.

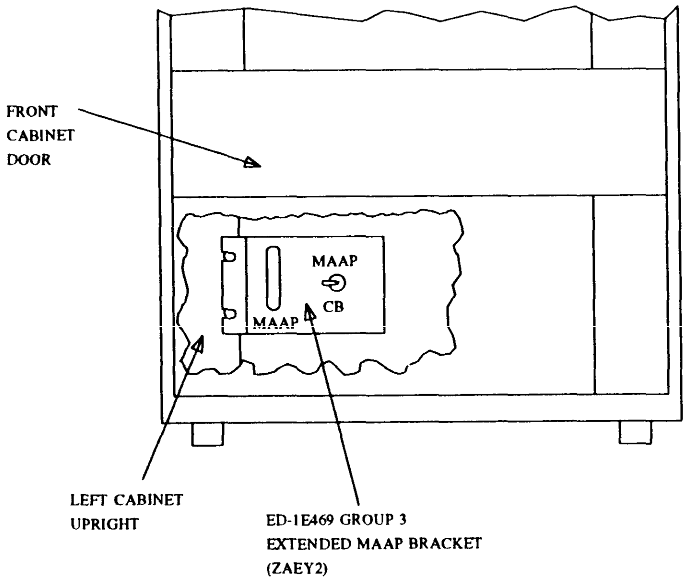


Figure 12-19. ED-1E469, Group 3 Central Extended MAAP Bracket Mounting Location

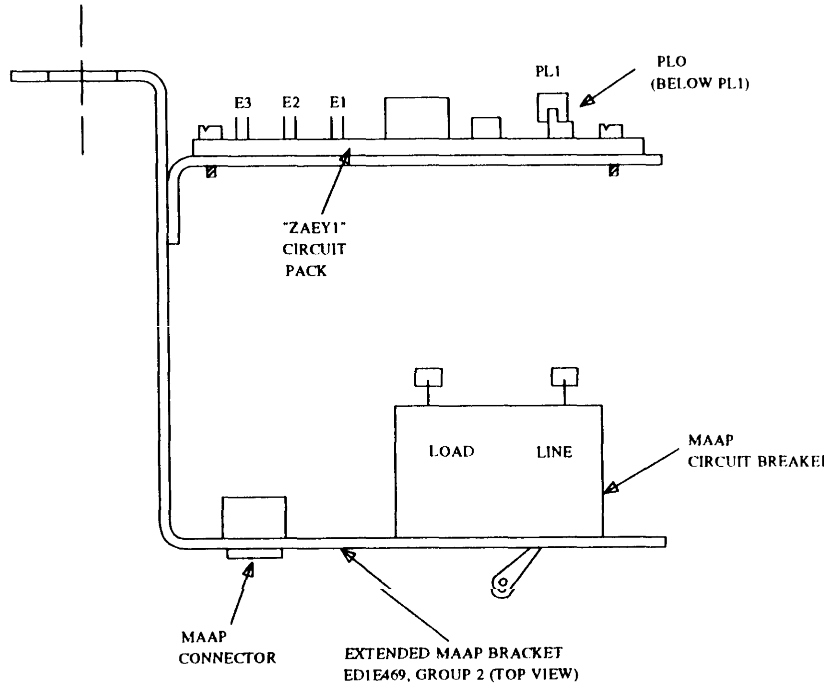


Figure 12-20. ED-1E469, Group 2 Remote Extended MAAP Bracket (Phases 1 and 2)

Group 2 Remote Extended MAAP Bracket (Phases 1 and 2 - pre DEFINITY Generic 2)

Install ED-1E469, Group 2 Extended MAAP Bracket (figure 12-20) in each Phase 1 or Phase 2 remote module control cabinet. When viewed from the front of the cabinet, this bracket is mounted on the left cabinet upright as shown in figure 12-21 using the hardware provided.

The ED-1E469, Group 2 Extended MAAP Bracket has a circuit pack mounted on the back that is designated **ZAEY1.** This bracket and the circuit pack connections are described in the *Remote Location Cabling* section.

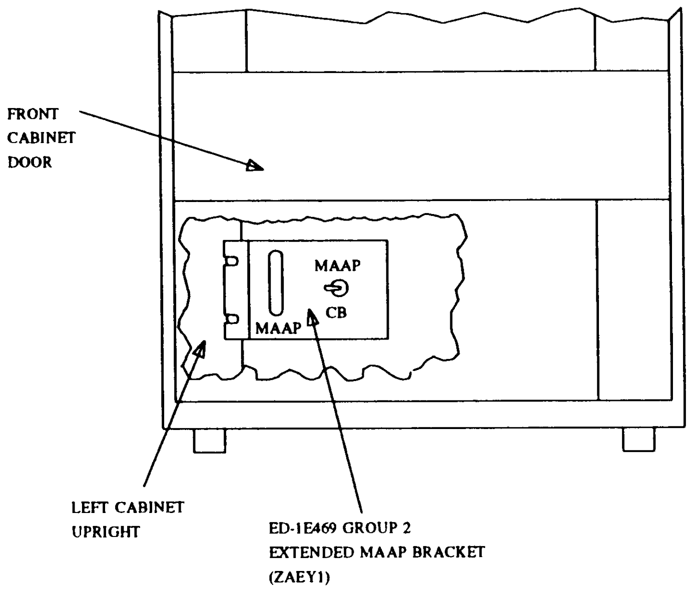


Figure 12-21. ED-1E469, Group 2 Remote Extended MAAP Bracket Mounting Location

Central Location Cabling (Phase 1)

ED-1E434, Group 133 Cable

Install the ED-1E434, Group 133 (figure 12-22) intracabinet cable(s) in the central traditional module control cabinet(s) associated with RMI as shown in table 12-4. These cables connect from the module control carrier backplane pins E56 to the inside of the rear connector **REM D0** on the plates (845416585) added as described in the *Cable Connector Plates* section. The connection for module control (01) is for duplicated systems only.

TABLE 12-4. ED-1E434, Group 133 Cable Connections (Phase 1)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control(00) Backplane	E56 (Slot 25)	Traditional Module Control (00) Connector Plate	REM D0
Traditional Module Control(01)* Backplane	E56 (Slot 25)	Traditional Module Control (01) Connector Plate	REM D0

* This cable is used for duplicated systems only.

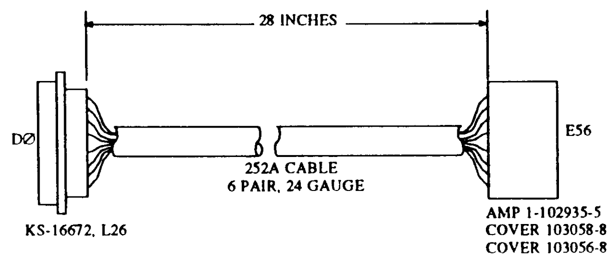


Figure 12-22. ED-1E434, Group 133 Cable

ED-1E434, Group 8 Cable (pre DEFINITY Generic 2 only)

Install the ED-1E434, Group 8 cable(s) (figure 12-23) from **E57** on the module control (01) backplane to connector **E2** on the ZAEY2 circuit pack (ED-1E469, Group 3 Extended MAAP Bracket) for each central module associated with RMI as shown in table 12-5. This cable is not required for an unduplicated system.

TABLE 12-5. ED- 1E434, Group 8 Cable Connection(s) (Phase 1)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control (01)* Backplane	E57 (Slot 25)	ZAEY2 (Extended MAAP Bracket)	E2

* This cable is used for duplicated systems only.

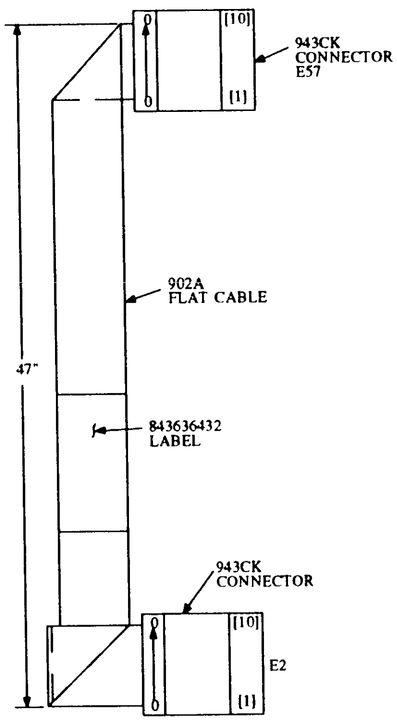


Figure 12-23. ED-1E434, Group 8 Cable

ED-1E434, Group 25 Cable (pre DEFINITY Generic 2 only)

Install the ED- 1E434, Group 25 cable(s) (figure 12-24) from **E57** on the module control ((K)) backplane to connector **E1** on the ZAEY2 circuit pack (ED- 1E469, Group 3 Extended MAAP Bracket) for" each central module associated with RMI as shown in table 12-6.

TABLE 12-6. ED-1E434, Group 25 Cable Connection(s) (Phase 1)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control (00) Backplane	E57 (Slot 25)	ZAEY2 (Extended MAAP Bracket)	E l

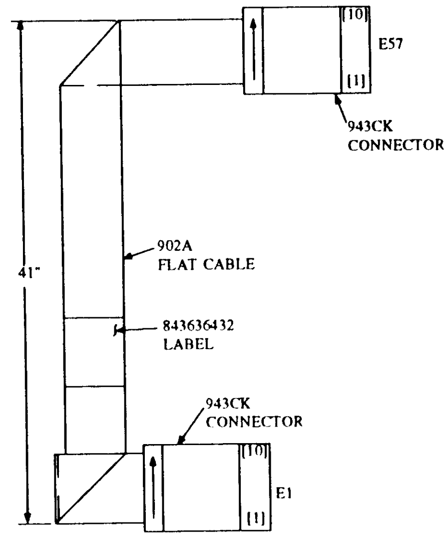


Figure 12-24. ED-1E434, Group 25 Cable

ED-1E434, Group 131 Cable (pre DEFINITY Generic 2 only)

Install the ED-1E434, Group 131 intracabinet cable(s) (figure 12-25) in the module control cabinet(s) associated with RMI as shown in table 12-7. This cable connects from **E5** on ZAEY2 of the Group 3 Extended MAAP Bracket to **EXT MAAP I** and **EXT MAAP 0** on the inside of the connector plate (8454 16577) added as described in the *Cable Connector Plates* section. This plate is located at the fan assembly level.

TABLE 12-7. ED-1E434, Group 131 Cable Connection (Phase 1)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
ZAEY2 (Extended MAAP Bracket)	E5	Connector Plate at Fan Assembly Level	EXT MAAP I,O

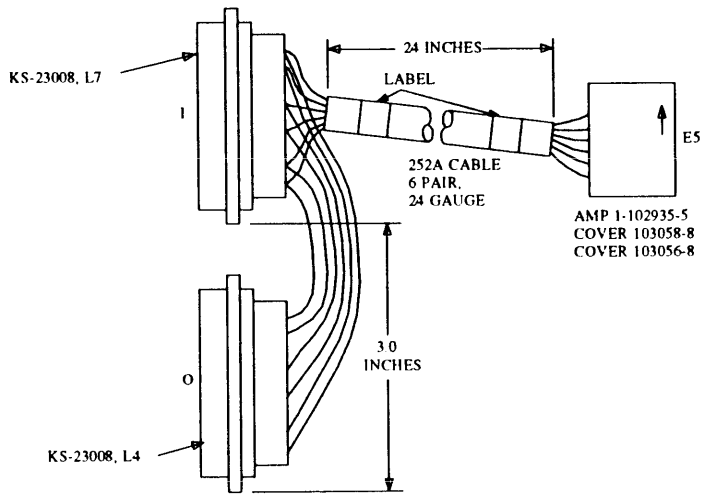


Figure 12-25. ED- 1E434, Group 131 Cable

ED-1E434, Group 132 Cable (pre DEFINITY Generic 2 only)

Connect ED-1E434, Group 132 cable (figure 12-26) from **MAAP** (backside of connector) to **E0** on the ED-1E469, Group 3 Extended MAAP Bracket (figure 12-18) as shown in table 12-8.

TABLE 12-8. ED-1E434, Group 132 Cable Connection (Phase 1)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
ED-1EA69 Group 3 (Extended MAAP Bracket)	MAAP	ZAEY2 (Extended MAAP Bracket)	E0

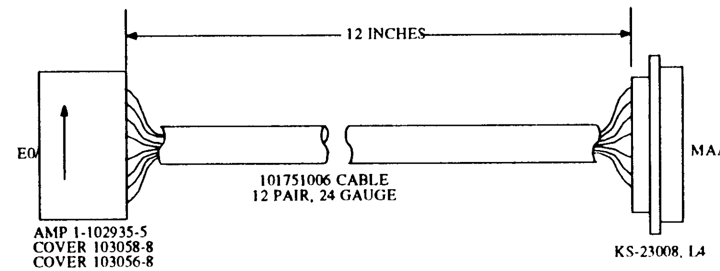


Figure 12-26. ED-1E434, Group 132 Cable

ED-1E434, Group 300 Cable (pre DEFINITY Generic 2 only)

Install the ED-1E434, Group 300 cables (figure 12-27) from the common control to the module control and TMS/RMI cabinets. These cables provide connections to daisy chain the extended MAAP feature.

The Group 300 cables run from **D5 (EXT MAAP)** on the common control cabinet to **EXT MAAP I** on the module control cabinet or TMS/RMI cabinet connector plate 845416577. Then another Group 300 cable is run from **EXT MAAP O** on the same connector plate to **EXT**

MAAP I on the next module control or TMS/RMI cabinet. This process is repeated until all the module control and TMS/RMI cabinets that require the extended MAAP feature are connected. After the last cabinet is connected, a ED-1E434, Group 344 terminating plug is required in connector **EXT MAAP O** of the last connector plate 845416577.

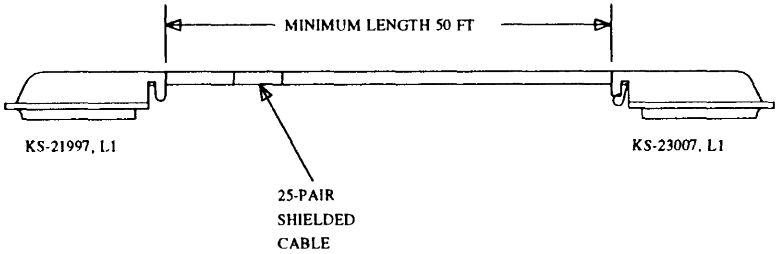


Figure 12-27. ED-1E434, Group 300 Cable

ED-1E434, Group 84 Coaxial Cabling (Phase 1)

NOTE: For Phase 3 4-MHz Cabling, see chapter 25.

Connect the ED-1E434, Group 84 intercabinet coaxial cable(s) (figure 12-28) from the common control backplane(s) to the traditional module control backplane(s). Figure 12-29 illustrates the connections for an all unduplicated system. Figure 12-30 illustrates the typical connections for an all duplicated system; while figure 12-31 shows the connections for a typical system with duplicated common control and unduplicated module control. Route the cable between the cabinets through the duct work (use the shielded intercabinet duct for flat cables). The B and D legs are not used in an all unduplicated system, or a duplicated common control and unduplicated module control. The B and D legs should be coiled and stored in the cable duct (if space permits). Use the Customer System Document (CSD) and tables 12-9, 12-10, and 12-11 to determine the backplane pin locations used at the common control and the leg(s) of the cable that is to be connected at each module control.

Use tables 12-9, 12-10, and 12-11 to determine this association by looking up the remote module number (to be paired with a central module) to find the appropriate common control backplane connector(s) and the leg that is used for the central module control.

The first column in tables 12-9, 12-10, and 12-11 is the remote module number. This is not the number the module is assigned within the total system, but is the number assigned the remote module. The first remote module may be the sixth module within the system. For example, if your remote module being installed is the fourth remote module in the system, then for an all unduplicated system, a cable will run from **E8** on the common control backplane to **B04** on the module control backplane using leg C. However, for an all duplicated system, the cable will run from **E8** on both common control backplanes to **B03** and **B04** on both the module control backplanes using legs C and D.

For a duplicated common control and unduplicated module control system, the cable will run from **E8** on both common controls. Leg A from CC0 will connect to **B04,** while leg A of CC1 will connect to **B03** of the same module control carrier. Leg B of each cable is connected in the same manner to the next module. Legs C and D are not used, and should be stored. Repeat this process for each central module control that is being linked to a remote module.

A Group 89 cable can be used to extend each leg of the Group 84 cable. The combined length of Groups 84, and 89 cables must be a maximum of 200 feet. The maximum length of the unused Group 84 cable must be no more than 8 feet. In addition, to connect a Group 501 cable to a traditional module control carrier, a Group 502 adapter is required. The combined maximum length of Group 501 and 502 cables must be no more than 200 feet.

An existing Group 84 or 501 cable can be used if its unused legs are not dead-dressed or cut off.

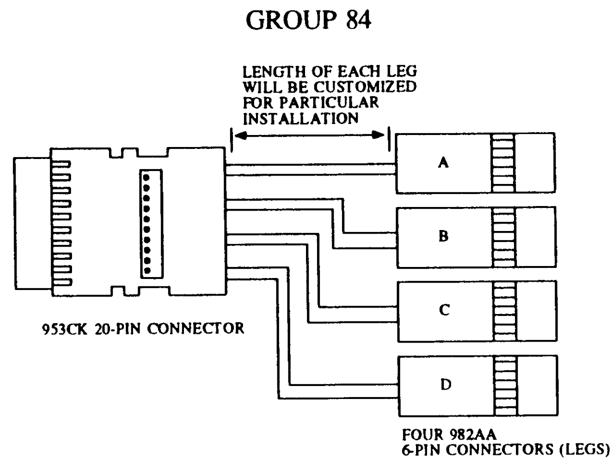


Figure 12-28. ED-1E434, Coaxial Cables

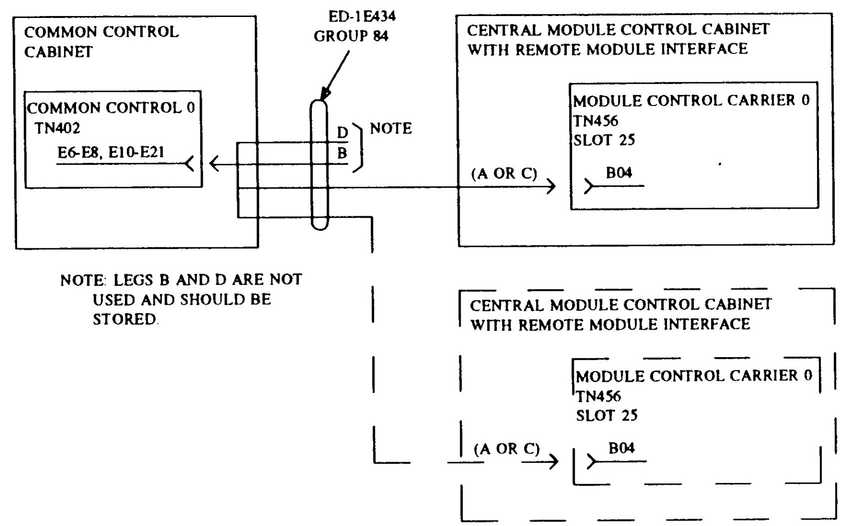


Figure 12-29. ED-1E434, Group 84 Connections for an All Unduplicated System (Phase 1)

TABLE 12-9. ED-1E434, Group 84 Connections for an All Unduplicated System (Phase 1)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 84)	CONNECTOR
01	E7	A	B04
02		C	B04
03	E8	A	B04
04		C	B04
05	E6	A	B04
06		C	B04
07	E13	A	B04
08		C	B04
09	E11	A	B04
10		C	B04
11	E12	A	B04
12		C	B04
13	E10	A	B04
14		C	B04
15	E17	A	B04
16		C	B04
17	E15	A	B04
18		C	B04
19	E16	A	B04
20		C	B04
21	El4	A	B04
22		C	B04
23	E2l	A	B04
24		C	B04
25	E19	A	B04
26		C	B04
27	E20	A	B04
28		C	B04
29	E18	A	B04
30		C	B04

This is the number of the module at the remote locale, not the actual module number within the system.

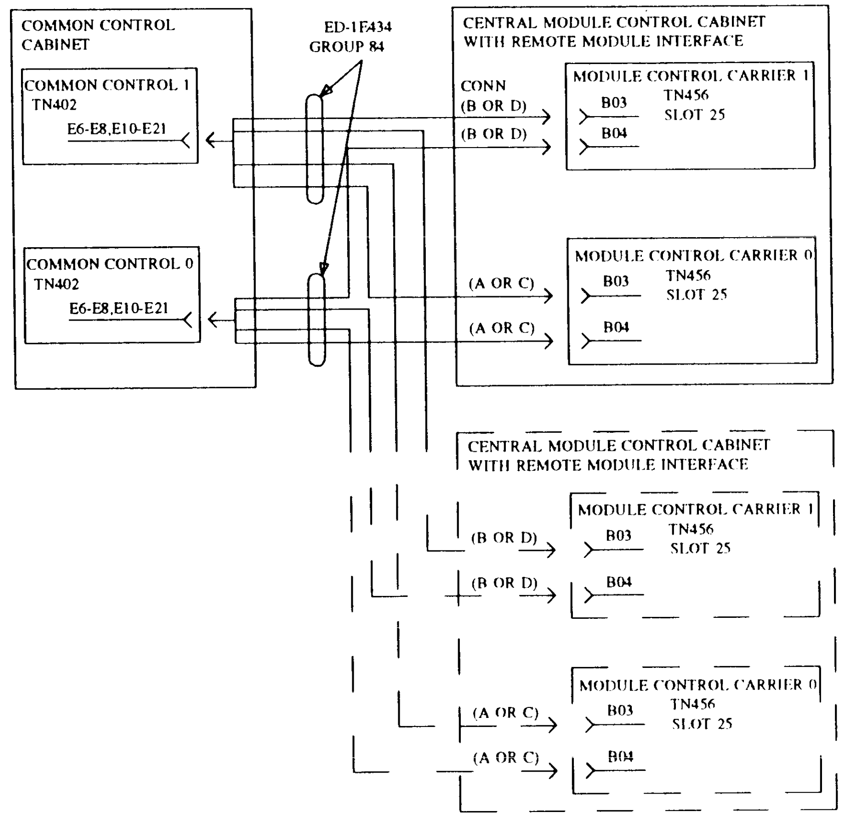


Figure 12-30. ED-1E434, Group 84 Connections for an All Duplicated System (Phase 1)

TABLE 12-10. ED-1E434, Group 84 Connections for an All Duplicated System (Phase 1)

REMOTE MODULE (NOTE)	COMMON CONTROL(00) AND (01) BACKPLANE CONNECTOR	MODULE CONTROL LEGS (GROUP 84)	CONNECTOR
01 02	E 7	A and B C and D	B04 B03
03 04	E8	A and B C and D	B04 B03
05 06	E6	A and B C and D	B04 B03
07 08	E13	A and B C and D	B04 B03
09 10	Ell	A and B C and D	B04 B03
11 12	E12	A and B C and D	B04 B03
13 14	E10	A and B C and D	B04 B03
15 16	E17	A and B C and D	B04 B03
17 18	E15	A and B C and D	B04 B03
19 20	E16	A and B C and D	B04 B03
21 22	El4	A and B C and D	B04 B03
23 24	E21	A and B C and D	B04 B03
25 26	E19	A and B C and D	B04 B03
27 28	E20	A and B C and D	B04 B03
29 30	E18	A and B C and D	B04 B03

This is the number of the module at the remote locale. not the actual module within the system.

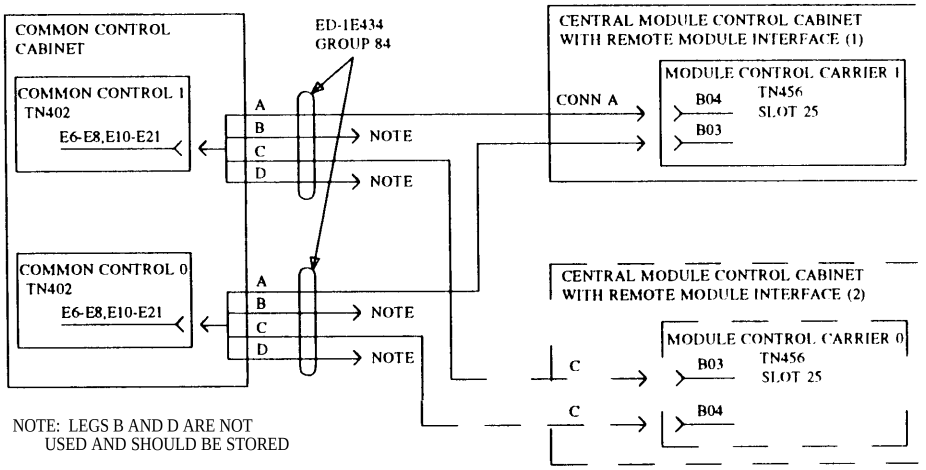


Figure 12-31. ED-1E434, Group 84 Connections for an all Duplicated Common Control and Unduplicated Module Control System (Phase 1)

TABLE 12-11. ED-1E434, Group 84 Connections for an all Duplicated Common Control and Unduplicated Module Control System (Phase 1)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 84)	CONNECTOR	REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 84)	CONNECTOR
01	E7(0) E7(1)	A A	B04 B03	16	E17(0) E17(1)	C C	B04 B03
02	E7(0) E7(1)	C C	B04 B03	17	E15(0) E15(l)	A A	B04 B03
03	E8(0) E8(1)	A A	B04 B03	18	E15(0) E15(l)	C C	B04 B03
04	E8(0) E8(1)	C C	B04 B03	19	E16(0) E16(1)	A A	B04 B03
05	E6(0) E6(1)	A A	B04 B03	20	E16(0) E16(1)	C C	B04 B03
06	E6(0) E6(1)	C C	B04 B03	21	E14(0) E14(1)	A A	B04 B03
07	E13(0) E13(1)	A A	B04 B03	22	E14(0) E14(1)	C C	B04 B03
08	E13(0) E13(1)	C C	B04 B03	23	E21(0) E21(1)	A A	B04 B03
09	El1(0) El1(l)	A A	B04 B03	24	E21(0) E21(1)	C C	B04 B03
10	El1(0) E11(l)	C C	B04 B03	25	E19(0) E19(1)	A A	B04 B03
11	E12(0) E12(1)	A A	B04 B03	26	E19(0) E19(1)	C C	B04 B03
12	E12(0) E12(1)	C C	B04 B03	27	E20(0) E20(1)	A A	B04 B03
13	E10(0) E10(1)	A A	B04 B03	28	E20(0) E20(1)	C C	B04 B03
14	El0(0) El0(l)	C C	B04 B03	29	E18(0) E18(1)	A A	B04 B03
15	E17(0) E17(1)	A A	B04 B03	3 0	E18(0) E18(1)	C C	B04 B03

This is the number of the module at the remote locale, not the actual module number within the system

Loose Wiring

Install the cable connections in the traditional module control cabinet as shown in table 12-12. These connections are needed to connect the ZAEY2 circuit pack to the bus bar -48V and bus-bar ground through the MAAP circuit breaker.

TABLE 12-12. Loose Wiring Connections (Phase 1)

ORIGINATION	CONNECTOR	CABLE	DESTINATION	CONNECTOR
MAAP Circuit Breaker	“Line Side”	GROUP 4 H600-161	BUS BAR -48V	N/A
ZAEY2 (Extended MAAP Bracket)	PL1	GROUP 5 H600-161	BUS BAR GRD	N/A
ZAEY2 (Extended MAAP Bracket)	PL0	GROUP 6 H600-161	MAAP Circuit Breaker	“Load Side”

Central Location Cabling (Phase 2)

ED-1E434, Group 133 Cable

Install the ED-1E434, Group 133 (figure 12-32) intracabinet cable(s) in the TMS/RMI cabinet(s) that is equipped with an RMI carrier, as shown in table 12-13. These cables connect from the remote module carrier backplane pins **E06** to the inside of the rear connector **REM D0** on the plates (8454 16585) added as described in the *Cable Connector Plates* section.

TABLE 12-13. ED-lE434, Group 133 Cable Connections (Phase 2)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
RMI Carrier Backplane (Position 00)*	E06	RMI Carrier (00) Connector Plate	REM D0
RMI Carrier Backplane (Position 01)*	E06	RMI Carrier (01) Connector Plate	REM D0
RMI Carrier Backplane (Position 02)*	E06	RMI Carrier (02) Connector Plate	REM D0
RMI Carrier Backplane (Position 03)*	E06	RMI Carrier (03) Connector Plate	REM D0

* Used only if RMI carrier is equipped in that position.

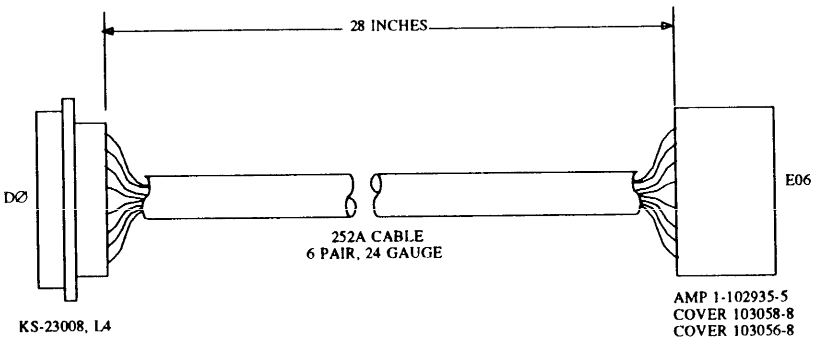


Figure 12-32. ED-1E434, Group 133 Cable

ED-1E434, Group 9, 137, 138, and 139 Cables (pre DEFINITY Generic 2 only)

Install the ED-1E434, Group 9, 137, 138, and 139 cables (figure 12-33) from **E07** on the RMI carrier(s) backplane to connector **E1, E2, E3,** and **E4** on the ZAEY2 circuit pack (ED-1E469, Group 4 Extended MAAP Bracket) as shown in table 12-14. One cable connection is made for each RMI carrier.

TABLE 12-14. ED- 1E434, Group 9, 137, 138, and 139 Cable Connections (Phase 2)

ORIGINATION	CONNECTOR	GROUP	DESTINATION	CONNECTOR
RMI Carrier Backplane [Position 00)*	E07	9	ZAEY2 (Extended MAAP Bracket)	E1
RMI Carrier Backplane (Position 01)*	E07	137	ZAEY2 (Extended MAAP Bracket)	E2
RMI Carrier Backplane (Position 02)*	E07	138	ZAEY2 (Extended MAAP Bracket)	E3
RMI Carrier Backplane (Position 03)*	E07	139	ZAEY2 (Extended MAAP Bracket)	E4

* Used only if RMI carrier is equipped in that position

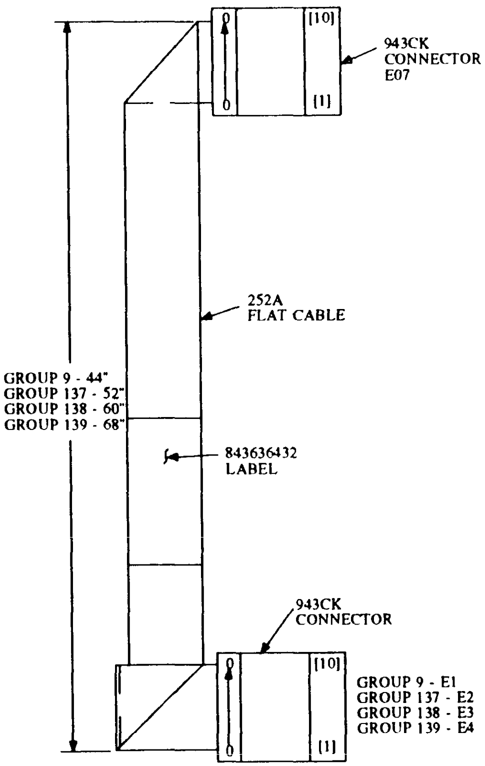


Figure 12-33. ED-1E434, Group 9, 137, 138, and 139 Cable

ED-1E434, Group 131 Cable (pre DEFINITY Generic 2 only)

Install the ED-1E434, Group 131 intracabinet cable(s) (figure 12-34) in the TMS/RMI cabinet(s) as shown in table 12-15. This cable connects from **E5** on ZAEY2 of the Group 4 Extended MAAP Bracket to **EXT MAAP I** and **EXT MAAP O** on the inside of the connector plate (8454 16577) added as described in the *Cable Connector Plates* section. This plate is located at the fan assembly level.

TABLE 12-15. ED-lE434, Group 131 Cable Connection (Phase2)

ORIGINATION	CONNECTOR	DESTINATION	CONECTOR
ZAEY2 (Extended MAAP Bracket)	E5	Connector Plate at Fan Assembly Level	EXT MAAP I,O

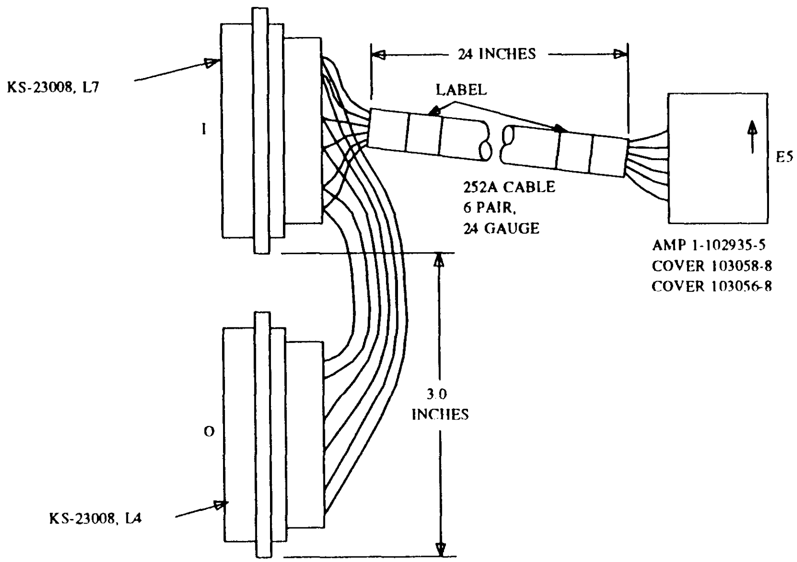


Figure 12-34. ED-1E434, Group 131 Cable

ED-1E434, Group 200 Cable

Install the ED-1E434, Group 200 cables (figure 12-35) from the RMI carrier backplane to the backplane of the central module(s) selected to provide the on-line and maintenance signals to the RMI carrier. Connect the cables from **E00, E01, E02,** and **E03** on the RMI carrier backplane to the next available electrical port on the designated module control carrier(s) (table 12- 16).

TABLE 12-16. ED-1E434, Group 200 Cable Connection (Phase 2)

RMI Carrier Connector		E00	E01*	E02	E03*
Module Control carrier		00	01	00	01
Electrical Port Number	1	E35	E35	E04	E04
	2	E32	E32	E09	E09
	3	E34	E34	E08	E08
	4	E37	E37	E13	E13
	5	E39	E39	E12	E12
	6	E36	E36	E17	E17
	7	E38	E38	E16	E16
	8	E41	E41	E21	E21
	9	E43	E43	E20	E20
	10	E40	E40	E25	E25
	11	E42	E42	E24	E24

* RMI Carrier Connector E01 and E03 are used for Duplicated Systems only.

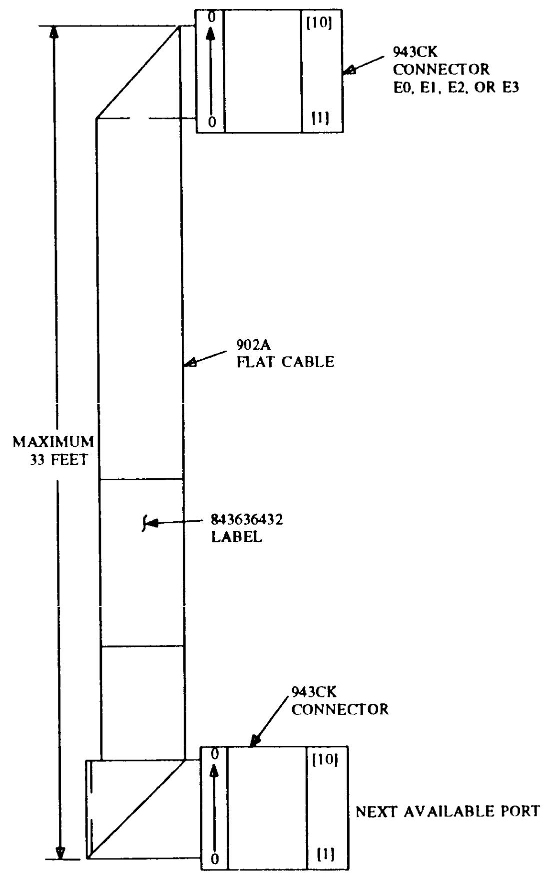


Figure 12-35. ED-1E434, Group 200 Cable

ED-1E434, *Group 300 Cable (pre DEFINITY Generic 2 only)*

Install the ED-1E434, Group 300 cables (figure 12-36) from the common control to the module control and TMS/RMI cabinets. These cables provide connections to daisy chain the extended MAAP feature. Al1

TMS/RMI cabinets with the RMI carrier will require the daisy chain MAAP cabling.

The Group 300 cables run from **D5** (EXT MAAP) on the common control cabinet to **EXT MAAP I** on the module control cabinet or TMS/RMI cabinet connector plate 845416577. Then another Group 300 cable is run from **EXT MAAP O** on the same connector plate to **EXT MAAP I** on the next module control or TMS/RMI cabinet. This process is repeated until all the module control and TMS/RMI cabinets that require the extended MAAP feature are connected. After the last cabinet is connected, a ED-1E434, Group 344 terminating plug is required in connector **EXT MAAP O** of the last connector plate 845416577.

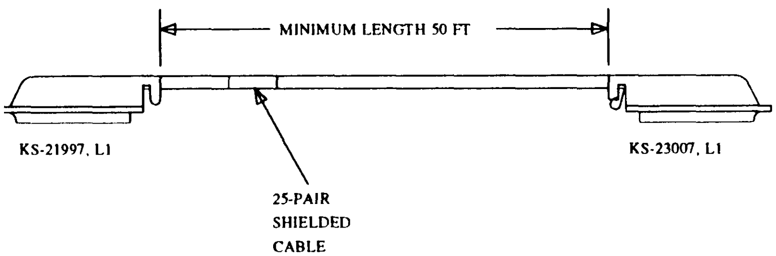


Figure 12-36. ED-1E434, Group 300 Cable

ED-1E434, Group 84 Coaxial Cabling

Connect the ED-1E434, Group 84 intercabinet coaxial cable(s) (figure 12-37) from the common control backplane(s) to the RMI carrier backplane(s) Figure 12-38 illustrates the connections for an all unduplicated system. Figure 12-39 illustrates the connections for a typical all duplicated system, while figure 12-40 shows the connections for a typical system with duplicated common control and unduplicated module control. Route the cable between the cabinets through the duct work (use the shielded intercabinet duct for flat cables). The B and D legs are not used in an all unduplicated or a duplicated common control and unduplicated module control system and should be coiled and stored in the cable duct (if space permits).

Use the Customer System Document (CSD) and tables 12-17, 12-18, and 12-19 to determine the backplane pin locations used at the common control and the backplane pin locations used at the RMI carrier. These tables should also be used to determine the legs that are used at the RMI carrier. This association can be determined by looking up the remote module number to find the appropriate common control backplane connector(s) and the leg that is used for the RMI carrier.

The first column in tables 12-17, 12-18, and 12-19 is the remote module number. This is not the number the module is assigned within the total system, but the number assigned to the remote module. The first remote module may be the sixth module within the system. For example, if your remote module being installed is the fourth in the system, then for an all unduplicated system a cable will run from **E8** on the common control backplane to **B18** on the RMI carrier backplane using leg C. However, for an all duplicated system, the cable will run from **E8** on both common control backplanes to **B06, B07, B22,** and **B23** on the RMI carrier (00) backplane using legs C and D off of each cable. For a duplicated common control and unduplicated module control system, the Group 84 cable will run from **E08** on both common controls. Leg C will connect to **B06** of the RMI carrier with leg C of the other common control running to **B22** on the same RMI carrier. Leg A of both cables will have been used previously on the third remote module. Repeat this process for each central module control that is being linked to a remote module.

A cable Group 89 can be used to extend each leg of the Group 84 cable. The combined length of Groups 84 and 89 must be a maximum of 200 feet. There may be unused legs for a Group 84 cable if connections are not needed for a succeeding module to the RMI carrier. In addition to connect a Group 501 cable leg to a RMI carrier in a MOLEX H-600-217, G1, adapter is requested.

An existing Group 84 cable can be used if its unused legs are not dead-dressed or cut off.

GROUP 84

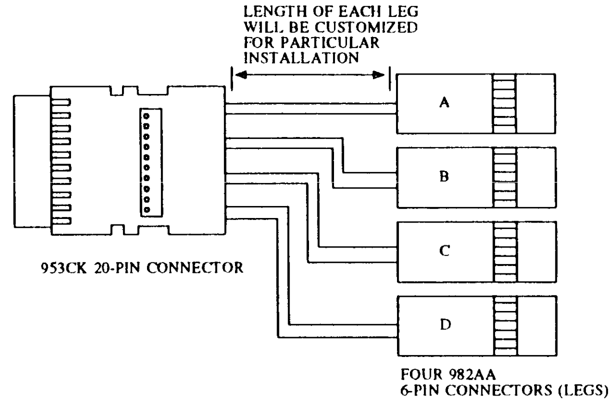
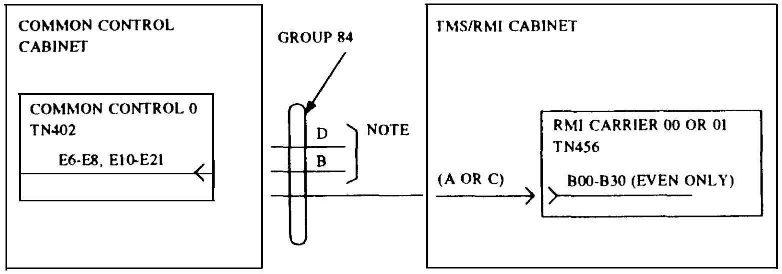


Figure 12-37. ED-1E434, Group 84 Coaxial Cable



NOTE: LEGS B AND D ARE NOT USED AND SHOULD BE STORED

Figure 12-38. ED-1E434, Group 84 Connections for an Unduplicated System (Phase 2)

TABLE 12-17. ED-1E434, Group 84 Connections for an Unduplicated System (Phase 2)

REMOTE MODULE NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 84)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR
01 02	El	A C	00 00	00 13	B00 B16
03 04	E8	A C	00 00	01 14	B02 B18
05 06	E6	A C	00 00	02 15	B04 B20
07 08	E13	A C	00 00	03 16	B06 B22
09 10	Ell	A C	00 00	05 18	B08 B24
11 12	E12	A C	00 00	06 19	B10 B26
13 14	E10	A C	00 00	07 20	B12 B28
15 16	E17	A C	00 00	08 21	B14 B30
17 18	E15	A C	01 01	00 13	B00 B16
19 20	E16	A C	01 01	01 14	B02 B18
21 22	E14	A C	01 01	02 15	B04 B20
23 24	E21	A C	01 01	03 16	B06 B22
25 26	E19	A C	01 01	05 18	B08 B24
27 28	E20	A C	0I 01	06 19	B10 B26
29 30	E18	A C	01 01	07 20	B12 R28

This is the number of the module at the remote locale, not the actual module number within the system.

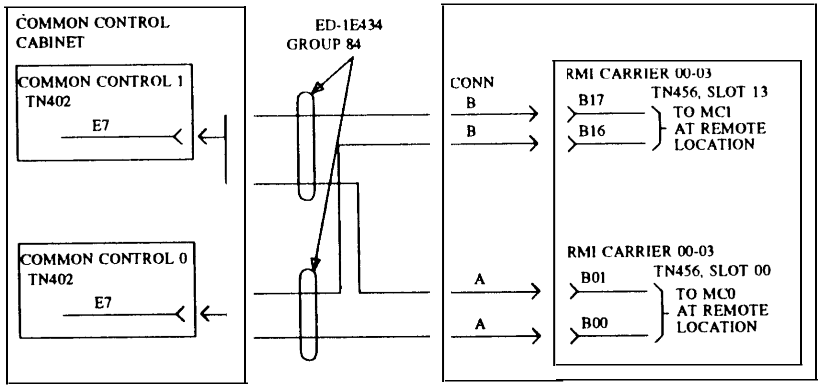


Figure 12-39. ED-1E434, Group 84 Connections for a Duplicated System (Phase 2)

TABLE 12-18. ED-1E434, Group 84 Connections for a Duplicated System (Phase 2) (Part 1 of 2)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEGS (GROUP 84)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS
01	00 and 01	E7	A	00	00	B00 and B01
		E7	B	00	13	316 and B17
02		E7	C	00	01	B02 and B03
		E7	D	00	14	B18 and B19
03	00 and 01	E8	A	00	02	B04 and B05
		E8	B	00	15	B20 and B21
04		E8	C	00	03	B06 and B07
		E8	D	00	16	B22 and B23
05	00 and 01	E6	A	00	05	B08 and B09
		E6	B	00	18	B24 and B25
06		E6	C	00	06	B10 and B11
		E6	D	00	19	B26 and B27
07	00 and 01	E13	A	00	07	B12 and B13
		E13	B	00	20	B28 and B29
08		E13	C	00	08	B14 and B15
		E13	D	00	21	B30 and B31
09	00 and 01	E11	A	01	00	B00 and B01
		Ell	B	01	13	B16 and B17
10		Ell	C	01	01	B02 and B03
		E11	D	01	14	B18 and B19
11	00 and 01	E12	A	01	02	B04 and B05
		E12	B	01	15	B20 and B21
12		E12	C	01	03	B06 and B07
		E12	D	01	16	B22 and B23
13	00 and 01		A	01	05	B08 and B09
		E10	B	01	13	B24 and B25
14		E10	C	01	06	B10 and B11
		E10	D	01	19	B26 and B27
15	00 and 01	E17	A	01	07	B12 and B13
		E17	B	01	20	B28 and B29
16		E17	c	01	08	B14 and B15
		E17	D	01	21	B30 and B31

This is the number of the module at the remote locale, not the actual module number within the system.

TABLE 12-18. ED-1E434, Group 84 Connections for a Duplicated System (Phase 2) (Part 2 of 2)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEGS (GROUP 84)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS
17	00 and 01	E15	A	02	00	B00 and B01
		E15	B	02	13	B16 and B17
18		E15	C	02	01	B02 and B03
		E15	D	02	14	B18 and B19
19	00 and 01	E16	A	02	02	B04 and B05
		E16	B	02	15	B20 and B21
20		E16	C	02	03	B06 and B07
		E16	D	02	16	B22 and B23
21	00 and 01	E14	A	02	05	B08 and B09
		E14	B	02	18	B24 and B25
22		E14	C	02	06	B10 and B11
		E14	D	02	19	B26 and B27
23	00 and 01	E21	A	02	07	B12 and B13
		E21	B	02	20	B28 and B29
24		E21	C	02	08	B14 and B15
		E21	D	02	21	B30 and B31
25	00 and 01	E19	A	03	00	B00 and B01
		E19	B	03	13	B16 and B17
26		E19	C	03	01	B02 and B03
		E19	D	03	14	B18 and B19
27	00 and 01	E20	A	03	02	B04 and B05
		E20	B	03	15	B20 and B21
28		E20	C	03	03	B06 and B07
		E20	D	03	16	B22 and B23
29	00 and 01	E18	A	03	05	B08 and B09
		E18	B	03	18	B24 and B25
30		E18	C	03	06	B10 and B11
		E18	D	03	19	B26 and B27

This is the number of the module at the remote locale, not the actual module number within the system.

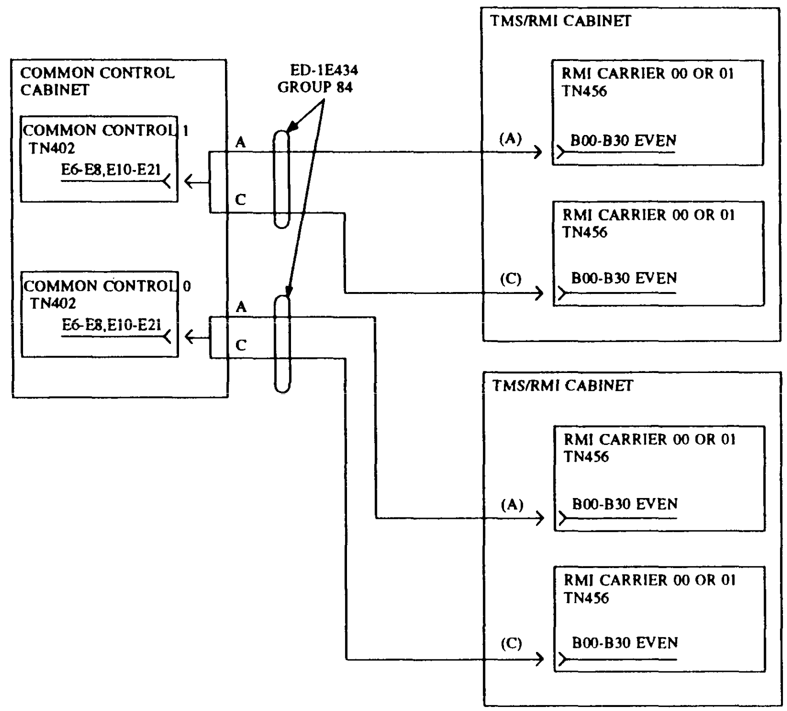


Figure 12-40. ED-1E434, Group 84 Connections for a Duplicated Common Control and Unduplicated Module Control System (Phase 2)

TABLE 12-19. ED-1E434, Group 84 Connections for a Duplicated Common Control and Unduplicated Module Control System (Phase 2)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEG (GROUP 84)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR	REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEG (GROUP 84)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR
01	00	E 7	A	00	00	B00	17	00	E15	A	02	00	B00
	01	E 7	A	00	00	B01		01	E15	A	02	00	B01
02	00	E 7	C	00	13	B16	18	00	E15	C	02	13	B16
	01	E 7	C	00	13	B17		01	E15	C	02	13	B17
03	00	E 8	A	00	01	B02	19	00	E16	A	02	01	B02
	01	E 8	A	00	01	B03		01	E16	A	02	01	B03
04	00	E 8	C	00	14	B18	20	00	E16	C	02	14	B18
	01	E 8	C	00	14	B19		01	E16	C	02	14	B19
05	00	E 6	A	00	02	B04	21	00	E14	A	02	02	B04
	01	E 6	A	00	02	B05		01	E14	A	02	02	B05
06	00	E 6	C	00	15	B20	22	00	E14	C	02	15	B20
	01	E 6	C	00	15	B21		01	E14	C	02	15	B21
07	00	E13	A	00	03	B06	23	00	E21	A	02	03	B06
	01	E13	A	00	03	B07		01	E21	A	02	03	B07
08	00	E13	C	00	16	B22	24	00	E21	C	02	16	B22
	01	E13	C	00	16	B23		01	E21	C	02	16	B23
09	00	E11	A	01	00	B00	25	00	E19	A	03	00	B00
	01	E11	A	01	00	B01		01	E19	A	03	00	B01
10	00	E11	C	01	13	B16	26	00	E19	C	03	13	B16
	01	E11	C	01	13	B17		01	E19	C	03	13	B17
11	00	E12	A	01	01	B02	27	00	E20	A	03	01	B02
	01	E12	A	01	01	B03		01	E20	A	03	01	B03
12	00	E12	C	01	14	B18	28	00	E20	C	03	13	B18
	01	E12	C	01	14	B19		01	E20	C	03	13	B19
13	00	E10	A	01	02	B04	29	00	E18	A	03	02	B04
	01	E10	A	01	02	B05		01	E18	A	03	02	B05
14	00	E10	C	01	15	B20	30	00	E18	C	03	15	B20
	01	E10	C	01	15	B21		01	E18	C	03	15	B21
15	00	E17	A	01	03	B06							
	01	E17	A	01	03	B07							
16	00	E17	C	01	16	B22							
	01	E17	C	01	16	B23							

This is the number of the module at the remote locale. not the actual module number within the system

Central Location Cabling (Phase 3)

NOTE	See chapter 25.

Remote Location Cabling (Phases 1 and 2)

ED-1E434, Group 97 Cable

This cable is required for all R2V1-R2V4 installations. It is only required for DEFINITY Generic 2 if' the system has emergency transfer and alarm signals from a remote location to the central location.

Install the ED-1E434, Group 97 cable(s) (figure 12-41) from **E56** on the module control (00) backplane to connector **El** on the ZAEY1 circuit pack (ED-1E469, Group 2 Extended MAAP Bracket) for each remote module, as shown in table 12-20.

TABLE 12-20. ED-1E434, Group 97 Cable Connection(s) (phases 1 and 2)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control(C00) Backplane	E56	ZAEY1 (Extended MAAP Bracket)	El

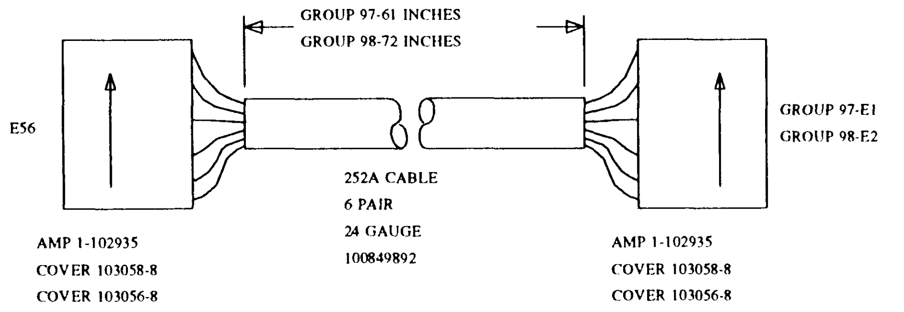


Figure 12-41. ED-1E434, Group 97 and 98 Cable

ED-1E434, Group 98 Cable

This cable is required for all R2V1-R2V4 installations. It is only required for DEFINITY Generic 2 if the system has emergency transfer and alarm signals from a remote location to the central location.

Install the ED-1E434, Group 98 cable(s) (figure 12-41) from **E56** on the module control (01) backplane to connector **E2** on the ZAEY1 circuit pack (ED-1E469, Group 2 Extended MAAP Bracket) for each remote module as shown in table 12-21. This cable is not required for an unduplicated system.

TABLE 12-21. ED-1E434, Group 98 Cable Connection(s) (Phases 1, and 2)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control (01)* Backplane	E56	ZAEY1 (Extended MAAP Bracket)	E2

* This cable is used for duplicate systems only.

ED-1E434, Group 93 Cable

This cable is required for all R2V1-R2V4 installations. It is only required for DEFINITY Generic 2 if the system has emergency transfer and alarm signals from a remote location to the central location.

Install the ED-1E434, Group 93 cables (figure 12-42) from **E3** on the ZAEY1 circuit pack (ED-1E469, Group 2 Extended MAAP Bracket) to **D0 (REM) EMER XFER** on the Remote Emergency Transfer Plate (845417229) as shown in table 12-22. This connection is made on the inside of the bracket for each module control cabinet at a remote location.

TABLE 12-22. ED-1E434, Group 93 Cable Connection(s) (Phases 1 and 2)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional ZAEY1 (Extended MAAP Bracket)	E3	Remote Emergency Transfer Plate	D0(REM) EMER XFER

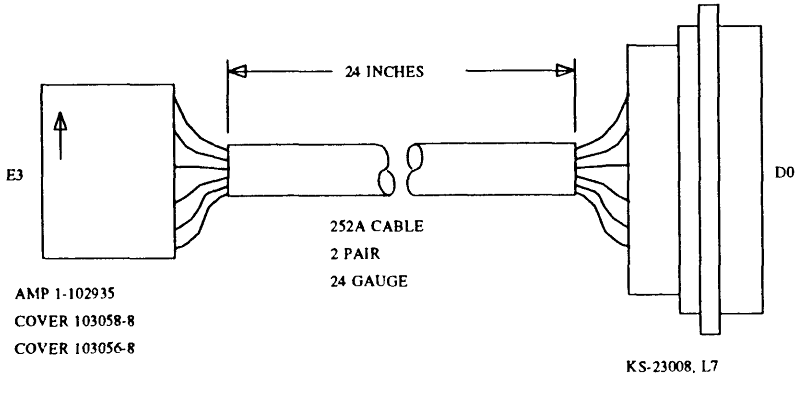


Figure 12-42. ED-1E434, Group 93 Cable

ED-1E434, Group 96 Cable

This cable is required for all R2V1-R2V4 installations. It is only required for DEFINITY Generic 2 if the system has emergency transfer and alarm signals from a remote location to the central location.

Connect ED-1E434, Group 96 cable (figure 12-43) from **MAAP** on the ED-1E469, Group 2 Extended MAAP Bracket (figure 12-20) to connector **E57** on the backplanes of both module control carriers with legs E57A and E57B. Leg E57B connects to module control carrier (00), and leg E57A connects to module control carrier (01). Leg E57A is used for duplicated module control systems only.

Install the other legs from the ED-1E434, Group 96 cable from **MAAP** on the Extended MAAP Bracket to **PL0, PL1, Bus-Bar Ground,** and the MAAP Circuit Breaker **Load Side,** respectively, for each remote module as shown in figure 12-43 and table 12-23.

TABLE 12-23. ED-1E434, Group 96 Cable Connections (Phases 1 and 2)

ORIGINATION	CONNECTOR	CABLE	DESTINATION	CONNECTOR
ED-1E469 Group 2 (Extended MAAP Bracket)	MAAP	GROUP 96	Traditional Module Control Carrier (01)	E57A
ED-1E469 Group 2 (Extended MAAP Bracket)	MAAP	GROUP 96	Traditional Module Control Carrier (00)	E57B
ED-1E469 Group 2 (Extended MAAP Bracket)	MAAP	GROUP 96 (24-Gauge Black Wire)	ZAEY1 (Extended MAAP Bracket)	PL0
ED-1E469 Group 2 (Extended MAAP Bracket)	MAAP	GROUP 96 (24-Gauge Red Wire)	ZAEY1 (Extended MAAP Bracket)	PL1
ZAEY1 (Extended MAAP Bracket)	PL0	GROUP 96 (22-Gauge Black Wire)	BUS BAR GRD	N/A
ZAEY1 (Extended MAAP Bracket)	PL1	GROUP 96 (22-Gauge Red Wire)	MAAP Circuit Breaker	"Load Side"

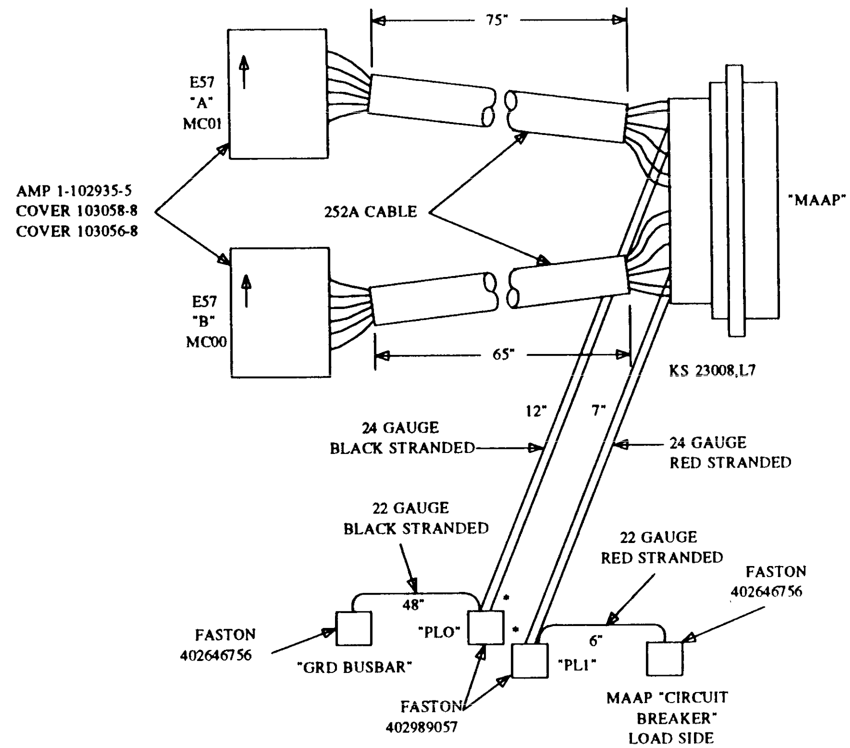


Figure 12-43. ED-E1434, Group 96 Cable

ED-1E434, Group 92 Cable

Install the ED1-E434, Group 92 cables (figure 12-44) from **B04** on module control (00) and (01) to connector **B02** on the same module control carrier for each remote module a.. shown in table 12-24. The connection for module control (01) is for duplicated systems only.

TABLE 12-24. ED-1E434, Group 92 Cable Connection(s) (Phases 1 and 2)

ORIGINATION	CONNECTOR	DESTINATION	CONNECTOR
Traditional Module Control Backplane	B04	Traditional Module Control (00) Backplane	B02
Traditional Module Control (01)* Backplane	B04	Traditional Module Control (01) Backplane	B02

* This cable is used for duplicate systems only.

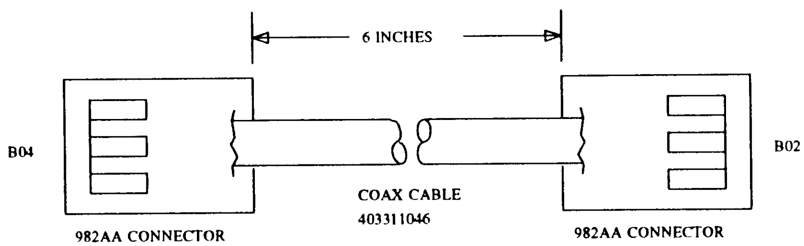


Figure 12-44. ED-1E434, Group 92 Cable

Loose Wiring

Connect the loose wire from the **Line Side** of the MAAP Circuit Breaker to **Bus Bar – 48V** for each remote module as shown in table 12-25.

TABLE 12-25. Loose Wire Connection(s) (Phases 1 and 2)

ORIGINATION	CONNECTOR	CABLE	DESTINATION
MAAP Circuit Breaker	"Line Side"	Group 2 H600-161	BUS BAR -48V

Fiber-Optic Links (Phases 1 and 2 only)

NOTE	Phase 3 connections are explained in chapter 25.

Figure 12-45 shows duplex cables (lightguide) with the paddleboard transmitters, and receivers. Figure 12-46 illustrates the proper mounting position for the paddleboard transmitter and receiver.

Six types of duplex cable may be used for the lightguide connections. In R2V1-V4, Group 461 (LL2A-B) or Group 463 (LB2A-B) for RMI, and Group 460 (LL2A-B) or Group 462 (LB2A-B) for TMS. In DEFINITY Generic 2, Group 504 and 505 are used both for RMI and TMS connections. These cables are fragile and should be routed from the appropriate carrier to the LCIT (figure 12-47) outside the overhead duct work. Figure 12-48 illustrates how the fiber cables should be routed.

The procedure for adjusting the fiber links should not be performed until all the cabling and hardware installation is complete. The procedure to adjust the fiber links involves the use of various attenuators until the correct combination is found that provides the desired signal level. This procedure and the types of attenuators are found in figures 12-49 through 12-51 and figures 12-53 through 12-58. For the DEFINITY Generic 2 systems, no adjustment is necessary, as only the 401M buildout is used.

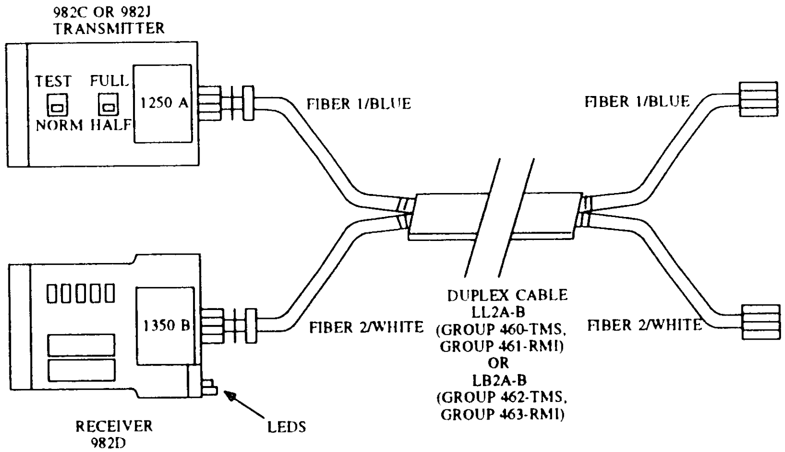


Figure 12-45. Lightguide Cables and Paddleboards

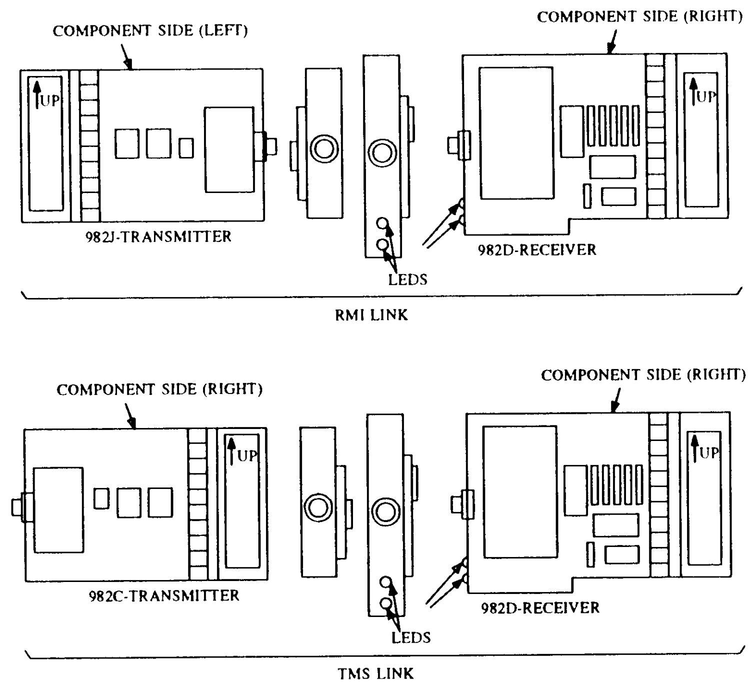


Figure 12-46. Paddleboards and Mounting Locations

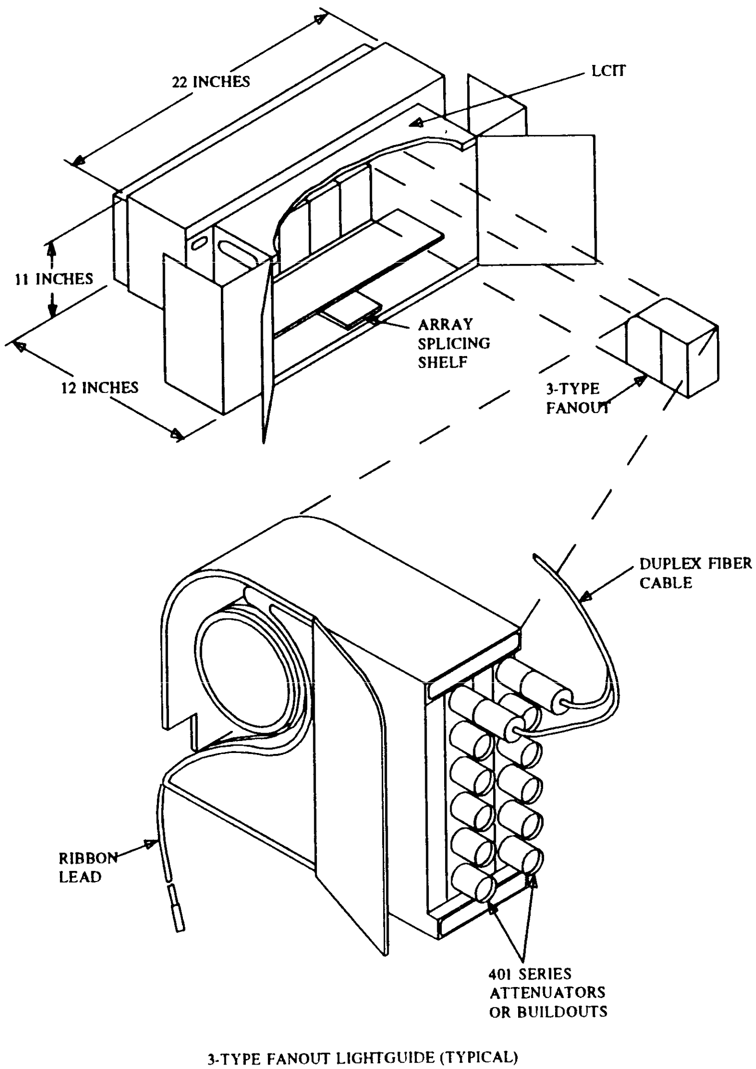


Figure 12-47. LCIT With 3-Type Fanout

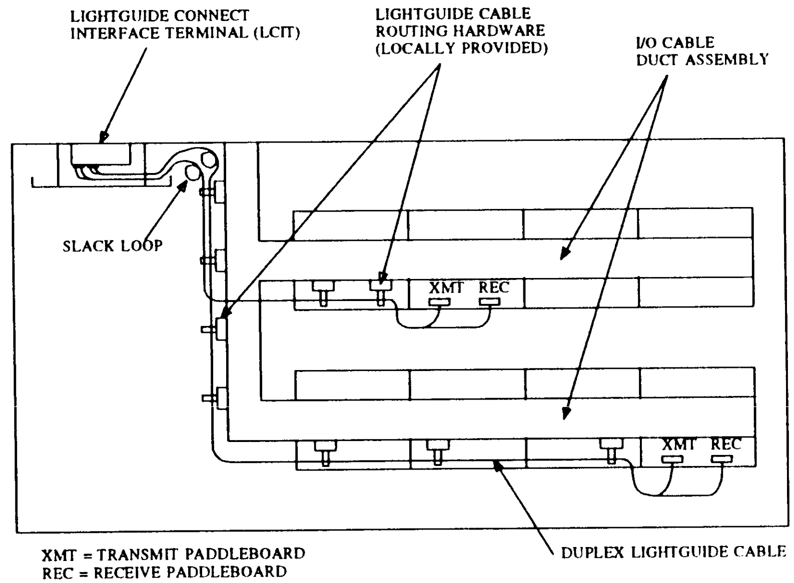


Figure 12-48. Routing of Lightguide Cables to LCIT

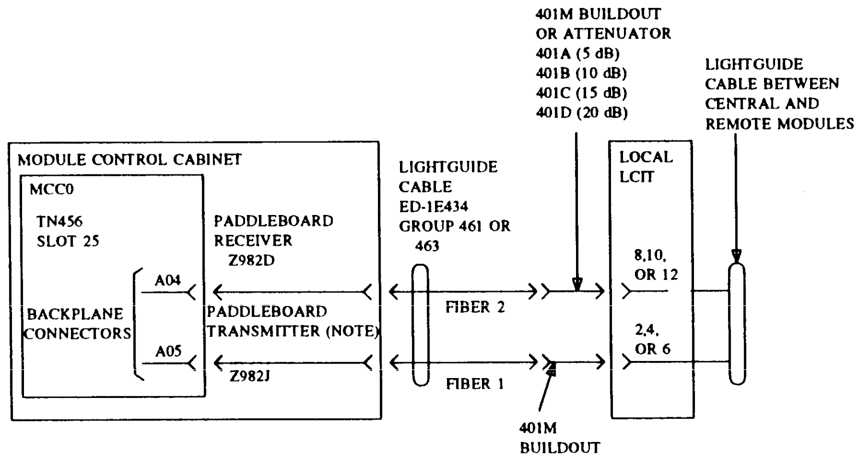
Central Location ED-1E434, Group 461 or 463 RMI Fiber Link(s) (Phase 1)

Install the RMI fiber link(s) for the central location from the module control(s) to the central LCIT.

The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 12-49 and 12-50 show the RMI fiber link for an unduplicated and duplicated system at the central location. Install the RMI fiber link(s) as follows:

1. Connect transmitter and receiver paddleboards to **A05** and **A04** on the backplane of the module control carriers. The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 461 or 463 lightguide cable.
3. Route the cable out of the module control cabinet to the central LCIT outside the overhead ducts using the locally provided hardware. This cable should enter the right side of the LCIT. Figure 12-48 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 12-47) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 12-49 and 12-50.



NOTE: TRANSMITTER PADDLEBOARD MUST BE MOUNTED FIRST

Figure 12-49. Central RMI Fiber-Link Connections for Unduplicated Module Control (Phase 1)

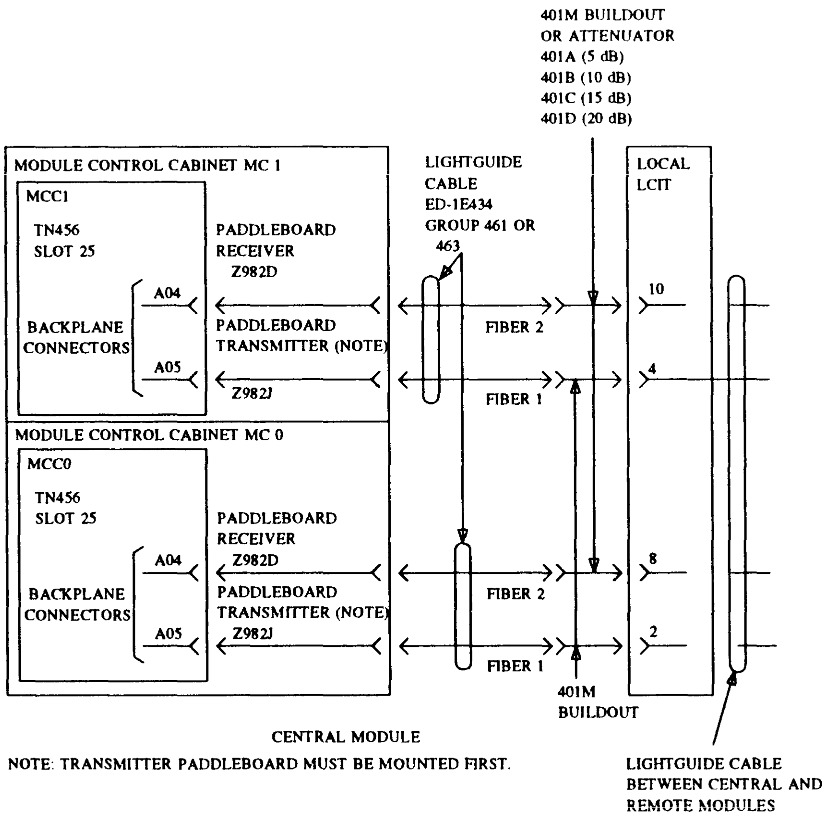


Figure 12-50. Central RMI Fiber-Link Connections for Duplicated Module Control (Phase 1)

Central Loaction ED-1E434, Group 461 or 463 RMI Fiber link(s) (Phase 2)

Install the RMI fiber link(s) for the central location from the RMI carriers to the central LCIT. The cable must be loosely supported to prevent damage. The fiber optic cable had a minimum bend radius of 1.5 inches

Figures 12-51 and 12-52 show the RMI fiber link and tables 12-26 and 12-27 show the appropriate backplane connectors used for an unduplicated and duplicated system at the central location. Install the RMI fiber link(s) as follows:

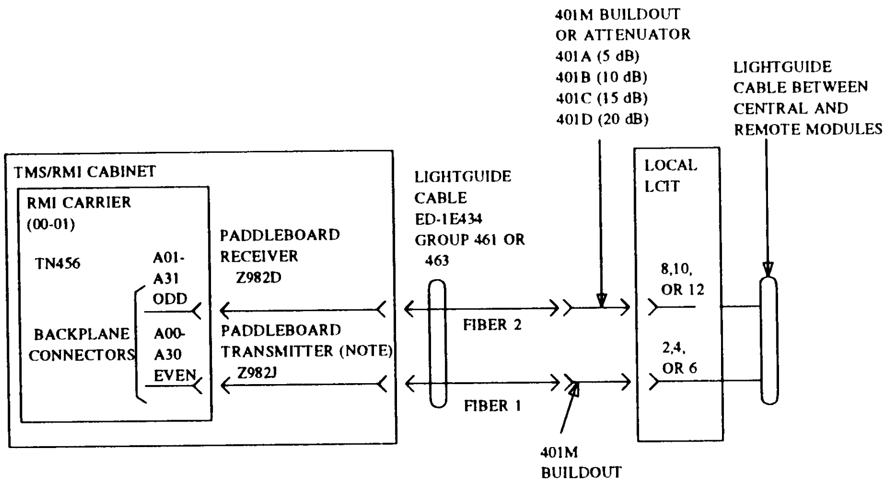
1. Connect transmitter and receiver paddleboards to **A00-A30** even and **A01-A31** odd on the backplane of the RMI carriers. The transmitter paddleboard must be mounted first.

2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 461 or 463 lightguide cable.

3. Route the cable out of the TMS/RMI cabinet to the central LCIT outside the overhead ducts using the locally provided hardware. This cable should enter the right side of the LCIT. Figure 12-48 illustrates the routing of lightguide cables.

4. Connect the appropriate attunator to the central LCIT (figure 12-47) in the correct position as determined by your CSD.

5. Connect the fiber-optic cables to the appropriate attunator as shown in figures 12-51 and 12-52.



NOTE: TRANSMITTER PADDLEBOARD MUST BE MOUNTED FIRST.

Figure 12-51. Central RMI Fiber-Link Connections for Unduplicated Module Control (Phase 2)

TABLE 12-26. RMI Carrier Backplane Connections for Unduplicated Module Control (Phase 2)

REMOTE MODULE (NOTE)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR	
			TRANSMITTER	RECEIVER
01	00	00	A00	A01
02	00	13	A16	A17
03	00	01	A02	A03
04	00	14	A18	A19
05	00	02	A04	A05
06	00	15	A20	A21
07	00	03	A06	A07
08	00	16	A22	A23
09	00	05	A08	A09
10	00	18	A24	A25
11	00	06	A10	A11
12	00	19	A26	A27
13	00	07	A12	A13
14	00	20	A28	A29
15	00	08	A14	A15
16	00	21	A30	A31
17	01	00	A00	A01
18	01	13	A16	A17
19	01	01	A02	A03
20	01	14	A18	A19
21	01	02	A04	A05
22	01	15	A20	A21
23	01	03	A06	A07
24	01	16	A22	A23
25	01	05	A08	A09
26	01	18	A24	A25
27	01	06	A10	A11
28	01	19	A26	A27
29	01	07	A12	A13
30	01	20	A28	A29

This is the number of the module at the remote locale, not the actual module number within the system.

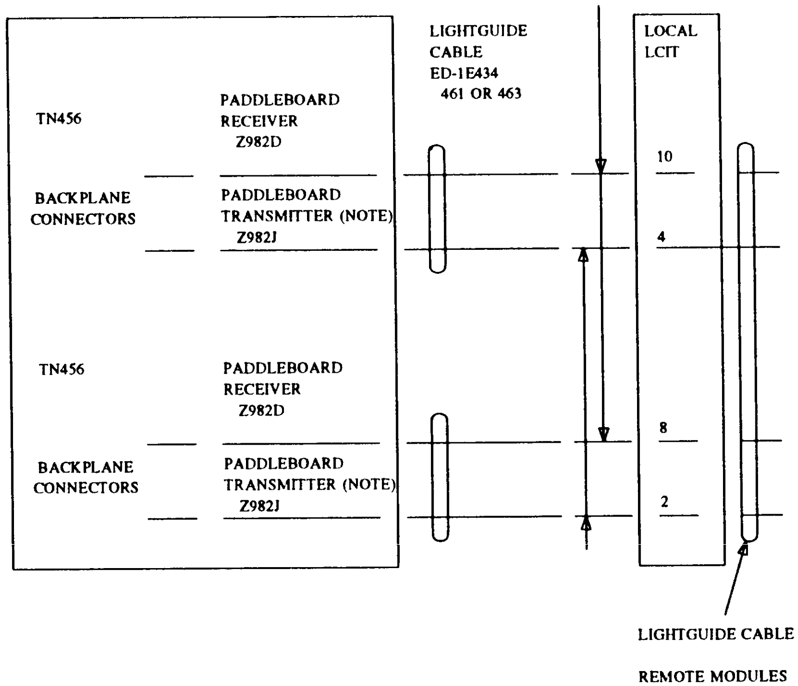


Figure 12-52. Central RMI Fiber-Link Connections for Duplicated Module Control (Phase 2)

TABLE 12-27. RMI Carrier Backplane Connections for Duplicated Module Control (Phase 2)

REMOTE MODULE (NOTE)	RMI CARRIER SLOT	RMI CARRIER NUMBER	RMI CARRIER BACKPLANE CONNECTOR		REMOTE MODULE (NOTE)	RMI CARRIER SLOT	RMI CARRIER NUMBER	RMI CARRIER BACKPLANE CONNECTOR	
			TRANSMITTER	RECEIVER				TRANSMITTER	RECEIVER
01	00	00	A00	01A	17	02	00	A00	A01
	00	13	A16	A17		02	13	A16	A17
02	00	01	A02	A03	18	02	01	A02	A03
	00	14	A18	A19		02	14	A18	A19
03	00	02	A04	A05	19	02	02	A04	A05
	00	15	A20	A21		02	15	A20	A21
04	00	03	A06	A07	20	02	03	A06	A07
	00	16	A22	A23		02	16	A22	A23
05	00	05	A08	A09	21	02	05	A08	A09
	00	18	A24	A25		02	18	A24	A25
06	00	06	A10	A11	22	02	06	A10	A11
	00	19	A26	A27		02	19	A26	A27
07	00	07	A12	A13	23	02	07	A12	A13
	00	20	A28	A29		02	20	A28	A29
08	00	08	A14	A15	24	02	08	A14	A15
	00	21	A30	A31		02	21	A30	A31
09	01	00	A00	A01	25	03	00	A00	A01
	01	13	A16	A17		03	13	A16	A17
10	01	01	A02	A03	26	03	01	A02	A03
	01	14	A18	A19		03	14	A18	A19
11	01	02	A04	A05	27	03	02	A04	A05
	01	15	A20	A21		03	15	A20	A21
12	01	03	A06	A07	28	03	03	A06	A07
	01	16	A22	A23		03	16	A22	A23
13	01	05	A08	A09	29	03	05	A08	A09
	01	18	A24	A25		03	18	A24	A25
14	01	06	A10	A11	30	03	06	A10	A11
	01	19	A26	A27		03	19	A26	A27
15	01	07	A12	A13					
	01	20	A28	A29					
16	01	08	A14	A15					
	01	21	A30	A31					

This is the number of the module at the remote locale, not the actual module number within the system.

Central Location ED-1E434, Group 460 or 462 TMS Fiber Link(s) (Phases 1 and 2)

NOTE For Phase 3 connections see chapter 25.

Install the TMS fiber link(s) for the central location from the TMS carrier(s) to the central LCIT. Figures 12-53 and 12-54 show the connections for an unduplicated and duplicated system. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Use the CSD to determine the connector pins that are used on TMS carrier(s) for the TMS fiber link to each remote module. If CSDs are unavailable, table 12-28 can be used to determine this information for an unduplicated system. Tables 12-29 and 12-30 can be used to determine this information for a duplicated system. Look up the module number of each remote module in the appropriate table, and use the corresponding TMS carrier and pin numbers to connect from the TMS backplane to the LCIT as shown in figures 12-53 and 12-54. The number of a remote module is determined by the module that is in the system.

Install the TMS fiber link as follows:

1. Connect transmitter and receiver paddleboards to the appropriate connectors on the backplane of the TMS carrier(s). The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 460 or 462 lightguide cable.
3. Route the cable out of the auxiliary cabinet to the central LCIT along the outside of the overhead ducts using locally provided hardware. Figure 12-48 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 12-47) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 12-53 and 12-54.

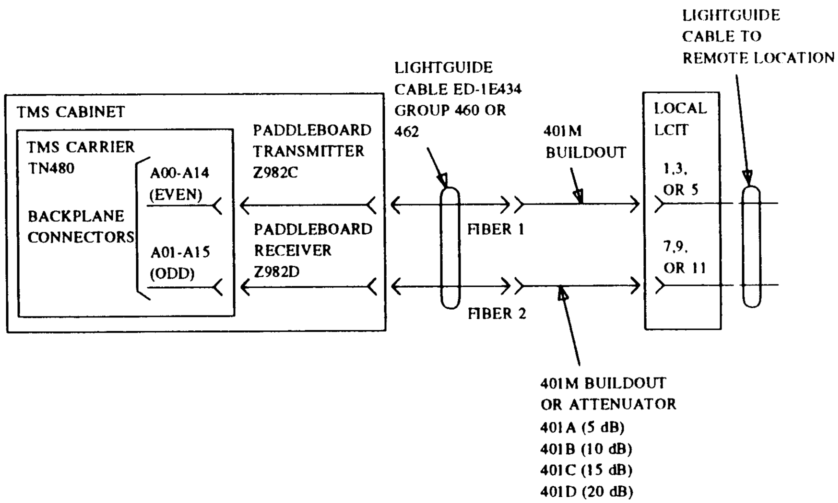


Figure 12-53. Central TMS Fiber-Link Connections for Unduplicated Module Control (Phases 1 and 2)

TABLE 12-28. Central TMS Fiber-Link Connections for Unduplicated Module Control (Phases 1 and 2)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR	REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00	17	A10(T) A11(R)	16	02	18	A12(T) A13(R)
02	00	16	A08(T) A09(R)	17	02	17	A10(T) A11(R)
03	00	02	A00(T) A01(R)	18	02	16	A08(T) A09(R)
04	00	03	A02(T) A03(R)	19	02	02	A00(T) A01(R)
05	00	04	A04(T) A05(R)	20	02	03	A02(T) A03(R)
06	00	05	A06(T) A07(R)	21	02	04	A04(T) A05(R)
07	01	19	A14(T) A15(R)	22	03	05	A06(T) A07(R)
08	01	18	A12(T) A13(R)	23	03	19	A14(T) A15(R)
09	01	17	A10(T) A00(R)	24	03	18	A12(T) A13(R)
10	01	16	A08(T) A09(R)	25	03	17	A10(T) A11(R)
11	01	02	A00(T) A01(R)	26	03	16	A08(T) A09(R)
12	01	03	A02(T) A03(R)	27	03	02	A00(T) A01(R)
13	01	04	A04(T) A05(R)	28	03	03	A02(T) A03(R)
14	01	05	A06(T) A07(R)	29	03	04	A04(T) A05(R)
15	02	19	A14(T) A15(R)	30	03	05	A06(T) A07(R)

(T) designates Transrnitter paddleboard Z982C
(R) designates receiver paddleboard Z982D

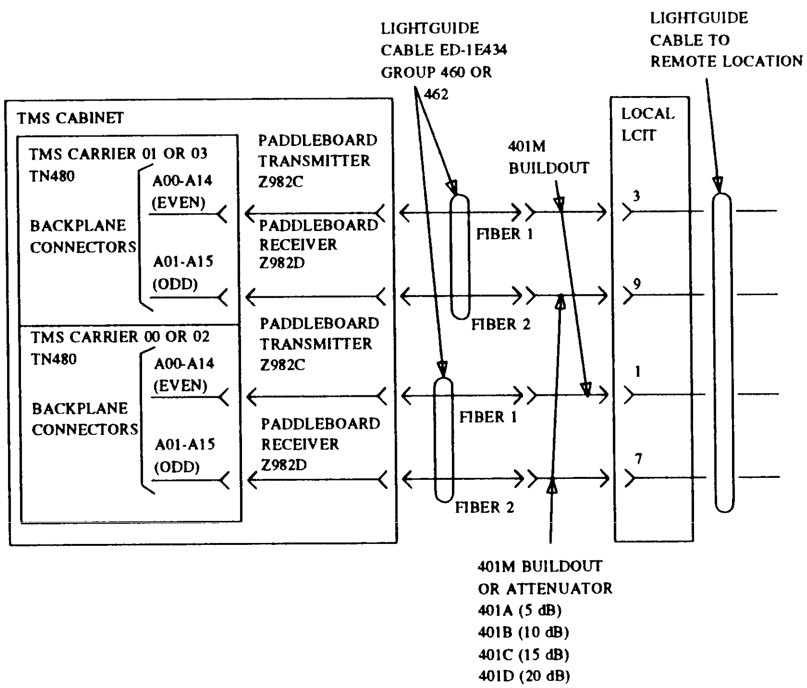


Figure 12-54. Central TMS Fiber-Link Connections for Duplicated Module Control (Phases 1 and 2)

TABLE 12-29. Central TMS Fiber-Link Connections for a 1 Through 15 Module System (Phases 1 and 2 Duplicating Module Control)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
0 1	00 and 02	17	A10(T) A11(R)
0 2	00 and 02	1 6	A08(T) A09(R)
0 3	00 and 02	0 2	A00(T) A01(R)
0 4	00 and 02	0 3	A02(T) A03(R)
0 5	00 and 02	0 4	A04(T) A05(R)
0 6	00 and 02	0 5	A06(T) A07(R)
0 7	01 and 03	1 9	A14(T) A15(R)
0 8	01 and 03	1 8	A12(T) A13(R)
0 9	01 and 03	1 7	A10(T) A11(R)
1 0	01 and 03	0 6	A08(T) A09(R)
1 1	01 and 03	0 2	A00(T) A01(R)
1 2	01 and 03	0 3	A02(T) A03(R)
1 3	01 and 03	0 4	A04(T) A05(R)
1 4	01 and 03	0 5	A06(T) A07(R)

(T) designates transmitter paddleboard Z982C
(R) designates receiver paddleboard Z982D

TABLE 12-30. Central TMS Fiber-Link Connections for a 1 Through 31 Module System (Phases 1 and 2 Duplicated Module Control)

REMOTE MODULE	TMS CABINET	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR	REMOTE MODULE	TMS CABINET	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00 and 01	00	17	A10(T) A11(R)	16	00 and 01	02	18	A12(T) A13(R)
02	00 and 01	00	16	A08(T) A09(R)	17	00 and 01	02	17	A10(T) A11(R)
03	00 and 01	00	02	A00(T) A01(R)	18	00 and 01	02	16	A08(T) A09(R)
04	00 and 01	00	03	A02(T) A03(R)	19	00 and 01	02	02	A00(T) A01(R)
05	00 and 01	00	04	A04(T) A05(R)	20	00 and 01	02	03	A02(T) A03(R)
06	00 and 01	00	05	A06(T) A07(R)	21	00 and 01	02	04	A04(T) A05(R)
07	00 and 01	01	19	A14(T) A15(R)	22	00 and 01	02	05	A06(T) A07(R)
08	00 and 01	01	18	A12(T) A13(R)	23	00 and 01	03	19	A14(T) A15(R)
09	00 and 01	01	17	A10(T) A11(R)	24	00 and 01	03	18	A12(T) A13(R)
10	00 and 01	01	16	A08(T) A09(R)	25	00 and 01	03	17	A10(T) A11(R)
11	00 and 01	01	02	A00(T) A01(R)	26	00 and 01	03	16	A08(T) A09(R)
12	00 and 01	01	03	A02(T) A03(R)	27	00 and 01	03	02	A00(T) A01(R)
13	00 and 01	01	04	A04(T) A05(R)	28	00 and 01	03	03	A02(T) A03(R)
14	00 and 01	01	05	A06(T) A07(R)	29	00 and 01	03	04	A04(T) A05(R)
15	00 and 01	02	19	A14(T) A15(R)	30	00 and 01	03	05	A06(T) A07(R)

(T) designates transmitter paddleboard Z982C
(R) designates receiver paddleboard Z982D

Remote Location ED-1E434, Group 461 or 463 RMI Fiber Link(s) (Phases 1 and 3)

NOTE	For Phase 3 connections and for universal modules at the remote site, see chapter 25.

Traditional Module at Remote Site

Install the RMI fiber link for the remote location from the module control to the central LCIT. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 12-55 and 12-56 show the RMI fiber link for the remote location for an unduplicated and duplicated system. Install the RMI fiber link as follows:

1. Connect transmitter and receiver paddleboards to **A05** and **A04** on the backplane of the module control carriers. The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 2, and the receiver paddleboard to Fiber 1 of the ED- 1E434 lightguide cable.
3. Route the cable out of the module control cabinet to the remote LCIT along the outside of the overhead ducts using locally provided hardware. Figure 12-48 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 12-47) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 12-55 and 12-56.

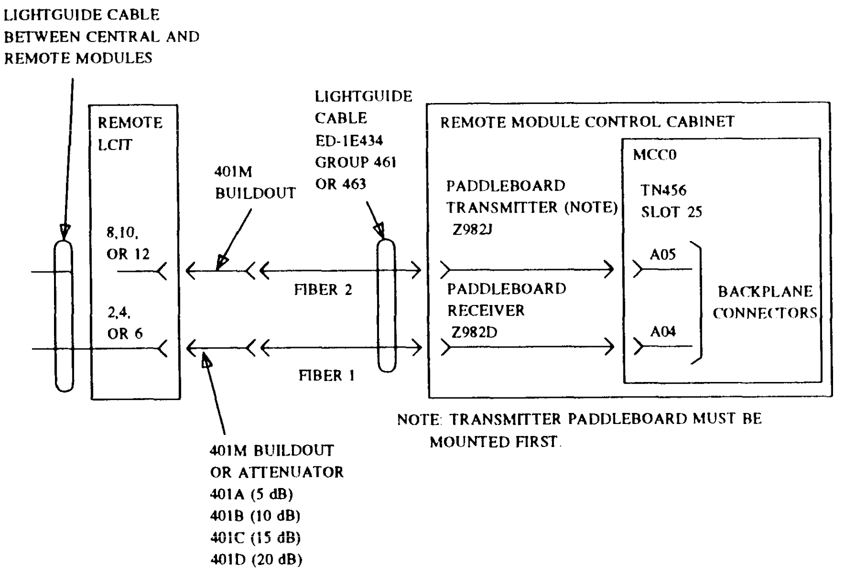


Figure 12-55. Remote RMI Fiber-Link Connections for Unduplicated Module Control (Phases 1 and 3 — Traditional Module at Remote Site)

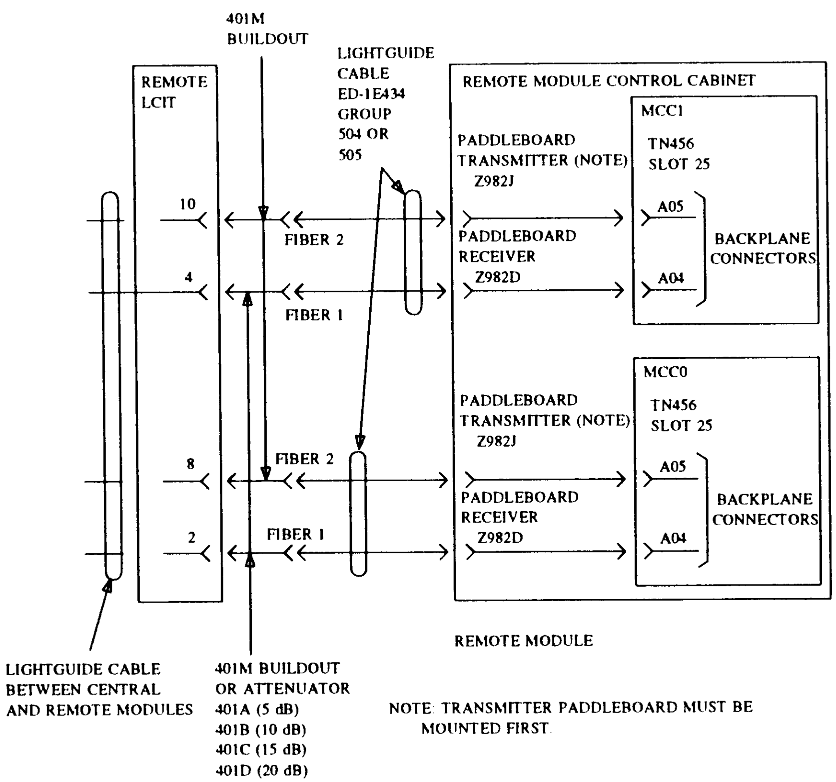


Figure 12-56. Remote RMI Fiber-Link Connections for Duplicated Module Control (Phases 1 and 3 — Traditional Module at Remote Site)

Remote Location ED-1E434, Group 460 or 462 TMS Fiber Link(s) (Phases 12, and 3 — Traditional Module at Remote Site)

Install all the TMS fiber link(s) for the remote location from the TMS carrier(s) to the remote LCIT as shown in figures 12-57 and 12-58 for an unduplicated and duplicated system. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Install the TMS fiber link as follows:

1. Connect transmitter and receiver paddleboards to the appropriate connectors on the backplane of the module control carrier(s). The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 2 and the receiver paddleboard to Fiber 1 of the ED-1E434 lightguide cable.
3. Route the cable out of the auxiliary cabinet to the remote LCIT along the outside of the overhead ducts using locally provided hardware. Figure 12-48 illustrates the routing of fiber-optic cables.
4. Connect the appropriate attenuator to the central LCIT (figure 12-47) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 12-57 and 12-58.

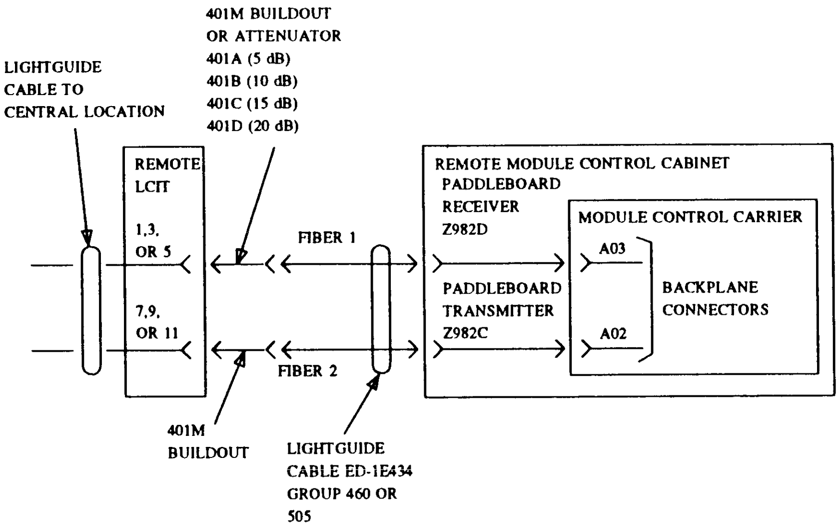


Figure 12-57. Remote TMS Fiber-Link Connections for Unduplicated Module Control (Phases 1, 2, and 3 — Traditional Module at Remote Site)

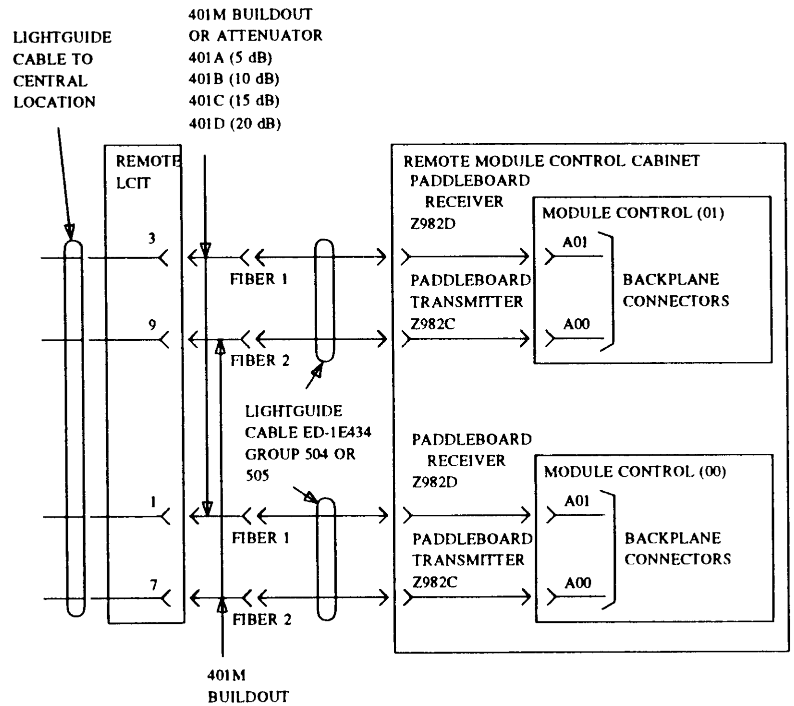


Figure 12-58. Remote TMS Fiber-Link Connections for Duplicated Module Control (Phases 1, 2, and 3 — Traditional Module at Remote Site)

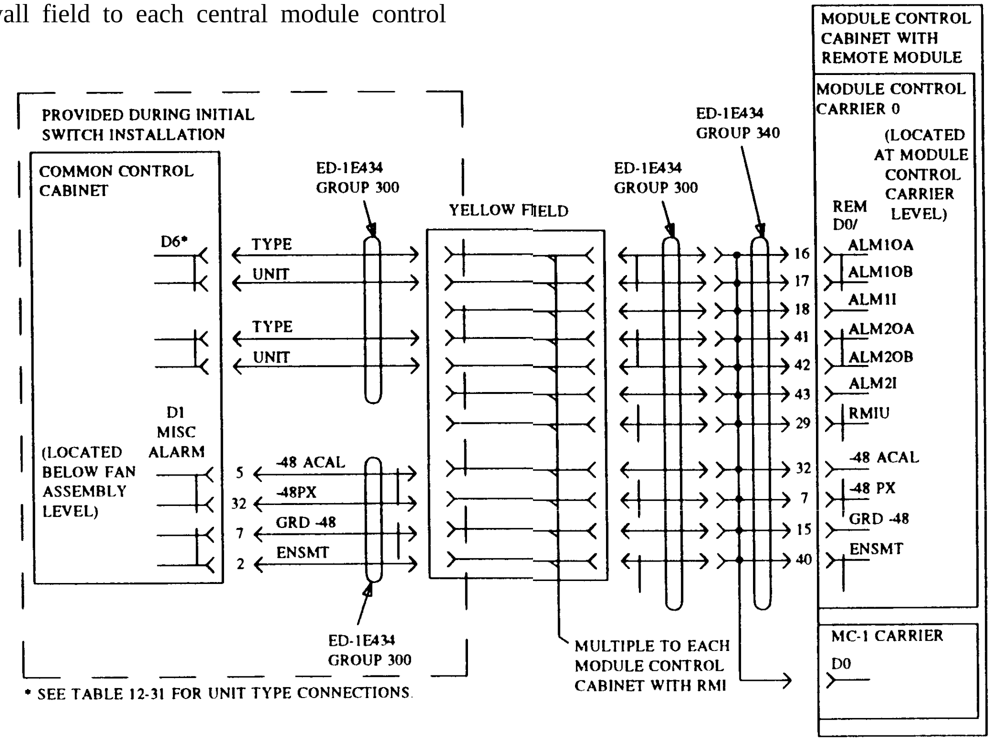
ED-1E434, Group 300 Cross-Connect Field Cabling

Central Location (Phase 1)

Connect the ED-1E434, Group 300 cables from DO on the traditional module control cabinet(s), that is associated with a remote module, through the ductwork to the cross-connect field. Make standard cross-connect field connections from the common control cabinet to the module control cabinet(s) as shown in figure 12-59. These cross-connections should be made in the yellow wall field to each central module control associated with a remote module.

CAUTION

DEFINITY Generic 2 systems use the System Access Manager (SAM) terminal instead of the MAAP. Therefore, in DEFINITY Generic 2, the MAAP leads are not functional.



NOTE: FOR DUPLICATED SYSTEMS, AN ED-1E434 GROUP 340 CABLE IS USED TO "Y" MC0 AND MCl "D0" CONNECTORS TOGETHER, AND THEN CONNECTS TO THE GROUP CABLE

Figure 12-59. Traditional Central Module with Remote Module Alarm and MAAP Connections (Phase 1)

Central Location (Phase 2)

Connect the ED-1E434, Group 300 cables from DO on the TMS/RMI cabinet(s), that has an RMI carrier, through the ductwork to the cross-connect field as shown in table 12-31. Make standard cross-connect field connections from the common control cabinet to the module control cabinet(s) for the alarms and MAAP as shown in figure 12-60. These cross-connections should be made in the yellow wall field to each RMI carrier.

CAUTION

DEFINITY Generic 2 system use the System Access Manager (SAM) terminal instead of the MAAP. Therefore, in DEFINITY Generic 2, the MAAP leads are not functional.

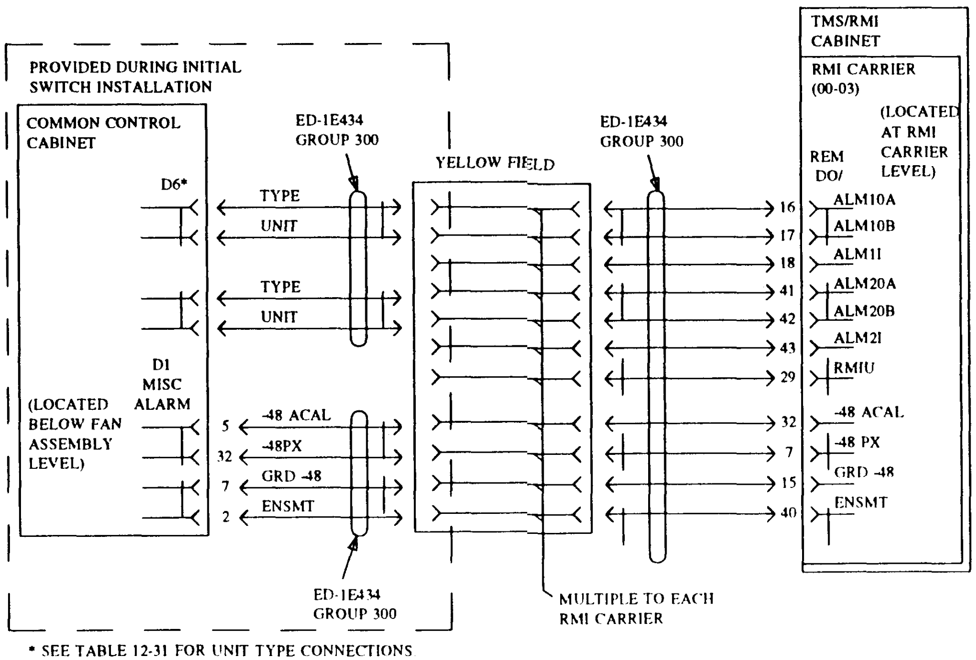
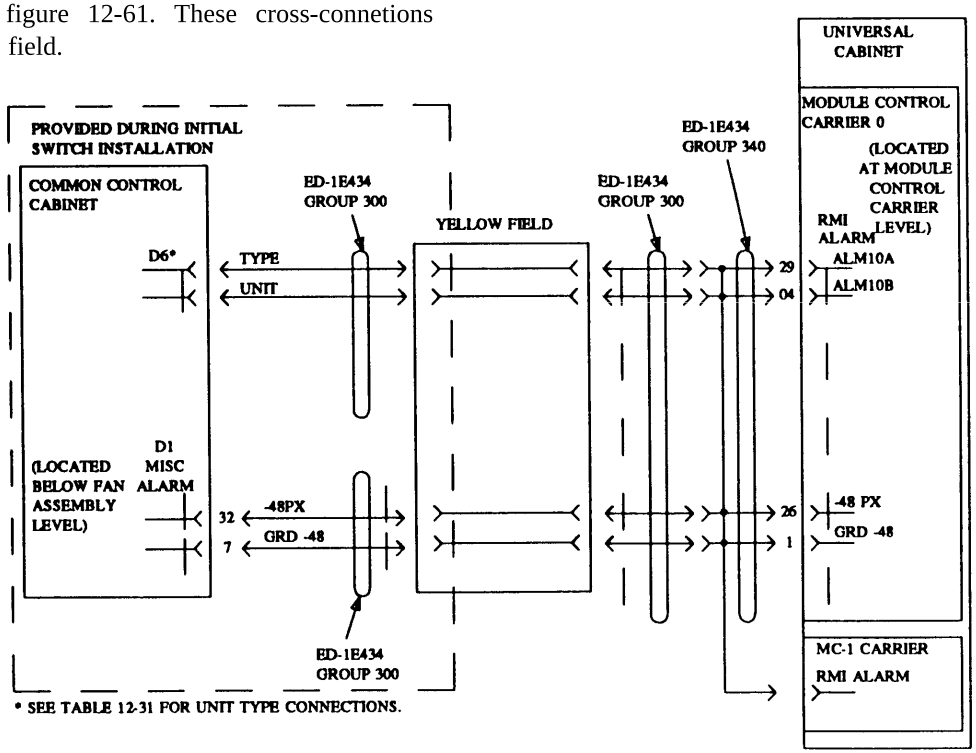


Figure 12-60. Central Alarm and MAAP Connections (Phase 2)

Central Location (Phase 3)

Connect the ED-1E434, Group 300 cables from **RMI ALARM** connector on the universal module control connector panel. Make standard cross-connect field connections from the common control cabinet to the module control cabinet(s) as shown in figure 12-61. These cross-connetions should be made in the yellow wall field.



NOTE:
FOR DUPLICATED SYSTEMS, AN ED-1E434 GROUP 340 CABLE IS USED TO "Y" MC0 AND MC1 "RMI ALARM" CONNECTORS TOGETHER, AND THEN CONNECTS TO THE GROUP CABLE.

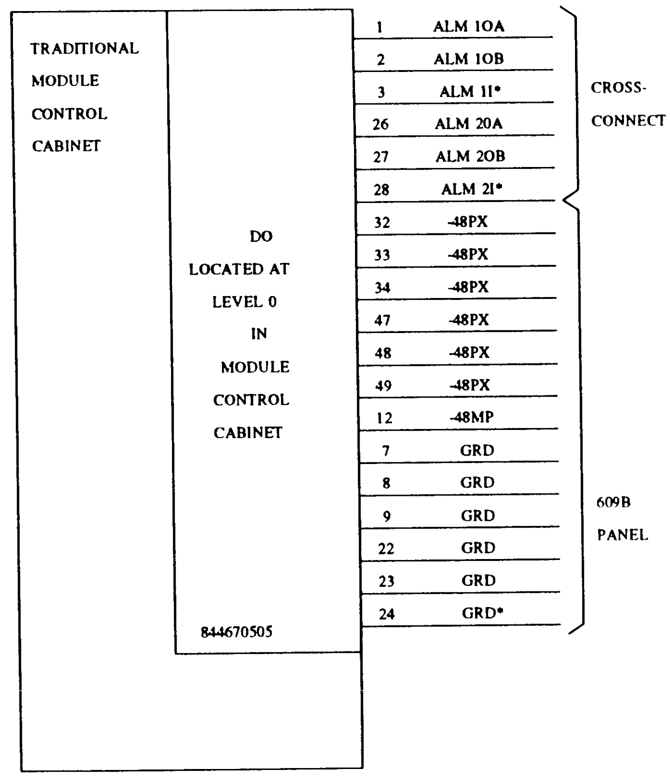
Figure 12-61. Central Alarm Connections (Phase 3)

TABLE 12-31. Unit Lead Connections

CONNECTOR PIN	LEAD DESIGNATION	CONNECTOR PIN	LEAD DESIGNATION
26	Unit 20	39	Unit 2
1	Unit 19	14	Unit 1
27	Unit 22	40	Unit 4
2	Unit 21	15	Unit 3
28	Unit 24	41	Unit 6
3	Unit 23	16	Unit 5
29		42	Unit 8
4	Unit 25	17	Unit 7
30	Unit 27	43	Unit 10
5	Unit 28	18	Unit 9
31	Unit 29	44	
6	Unit 28	19	Unit 11
32	Unit 31	45	Unit 13
7	Unit 30	20	Unit 12
33	AUXCTMP	46	Unit 15
8	Unit 32	21	Unit 14
34	EXTEQMN	47	Unit 17
9	EXTEQMJ		22
35	AUXCRCT	48	
10	AUXCHO	23	Unit 18
36	AUXCCB	49	RING0
11	AUXCFRQ	24	TIP0
37	AUXCFAN	50	RING1
12		25	TIP1
38	EXTPRMJ		
13	EXTPRMN		

Remote Location (Traditional Module Phases 1, 2, and 3)

If the Remote Emergency Transfer feature is provided connect ED-1E434, Group 300 from **D0** on the rear connector plate 845417229 to yellow wall field. Standard cross-connections for remote emergency transfer and alarm leads are required (figure 12-62).



* ONLY 2 ALARMS CAN BE ACTIVATED FOR EXTERNAL EQUIPMENT, ALM11 AND ALM21. THERE MUST ALSO BE A GROUND LEAD FOR

Figure 12-62. Remote Location Cross-connections (Phases 1, 2, and 3)

Remote Location (Phase 3)

If the Remote Emergency Transfer feature is provided, connect ED-1E434, Group 300 from the RMI ALARM and AUX/CNSLl connectors on the module control connector panel to the yellow wall field. Standard cross-connections for remote emergency transfer and alarm leads are required (figure *12-63).*

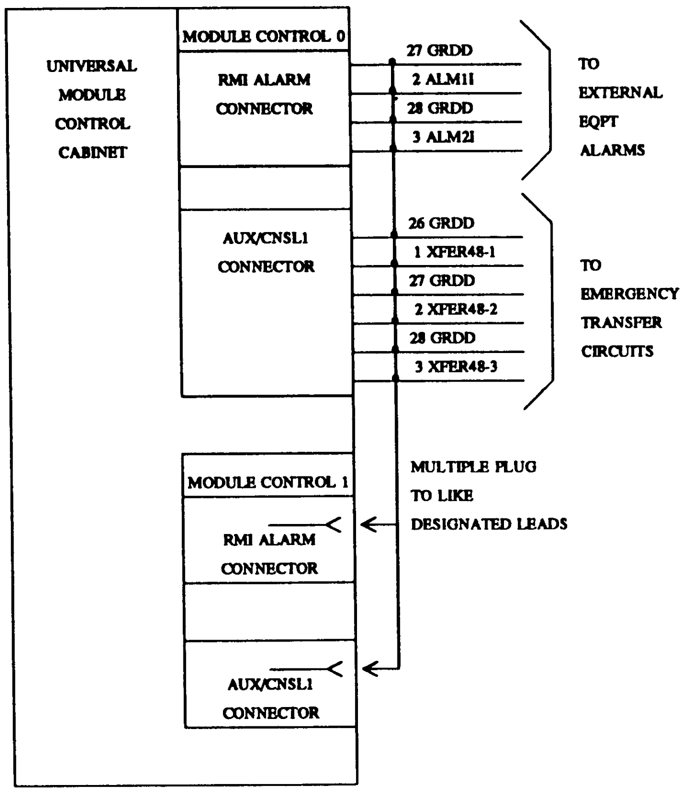


Figure 12-63. Remote Location Cross-Connections (Phase 3)

Lightguide Splicing in LCIT

The lightguide cables should be spliced in the LCITs at the central and remote locations according to standard splicing procedures for lightguide cable. Refer to *LGA1 Lightguide Cable Splicing and Splice Testing* (640-252-101) for the procedures to splice the lightguide cables.

NOTE	It is recommended that splicing lightguide cable be performed by a qualified technician trained in this operation.

The procedure for splicing lightguide cable requires the *1030B Splice Tool Kit* and special training for splicing the cable in a vacuum environment.

13. REMOTE GROUP INTERFACE (RGI) INSTALLATION

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GENERAL INFORMATION

The Remote Group Interface (RGI) feature provides for small groups of voice and/or data terminals at a remote location connected directly to the system switch through DS1 facilities. Because this configuration involves only small numbers of digital signal level 1 (DS1) port interfaces, there are no switch considerations. Each remote port group is connected to a DS1 carrier in a traditional port cabinet at the central location through a pair of dedicated RGI circuit packs. The ANN15B is located at the central location, and the ANN16B is located at the remote location in the Remote Group Housing (RGH). The RGH also contains the required conventional port circuits.

A block diagram of the RGI feature is shown in figure 13-1.

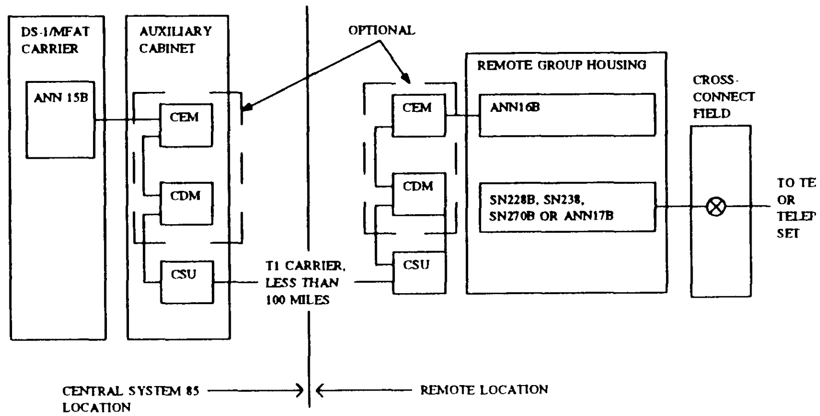


Figure 13-1. RGI Block Diagram

CENTRAL LOCATION CONNECTIONS

Remote Group Interface requires that an ANN15B circuit pack be installed in the J58888N DS1/mutifunction analog terminal (MFAT) carrier at the AT&T System 85. The treminations and connections for this circuit pack are shown in chapter 11.

The remote group uses DS1 signaling via DS1 interface ANN15B from the central location to the DS1 interface ANN16B at the remote location (see chapter 11).

REMOTE LOCATION CONNECTIONS

The RGH can be wall mounted or set on a table or shelf. If the housing is wall mounted, refer to the next paragraph. The RGH must be mounted in a position where both sides are not blocked. AU vents are in each side; proper airflow is critical. If the RGH is equipped with an ANN17B circuit pack, the connector (D0l, D02, D03, D05, D07, or D08) must be equipped with a J58889AN (-1 or -2), List 8 electromagnetic interface (EMI) filter. When this filter is used, it is critical that the retaining screws are properly tightened.

A rear view of the J58889AN-1 RGH is shown in figure 13-2. A rear view of the J58889AN-2 RGH is shown in figure 13-3.

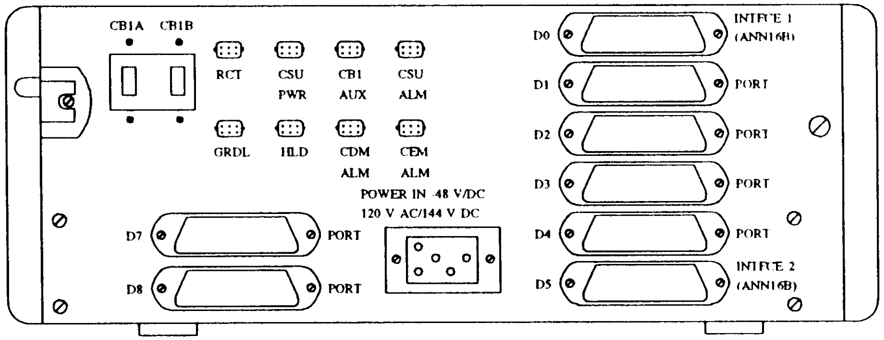


Figure 13-2. RGH (J58889AN-1)

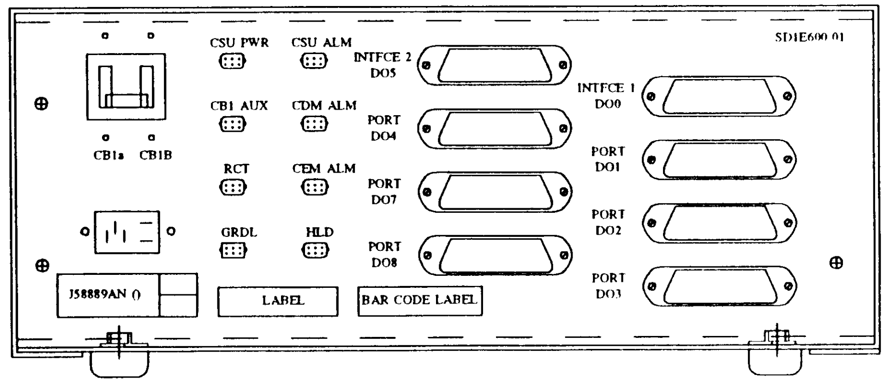


Figure 13-3. RGH (J58889AN-2)

A cross-connect field must be established at the RGH. This cross-connect field is usually mounted on a wall close to the remote group interface. Use the information provided in the *Equipment Room Floor Plans and Specifications Manual* (555-104-603).

Wall Mounting the RGH

Perform the following steps to wall mount the RGH (figure 13-4).

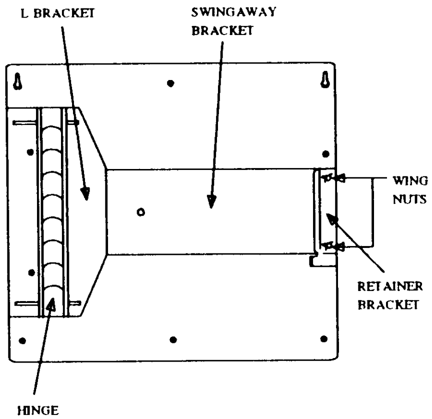


Figure 13-4. RGH Wall Mounting Bracket

1. Mount a plywood backboard to the wall. The bottom of the RGH should be a least 24 in. from the floor; mount the plywood accordingly. The plywood must be securely attached to the wall studs because the weight of the wall mounting bracket and RGH exceeds 100 pounds. The backing should measure at least 28 in. wide by 22 in. high and be at least 3/4-in. thick.
2. Place two of the 3/4-in. wood screws 25-3/8 in. apart near the top of the plywood backing.
3. Insert the screws far enough to temporarily hold the wall mounting bracket.
4. Holding the wall mounting bracket with the slotted holes at the top, place the bracket over the two screws; then tighten.
5. Insert wood screws in remaining seven holes of the wall mounting bracket, and then tighten.
6. Loosen the wing nut clamps on the retainer bracket. Slide the bracket to the right to free the hinged bracket.
7. Swing the hinged bracket away from the wall.
8. Position the RGH so the rear of the RGH faces the hinge.
9. Slide the U bracket on the under side of the RGH until the rear edge meets the L bracket.
10. Tighten the screw on the back of the hinged bracket against the base of the RGH.
11. Swing the hinged bracket with the mounted RGH closed,
12. Slide the retainer bracket to the left, and tighten the wing nuts to secure the hinged bracket.

Removing and Installing RGH Circuit Packs

Before the circuit packs can be removed or installed, the RGH front cover must be removed. There are three different methods of removing the front cover of the J58888AN-1 RGH. One method uses one quarter-turn captive screw accessed from the front cover. This is shown in sketch A of figure 13-5. The second method uses two threaded screws accessed from both sides of the RGH. his is shown in sketch B of figure 13-5. The third method uses two quarter-turn captive screws accessed from the front of the RGH. This is shown in sketch C of figure 13-5. After the screws are loosened or removed snap the front cover off to access the circuit packs.

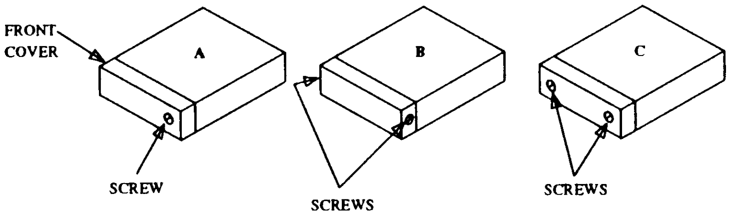


Figure 13-5. J58889AN-1 Front Cover Description

The front cover of the J58888AN-2 RGH is removed by loosening, but not removing, the screws shown in figure 13-6. The front cover can then be removed by sliding it off.

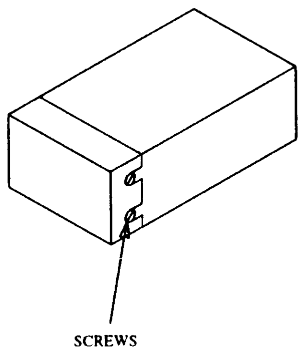


Figure 13-6. J58889AN-2 Front Cover Description

To install or verify the option settings on the CAL1B board, remove the housing cover (one piece, front and side). After the front cover has been removed, turn the RGH so that the bottom is accessible. Six screws hold the housing cover in place. Remove the front and middle pairs of screws. The two rear screws should be loosened only. The cover can then be slid off toward the front.

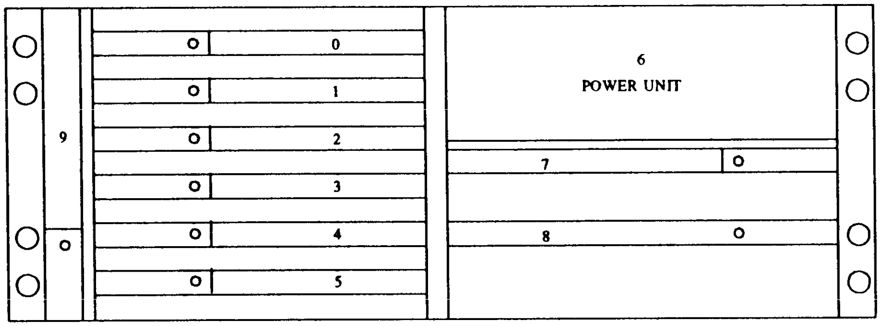
WARNING

Electrostatic discharge can damage circuit packs containing integrated circuits (ICs).

Installation personnel must always attach properly grounded wrist-grounding straps before handling circuit packs. The J58889AN-1 circuit pack and locations are shown in figure 13-7. The J58889AN-2 circuit packs and locations are shown in figure 13-8. After the proper circuit slot has been determined, remove the circuit pack by unfastening the latch and pulling the circuit pack straight out. To install the circuit pack, insert the circuit pack in the desired slot and fasten the latch.

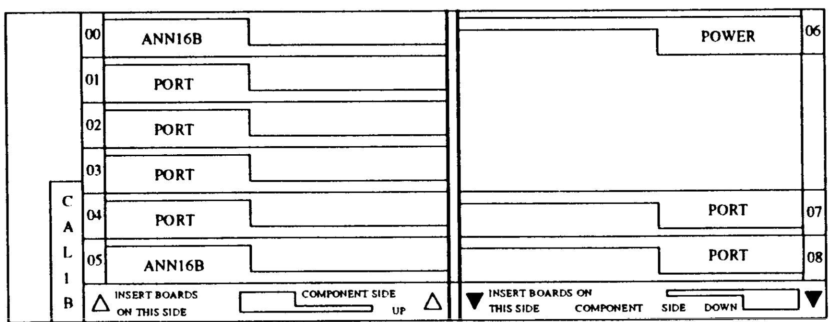
WARNING

Circuit packs in slots 00 through 05 mount component side up; circuit packs in slots 06 through 08 mount component side down.



SLOT 0 ANN16 B
1 PORT
2 PORT
3 PORT
4 PORT
5 ANN16B
6 POWER UNIT
7 PORT
8 PORT
9 CAL1B

Figure 13-7. J58889AN-1 Circuit Pack Location



SLOT 0 ANN16 B
1 PORT
2 PORT
3 PORT
4 PORT
5 ANN16B
6 POWER UNIT
7 PORT
8 PORT

Figure 13-8. J58889AN-2 Circuit Pack Locations

CIRCUIT PACK OPTION SETTINGS

Use the following paragraphs to set the options on all the circuit packs, power supplies, channel-division multiplexer (CDMs), channel service units (CSUs), and channel-expansion multiplexer (CEMs) associated with the RGH.

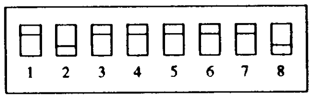
CAL1B

The CAL1B circuit pack options should be factory set. Verify using figure 13-9.

There is a cable that connects to the CAL1B that must be disconnected before the board can be removed. After the CAL1B is reinserted, reconnect the cable. After the cable is reconnected, care should be taken that the cable is placed in the cable trough so it will not interfere with the operation of the fan.

POWER UNIT	SWITCH							
	1	2	3	4	5	6	7	8
OLS	0	1	0	0	0	0	0	1
DC CONVERTER	0	1	0	0	0	1	1	0

1 = OPTION DIP SWITCH CLOSED
0 = OPTION DIP SWITCH OPEN



A SWITCH IS CLOSED WHEN THE ROCKER ARM IS DEPRESSED TOWARD THE SWITCH POLE NUMBER AS SHOWN, POLES 2 AND 8 ARE CLOSED

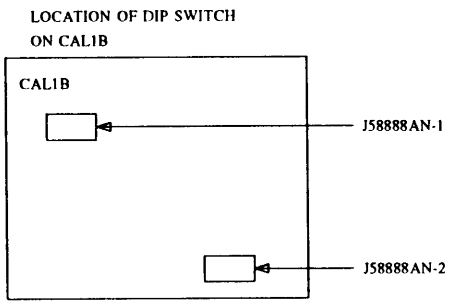


Figure 13-9. CAL1B Options

ANN15B and ANN16B Options

One switch package (S1) containing three rocker switch sections is positioned on the circuit pack as shown in figure 13-10.

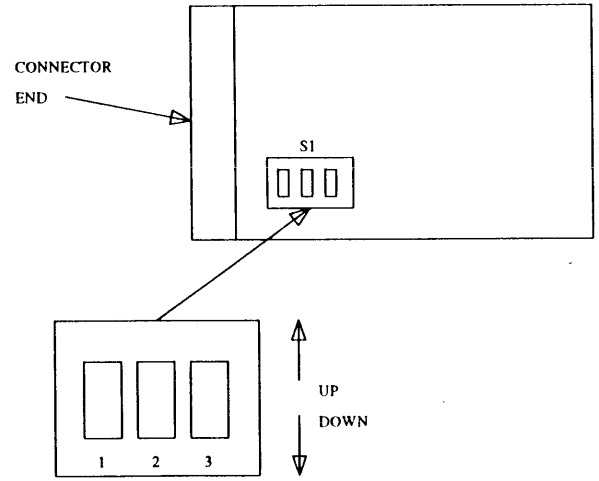


Figure 13-10. ANN15B and ANN16B Switch Locations

Set the option switches based on the length of the DS1 cross-connect point using table 13-1. If a DS1 trunk port from a System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the distance. The options at both systems should be set at the distance to the phantom point. If the unit being connected to the DS1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 13-1. Switch Settings

Cable Length	SW1	SW2	SW3
0-133 ft.	D	D	U
133-266 ft.	D	U	D
266-399 ft.	D	U	U
399-533 ft.	U	D	D
533-655 ft.	U	D	U

634WAAB1 Series 4 and Higher Power Supply

The input voltage switch should be factory set to the 110V position. Verify that it is properly set. If it isn't, set the input voltage switch to the 110V position using a nonmetallic tool. See figure 13-11 for the switch locations. Only Vintage 4 and above power supplies are set to 110V. Older vintages of the power supply should not be in the field.

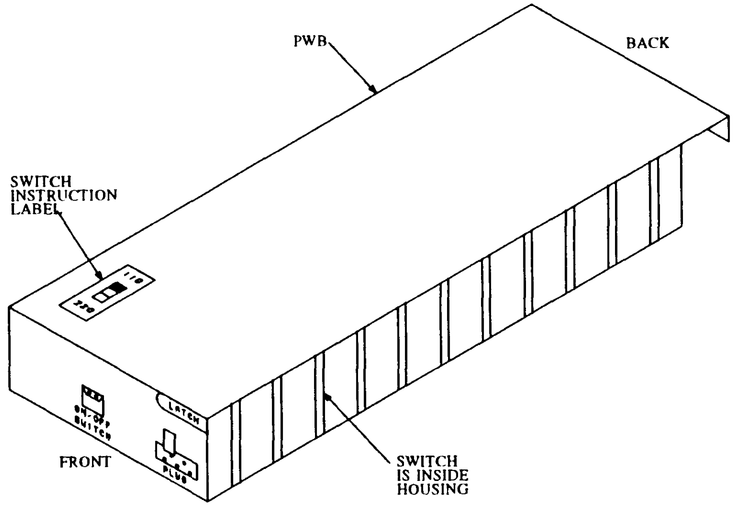


Figure 13-11. 634WAAB1 Switch Locations

551V CSU Options

The settings for each installation can be determined from the hardware customer system document (CSD).

The option switch location for the system monitor unit and the office repeater (OR) boards of the CSU are shown in figures 13-12 and 13-13.

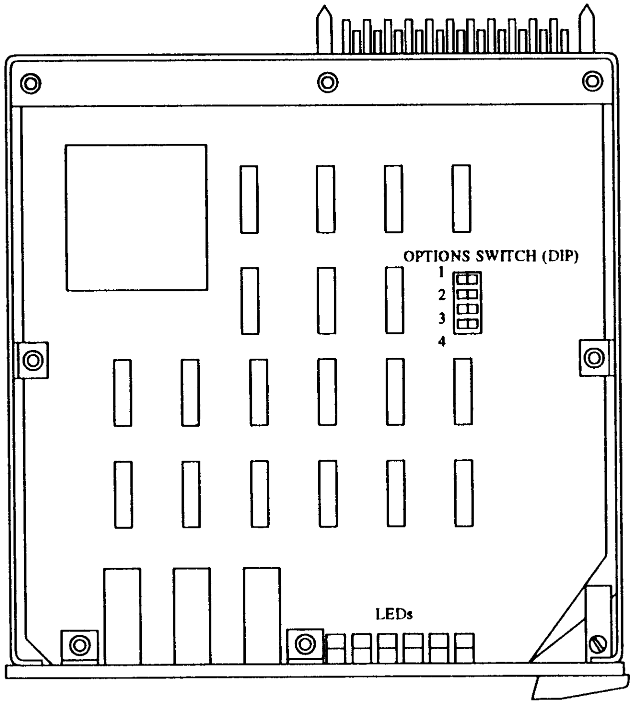


Figure 13-12. System Monitor Unit

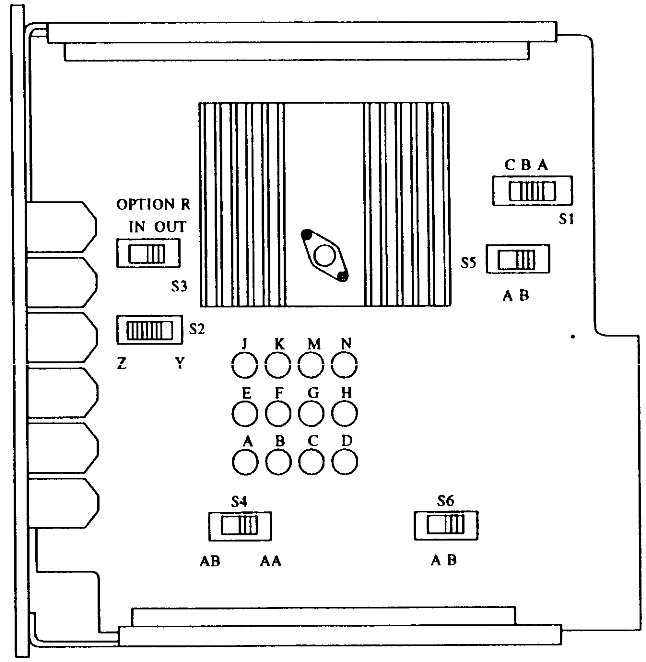


Figure 13-13. OR Board

The Signal Monitor Unit (SMU) option settings are shown in table 13-2.

TABLE 13-2. SMU Options

Option		Switch	Setting
All Ones		1	C
		2	0
ESS		1	0
		2	C
Zeros	16	3	C
	50	3	0
Active Fault Locate		4	C

The OR option settings are shown in table 13-3.

TABLE 13-3. OR Options

551V or Powering Mode Data					
Screw Options		**S2**	**S3**	**S4**	**S6**
60mA Line Line Power	C, E, K	N/A	N/A	AB	B
-48V with sealing current	C, E, K	Y	OUT	AA	B
-48 V without sealing current	C, G, J	Y	OUT	AA	B

Artificial Line Option Selection		
dB Level	**S1**	**S5**
0 db	C	NA
7.5 db	A	A
15 db	B	B

CEM Options

The settings for each individual installation can be determined from the hardware CSD.

The option settings for the SM470 are shown in table 13-4.

TABLE 13-4. SM470 Options

Port	1	2	3	4	5	6	7	8
Switch	1	2	3	4	5	6	7	8
Echo Canceling Provided	0	0	0	0	0	0	0	0
Echo Canceling Not Provided	C	C	C	C	C	C	C	C

The option settings for the TM501 (line Z options) are shown in table 13-5.

TABLE 13-5. TM501 Options

Option		Switch							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Equalizer Value	0-133 ft	C	C	0			Not Used		
	134-267 ft	C	0	C					
	268-400 ft	C	0	0					
	401-533 ft	0	C	C					
	534-655 ft	0	C	0					
Framing Format	D4				C				
	Fe				0				
Line Format	Bipolar					C			
	B8ZS					0			

The options settings for the TM500 (line X and Y options) are shown in table 13-6. The switch locations are shown in figure 13-14.

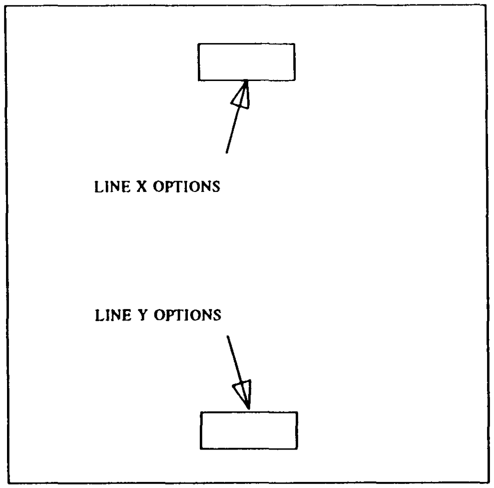


Figure 13-14. Switch Locations

TABLE 13-6. TM500 Options

Option		Switch							
		1	2	3	4	5	6	7	8
Equalizer Value	0-133 ft	C	C	0					
	134-267 ft	C	0	C					
	268-400 ft	C	0	0					
	401-533 ft	0	C	C					
	534-655 ft	0	C	0			Not Used		
Framing Format	D4				C				
	Fe				0				
Line Format	Bipolar					C			
	B8ZS					0			

The option switch settings for the MC90069A-1 are shown in table 13-7.

TABLE 13-7. MC90069A-1 Options

Option			Switch							
			1	2	3	4	5	6	7	8
Clock Reference	Local BCM		0	0	0	0	0	0		
	Line X		C	0	0	0	0	C		
	Line Y		0	C	0	0	0	C		
	Line X		0	0	C	0	0	C		
Echo Tail Length	Line X	Not used or 16 ms							0	
		32 ms							C	
	Line Y	Not used or 16 ms								0
		32 ms								C

The MC90069A-1 faceplate options are shown in tables 13-8 and 13-9.

TABLE 13-8. MC90069A-1 Faceplate Options — No Through Channels

	Switch	Rocker					
		1	2	3	4	5	6
Line x Channels 1-12	1	C	C	0	0	0	0
	2	0	C	0	0	0	0
Line x Channels 13-24	1	C	0	0	0	0	0
	2	0	0	0	0	0	0
Line y Channels 1-12	3	C	C	0	0	0	0
	4	0	C	0	0	0	0
Line Y Channels 13-24	3	C	0	0	0	0	0
	4	C	0	0	0	0	0

TABLE 13-9. 12 Channels Compressed — No Signaling

Switch					
1	2	3	4	5	6
C	C	C	0	0	0

The signaling channels with through channel options are shown in table 13-10.

TABLE 13-10. Signaling Channels with Through Channels

Number of Through Channels	Switches: Open	Switches: Closed	Available Channel Configurations: 1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23	12 or 24
1	2,3,4,5,6	1	T-N	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	1,3,4,5,6	2	T-S	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	2,5	1,3,4,6	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
2	3,4,5,6	1,2	T-N	T-N	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	1,2,4,5,6	3	T-N	T-S	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	2,4,5,6	1,3	T-S	T-S	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	2,4,6	1,3,5	T-N	--	T-N	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	--
	1,5	2,3,4,6	T-N	--	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	2,3	1,4,5,6	--	--	--	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
3	1,4,5,6	2,3	T-N	T-N	T-N	--	--	--	C-S	C-S	C-S	C-S	C-S	--
	4,5,6	1,2,3	T-N	T-N	T-S	--	--	--	C-S	C-S	C-S	C-S	C-S	--
	1,2,3,5,6	4	T-N	T-S	T-S	--	--	--	C-S	C-S	C-S	C-S	C-S	--
	2,3,5,6	1,4	T-S	T-S	T-S	--	--	--	C-S	C-S	C-S	C-S	C-S	--
	1,4,6	2,3,5	T-N	--	T-N	--	T-N	--	C-S	C-S	C-S	C-S	C-S	--
	5	1,2,3,4,6	T-N	T-N	--	--	--	--	C-S	C-S	C-S	C-S	C-S	T-N
	2,3,4	1,5,6	T-N	--	T-N	--	--	--	C-S	C-S	C-S	C-S	C-S	T-N
	1,3	2,4,5,6	T-N	--	--	--	--	C-S	C-S	C-S	C-S	C-S	T-N	T-N
4	1,3,5,6	2,4	T-N	T-N	T-N	T-N	--	--	--	--	C-S	C-S	C-S	--
	3,5,6	1,2,4	T-N	T-N	T-N	T-S	--	--	--	--	C-S	C-S	C-S	--
	1,2,5,6	3,4	T-N	T-N	T-S	T-S	--	--	--	--	C-S	C-S	C-S	--
	2,5,6	1,3,4	T-N	T-S	T-S	T-S	--	--	--	--	C-S	C-S	C-S	--
	1,5,6	2,3,4	T-S	T-S	T-S	T-S	--	--	--	--	C-S	C-S	C-S	--
	4,6	1,2,3,5	T-N	--	T-N	--	T-N	--	T-N	--	C-S	C-S	C-S	--
	1,2,3,4	5,6	T-N	T-N	T-N	--	--	--	--	--	C-S	C-S	C-S	T-N
	3	1,2,4,5,6	T-N	T-N	--	--	--	--	--	C-S	C-S	C-S	T-N	T-N
	1,3,4	2,5,6	T-N	--	T-N	--	T-N	--	--	--	C-S	C-S	C-S	T-N
5	5,6	5,6	T-N	T-N	T-N	T-N	T-N	--	--	--	--	--	C-S	--
	1,2,3,4,6	1,2,3,4,6	T-N	T-N	T-N	T-N	T-S	--	--	--	--	--	C-S	--
	2,3,4,6	2,3,4,6	T-N	T-N	T-N	T-S	T-S	--	--	--	--	--	C-S	--
	1,3,4,6	1,3,4,6	T-N	T-N	T-S	T-S	T-S	--	--	--	--	--	C-S	--
	3,4,6	3,4,6	T-N	T-S	T-S	T-S	T-S	--	--	--	--	--	C-S	--
	1,2,4,6	1,2,4,6	T-S	T-S	T-S	T-S	T-S	--	--	--	--	--	C-S	--

C=Compressed, T=Through, S=Signaling, N=No Signaling, --=Unused

The no signaling channels with through channel options are shown in table 13-11.

TABLE 13-11. No Signaling Channels with Through Channels

Number of Through Channels	Switches		Available Channel Configurations											
	Open	Closed	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23	12 or 24
1	2,3,6	1,4,5	T	--	C	C	C	C	C	C	C	C	C	C
	1,2,4,5	3,6	--	C	C	C	C	C	C	C	C	C	C	T
2	1,3,6	2,4,5	T	T	--	--	C	C	C	C	C	C	C	C
	1,2,3,4,5	6	T	--	T	--	C	C	C	C	C	C	C	C
	2,4,5	1,3,6	T	--	--	C	C	C	C	C	C	C	C	T
	3,4	1,2,5,6	--	--	C	C	C	C	C	C	C	C	T	T
3	3,6	1,2,4,5	T	T	T	--	--	--	C	C	C	C	C	C
	2,3,4,5	1,6	T	--	T	--	T	--	C	C	C	C	C	C
	1,4,6	2,3,6	T	T	--	--	--	C	C	C	C	C	C	T
	1,3,5	2,4,6	T	--	T	--	--	C	C	C	C	C	C	T
	1,2,4	3,5,6	T	--	--	--	C	C	C	C	C	C	T	T
4	1,2,6	3,4,5	T	T	T	T	--	--	--	--	C	C	C	C
	1,3,4,5	2,6	T	--	T	--	T	--	T	--	C	C	C	C
	4,5	1,2,3,6	T	T	T	--	--	--	--	C	C	C	C	T
	3,5	1,2,4,6	T	--	T	--	T	--	--	C	C	C	C	T
	2,4	1,3,5,6	T	T	--	--	--	--	C	C	C	C	T	T
	4	1,2,3,5,6	T	--	T	--	--	--	C	C	C	C	T	T
5	2,6	1,3,4,5	T	T	T	T	T	--	--	--	--	--	C	C
	3,4,5	1,2,6	T	--	T	--	T	--	T	--	T	--	C	C
	1,2,3,5	4,6	T	T	T	T	--	--	--	--	--	C	C	T
	1,2,5	3,4,6	T	--	T	--	T	--	T	--	--	C	C	T
	1,4	2,3,5,6	T	T	T	--	--	--	--	--	C	C	T	T
	1,2,3	4,5,6	T	--	T	--	T	--	--	--	C	C	T	T
6	1,6	2,3,4,5	T	T	T	T	T	T	--	--	--	--	--	--
	6	1,2,3,4,5	--	--	--	--	--	--	T	T	T	T	T	T
	2,3,5	1,4,6	T	T	T	T	T	--	--	--	--	--	--	T

C=Compressed, T=Through, --=Unused

The MC9007A-1 dip switch options are shown in table 13-12.

TABLE 13-12. MC90007A-1 Dip Switch Options

Option			Switch							
			1	2	3	4	5	6	7	8
Clock Reference	Local BCM		0	0	0	0	C	0		
	Line X		C	0	0	0	0	C		
	Line Y		0	C	0	0	0	C		
	Line X		0	0	C	0	0	C		
Echo Tail Length	Line X	Not used or 16 ms							0	
		32 ms							C	
	Line Y	Not used or 16 MS								0
		32 ms								C

The MC90007A-1 faceplate options for Robbed-Bit Signaling with through channels are shown in table 13-13.

TABLE 13-13. Robbed-Bit Signaling with Through Channels (Part 1 of 3)

Number of Througb Channels	Rockers		Available Channel Configurations											
	Closed	Open	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23	12 or 24
	2,3,4,5,6	1	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
1	1,3,4,5,6	2	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,4,5	3,6	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	3,4,5,6	1,2	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,4,5,6	3	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,4,5,6	1,3	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
2	1,2,3,4,5	6	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,4,5	1,3,6	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	1,4,5	2,3,6	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	1,3,4	2,5,6	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	1,4,5,6	2,3	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	4,5,6	1,2,3	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,3,5,6	4	T-N	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,3,5,6	1,4	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,3,4,5	1,6	T-N	C-S	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S
3	1,3,4,5	2,6	T-N	C-S	T-N	C-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	4.5	1,2,3,6	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	1,2,3,5	4,6	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	2,3,5	1,4,6	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	5	1,2,3,4,6	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	3,4	1,2,5,6	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	1,2,4	3,5,6	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	c-s	T-N	T-N

(continued)

TABLE 13-13. Robbed-Bit Signaling with Through Channels (Part 2 of 3)

Number of Through Channels	Rockers		Available Channel Configurations											
	Closed	Open	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23	12 or 24
4	1,3,5,6	2,4	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C - S	C-S	C-S	C-S	C-S
	3,5,6	1,2,4	T-N	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,25,6	3,4	T-N	T-N	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,5,6	1,3,4	T-N	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,5,6	2,3,4	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	3,4,5	1,2,6	T-N	C-S	T-N	C-S	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S
	1,33	2,4,6	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	3,5	1,2,4,6	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	1,2,3,4	5,6	T-N	C-S	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	2,4	1,3,5,6	T-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	1,4	2,3,5,6	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	1	2,3,4,5,6	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
5	5,6	1,2,3,4	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,3,4,6	5	T-N	T-N	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,3,4,6	1,5	T-N	T-N	T-N	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,3,4,6	2,5	T-N	T-N	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	3,4,6	1,2,5	T-N	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,4,6	3,5	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,5	3,4,6	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	2,3,4	1,5,6	T-N	C-S	T-N	C-S	T-N	C-S	T-N	C-S	C-S	C-S	C-S	T-N
	4	1,2,3,5,6	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	‘r-N
	1,2,3	4,5,6	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	2,3	1,4,5,6	T-N	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	1,3	2,4,5,6	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
	--	1,2,3,4,5,6	T-N	C-S	T-N	C-S	T-N	C-S	C-S	C-S	C-S	C-S	T-N	T-N

(continued)

TABLE 13-13. Robbed-Bit Signaling with Through Channels (Part 3 of 3)

Number of Through Channels	Rockers		Available Channel Configurations											
	Closed	Open	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23	12 or 24
6	2,4,6	1,3,5	T-N	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S
	1,4,6	2,3,5	T-N	T-N	T-N	T-N	T-N	T-S	C-S	C-S	C-S	C-S	C-S	C-S
	4,6	1,2,3,5	T-N	T-N	T-N	T-N	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,2,3,6	4,5	T-N	T-N	T-N	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S
	2,3,6	1,4,5	T-N	T-N	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S
	1,3,6	2,4,5	T-N	T-S	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C-S	C-S
	3,6	1,2,4,5	T-N	T-S	T-S	T-S	T-S	T-S	C-S	C-S	C-S	C-S	C S	C-S
	1,2,6	3,4,5	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N	T-N	T-N	T-N	T-N
	2,6	1,3,4,5	C-S	C-S	C-S	C-S	C-S	C-S	T-S	T-S	T-S	T-S	T-S	T-S
	2,5	1,3,4,6	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	C-S	T-N
	3	1,2,4,5,6	T-N	T-S	T-S	T-N	C-S	C-S	C-S	C-S	C-S	C-S	T-N	T-N
7	1,5	2,3,4,6	T-N	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	T-N
	1,2	3,4,5,6	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	C-S	T-N	T-N
8	2	1,3,4,5,6	T-N	T-N	T-N	T-N	T-N	T-N	C-S	C-S	C-S	C-S	T-N	T-N
12	1,6	2,3,4,5	T-N	T-N	T-N	T-N	T-N	T-N	T-N	T-N	T-N	T-N	T-N	T-N
	6	1,2,3,4,5,6	T-S	T-S	T-S	T-S	T-S	T-S	T-S	T-S	T-S	T-S	T-S	T-S

CDM — Matrix Programming

The CDM has an address matrix that permits an individual channel to occupy any time slot by installing a matrix jumper. For example, channel 1 may be programmed to occupy time slot 24, and channel 2 may be programmed to occupy time slot 7. On Model No. 2521-024, only the first eight channels can be programmed. Thirty matrix jumpers are provided with the CDM.

NOTE

The channel select matrix must always be programmed if any other 8-channel drop slots are to be used.

Channel and bandwidth selections are made by programming the matrix with the jumpers. The bandwidth requirement for each channel unit is one time slot with the exception of the 56/64 KXN data channel units (DCUs) that may occupy multiple time slots.

The following example is given on how to program the matrix.

Assume that from a given site the following services are to be provided:

a. E&M service for one subscriber

b. 4.8 Kbps data service for one subscriber

c. 56/64 KXN data service for one subscriber operating at 256 Kbps when N = 4

d. Bandwidth requirements:

- E&M circuit requires one drop- and one insert-time slot
- 0-19.2 Kbps data channel requires one drop- and one insert-time slot
- 56/64 KXN data channel requires four drop- and four insert-time slots

e. Available time slots are 1, 5, 8, 9, 14, and 16.

WARNING

Do not use time slots 6, 12, 18, or 24 when the CDM is used in conjunction with the CDM. These time slots carry signaling information for the bundled voice channels.

Assign the channel units

- E&M service is channel 1, time slot 1
- 0-19.2 data service is channel 2, time slot 5
- 56/64 KXN data service is channel 3, time slots 8, 9, 14, and 16

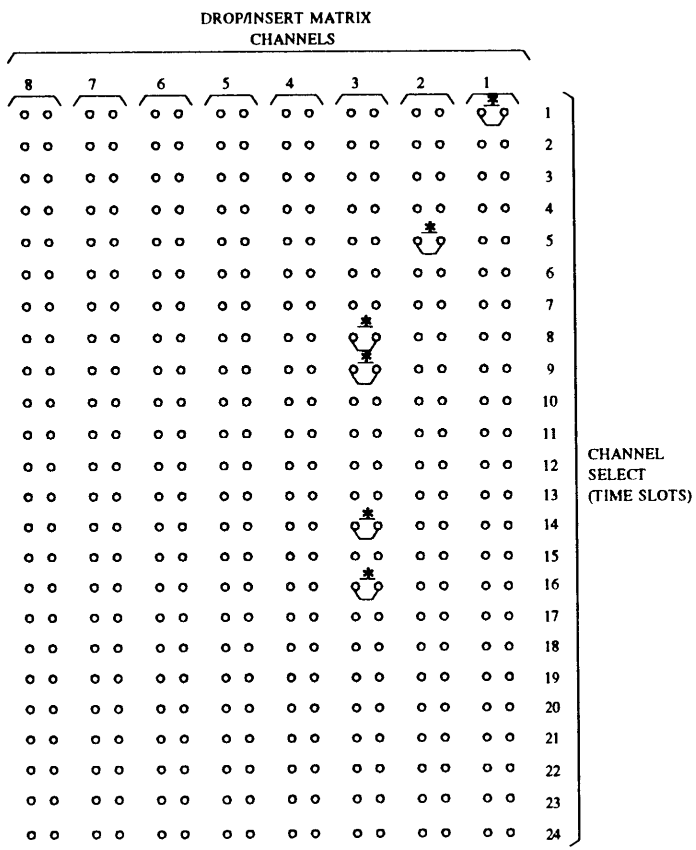
Record the channels on the Matrix Programming Guide (table 13-14). The Matrix Programming Guide must be filled out for each direction of transmission.

TABLE 13-14. Matrix Programming Guide

Select Time Slot	CDM Channel Unit Type							
						Data 56/64 KXN	Data 0-19	E&M
	Card Slot							
	8	7	6	5	4	3	2	1
1								*
2								
3								
4								
5							*	
6								
7								
8						*		
9						*		
10								
11								
12								
13								
14						*		
15								
16						*		
17								
18								
19								
20								
21								
22								
23								
24								

* Place jumpers on both drop and insert matrixes.

To program the matrix, loosen the thumbscrews at the top of the data service panel; and let the panel swing down. Place the jumpers on the Drop and Insert Matrix as shown in figure 13-15 using the programming guide. Close and secure the panel.



* PLACE JUMPER ON BOTH DROP AND INSERT MATRIXES

Figure 13-15. Jumper-Wire Assignment for Drop/Insert Matrix

Alarm Unit 30005-001

Set the options on the alarm unit using figure **13-16 and table 13-15.**

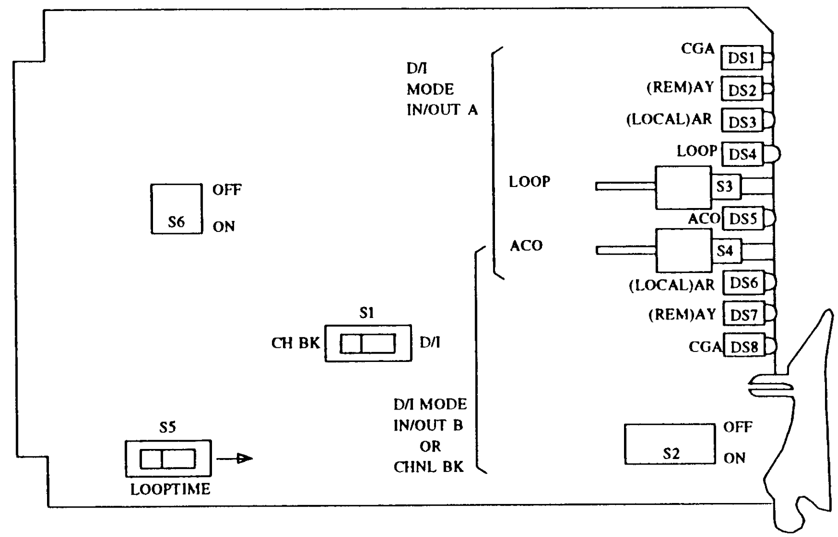


Figure 13-16. Switch Locations

TABLE 13-15. Switch Settings

Switch No.	Mode	Switch Position	Switch Description	
S1		CH BK	CDM operates as a channel bank (terminating multiplex)	
		D/I	CDM operates as a drop and insert terminal (multiplex)	
S2		OFF (all sections)		
S3		Momentary pushbutton	Places terminal in loop if CD1 is in CGA and ACO is operated	
S4		Momentary pushbutton	ACO is momentary switch that turns off audible alarm in an alarmed condition	
S5	CH BK*	Local	Source of Timing	Onboard clock
		Looped		Incoming DS-1 signal
	D/I	Local		Alarm timing derived from on-board clock in alarmed condition
		Looptime		Alarm timing derived from opposite direction DS-1 signal in alarmed condition
S6		Off (all sections)		

* In the Channel Bank mode one CDM is usually optioned for LOCAL and the far end is optioned for LOOPED except when the DS-1 facility provides timing. In that case, both CDMs are optioned for LOOPED.

CDM — Four-Wire E&M Channel Unit

Set the options on the 4-wire E&M channel unit using the following procedures.

1. To set the transmit attenuator:

   a. For No. 30003-002 (figure 13-17), insert a 1004-HZ signal at the proper system level into the channel. Connect a dB meter (600-ohm bridged) to J1. Set switches S2 and S3 as required to obtain a meter reading of +84.

   b. For No. 30044-002 (figure 13-18), insert a 1004-HZ signal at the proper system level into the channel. Connect a dB metter (600-ohm bridged) to TP5 and TP6. Set switches on S8 and S9 to obtain a meter reading of +.84.

2. To set receiver attenuator:

   a. For No 30003-002 (figure 13-17), connect a dB meter (600-ohm bridged) to J2. From a distant end transmitter, transmit a 1004-HZ signal at the proper system level. Set the switches on S8 and S9 to achieve the proper system level.

   b. For No. 30044-002 (figure 13-18), connect a dB meter (600-ohm bridged) to TP7 and TP8. From a distant end transmitter, transmit a 1004-Hz signal at the proper system level. Set the switches on S8 and S9 to achieve the proper system level.

3. On No. 30003-002, set switch S 10 as shown in table 13-16.

4. On No. 30044-002, set switches S2, S3, S5, and S10 as shown in table 13-17.

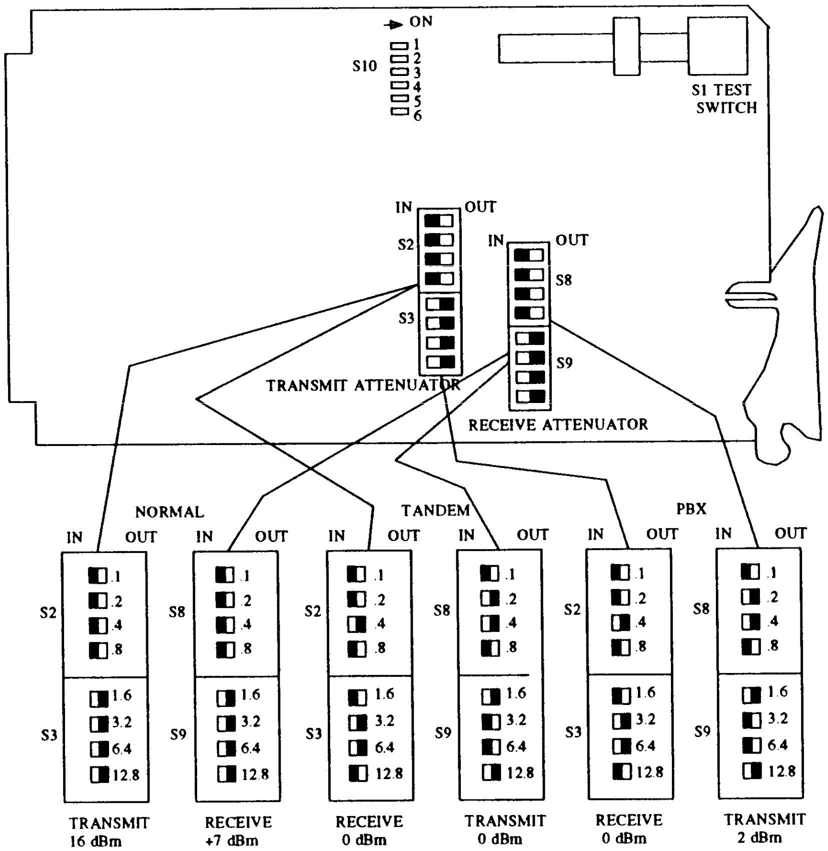


Figure 13-17. 30003-002 4-Wire E&M Chanel Unit

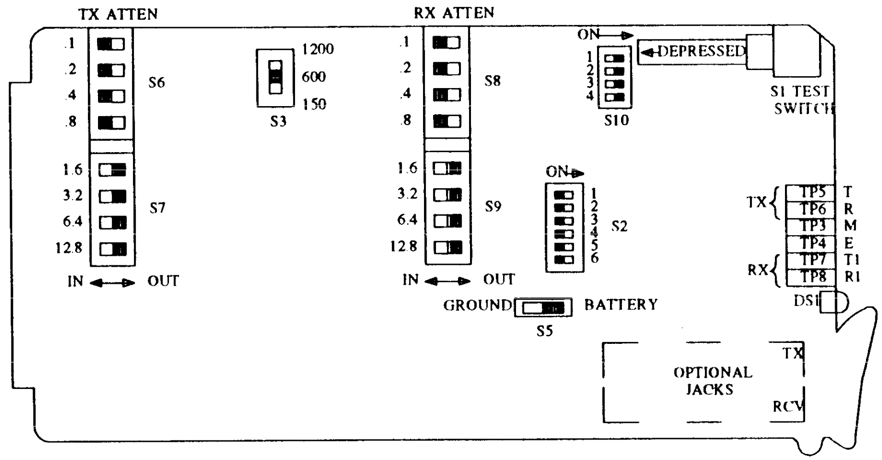


Figure 13-18. 30044-002 4-Wire E&M Channel Unit Switch Locations

Table 13-16. 30003-002 4-Wire E&M Unit — S10 Switch Settings

Switch	Section	Setting	Description		
S10	1	Off			
	2	Off			
	3	On	Type of Signaling	I	E-lead switch salting for E&M signaling
		Off		II	
		On		III	
	4	Off			
	5	Off	E-lead routines on CGA*	Idle immediately	
	6				
	5	On		Busy immediately	
	6	Off			
	5	Off		Idle immediately then busy after a delay	
	6	On			

* Most PBX interfaces will require Type 1 signaling and idle immediately then busy, after a delay. Type II and III signaling require a 4-connector (VF connector) CDM shelf.

TABLE 13-17. 30044-002 4-Wire E&M Unit — S2, S3, S5, and S10 Settings

Switch	Section	Setting	Description	
S2	1 2	Off Off	E-lead routines on CGA	Idle immediately
	1 2	Off On		Busy immediately
	1 2	On Off		Idle immediately, then busy
	3 4	Off On	E&M Operation	E lead (Busy=GND)
S5		GND		
S2	5	Off		M lead (Busy=BAT)
S2	3 4	On On	PLR Operation	E-lead busy
S5		BAT		
S2	5	On		M lead (Busy=GND)
S3		150 600 1200	150 phms 600 ohms 1200 ohms	
S10	1 2 3 4	Off Off Off Off	Breaks connection to external equipment	

Asynchronous Data Channel Unit Switch Locations and Setting

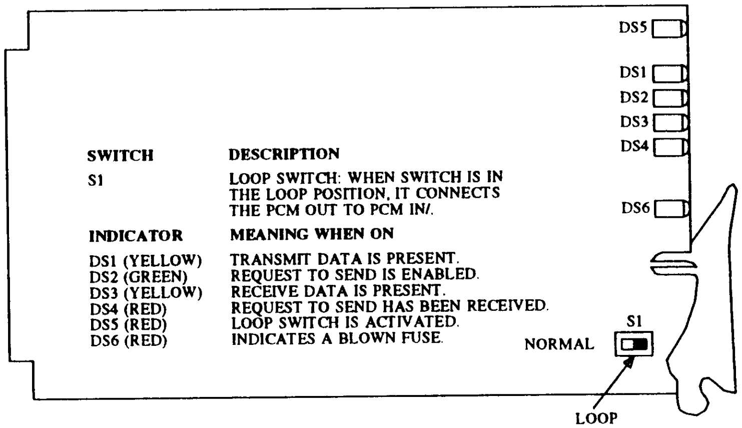


Figure 13-19. Asynchronous Data Channel Unit Switch Locations and Setting

CDM — RS422 Interface Subboard

Set the options on the RS422 interface subboard using figure 13-20 and table 13-18.

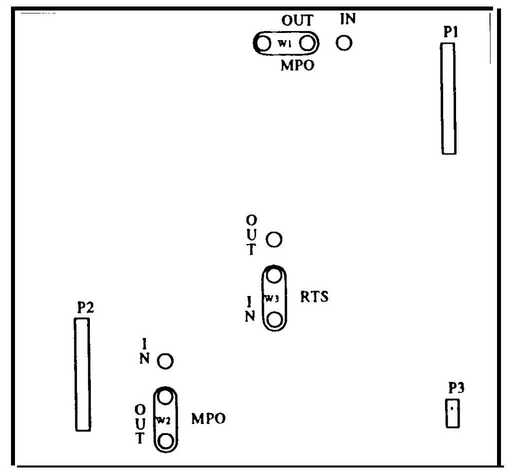


Figure 13-20. RS422 Switch Locations

TABLE 13-18. RS422 Option Settings

Option	Switch		Description
	Location	Position	
MPO (Transmit and receive)	W1,W2	In	Tristate mode is activated Both data and control bits are received/transmitted simultaneously on the same pair or wires.
		Out (Normal setting)	Tristate mode is disabled. Unit transmits and receives data only.
RTS Channel Control	W3	In	Enables insert strobe (Polled).
		OUT (Normal setting)	Insert strobe is enabled all the time (Nonpolled).

CDM — RS232C Interface Subboard

Set the options on the RS232C Interface Subboard using figure 13-21 and table 13-19.

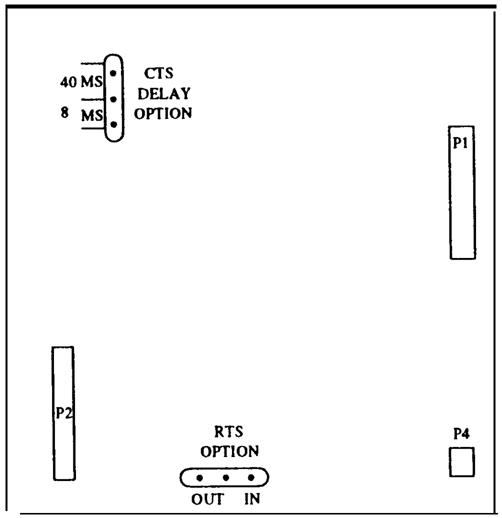


Figure 13-21. RS232C Switch Locations

TABLE 13-19. RS232C Option Settings

Alarm Option	Switch Position	Description
CTS	In	Delays clear to send signal for 40 msec
	Out (Normal setting)	Delays clear to send signal for 8 msec
RTS	In	Enables insert strobe (Polled)
	Out (Normal setting)	Insert strobe is enabled all the time (nonpolled)

CDM — 56/64 Kbps Synchronous Data Channel Unit

Use the hardware CSD and figure 13-22 to set the options on the data channel unit.

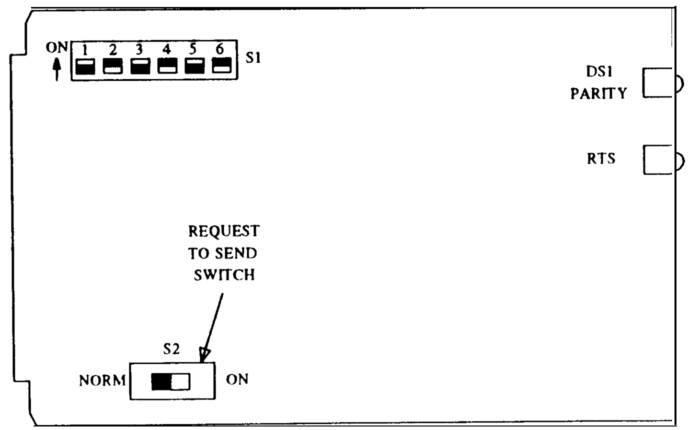


Figure 13-22. 56/64 Kbps Synchronous Data Channel Unit

CDM — V.35/RS449 Subboard

Set the jumpers to the V.35 or RS449 position using the hardware CSD, figure 13-23, and table 13-20.

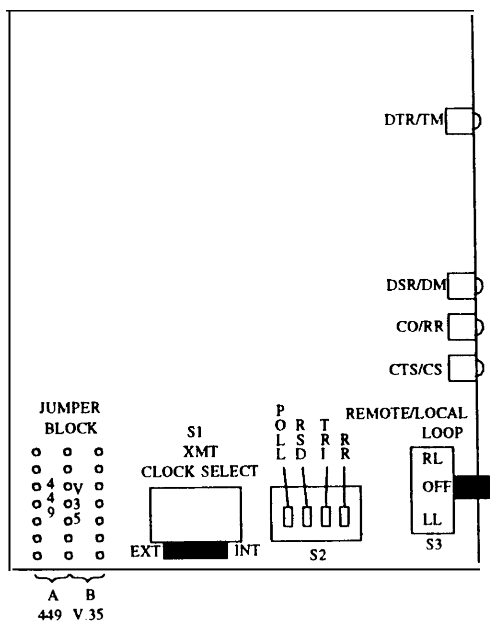


Figure 13-23. V.35/RS449 Option Switch Locations

TABLE 13-20. V.35/RS449 Option Settings

Switch Designation	Switch	Section	Switch Position	Description	
POLL		1	On*	Enables polling	Polling application
			Off†	Normal operation	
RSD	S2	2	On*	RS to CS = 0 msec	RS to CS delay
			OFF†	RS to CS= 4 msec, normal operation	
TR1		3	On*	Enables polling	Tristate
			Off†	Normal operation	
RR		4	On†	Receiver ready, normal operation	Receiver read y control
			Off*	Receiver ready, continuous operation	
Remote/Local loop†			LL	Local loop (XMT PCM to RCV PCM)	Loop switch
			Off	No loop	
			RL	Remote loop (RCV to XMT data)	
XMT clock select			INT†	Internal clock control	
			EXT	External clock control	

* Polled setting.
† Normal setting
Located on front of board

CDM — Equalization

Perform the following steps to set the CDM equalization.

1. Determine the proper equalizer using the CSD and table 13-21.
2. At the rear of the CDM, loosen thumbscrews at the top of the Data Service Panel and swing the panel down.

3. Unplug the equalizers, see figure 13-24.

4. Plug in the proper equalizers with the component side out. The components are located on the lower half of the equalizers.

5. Close and secure the Data Service Panel.

TABLE 13-21. CDM Equalizers

PART NO.	DISTANCE
39004-001	0-150 feet
39004-002	150-450 feet
39004-003	450-750 feet
39004-004	Lightning Arrester

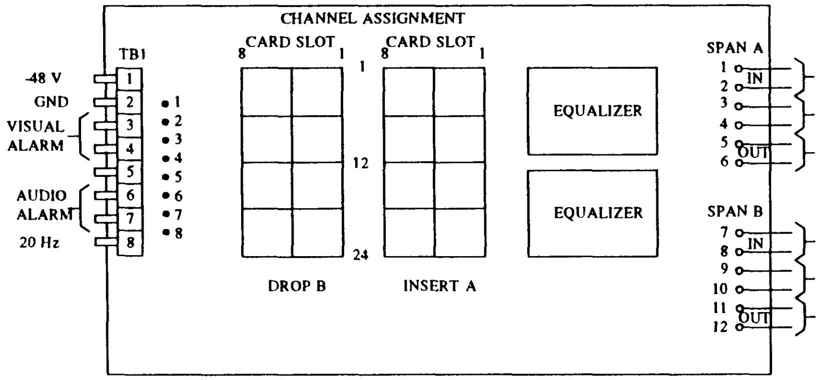


Figure 13-24. Equalizer Location

RGH POWER, GROUNDING AND ALARM CONNECTIONS

Five arrangements of equipment are used with the RGH. These are shown in the next five figures which also provide information for RGH grounding and alarm connections.

OLS With No Battery Reserve

The RGH must have an OLS (634WAAB) board in slot 06 for this power arrangement. This connection is shown in figure 13-25.

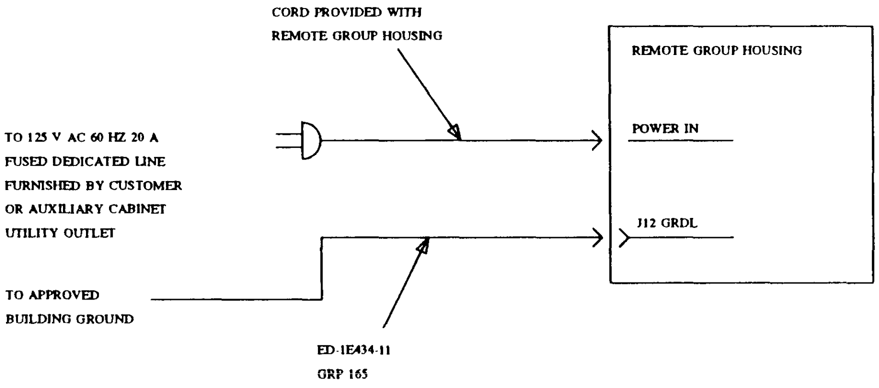


Figure 13-25. OLS with No Battery Reserve

OLS with Battery Reserve

The RGH must have an OLS (634WAAB) board in slot 06 for this power arrangement. This connection is shown in figure 13-26.

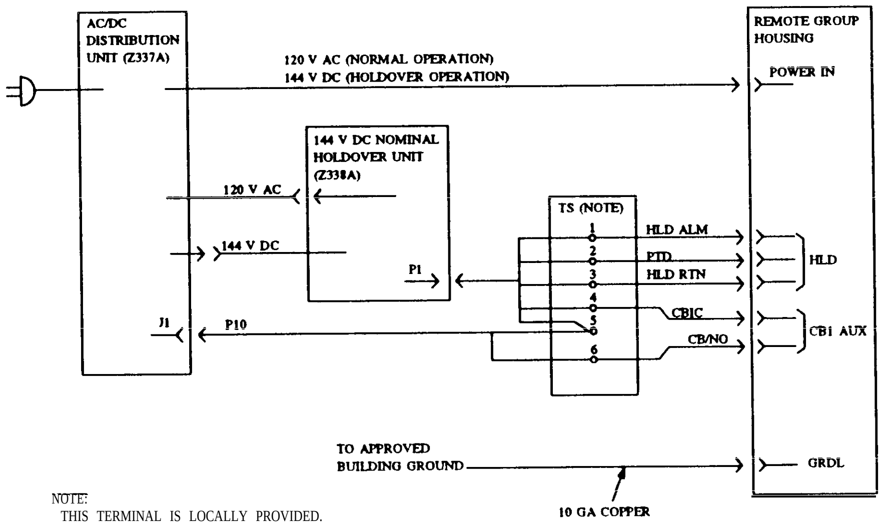


Figure 13-26. OLS with Battery Reserve

-48V Rectifier with No Battery Reserve

A DC/DC converter (495JB) must be located on slot 06 of the RGH for this power arrangement. This connections is shown in figure 13-27.

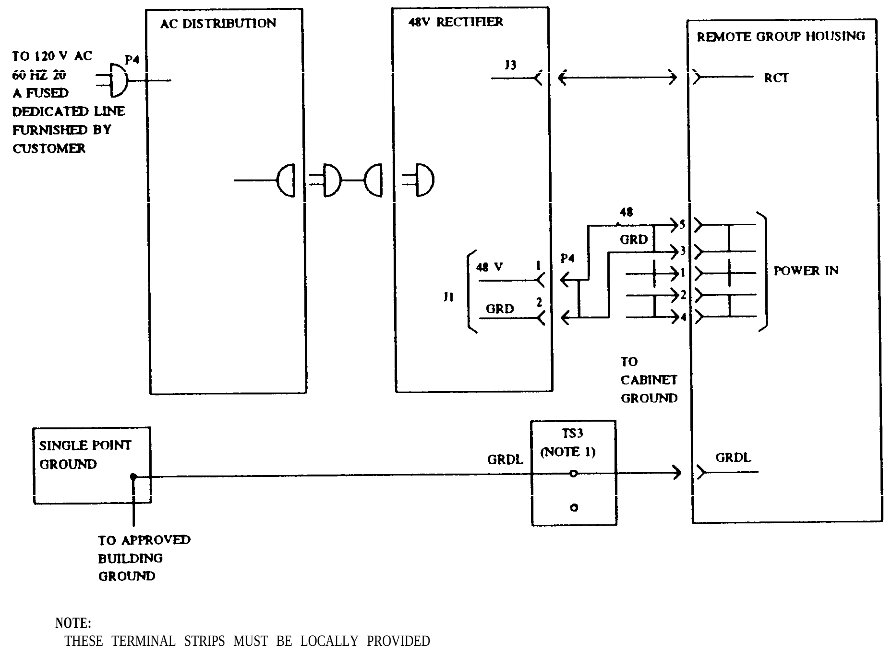
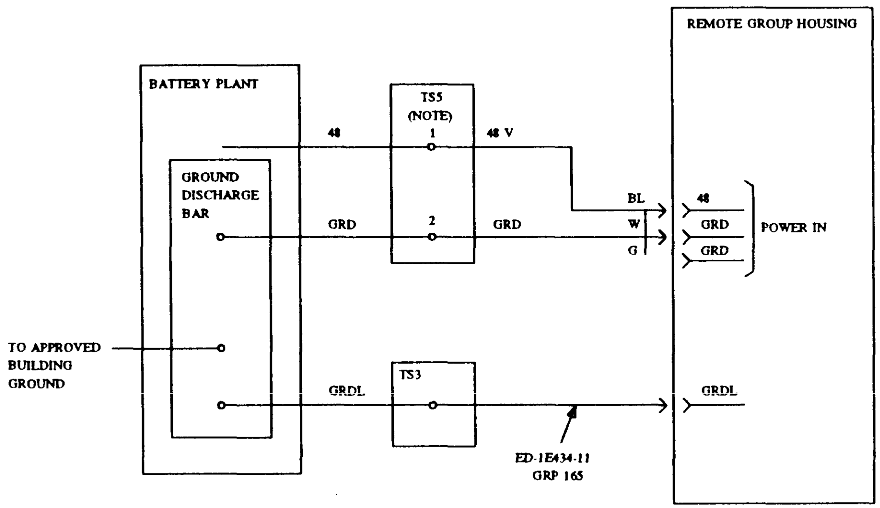


Figure 13-27. -48V Rectifier With No Battery Reserve

Standby Power

This configuration is used with a dc/dc converter installed in slot 06. Connections to the RGH are as shown. The housing is wired internally to properly distribute -48V to the DC/DC converter. The battery plant should be engineered by AT&T National Customer Support Center (NCSC). This connection is shown in figure 13-28.



NOTE:
THESE TERMINAL STRIPS MUST BE LOCALLY PROVIDED

Figure 13-28. Standby Power

CSU, CDM, and CEM Power, Grounding, and Alarms

Connect the CSU, CDM, and CEM power, grounding, and alarms using the information in figure 13-29.

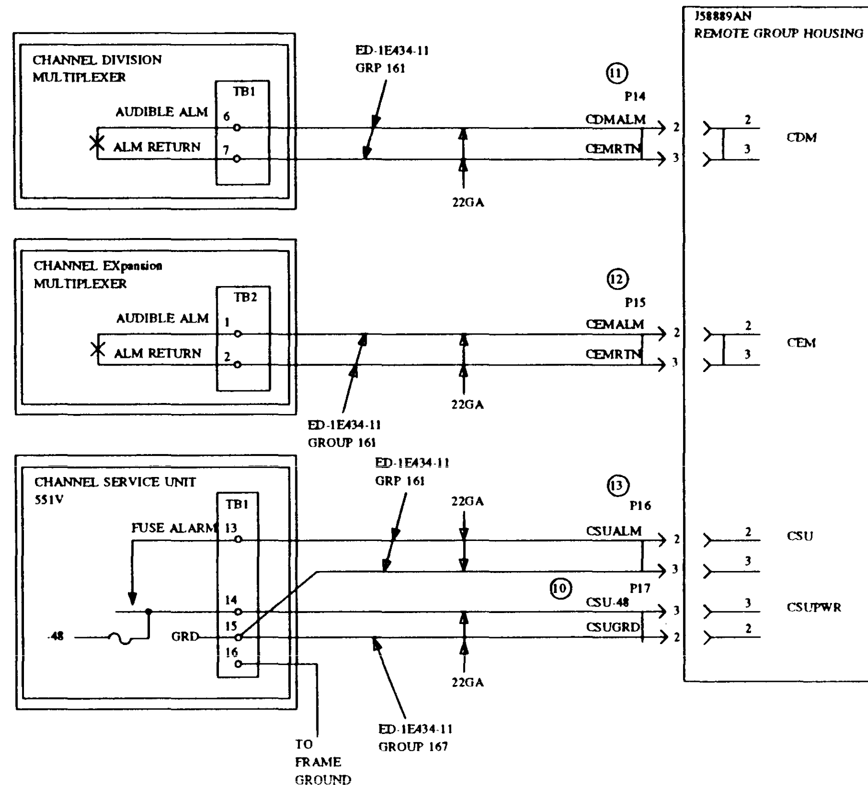


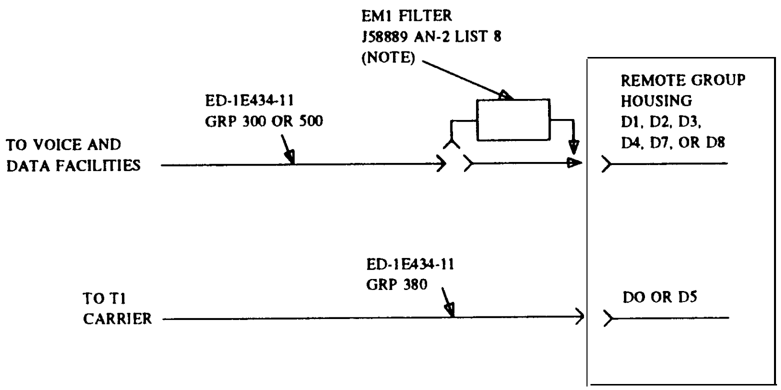
Figure 13-29. CSU, CDM, and CEM Power, Grounding, and Alarms

T1 CARRIER TO RGI

Before the 25-pair cables are attached to the DO connectors, place the 4A cable retainer clip on the connector. If the J58889AN-2, list 8 filter is being used, extensions (845798081) must be used with the retaining clip. After the clips are in place, connect the cables. Then snap the latch at the retainer into place. Detailed instructions are furnished with the RGH.

T1 Carrier Directly to RGI

Connect the T1 carrier directly to the RGI using the information in figure 13-30.

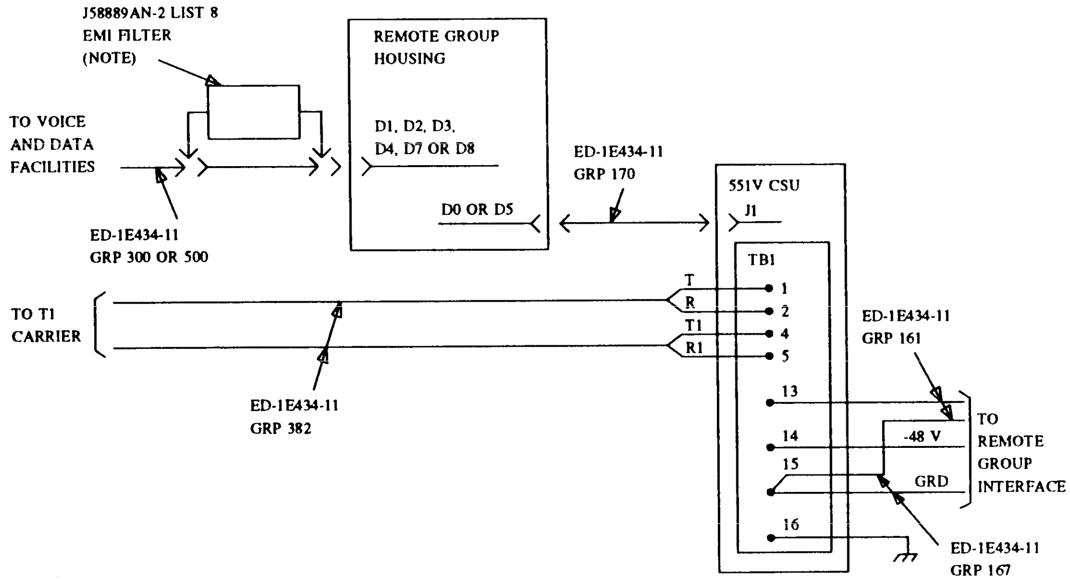


NOTE:
This filter is required only if RGH is equipped with ANN17B. but each connector associated with a ANN17B requires a filter.

Figure 13-30. T1 Carrier Directly to RGI

T1 Carrier to RGI Using CSU

Connect the T1 carrier to the RGI through the CSU using the information in figure 13-31.

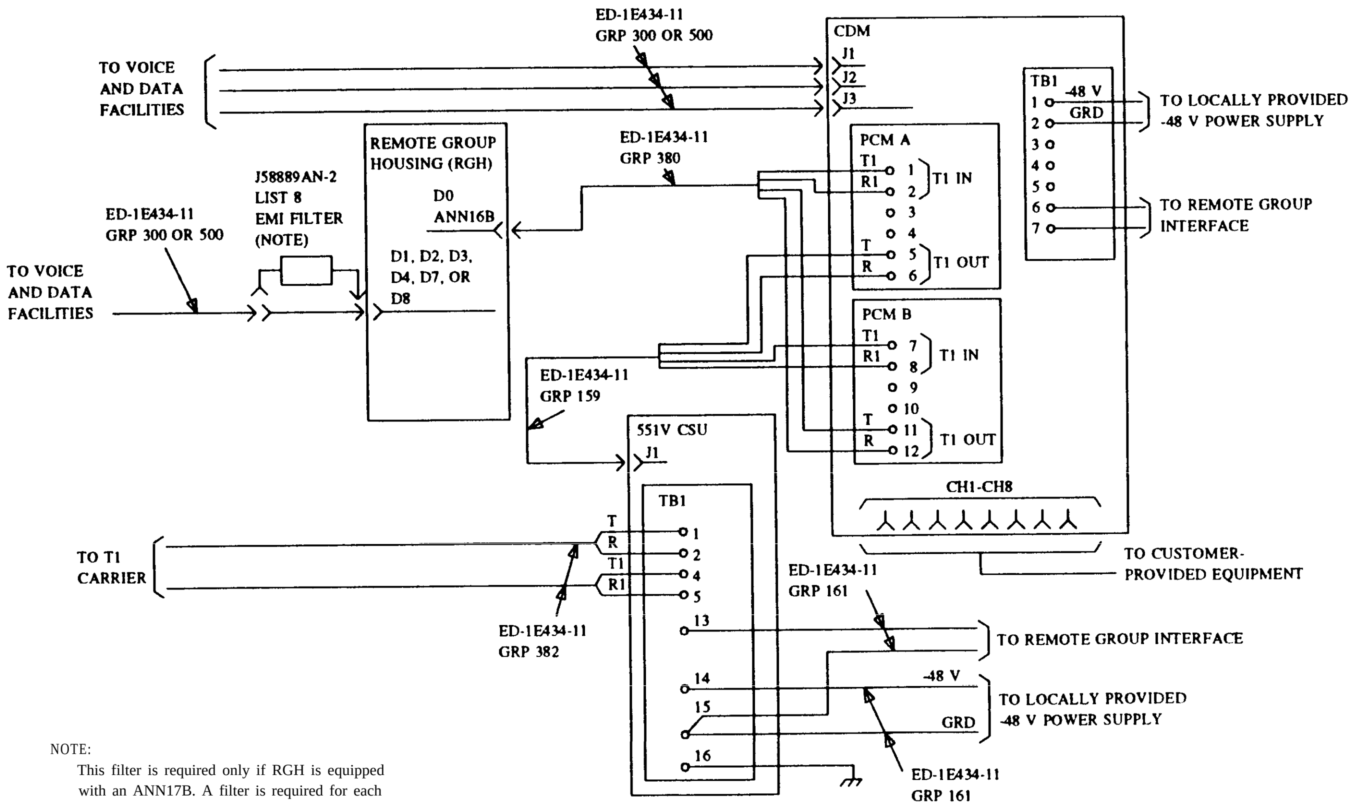


NOTE:
This filter is required only if RGH is equipped with ANN17B. A filter is required for each connector associated with an ANN17B.

Figure 13-31. T1 Carrier to RGI Using CSU

T1 Carrier to RGI Using CDM and 551V CSU

Connect the T1 carrier to the RGI using the CDM and CSU per figure 13-32.

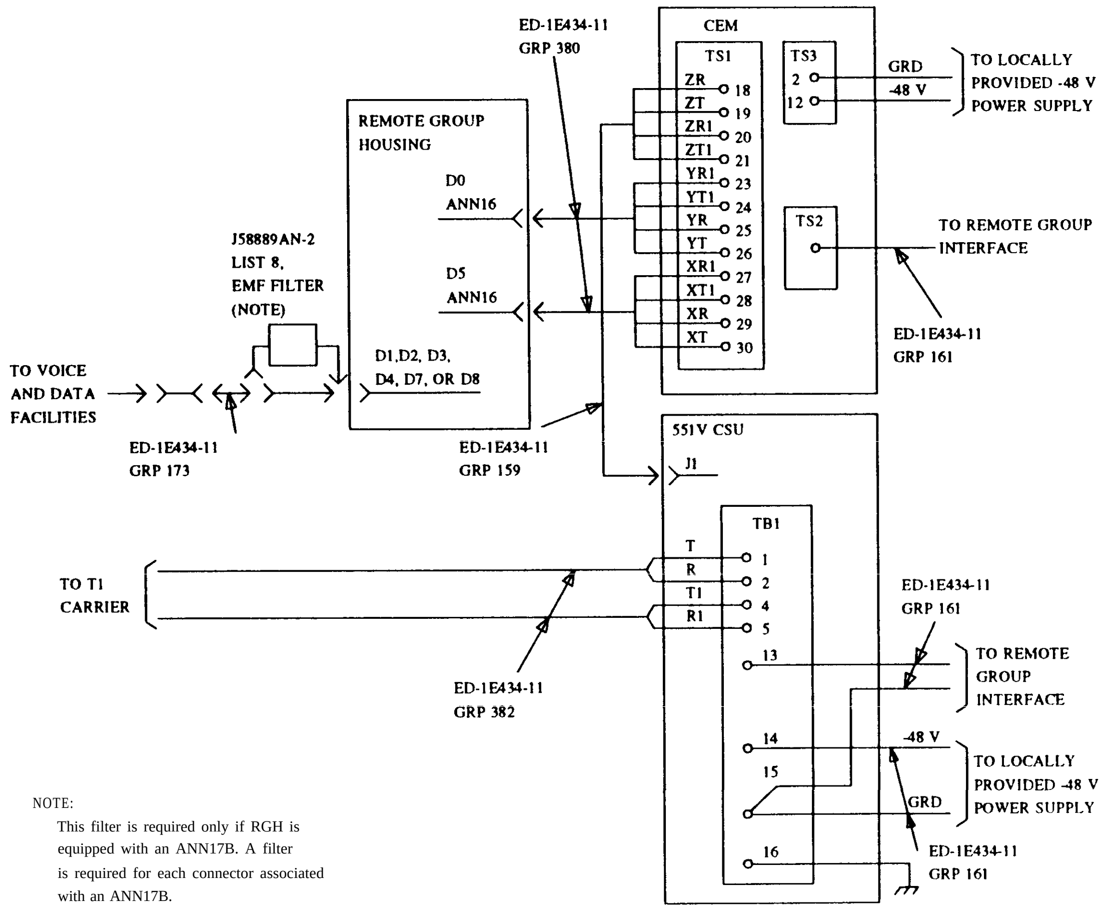


NOTE:
This filter is required only if RGH is equipped with an ANN17B. A filter is required for each connector associated with an ANN17B.

Figure 13-32. T1 Carrier to RGI Using CDM and CSU

T1 Carrier to RGI Using CEM and 551V CSU

Connect the T1 carrier to the RGI using the CEM and the CSU per figure 13-33.

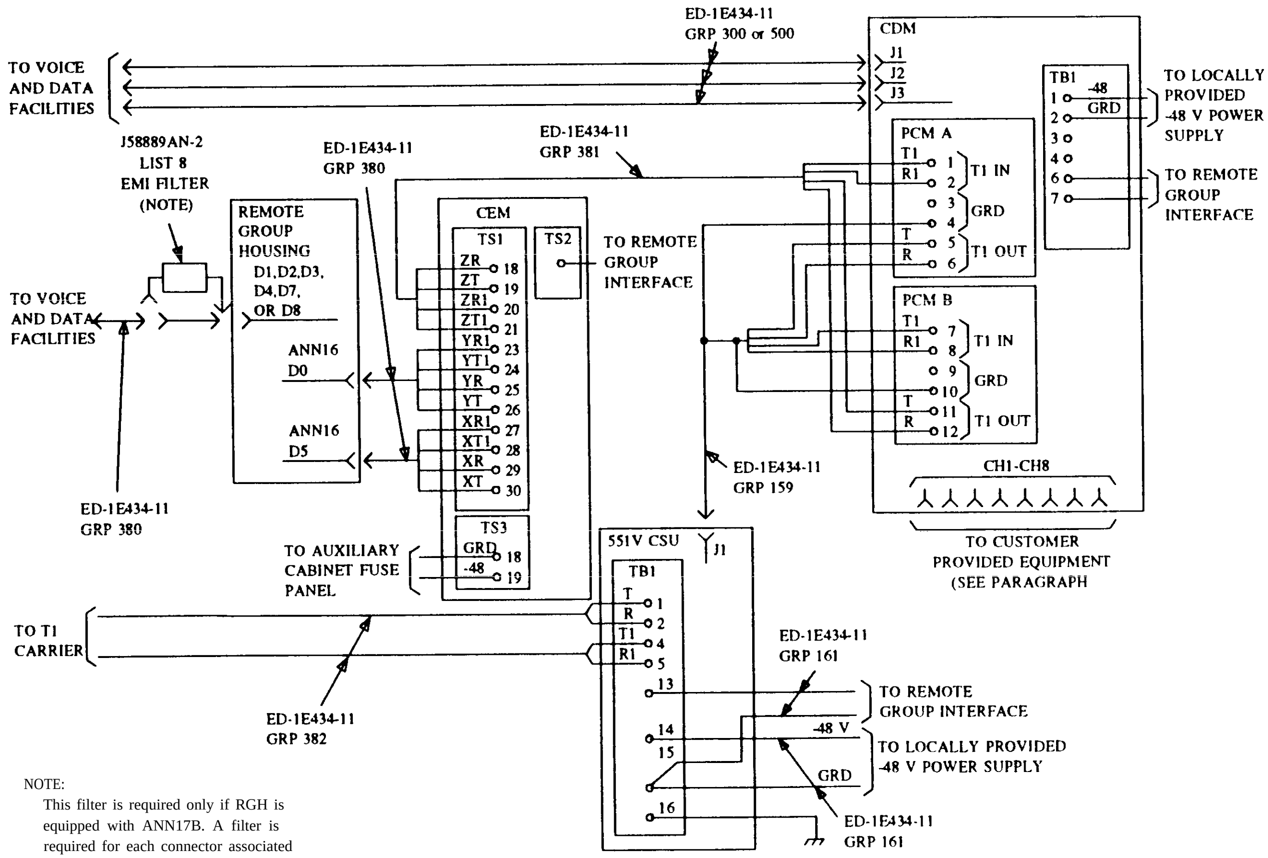


NOTE:
This filter is required only if RGH is equipped with an ANN17B. A filter is required for each connector associated with an ANN17B.

Figure 13-33. T1 Carrier to RGI Using CEM and CSU

T1 Carrier to RGI Using CEM, CDM, and CSU

Connect the T1 carrier to RGI using the CEM, CDM, and CSU per figure 13-34.



NOTE:
This filter is required only if RGH is equipped with ANN17B. A filter is required for each connector associated with an ANN17B.

Figure 13-34. T1 Carrier to RGI Using CEM, CDM, and CSU

LOR

This repeater is required at the local and remote location if the RGH is more than 3400 cable ft. from the ANN15B and local cable is being used. The repeater at the local location is usually rack mounted in an auxiliary cabinet. The repeater at the remote location is wall mounted in a small mounted rack equipped with its own –48V power supply.

Options

Use figure 13-35 and tables 13-22 through 13-26 to set the options on the LOR.

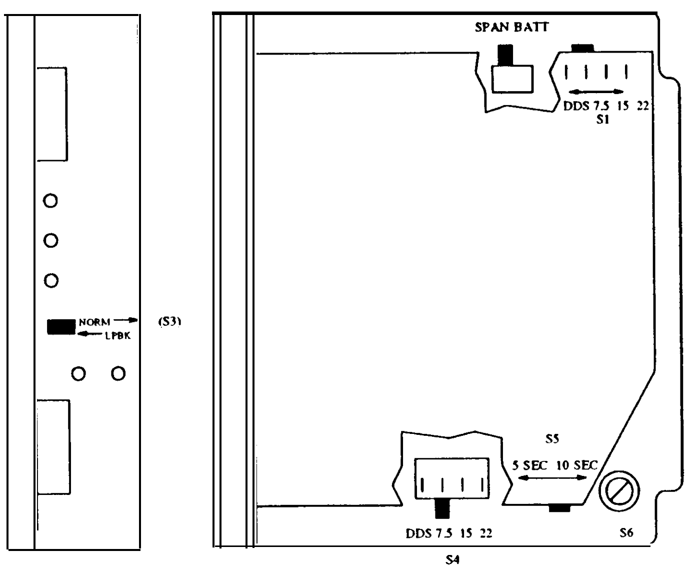


Figure 13-35. LOR Option Switch Locations

TABLE 13-22. LOR Switches S1 and S4

Facility Loss in dB	S1 (Transmit and S4 (Line) Settings
0 to 7.5	22
7.5 to 15	15
15 to 22.5	7.5
22.5 to 35	0

TABLE 13-23. Power Switch S2

Setting	Power Source
SPAN	60 or 140 mA span current
BATT	-48V dc

TABLE 13-24. Loopback Switch S3

Setting	Option
LPBK	Loopback operation
NORM	Normal operation

TABLE 13-25. Loop-Up Timing Switch S5

Setting	Option
5 sec	5 second loop-up detect interval
10 sec	10 second loop-up detect interval

TABLE 13-26. Fault Locate Switch S6

Setting	Option
Open	With fault locate filter
Closed	Without fault locate filter

Connections

All of the connections should be wire wrapped to a 56-pin connector at the rear of the shelf. This is true for the rack-mounted shelf and the smaller wall-mounted unit used at the remote location.

A block diagram of the RGI using the LOR is shown in figure 13-36.

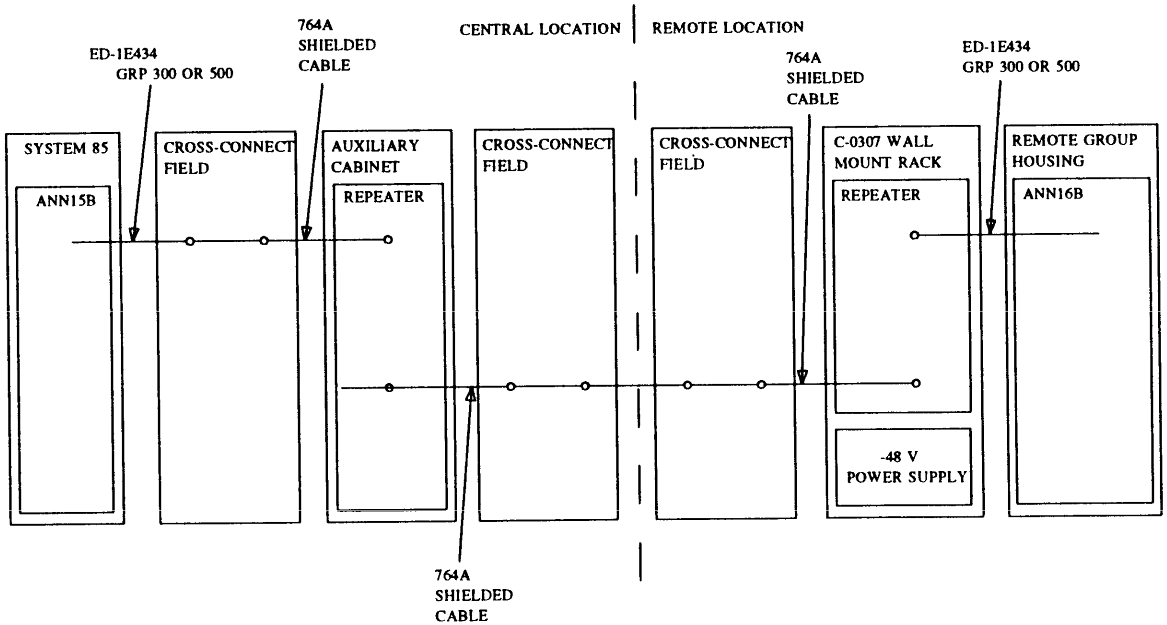


Figure 13-36. RGI With LOR Block Diagram

The LOR connections are shown in figure 13-37. The 764A cable shield should be connected at the cross-connect field and at the repeater.

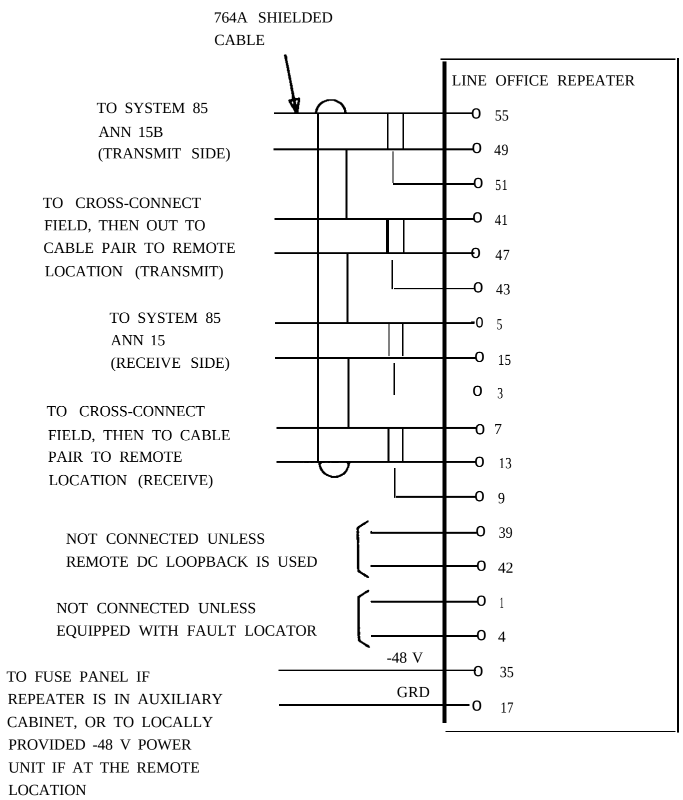


Figure 13-37. LOR Connections

CDM TERMINATING INFORMATION

The terminating information for the J1, J2, and J3 connectors on the 24-channel CDM is shown in table 13-27. The terminating information for the J1, J2, and J3 connectors on the 8-channel CDM is shown in table 13-28.

TABLE 13-27. Connections for 24-Channel CDM

Lead Designations From CDM Connectors			CDM Channel No.	Lead Color	To Cross-Connect Field		Lead Designations From CDM Connectors			CDM Channel No.	Lead Color	To Cross-Connect Field	
J1	J2	J3			CONN Pin No.	CONN BLK Term No. (Note)	J1	J2	J3			CONN Pin No.	CONN BLK Term No. (Note)
T	T1	E	1	W-BL	26	1	T	T1	E	13	BK-G	38	25
R	R1	M		BL-W	1	2	R	R1	M		G-BK	13	26
T	T1	E	2	W-O	27	3	T	T1	E	14	BK-BR	39	27
R	R1	M		W-O	2	4	R	R1	M		BR-BK	14	28
T	T1	E	3	W-G	28	5	T	T1	E	15	BK-S	40	29
R	R1	M		G-W	3	6	R	R1	M		S-BK	15	30
T	T1	E	4	W-BR	29	7	T	T1	E	16	Y-BL	41	31
R	R1	M		BR-W	4	8	R	R1	M		BL-Y	16	32
T	T1	E	5	W-S	30	9	T	T1	E	17	Y-O	42	33
R	R1	M		S-W	5	10	R	R1	M		O-Y	17	34
T	T1	E	6	R-BL	31	11	T	T1	E	18	Y-G	43	35
R	R1	M		BL-R	6	12	R	R1	M		G-Y	18	36
T	T1	E	7	R-O	32	13	T	T1	E	19	Y-BR	44	37
R	R1	M		O-R	7	14	R	R1	M		BR-Y	19	38
T	T1	E	8	R-G	33	15	T	T1	E	20	Y-S	45	39
R	R1	M		G-R	8	16	R	R1	M		S-Y	20	40
T	T1	E	9	R-BR	34	17	T	T1	E	21	V-BL	46	41
R	R1	M		BR-R	9	18	R	R1	M		BL-V	21	42
T	T1	E	10	R-S	35	19	T	T1	E	22	V-O	47	43
R	R1	M		S-R	10	20	R	R1	M		O-V	22	44
T	T1	E	11	BK-BL	36	21	T	T1	E	23	V-G	48	45
R	R1	M		BL-BK	11	22	R	R1	M		G-V	23	46
T	T1	E	12	BK-O	37	23	T	T1	E	24	V-BR	49	47
R	R1	M		O-BK	12	24	R	R1	M		BR-V	24	48
											V-S	50	49
											S-V	25	50

NOTE: One connecting block is associated with each of the CDM connectors J1-J3.

TABLE 13-28. Connections for 8-Channel CDM

Lead Designations From CDM Connectors J1	J2	J3	CDM Channel No.	Lead Color	To Cross-Connect Field CONN Pin No.	CONN BLK Term No. (Note)	Lead Designations From CDM Connectors J1	J2	J3	CDM Channel No.	Lead Color	To Cross-Connect Field CONN Pin No.	CONN BLK Term No. (Note)
T	T1	E	1	W-BL	26	1					G-BK	13	26
R	R1	M		BL-W	1	2					BK-BR	39	27
T	T1	E	2	W-O	27	3					BR-BK	14	28
R	R1	M		O-W	2	4					BK-S	40	29
T	T1	E	3	W-G	28	5					S-BK	15	30
R	R1	M		G-W	3	6					Y-BL	41	31
T	T1	E	4	W-BR	29	7					BL-Y	16	32
R	R1	M		BR-W	4	8					Y-O	42	33
T	T1	E	5	W-S	30	9					O-Y	17	34
R	R1	M		S-W	5	10					Y-G	43	35
T	T1	E	6	R-BL	31	11					G-Y	18	36
R	R1	M		BL-R	6	12					Y-BR	44	37
T	T1	E	7	R-O	32	13					BR-Y	19	38
R	R1	M		O-R	7	14					Y-S	45	39
T	T1	E	8	R-G	33	15					S-Y	20	40
R	R1	M		G-R	8	16					V-BL	46	41
				R-BR	34	17					BL-V	21	42
				BR-R	9	18					V-O	47	43
				R-S	35	19					O-V	22	44
				S-R	10	20					V-G	48	45
				BK-BL	36	21					G-V	23	46
				BL-BK	11	22					V-BR	49	47
				BK-O	37	23					BR-V	24	48
				O-BK	12	24					V-S	50	49
				BK-G	38	25					S-V	25	50

NOTE: One connecting block is associated with each of the CDM connectors J1-J3.

The terminating information for the Data Channel Connector cable wiring (Customer End) connectors CH1 through CH8 is shown in table 13-29.

TABLE 13-29. CDM CH1 Through CH8 Connecting Information

	CDM						Connect To Customer Interface Connector Pin No.				
	Data Lead Designation for Interface Type										
CONN Pin No.	Infotron V.35 (Note 1)	V.35 (Note 2)	RS449 (Note 1)	RS422	RS232 (Note 3)	TTY	Infotron V.35	V.35	RS449	RS422	RS232
1	GRD	GRD	GRD		GRD	GRD	1	1	1		1
2	TX1	TX1	SD1	SD1	TX1	OUT1	2	P	4	T	2
3	RX1	RX1	RD1	RD1	RX1	OUT2	3	R	6	T1	3
4	RTS	RTS	RS		RTS		4	C	7		4
5	CTS	CTS	CS		CTS		5	D	9		5
6		DSR	DM		DSR			E	11		6
7	SG	SG	SG		SG	OUT5	7*	B	19*		7*-
8		CO	RR		CO	OUT7	13*	F	13		8
9			LL				19*		10		12*
10			RL			IN7			14		13*
11			TM			OUT6			18		14*
12									20*		16*
13									25*		19*
14	TX2	TX2	SD2	SD2		IN1	21	s	22	R	
15	TX CLK1	SCT1	ST1	RD2	SCT	IN3	15	Y	5	R1	15
16	RX2	RX2	RD2			IN2	22	T	24		
17	RX CLK1	SCR1	RT1		SCR	OUT3		v	8		17
18	RX CLK2	SCR2	RT2			OUT4	36	x	26		
19	TX CLK2	SCT2	ST2			IN4	34	AA	23		
20		DTR	TR		DTR	IN5		H	30		20
21									27*		
22									29*		
23									31*		
24									37*		
25						IN6					

PORT CIRCUIT PACK TERMINATING INFORMATION

The following tables show port circuit pack terminations.

ANN17B

The ANN17B circuit pack can be located in slots 01, 02, 03, 04, and/or 08. The terminating information for the 25-pair connector cable associated with the ANN17B is shown in table 13-30.

WARNING

The ANN17B utilizes a solid state power-feed device to power the associated terminal. Care should be taken at the cross-connect field as voltages greater than –48 VDC or ringing voltages will damage the ANN17B.

TABLE 13-30. ANN17B Terminations

Circuit Pack Lead Desig	Connector Lead Desig	Pin No.	Color	Circuit Pack Lead Desig	Connector Lead Desig	Pin No.	Color
V1T0	T00	26	W-BL	V1R1	R12	13	G-BK
V1R0	R00	1	BL-W	CT1	T13	39	BK-BR
CT0	T01	27	W-O	CR1	R13	14	BR-BK
CR0	R01	2	O-W	P-1	T14	40	BK-S
P-0	T02	28	W-G	P+1	R14	15	S-BK
P+0	R02	3	G-W	V1T3	T15	41	Y-BL
V1T2	T03	29	W-BR	V1R3	R15	16	BL-Y
VlR2	R03	4	BR-W	CT3	T16	42	Y-O
CT2	T04	30	W-S	CR3	R16	17	O-Y
CR2	R04	5	S-W	P-3	T17	43	Y-G
P-2	T05	31	R-BL	P+3	R17	18	G-Y
P+2	R05	6	BL-R	V1T5	T18	44	Y-BR
V1T4	T06	32	R-O	V1R5	R18	19	BR-Y
V1R4	R06	7	O-R	CT5	T19	45	Y-S
CT4	T07	33	R-G	CR5	R19	20	S-Y
CR4	R07	8	G-R	P-5	T20	46	V-BL
P-4	T08	34	R-BR	P+5	R20	21	BL-V
P+4	R08	9	BR-R	V1T7	T21	47	V-O
V1T6	T09	35	R-S	V1R7	R21	22	O-V
V1R6	R09	10	S-R	CT7	T22	48	V-G
CT6	T10	36	BK-BL	CR7	R22	23	G-V
CR6	R10	11	BL-BK	P-7	T23	49	V-BR
P-6	T11	37	BK-O	P+7	R23	24	BR-V
P+6	R11	12	O-BK	GRD	GRDCOM	50	V-S
V1T1	T12	38	BK-G	GRD	GRDCOM	25	S-V

SN-Type Port Circuit Packs

The SN228B, SN238, and SN270B can be located in slots 01, 02, 03, 04, 07, and/or 08 of the RGH. The terminating information for the 25-pair connector cable associated with the SN-type port circuit pack is given in table 13-31.

TABLE 13-31. SN-Type Circuit Pack Terminations

SN228B	SN238 EIA Interface	SN270B General Purpose Port	Lead Color	Connecting Block Terminal
T0			W-BL	1
R0			BL-W	2
T1	R10	RT0	W-O	3
R1	R20	RR0	O-W	4
T2	S10	TT0	W-GR	5
R2	S20	TR0	GR-W	6
T3			W-BR	7
R3			BR-W	8
	R12	RT2	W-SL	9
	R22	RR2	SL-W	10
	S12	TT2	R-BL	11
	S22	TR2	BL-R	12
			R-O	13
			O-R	14
	R14	RT4	R-GR	15
	R24	RR4	GR-R	16
T4	S14	TT4	R-BR	17
R4	S24	TR4	BR-R	18
T5			R-SL	19
R5			SL-R	20
T6	R16	RT6	BK-BL	21
R6	R26	RR6		22
T7	S16	TT6		23
R7	S26	TR6		24
				25
	GRDD	GRDD	V-SL	26
	GRDD	GRDD	SL-V	27

ANN16B

The ANN16B can be located in slots 00 and 05 in the RGH. The terminating information for the 25-pair connector cable associated with the ANN16B is shown in table 13-32.

TABLE 13-32. ANN16B Terminations

Slot	Lead Designation	Connector	Connector Pin Number
00	LIN	D0	26
	LIP		1
	L175		27
			2
	LON75		28
	LOP175		3
	LON120		29
	LOP120		4
			30
	LON		5
	LBACK2R8		31
	LBACK1R8		6
05	LIN	D5	26
	LIP		1
	L175		27
			2
	LON75		28
	LOP175		3
	LON120		29
	LOP120		4
			30
	LON		5
	LBACK2R8		31
	LBACK1R8		6

FRONT COVER LABEL

The label on the inside of the front cover is shown on figure 13-38. This label is used to record the equipment location of the ANN15B(s) associated with the RGI. This information can be obtained at the central location of the System 85. The draftsperson at the System 85 can obtain the required information by using local records or by using PROC 290, Word 2. The instructions for using PROC 290, Word 2 are contained in *AT&T System 85 Feature Translation Service Manual* [555-102-107 (R2V2) or 555-103-107 (R2V4) or 555-104-107 (DEFINITY Generic 2)].

CENTRAL SWITCH REFERENCE
(TO BE FILLED IN DURING INSTALLATION)

RGI-C (ANN15B) GROUP 1		RGI-C (ANN15B) GROUP 2	
MODULE	______	MODULE	______
CABINET	______	CABINET	______
CARRIER	______	CARRIER	______
SLOT	______	SLOT	______

MAAP REFERENCE

MAAP DISPLAY		REMOTE CARRIER SLOTS GROUP 1	REMOTE CARRIER SLOTS GROUP 2
RGI-C (ANN15B)	0, 5, 13 or 18		
RGI-R (ANN16B)	1, 6, 14 or 19	0	5
PORT 1	0, 5, 13 or 18	1	4
PORT 2	1, 6, 14 or 19	2	7
PORT 3	2, 7, 15 or 20	3	8

Figure 13-38. Front Cover Label

14. ATTENDANT CONSOLE

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This section provides installation and connection information for attendant consoles and related hardware. This includes attendant console, attendant console repeaters, and visually impaired attendant console adjuncts.

The console is equipped with an 8-foot long, 12-pair mounting cord that is connected to a B12A (12-pair) or B25A (25-pair) connecting cable from the system. The mounting cord is equipped with a 50-pin KS-16689, List 1 connector. The mating connector terminates the 12- or 25-pair connecting cable. The range of the 12-pair cable is 700 feet and the range of the 25-pair cable is 1000 feet. This range can be extended to a maximum of 11,000 feet with attendant console repeaters. If the attendant console is located in a building other than the one in which the system is located, attendant console repeaters must be used.

Visually impaired attendant service is provided by using a light-sensitive probe, grooved console faceplate, and additional audible tones that identify the type of call. The system consoles allow plugging an audible tone adjunct directly into the console.

REQUIREMENTS

The attendant console interfaces the system through four connector cables connected to the single console connector cable via a cross-connection arrangement on the auxiliary cross-connect field. The attendant console functions provided by the four connector cables are voice and control, power and ground, data channels, and alarms.

Cabling between the console and the system cabinets must be 24- or 26-gauge shielded cable using KS-16689 connectors with high hoods. Cables cut down on the back side of the 110 terminal block may be 22, 24, or 26 gauge. The jumper wires or cable cut down on the front side must be 24 gauge.

Each console connection requires a power cable from a module control or port cabinet that contains the power supply. A maximum of four consoles can be powered by a single power supply.

An alarm multiple shorting plug (ED-1E434-11 GRP 360) is plugged into the connector associated with the 110 block chosen to cross-connect the alarm leads. This will provide extension of the alarms to a maximum of 15 consoles. For a system to operate with more than 15 consoles, a second 110 block and shorting plug is required.

For traditional cabinets, the first console cable (console 0) is run to a module control cabinet connector. This connector (CONS IN) is jumpered internally in the cabinet to the adjoining connector (CONS TST) and a cable is then run back to the auxiliary or white field. These jumpered connectors allow the console to be disconnected and a “test” console connected at the module control cabinet. All other console cables extend from the auxiliary field to the console location.

For Universal cabinets, attendant console cables 1-3 are connected to the module control carrier via the main cross-connect field.

Due to differences in the installation environment, the path of the console cable from the main cross-connect field to the console location varies. The console cable may exit as part of a riser cable or as a separate 25-pair cable. This cable may go to a satellite cross-connect field and then to the console or directly to the console.

CONSOLE CONNECTION INSTRUCTIONS

This section explains connections for a typical installation of a single console. The 110 connecting block used in this paragraph is randomly picked for the ease of explanation. The actual selection made by the craftperson should be made to allow for orderly growth. Each console requires cross-connections from four different circuits within the AT&T system 85. These four circuits are: data channel leads from TN403 circuit pack in a common control cabinet, voice and control leads from an SN233C or TN760C circuit pack in a port carrier, alarm leads from the alarm panel in the common control cabinet and power leads from a fan assembly in a network cabinet with a power supply. Voice can come from any cabinet, but power must come from a cabinet with a fan assembly.

Figure 14-1 shows a block diagram of the connections for a typical console. Terminations and connections for SN233C, TN760C, and TN403 are given in chapter 10. Figure 14-2 suggests a method of setting up a 110-type connectorized cross-connect field. The alarm leads are cross-connected from the MISC ALM connector on the common control cabinet. To obtain the multiple appearances of these alarm leads required for multiple consoles, see figure 14-4. Power and ground leads are cross-connected from the CSL PWR connector on a network cabinet equipped with a rectifier. These terminations and connections are shown in table 14-3.

The leads from each of these circuits should be crossed-connected to a connecting block used as the console connecting block. This is shown in figure 14-7. After these cross-connections are made, this block is connected to the console using a 25-pair cable and/or the console mounting cable. Block diagrams for traditional and universal cabinets are shown in figure 14-8.

As more consoles are added to the system, more of each circuit hookups will be required than one connecting block can provide. By using the CSD, chapter 9 and this chapter, the draftsperson should be able to locate these circuits. These circuits should then be cross-connected to the desired 110 block for connection to the console.

The power for the consoles should be obtained from different cabinets as often as possible. This reduces the possibility of total console failure.

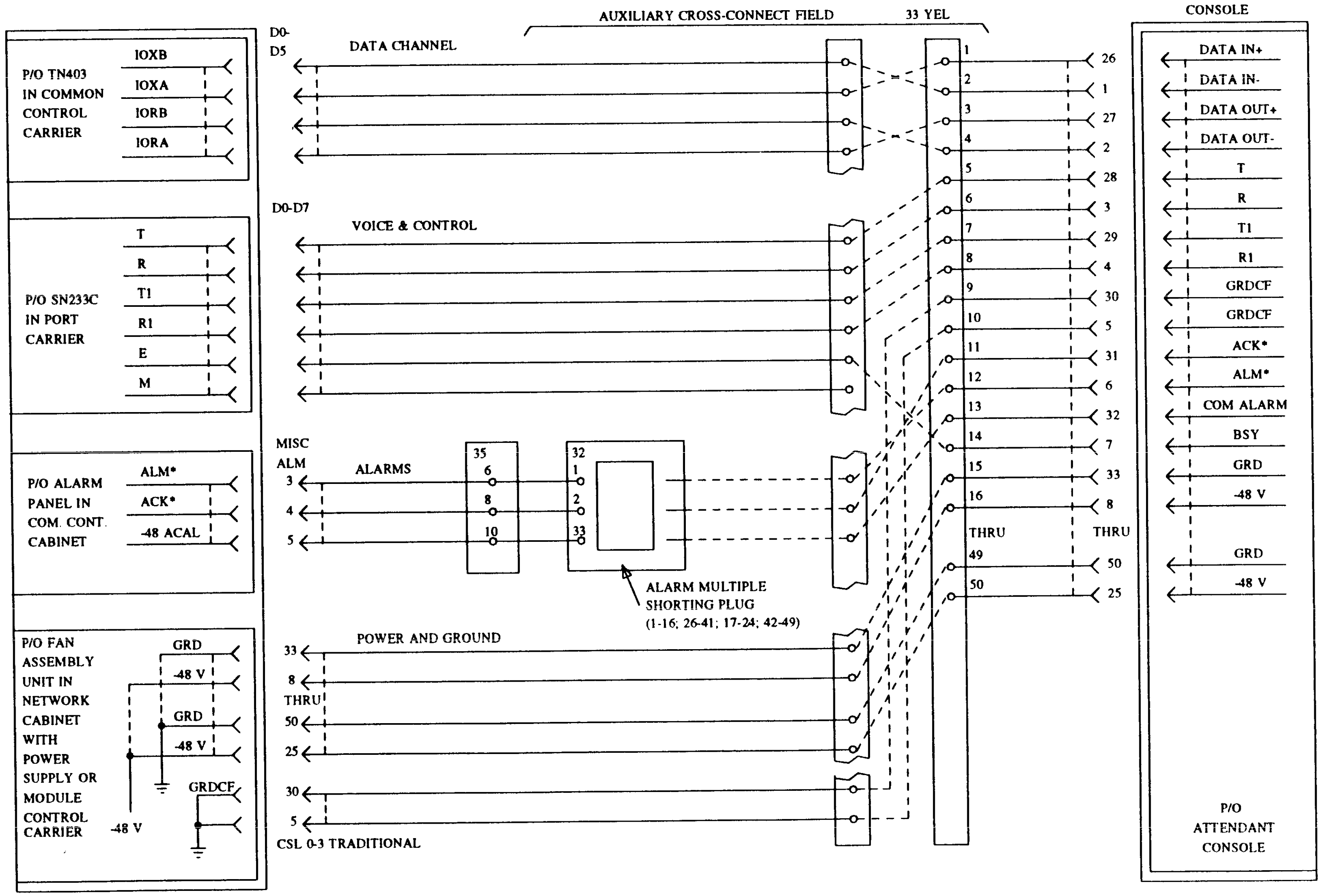


Figure 14-1. Console Connections

Setting Up 110 Cross-Connect Field

To set up 110 cross-connect field, see:

- Chapter 10 for circuit pack connections and terminations
- This chapter, *Fanning Out Alarm Leads*, for alarm lead cross-connections
- This chapter, *Power Cable Connections,* for Universal and Traditional console terminations

  This chapter, *Console Cable Connections*, for console cross-connections

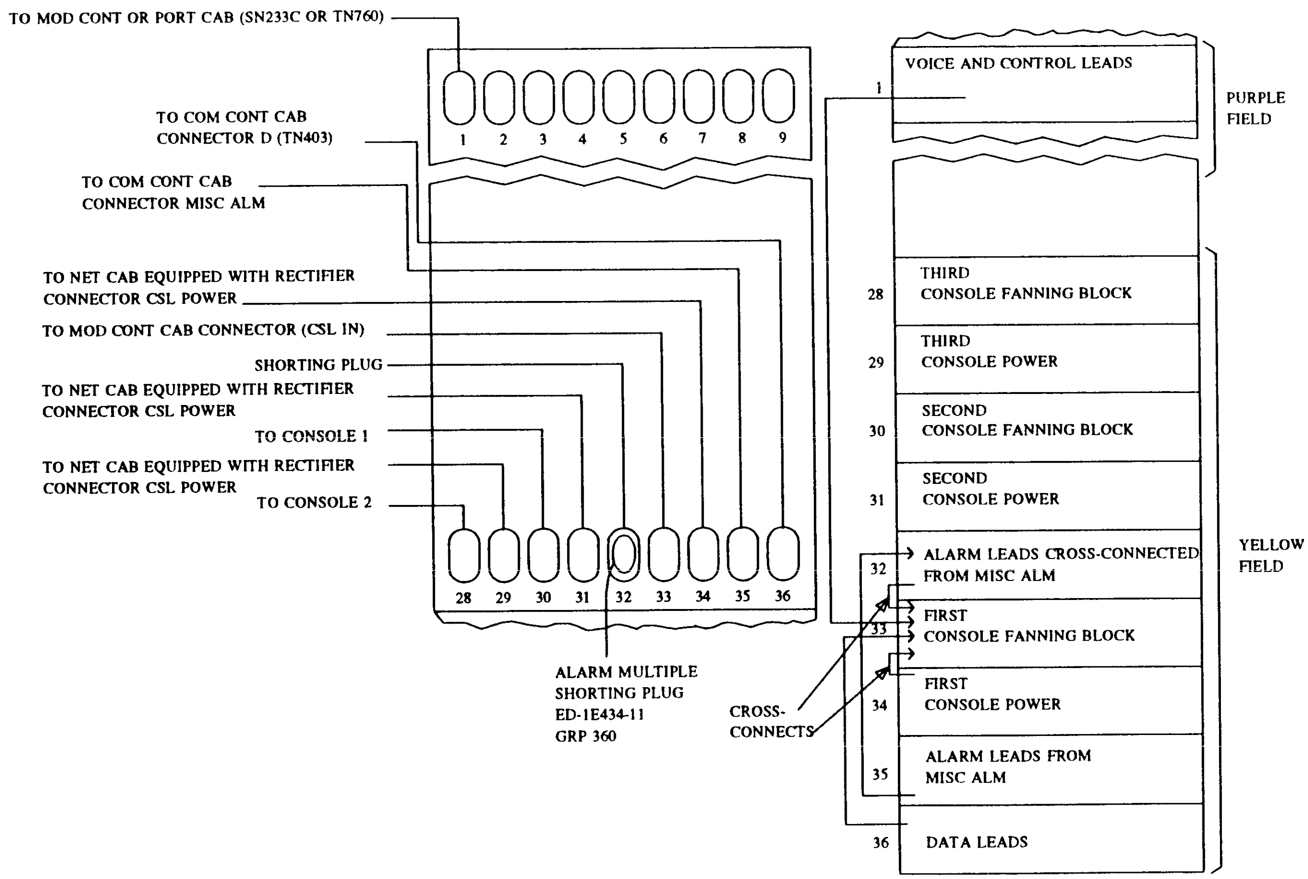


Figure 14-2. Diagram of 110-Type Cross-Connect Field

FANNING OUT ALARM LEADS

Alarm leads can be fanned out to either connectorized or nonconnectorized 110 connecting blocks.

Connectorized Fanout

Figure 14-3 shows the cross-connect alarm leads from 110 connecting block associated with the MISC ALM to the 110 block.

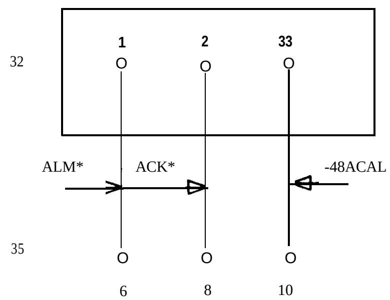


Figure 14-3. Cross-Connect Alarm Leads

If you want alarms to be indicated at more than one console, install multiple alarm shorting plug (ED-1E434-11 Group 360) into 110 connecting block chosen to be alarm connection block (block 32 in this part).

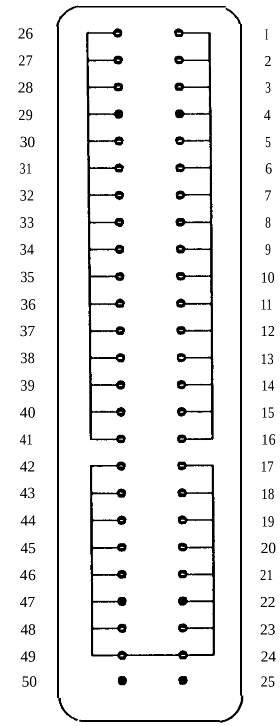


Figure 14-4. ED-1E434-11 Group 360 Multiple Alarm Shorting Plug

Table 14-1 shows the lead designations for the 110 connecting block chosen as the alarm block.

TABLE 14-1. Alarm Block Lead Designations

LEAD DESIGNATION	CONNECTING BLOCK TERMINAL															
ALM	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31
ACK	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
-48ACAL	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

Nonconnectorized Fanout

Figure 14-5 shows the cross-connect alarm leads from 110 connecting block associated with the MISC ALM to the 110 block.

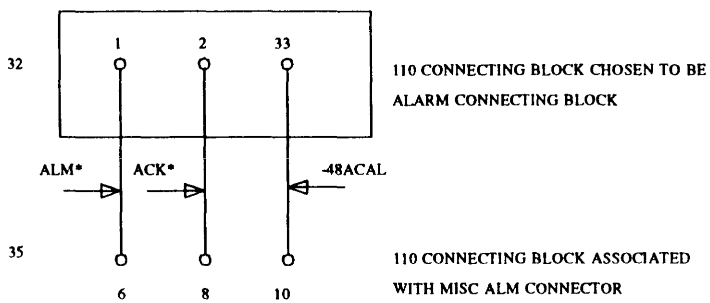


Figure 14-5. Cross-Connect

Shown below are the Quick-clip blocks that must be installed for the terminals shown on the connecting block.

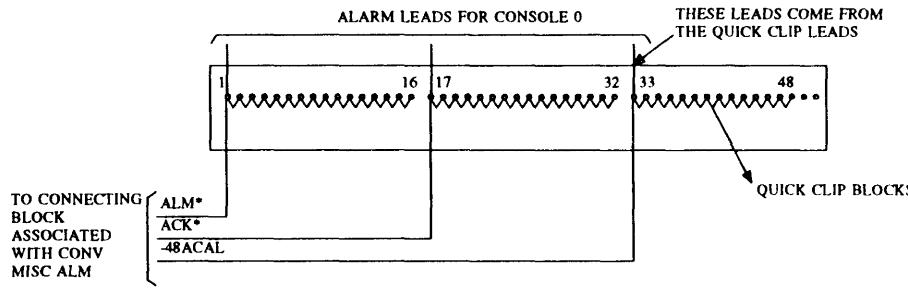


Figure 14-6. Quick-Clip Block Alarm Connections

Table 14-2 shows lead designations for the 110 connecting block chosen as alarm block.

TABLE 14-2. Alarm Block Lead Designations

LEAD DESIGNATION	CONNECTING BLOCK TERMINAL															
ALM	1	2	3	4	5	6	7	8	9	10	12	12	13	14	15	16
ACK	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
-48ACAL	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

POWER CABLE CONNECTIONS

Table 14-3 shows connecting and terminating information on CSL Power connecting blocks.

TABLE 14-3. CSL Power Connections

LEAD DESIGNATION	CONNECTOR PIN NUMBER	COLOR	CONNECTING BLOCK TERMINAL	LEAD DESIGNATION	CONNECTOR PIN NUMBER	COLOR	CONNECTING BLOCK TERMINAL
	26	W-BL	1	-48C	13	G-BK	26
	1	B-W	2	GRD	39	BK-BR	27
	27	W-O	3	-48C	14	BR-BK	28
	2	O-W	4	GRD	40	BK-S	29
	28	W-G	5	-48C	15	S-BK	30
	3	G-W	6	GRD	41	Y-BL	31
	29	W-BR	7	-48C	16	BL-Y	32
	4	BR-W	8	GRD	42	Y-O	33
GRDCF	30	W-S	9	-48C	17	O-Y	34
GRDCF	5	S-W	10	GRD	43	Y-G	35
	31	R-BL	11	-48C	18	G-Y	36
	6	BL-R	12	GRD	44	Y-BR	37
	32	R-O	13	-48C	19	BR-Y	38
	7	O-R	14	GRD	45	Y-S	39
GRD	33	R-G	15	-48C	20	S-Y	40
-48C	8	G-R	16	GRD	46	V-BL	41
GRD	34	R-BR	17	-48C	21	BL-V	42
-48C	9	BR-R	18	GRD	47	V-O	43
GRD	35	R-S	19	-48C	22	O-V	44
-48C	10	S-R	20	GRD	48	V-G	45
GRD	36	BK-BL	21	-48C	23	G-V	46
048C	11	BL-BK	22	GRD	49	V-BR	47
GRD	37	BK-O	23	-48C	24	BR-V	48
-48C	12	O-B K	24	GRD	50	V-S	49
GRD	38	BK-G	25	-48C	25	S0V	50

CONSOLE CABLE CONNECTIONS

Figures 14-7 and 14-8 show diagrams for console cable connections for the 110 block traditional and universal cabinets.

Cross-connect Between Console and its 110-Block

See:

- Chapter 10 for circuit pack termination
- This chapter, *Fanning Out Alarm Leads,* for alarm lead connections
- This chapter, *Power Cable Connections,* for CSL Power terminations

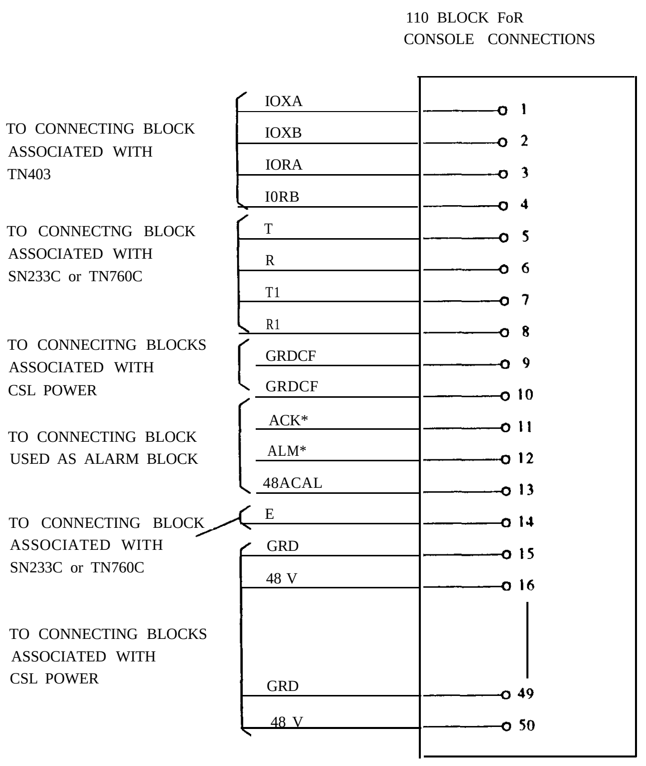
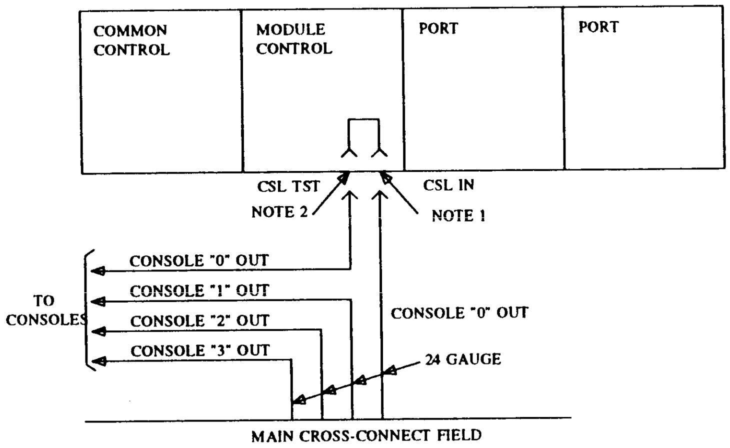


Figure 14-7. 110-Type Block Console Connections

Console connections from main cross-connect field to consoles powered by traditional cabinets.



NOTES:

1, Connectors are located facing the cabinet rear on the right side at the module control carrier 01.

2. Break point for "TEST" console.

Console connections from module control backplane to consoles for universal powered cabinets.

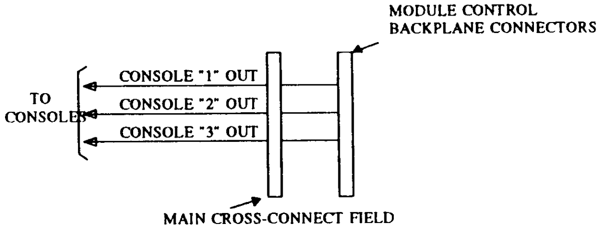


Figure 14-8. Main Cross-Connect to Console Connections

CONSOLE REPEATERS

The console repeater consists of the J58889Y console range extender unit equipped with a 28D2 power supply and data channel repeaters (circuit packs AE48 and AEM9). Two alarm repeater circuit packs are necessary for the console as shown in figure 14-9.

Console range can be increased from 1000 feet to 2000 feet by adding data channel repeaters (CP-AE49B and AE48) at one end if the console is located in the same building. See figure 14-10.

When the console must be off premises without range extension, the console repeaters require only data link buffers (circuit pack WJ3) to provide lightning protection on the data channels and the two circuit pack codes to provide protection of the alarm and power leads. This arrangement is shown in figure 14-11.

When the console requires off-premises range extension, one console repeater at each end provides a maximum of 3000 feet between repeaters plus an additional 1000-foot maximum at each end for a total of 5000 feet. A maximum of four repeaters can be used in series to achieve a total distance of 11,000 feet. Intermediate repeaters require no alarm lead repeaters. This arrangement is shown in figure 14-12.

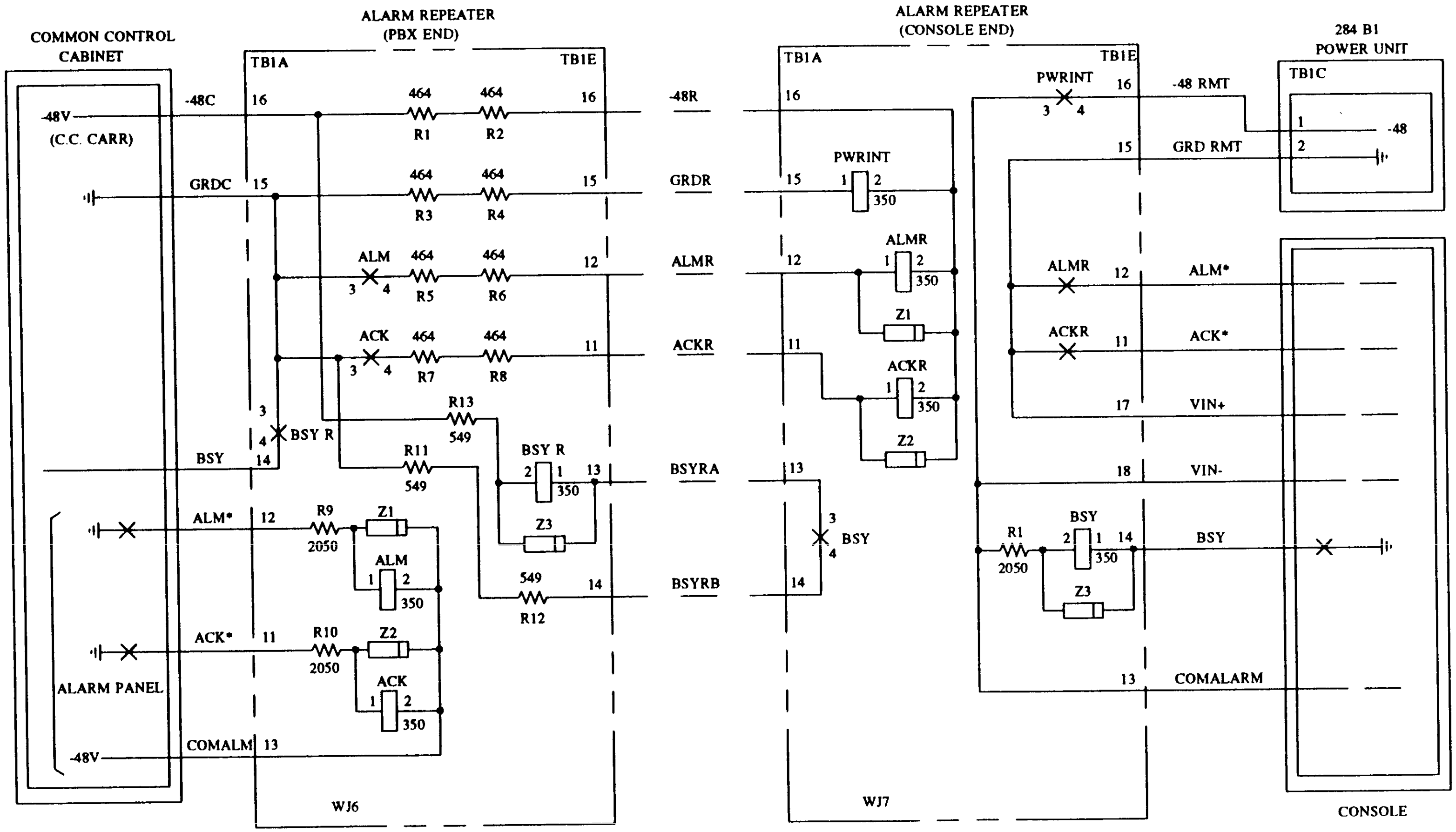


Figure 14-9. Alarm Repeater Circuit Packs and Connections

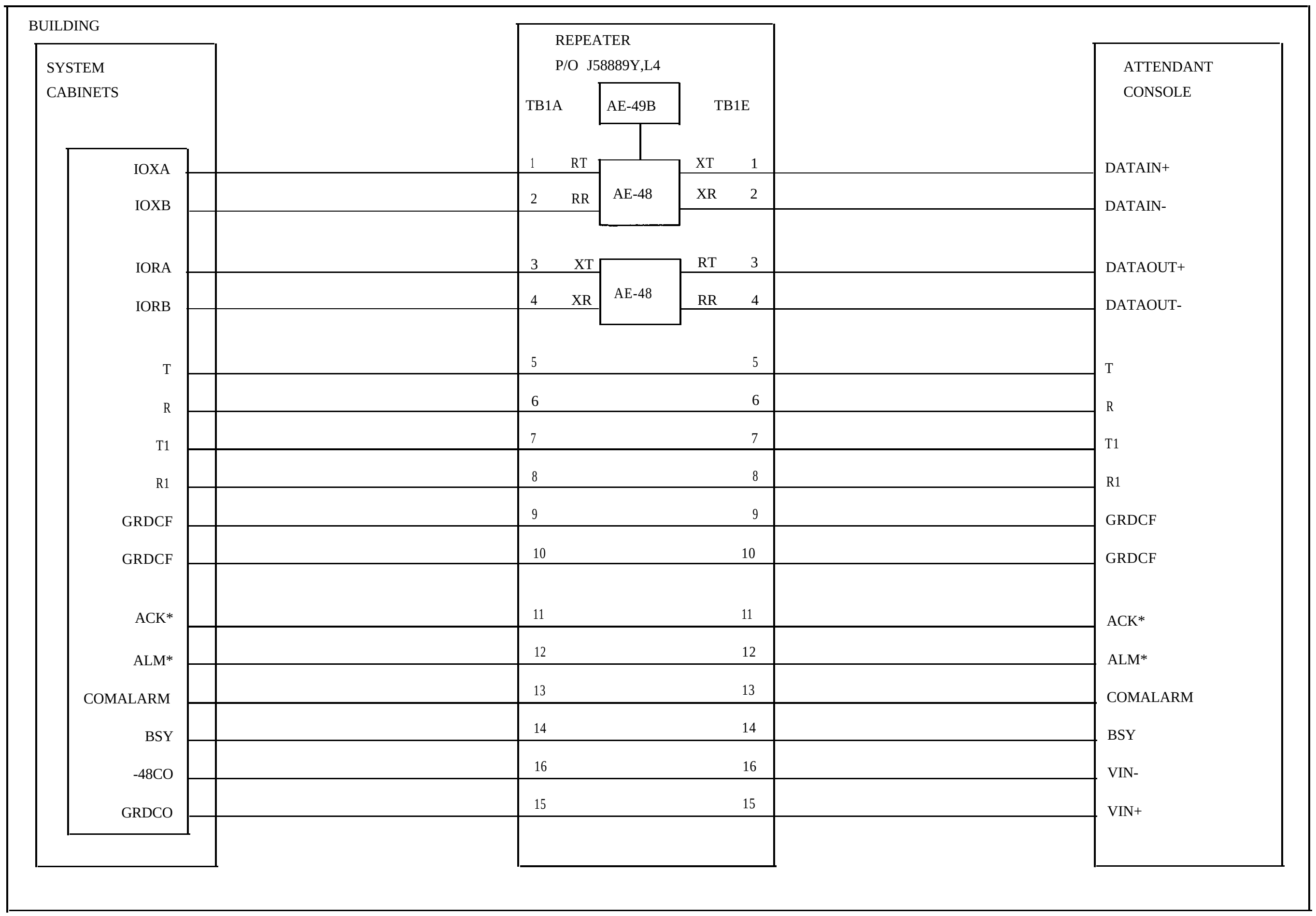


Figure 14-10. Connection for System and Attendant Console — Same Building

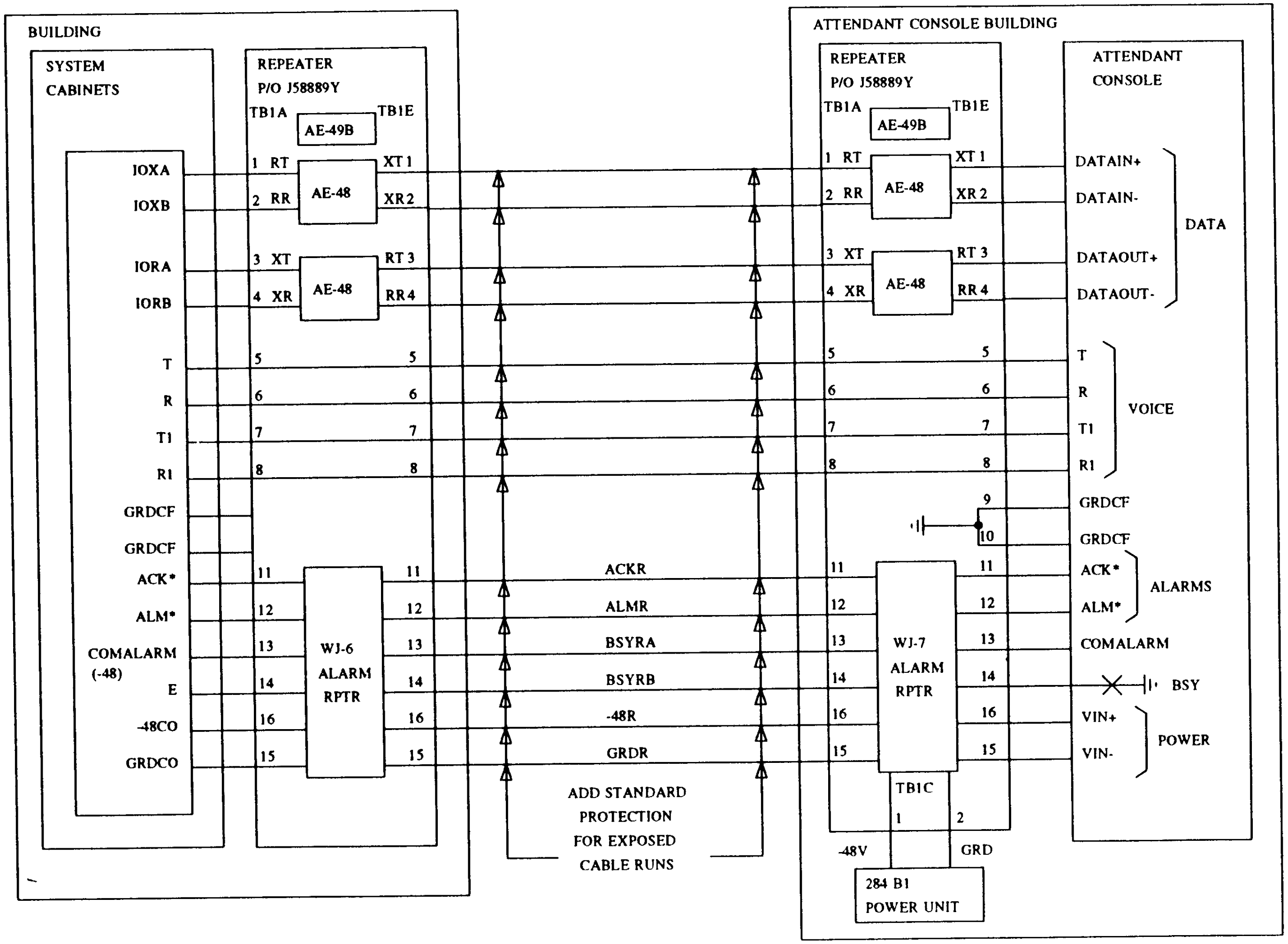


Figure 14-11. Off-Premises Console with Lightning Protection

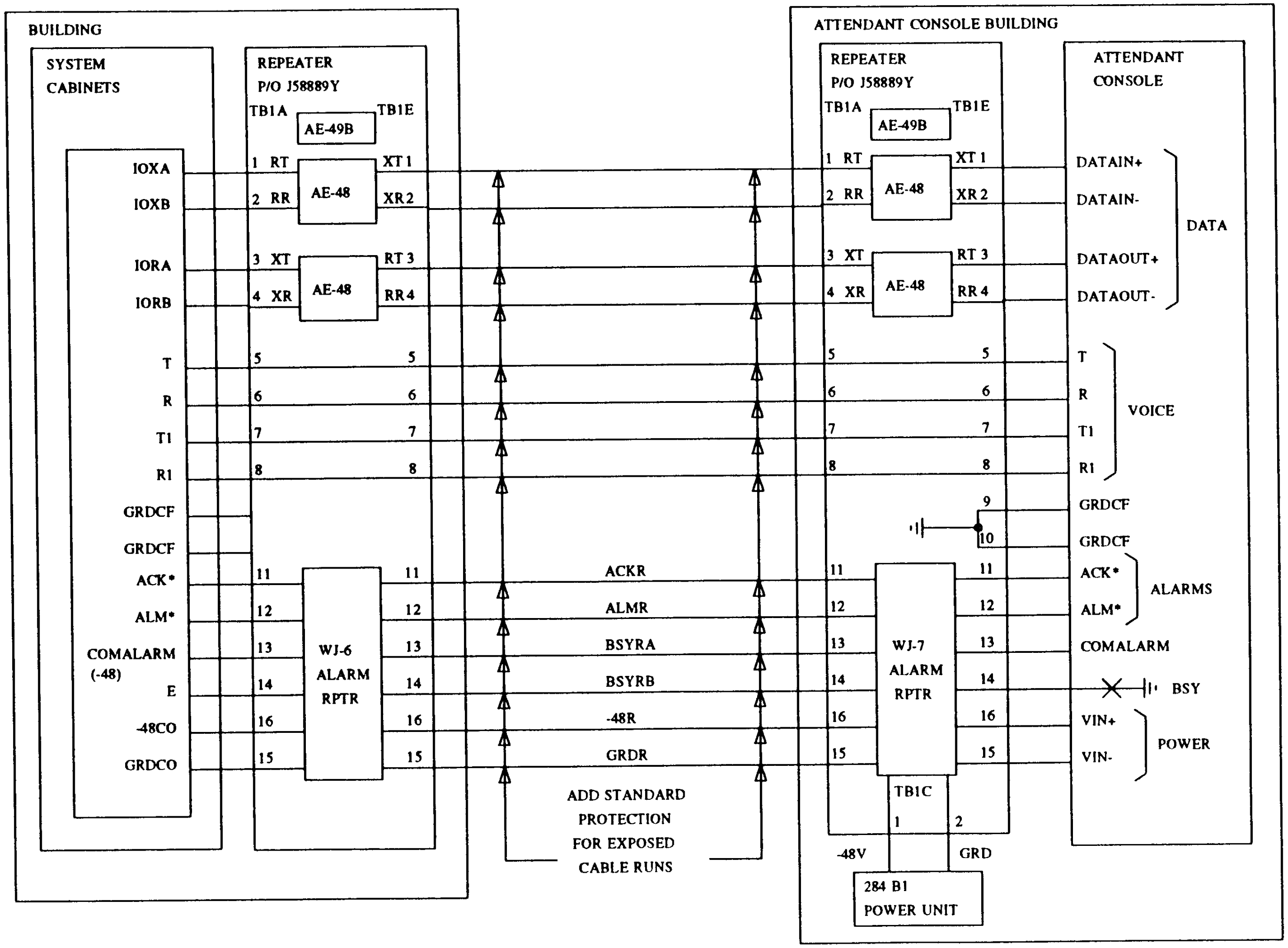


Figure 14-12. Off-Premises Console with Range Extension and Lightning Protection

VISUALLY IMPAIRED ATTENDANT CONSOLE ADJUNCT

The visually impaired attendant console adjunct consists of a 990A light sensor (see figure 14-13), a 2A translator (see figure 14-14), and a 6C guide (console faceplate). The adjunct is used with a system console which is modified with a KS-16689 connector assembly in the console base.

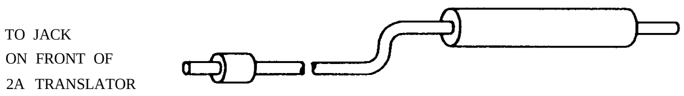


Figure 14-13. 990A Light Sensor

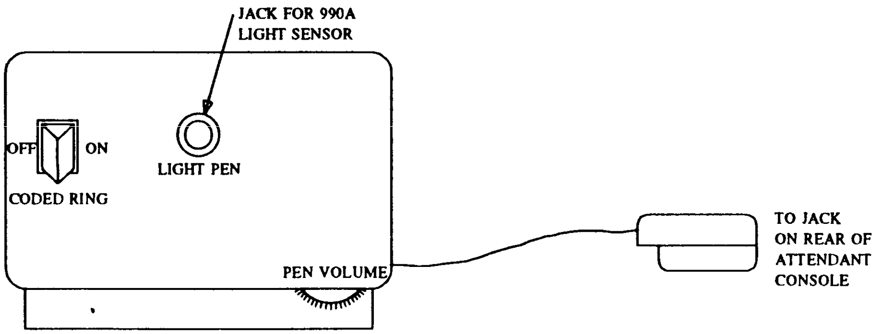


Figure 14-14. 2A Translator

Install the 6C guide (console faceplate) by peeling off the backing and placing the faceplate squarely on the console.

REMOTE CONSOLE

A remote console is available for use with systems equipped with Remote Modules. This feature requires connections at both the remote and central locations. In addition to the connections required at the remote location, the connections unique to the remote console at the central location are contained in this manual. The connections at the central location that are not unique to remote console are contained in this document, chapters 11 and 12. A block diagram of the Remote Console connection is shown in figure 14-15.

The remote feature uses the 107A Optically Remoted Peripheral Interface (ORPI) in a fiber-optic link subsystem in combination with the TMS and RMI links to provide attendant console service for one or more remote System 85 modules. The ORPI unit is designed to function in pairs, one located at the central location and the other at the remote location. The ORPI can serve a maximum of five consoles. The ORPI should be mounted near the cross-connect field since the ORPI requirements of data, voice and control, alarm, and power come from the System 85 via the cross-connect field.

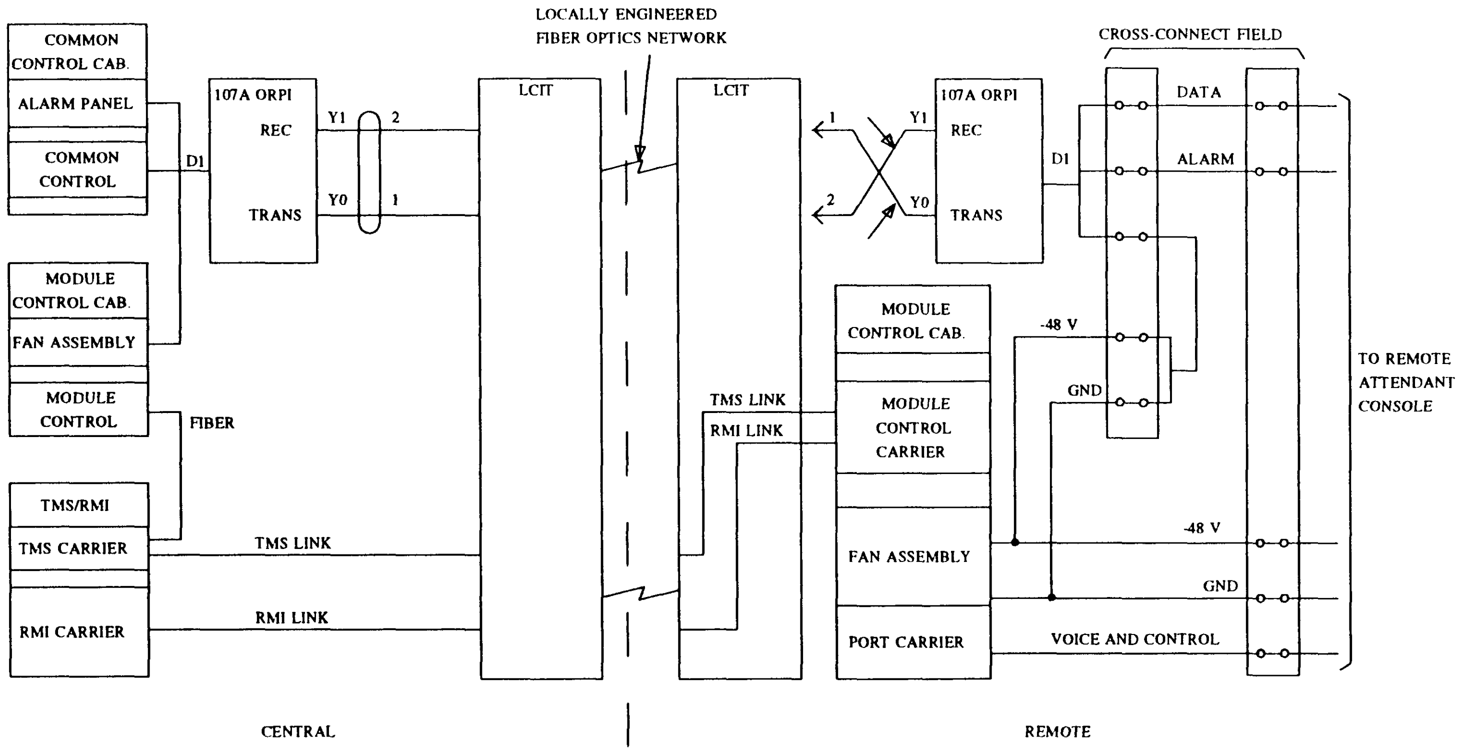


Figure 14-15. Remote Console Block Diagram

Installing the ORPI — Central Location Connections

An ORPI is required at both the central and remote locations and should be mounted near the cross-connect field. The ORPIs equipped with AEW3, Vintage 1 circuit pack are position sensitive and must be wall mounted because the ORPIs contain mercury relays that will not operate if mounted horizontally. The ORPIs equipped with AEW3 Vintage 2 circuit packs can be mounted in any position.

Attach the "WARNING" label (figure 14-16) supplied with the ORPI unit to the carrier fuse panel that supplies power to the ORPI.

WARNING

FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE
REPLACE ONLY WITH SAME
TYPE AND RATING OF FUSE

Figure 14-16. ORPI Warning Label

ORPI to System 85 Connections

You can connect the ORPI using figure 14-17 and table 14-4. Figure 14-17 shows the connections required at the System 85 cross-connect field. Table 14-4 contains the lead and pin designations required to connect the ORPI.

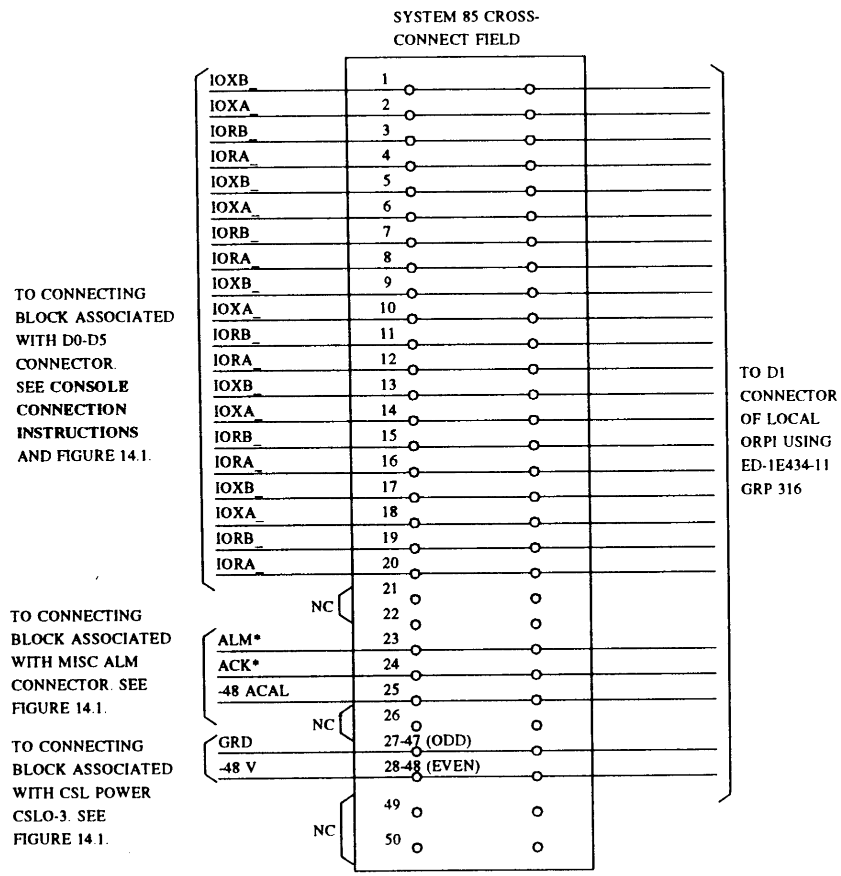


Figure 14-17. System 85 to ORPI Connections

TABLE 14-4. D1 Connector Lead Designations

LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECTING BLOCK TERMINAL	LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECTING BLOCK TERMINAL
IOXBO						GR-BK	26
IOXAO	1	B-W	2	GRD	39	BK-BR	27
IORBO	27	W-O	3	-48V	14	BR-BK	28
IORAO	2	O-W	4	GRD	40	BK-SL	29
IOXB1	28	W-GR	5	-48V	15	SL-BK	30
IOXA1	3	GR-W	6	GRD	41	Y-BL	31
IORB1	29	W-BR	7	-48V	16	BL-Y	32
IORA1	4	BR-W	8	GRD	42	Y-O	33
IOXB2	30	W-SL	9	-48V	17	O-Y	34
IOXA2	5	SL-W	10	GRD	43	Y-GR	35
IORB2	31	R-BL	11	-48V	18	GR-Y	36
IORA2	6	BL-R	12	GRD	44	Y-BR	37
IOXB3	32	R-O	13	-48V	19	BR-Y	38
IOXA3	7	O-R	14	GRD	45	Y-SL	39
IORB3	33	R-GR	15	-48V	20	SL-Y	40
IORA3	8	GR-R	16	GRD	46	V-BL	41
IOXB4	34	R-BR	17	-48V	21	BL-V	42
IOXA4	9	BR-R	18	GRD	47	V-O	43
IORB4	35	R-SL	19	-48V	22	O-V	44
IORA4	10	SL-R	20	GRD	48	V-GR	45
		BK-BL	21	-48V	23	GR-V	46
		BL-BK	22	GRD	49	V-BR	47
ALM*	37	BK-O	23	-48V	24	BR-V	48
ACK*	12	O-BK	24		50	V-SL	49
-48 ACAL	38	BK-GR	25		25	SL-V	50

ORPI to LCIT Connections

Use table 14-5 to determine the proper cable group. Make the connections between the LCIT and ORPI using the selected cable and figure 14-18. Cables with 50 micron diameter are coded blue (1) or white (2); 62.5 micron cables are gray and stamped with “1” or “2.” DEFINITY Generic 2 installations will use the 3B/ST fanouts. Previously installed systems use 3B biconic fanouts, but they will not have to be replaced. For LCITs with biconic connectors, GRP465 must be used with GRP509.

TABLE 14-5. Cable Group

CABLE GROUP ED1E434-11	CABLE TYPE	MICRON	LENGTH (FT)
464	LA2A-B	50	10, 15, 20, 25, 30 40, 50, 75, 100
465	LL2A-B	62.5	

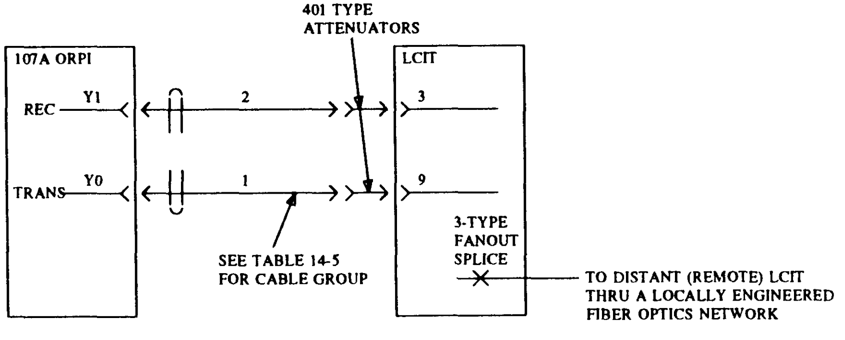


Figure 14-18. ORPI to Central LCIT Connections

Installing the ORPI — Remote Location Connections

The remote console is connected to several sources through the remote cross-connect field, and receives its data from the remotely located ORPI. The alarm leads also come from the ORPI but must be fanned out if more than one remote console is provided. The remote console receives its voice from an SN233 or TN760 located in a remote port carrier. The remote console receives its power from a remote module control or port cabinet with a DC fan power supply.

LCIT to ORPI Connections

Use table 14-6 to determine the proper cable group. Make the connections between the LCIT and ORPI using the selected cable and figure 14-19. Cables with 50 micron diameter are coded blue(1) or white(2); 62.5 micron cables are gray and stamped with “ 1” or “2.” DEFINITY Generic 2 installations will use the 3B/ST fanouts. Previously installed systems use 3B biconic fanouts, but they will not have tobe replaced. For LCITs with biconic connectors, GRP465 must be used with GRP509.

TABLE 14-6. Cable Group

CABLE GROUP ED1E434-11	CABLE TYPE	MICRON	LENGTH (FT)
464	LA2A-B	50	10, 15, 20, 25, 30 40, 50, 75, 100
465	LL2A-B	62.5	

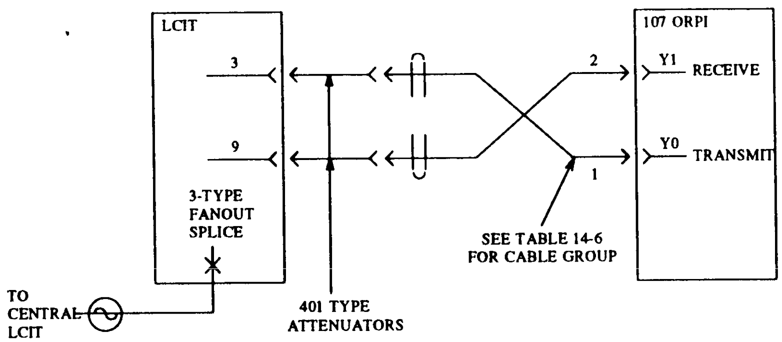


Figure 14-19. ORPI to Remote LCIT Connections

ORPI Connections

Make the connections shown in table 14-7 and figure 14-20 at the ORPI and the remote cross-connect field.

TABLE 14-7. D1 Connector Lead Designation

LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECTING BLOCK TERMINAL	LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECTING BLOCK TERMINAL
IOXBO	26	W-VL	1	COMALARM	13	GR-BK	26
IOXAO	1	B-W	2	GRD	39	BK-BR	27
IORBO	27	W-O	3	-48V	14	BR-BK	28
IORAO	2	O-W	4	GRD	40	BK-SL	29
IOXB1	28	W-GR	5	-48V	15	SL/BK	30
I0XA1	3	GR-W	6	GRD	41	Y-BL	31
IORB1	29	W-BR	7	-48V	16	BL-Y	32
IORA1	4	BR-W	8	GRD	42	Y-O	33
IOXB2	30	W-SL	9	-48V	17	O-Y	34
IOXA2	5	SL-W	10	GRD	43	Y-GR	35
IORB2	31	R-BL	11	-48V	18	GR-Y	36
IORA2	6	BL-R	12	GRD	44	Y-BR	37
IOXB3	32	R-O	13	-48V	19	BR-Y	38
IOXA3	7	O-R	14	GRD	45	Y-SL	39
IORB3	33	R-GR	15	-48V	20	SL-Y	40
IORA3	8	GR-R	16	GRD	46	V-BL	41
IOXB4	34	R-BR	17	-48V	21	BL-V	42
IOXA4	9	BR-R	18	GRD	47	V-O	43
IORB4	35	R-SL	19	-48V	22	O-V	44
IORA4	10	SL-R	20	GRD	48	V-GR	45
OUTALM*	36	BK-BL	21	-48V	23	GR-V	46
OUTACK*	11	BL-BK	22	GRD	49	V-BR	47
	37	BK-O	23	-48V	24	BR-V	48
	12	O-BK	24		50	V-SL	49
	38	BK-GR	25		25	SL-V	50

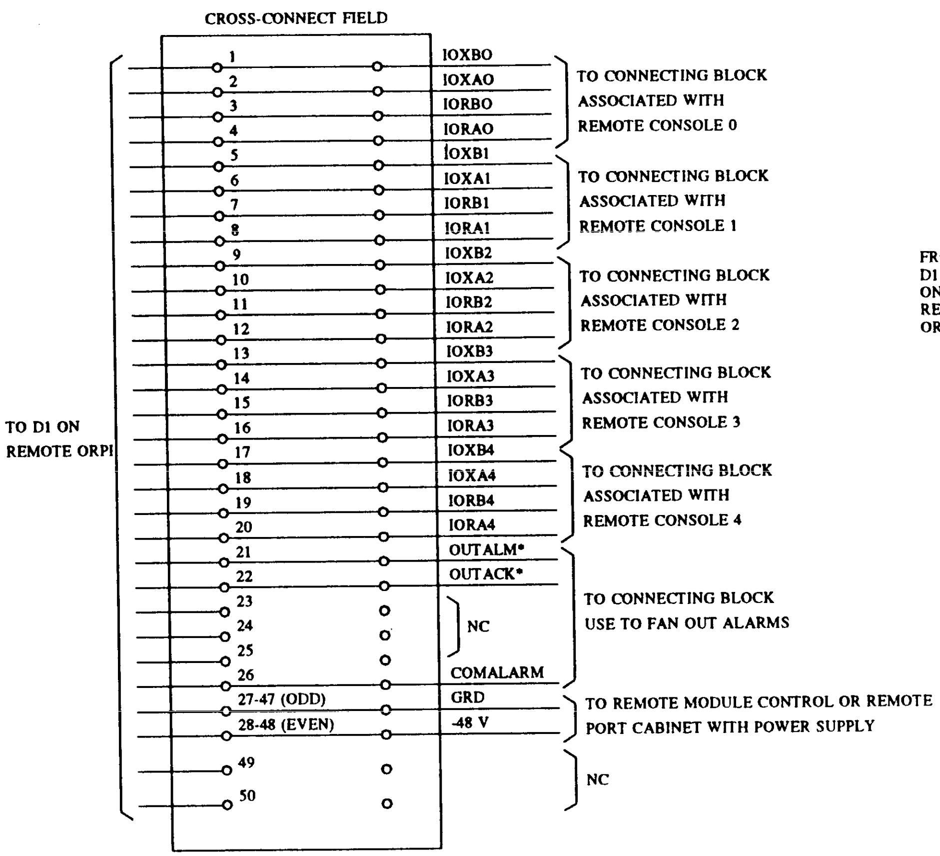


Figure 14-20. D1 Cross-Connect Connections

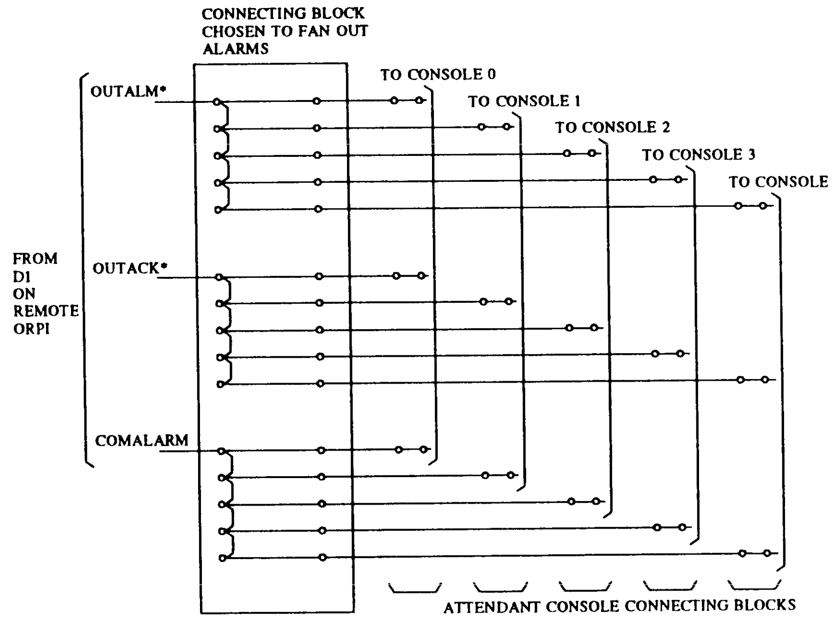


Figure 14-21. Fanning Out Alarm Leads

Fanning Out Alarm Leads

The ORPI provides only one set of alarm leads. If you have more than one console at the remote location, the alarm leads must be fanned out. Use the information in figure 14-21 to fan the leads out.

Console Connections

Make the connections from the console to the cross-connect field as shown in figure 14-22.

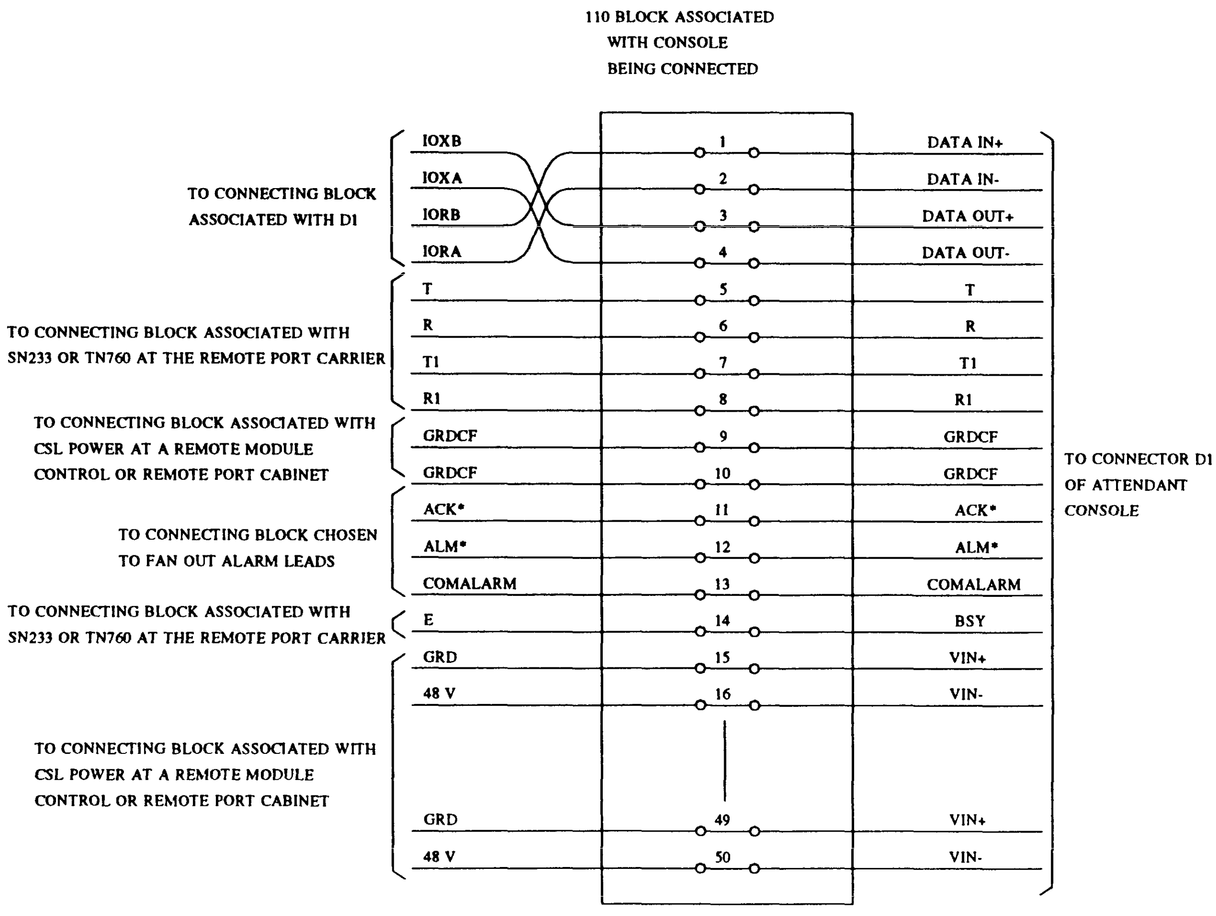
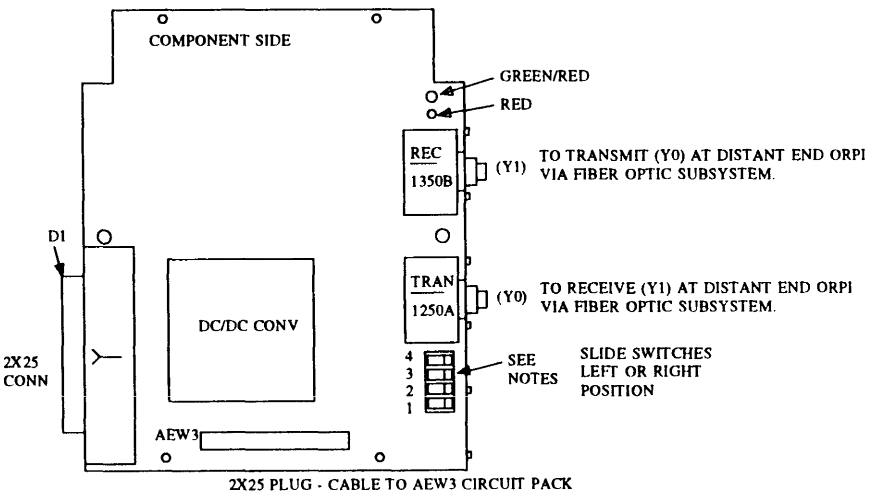


Figure 14-22. Console Connector Terminating Information

Customizing Fiber-Optic Links

The fiber-optic network between the ORPI and the LCIT must be customized to achieve the required power levels. Each fiber link must be tested individually.

Figure 14-23 shows the location of switches that are used in customizing the fiber network; figure 14-24 shows the attenuator locations.



NOTES:

1. Switch 1 is used in balancing the lightguide. Settings are TST or NORMAL.
2. Switch 2 is used to select power level for the transmitter. Settings are HALF or FULL.
3. Switch 3 is used for factory test only. Ensure that S3 is in the NORMAL position (as shipped from the factory) when performing the balancing tests.
4. Switch 4 is not used.

Figure 14-23. Circuit Pack AEW3 Switch Locations

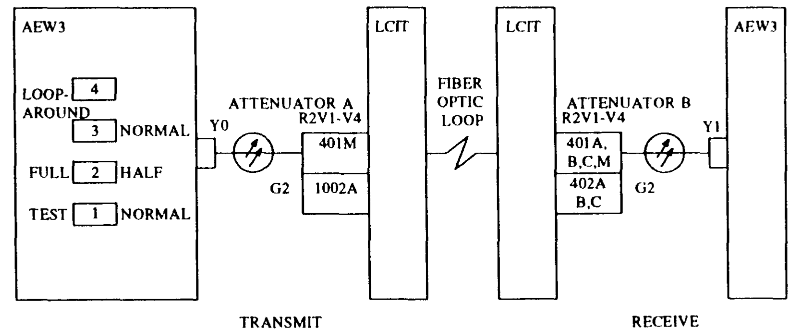


Figure 14-24. Attenuator Locations

Adjust the fiber-optic link as follows:

1. On the AEW3, in the transmit LCIT, set switch 1 to TEST. (See figure 14-23.)
2. Insert 401M (R2V1-V4) or 1002A (DEFINITY Generic 2) as attenuator A. (See figure 14-24.)
3. Set Switch 2 (FULL or HALF), and insert Attenuator B according to table 14-8.
4. Determine the condition of the fiber-optic link by observing the LEDs on the receiver and AEW3.
   a. If one green LED lights, the link is within the required power range.
   b. If both LEDs are red, the link is in an overdrive condition.
   c. If a single LED is red, the link is in an underdriven condition.
5. If the fiber-optic link is overdriven or underdriven, adjust it by changing the power level settings on the Transmit AEW3 and/or replacing the 401 or 402 (DEFINITY Generic 2) series attenuators at the Receive LCIT with different values (see table 14-8). If the link still doesn’t fall into adjustment, use the information in flowchart

figure 14-25. Adjust until the link is brought in range.

6. Return Switch 1 to the Normal Mode. Disregard LED indications when operating in the Normal Mode.

TABLE 14-8. Fiber-Optic Link Power Options

LCIT to LCIT DISTANCE	FIBER GRADE	SWITCH 2 FULL/HALF	ATTEN-UATOR B	INITIAL ACTION IF UNDER-DRIVEN 1 RED LED	INITIAL ACTION IF OVER-DRIVEN 2 RED LED
0 - 1000 ft 0 - 0.19 mi 0 - 0.30 km	L	FULL	10 dB 401B	Switch 2 to half power, ATTEN B to D 5 dB	Switch 2 to half power
1000 2800 ft 019 - 0.53 mi 1.30 - 0.85 km	L	HALF	5 dB 401A	Switch 2 to full power ATTEN B	Switch 2 to half power, to 10 dB
2800 - 4900 ft 0.53 - 0.98 mi 0.85 - 1.49 km	L	FULL	5 dB 401A	Switch 2 to half power, ATTEN B to 0 dB	Switch 2 to half power
4900 - 7200 ft 0.93 - 1.36 mi 1.49 - 2.20 km	L	HALF	0 dB 401M	Switch 2 to full power	Switch 2 to half power ATTEN B to 5 dB
7200 - 9800 ft 1.36 - 1.86 mi 2.20 - 2.99 km	N	HALF	0 dB 401M	Switch 2 to full power	Switch 2 to half power ATTEN B to 5 dB
9800 - 13000 ft 1.86 - 2.46 mi 2.99 - 4.00 km	N	FULL	0 dB 401M		Switch 2 to half power

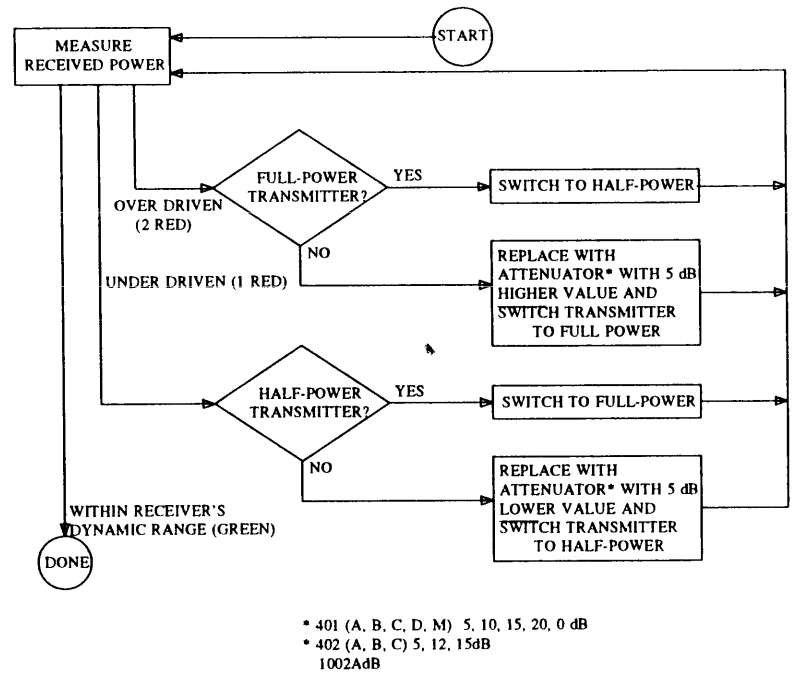


Figure 14-25. Flowchart for Adjusting the ORPI Fiber-Optic Link

15. ADJUNCT PROCESSOR CONNECTIONS

MODEM/DATA MODULE OPTIONS 15-2

LIST OF TABLES

212AR Modem (Data Set) Options 15-5
801CR Data Auxiliary Set Options 15-6
IDI Application 15-10

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LDSU (48250) Options 15-4
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801CR Switches 15-7
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AP to DCIU Using LADS/LDSU — Noncolocated 15-9
AP to DCIU Using IDI — Less Than 400 Ft 15-10
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AP ICI Connections 15-14
AP Traffic Connections 15-15
AP EIA/ACU Cabling to Data Sharing Unit 15-16

Adjunct processors enhance the capabilities of the AT&T System 85 by providing voice mail, system administration, performance monitoring, etc. Below are listed some System 85 adjunct processor installation guides:

- *3B5 AP installation, Administration, and Acceptance Test Service Manual* (585-210-101)
- *AP16 Installation, Administration, and Acceptance Test Service Manual* (585-201-106)
- *AT& T 3B2 Messaging Server Installation and Maintenance Guide* (585-205-110)
- *AUDIX-L Enhanced Installation Manual* (585-300-101)
- *AUDIX-M Enhanced Installation Manual* (585-300-103)

Both the 3B5 AP and the AP16 are called APs.

APs are housed in a cabinet with the same dimensions as the System 85 cabinets. The AP and the System 85 combine to furnish several communications features. This section gives the connections between the System 85 and the AP. Additional information on the AP can be found in documentation written for the AP.

MODEM/DATA MODULE OPTIONS

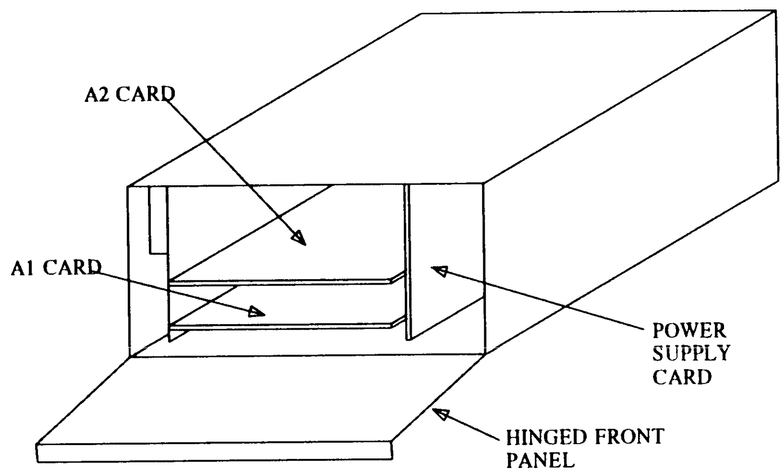


Figure 15-1. LADS — Showing Location of A1, A2, and Power Supply Cards

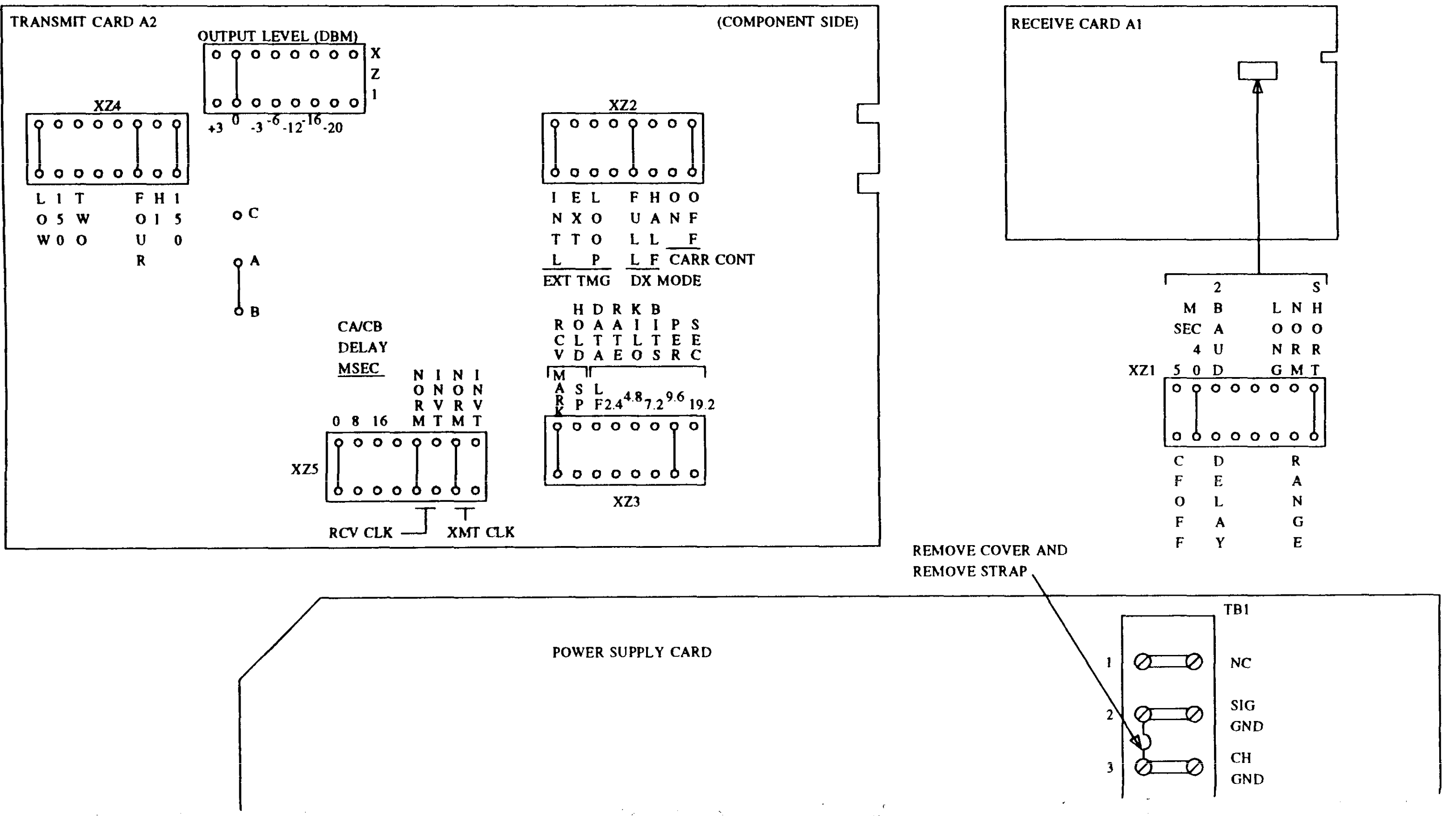


Figure 15-2. LADs (48230) — Options

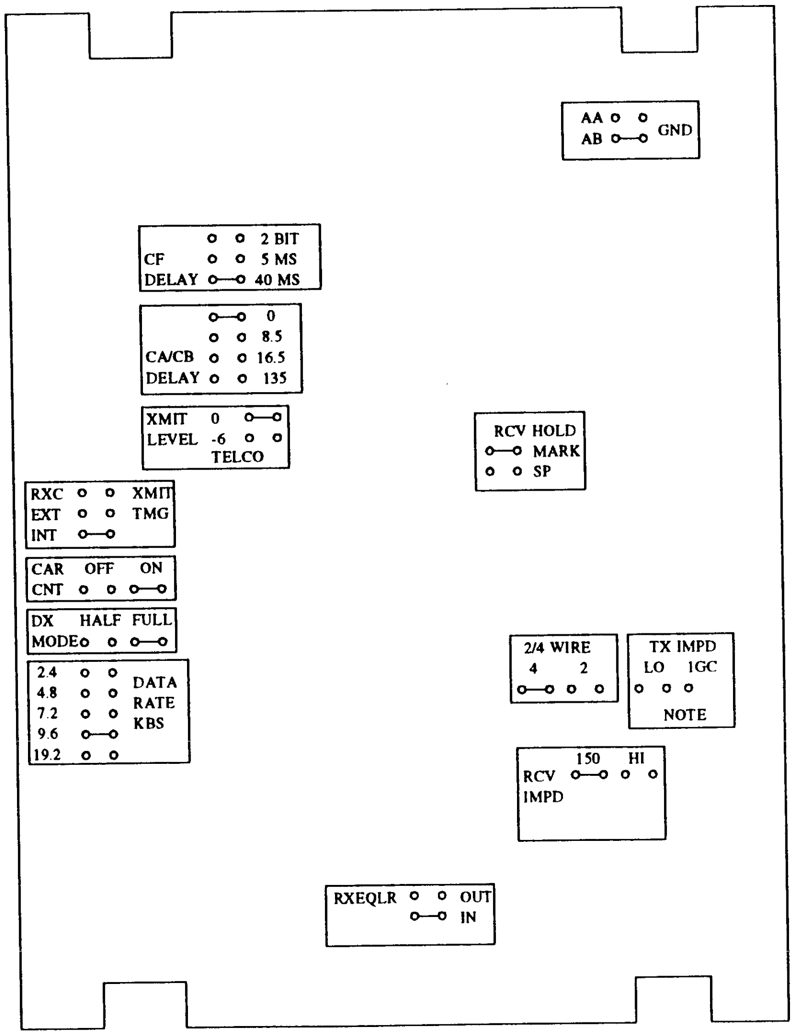


Figure 15-3. LDSU (48250) Options

NOTE	TX IMPD Switch is set to 150 when the LDSU is noncolocated. The TX IMPD Switch is set to HI when the LDSU is colocated.

The screw switch S1 should be fully open so signal ground is not connected to frame ground. Plug-in straps should be installed between terminals E1 and E2 and between terminals E3 and E4. The pushbutton switches on the 212AR should never be operated unless the modem is in the test mode.

TABLE 15-1. 212AR Modem (Data Set) Options

SWITCH	ROCKER	212 ASSOCIATED WITH: AP16	AT&T SYSTEM 85 R2	AP16 MAIN-TENANCE PORT	COMMENT
S1	1	O	C	O	C=Close Loop in MB/AL Mode
	2	O	O	O	O=No Function
	3	C	C	C	C=Modem Ready Indication in AL Mode
S2	1	O	C	C	O=Speed Controlled by Pin 23
	2	C	O	C	O=MB/AL Controlled by Pin 25
	3	O	O	O	O=High Speed Internal Timing
	4	O	O	O	
	5	O	O	O	O=High Speed Asynchronous Operation
	6	C	C	C	C=10 Bits Per Character
	7	C	C	C	O=High Speed DL Controlled Remotely
	8	O	O	O	C=RDL Controlled by Pin 21
	9	C	C	O	C=Speed Controlled by Pin 23
S3	1	C	C	C	C=Modem Disconnects if Loss of Carrier
	2	O	O	O	C=Modem Disconnects if Spaces Received
	3	C	C	C	C=Not Clear to Send if No Carrier
	4	O	O	O	C=Send Spaces at End of Call
	5	O	O	O	O=Automatically Answer Incoming Call
	6	O	O	O	O=No Answer Indication on Pin 22
	7	O	C	O	C=High Speed Operation Only
	8	O	O	C	C=Speed Indication on Pin 12
S5	1	O	O	O	O=High Speed Asynchronous Operation
	2	O	O	O	

O=Open (Rocker Down on Side Opposite Numbers)
C=Closed (Rocker Down on Side Adjacent to Numbers)

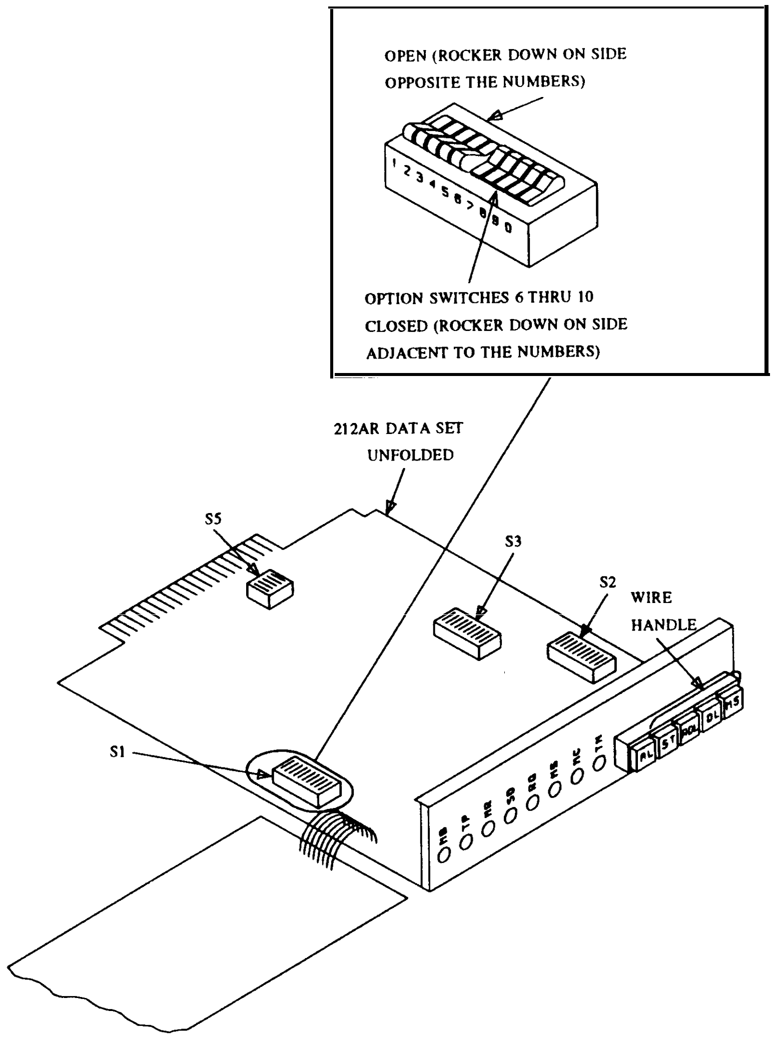


Figure 15-4. 212AR Switch Settings

To separate frame ground from signal ground, the screw on the backplane of the unit must be set open (loosened). The pushbutton switches on the front panel should never be operated unless the automatic calling unit (ACU) is in the test mode.

TABLE 15-2. 801CR Data Auxiliary Set Options

SWITCH	ROCKER	SETTING	COMMENT
S1	1	C	Grounded answer relay contact
	2	O	Loop start operation
	3	O	Grounded answer relay contact
	4	C	Clear signal to modem
S2	1	O	Loop start operation
	2	C	Detect 2225 Hz answer tone
	3	O	
	4	C	Loop start operation
S3	1	C	Stop ACR timer when modem goes on-line
	2	C	
	3	O	Modem goes on-line at start of answer tone
	4	O	ACR interval is 28 sec (see note below)
	5	O	
S4	1	C	Loop start operation
	2	C	Modem disconnects when AP not ready

NOTE

Too short of an ACR interval may cause the ACU to tear down the call before the modem at the far end can return answer tone. Too long of an ACR interval may tie up the link and ACU longer than necessary. For long distance calls (dial 1 and Cornet), the ACR interval should be 28 seconds as shown in table 15-2. For local calls, 14 seconds is long enough, in which case switch 3 rockers 4 and 5 should be closed.

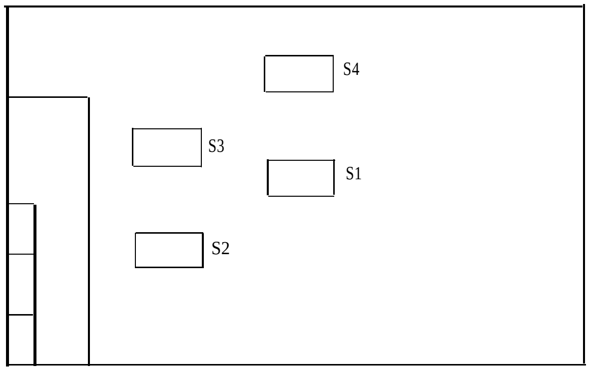
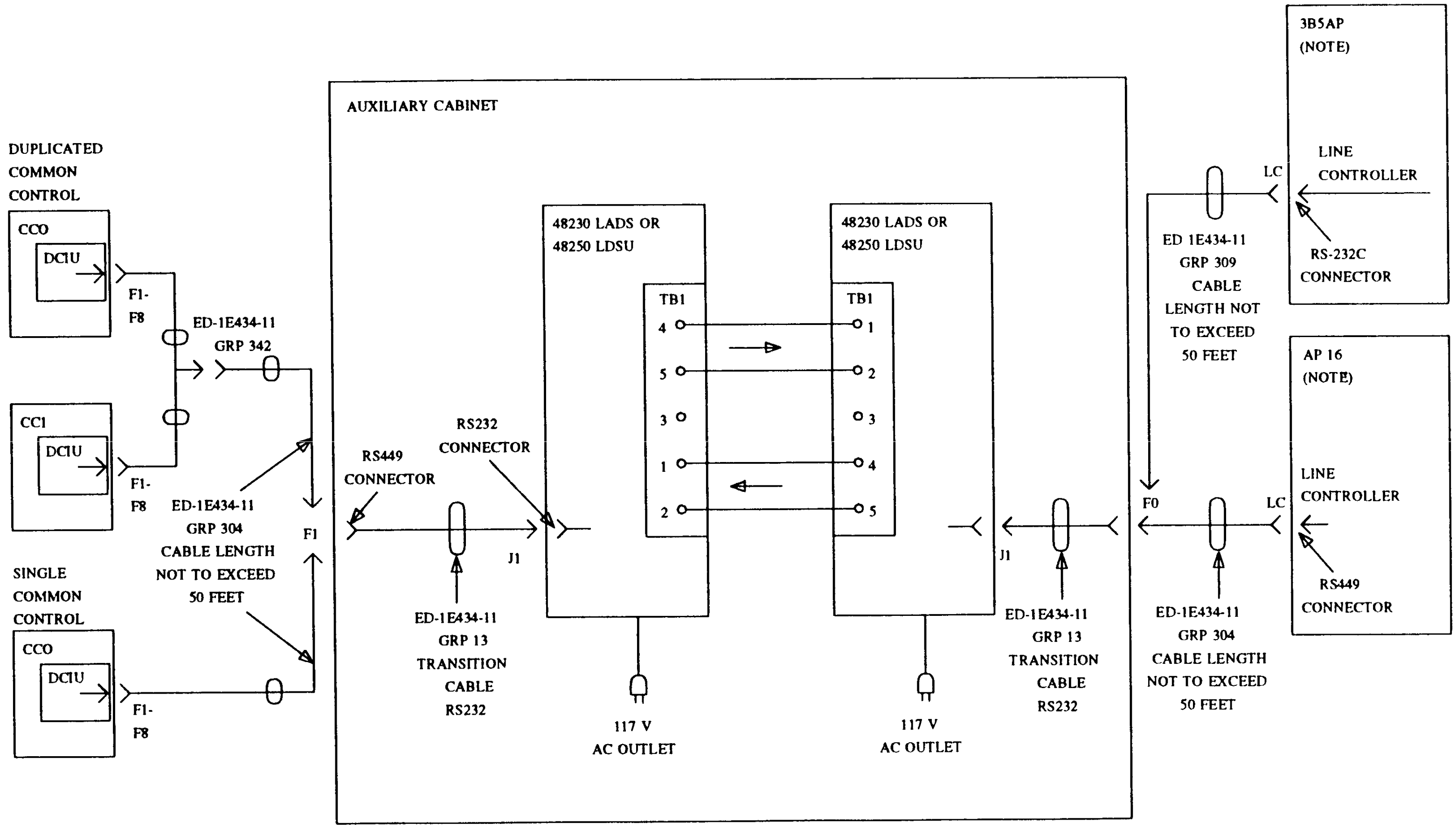
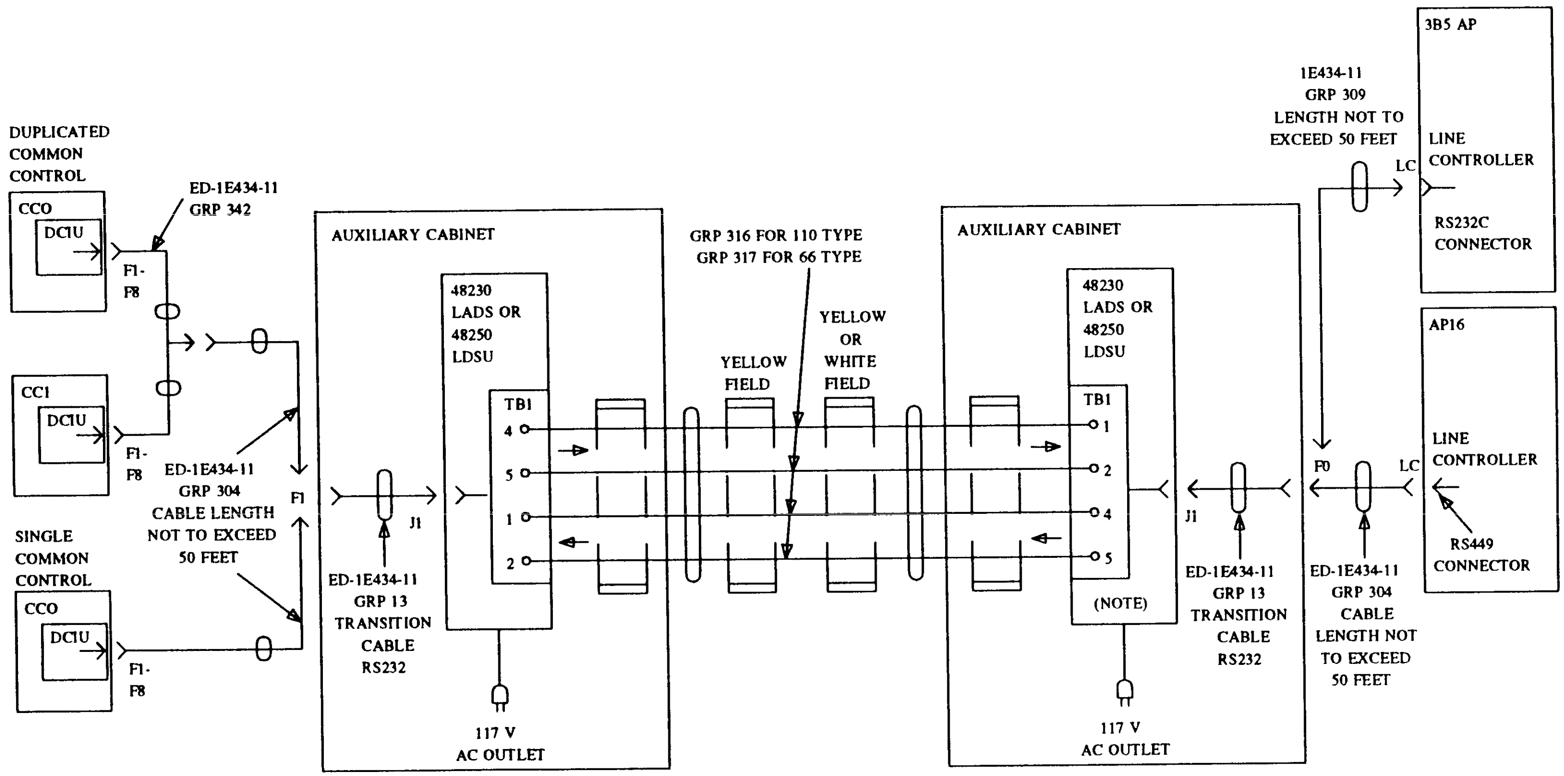


Figure 15-5. 801 CR Switches



NOTE: For ground isolation, the LADS must be provided in the Data Link, even if the application processor cabinet is in the same lineup with the switch cabinets.

Figure 15-6. AP to DCIU Using LADS/LDSU — Colocated



NOTE: This local area data set may or may not be in an auxiliary cabinet depending upon customer applications. If an auxiliary cabinet is not provided, connect ED-1E434-11 GRP 13 directly to ED-1E434-11 GRP 304.

Figure 15-7. AP to DCIU Using LADs/LDSU — Noncolocated

The 105A IDI can be used in applications where the external processors within 400 feet of the System 85 control cabinet. The cable groups shown must be used, house wiring cannot be used.

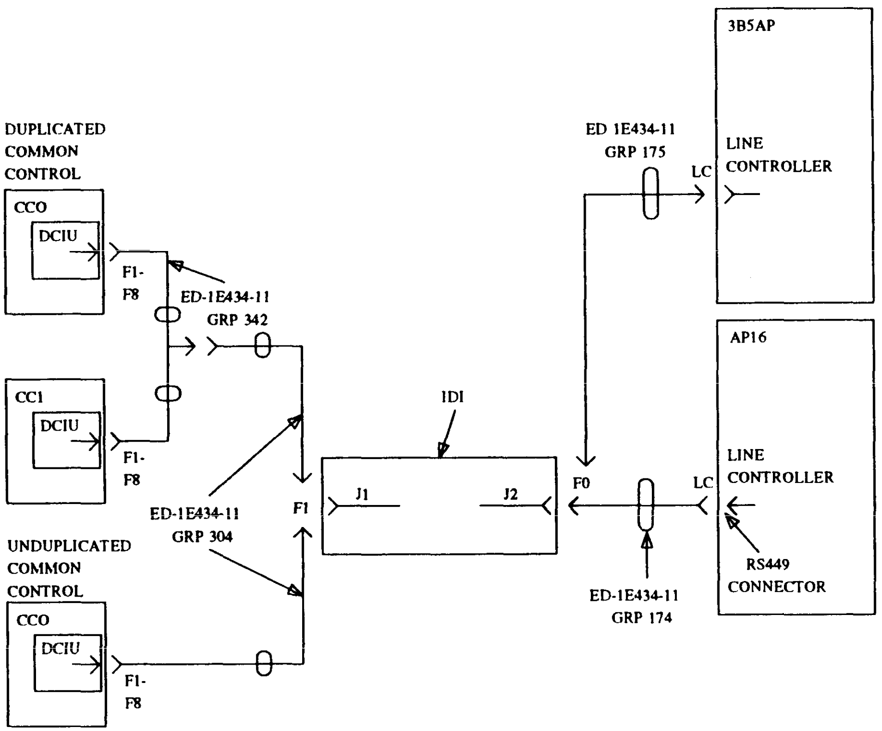
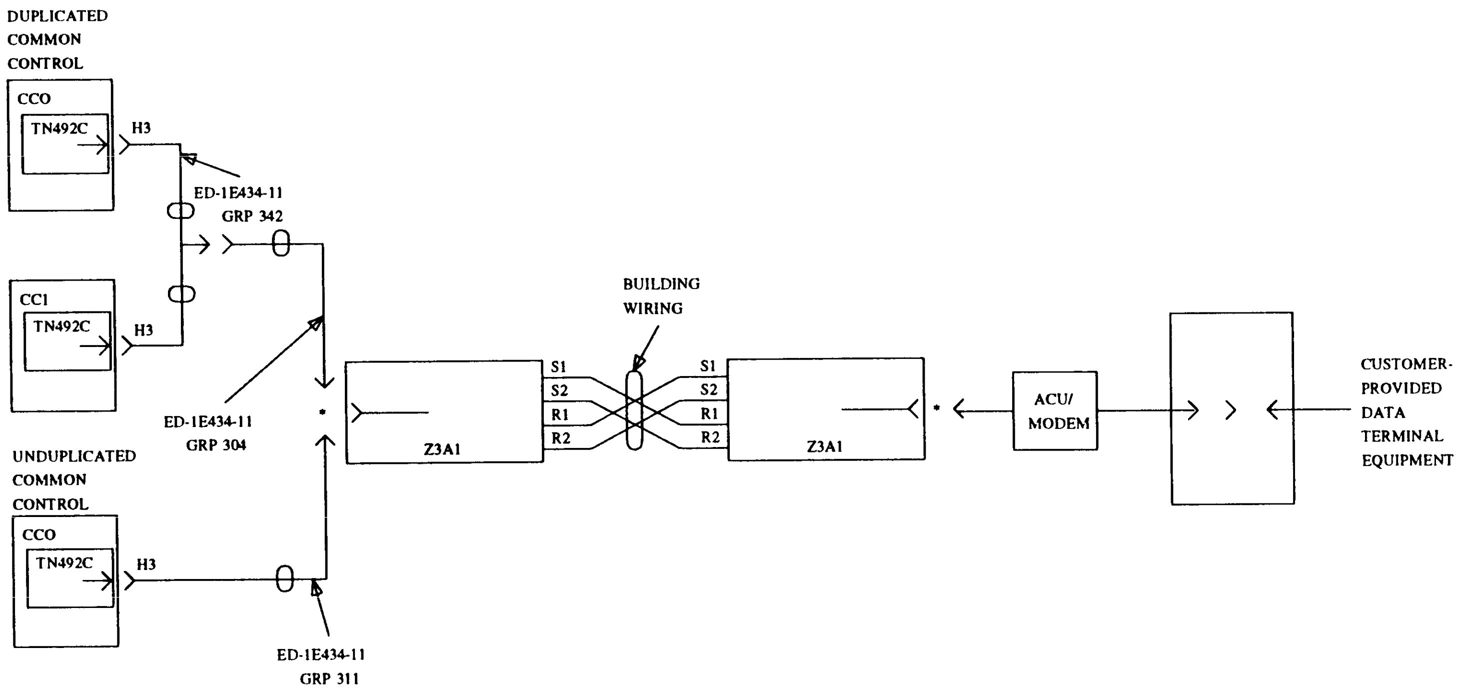


Figure 15-8. 15-8. AP to DCIU Using IDI — Less Than 400 Ft

TABLE 15-3. IDI Application

DCIU	EXTERNAL PROCESSOR
System 85 R2 DCIU	System 85 R2DCIU
System 85 R1 DCIU	System 85 R1 DCIU
Dimension 2000 DCIU	Dimension 2000 DCIU
Dimension 600 DCIU	Dimension 600 DCIU
AUDIX 200	AUDIX 200
	AP16
	3B5 AP
	3B2



* RS232 25-PIN CONNECTOR
MAXIMUM DISTANCE OF 16,000 FEET
OF 26 AWG WIRE OR 20,000 FEET
OF 24 AWG WIRE
EIGHT-PIN MODULAR PLUG

Figure 15-9. Customer-Provided Data Terminal Equipment to System Connections Through Z3A1 ADUs

Dial Up Link Between AP and System 89

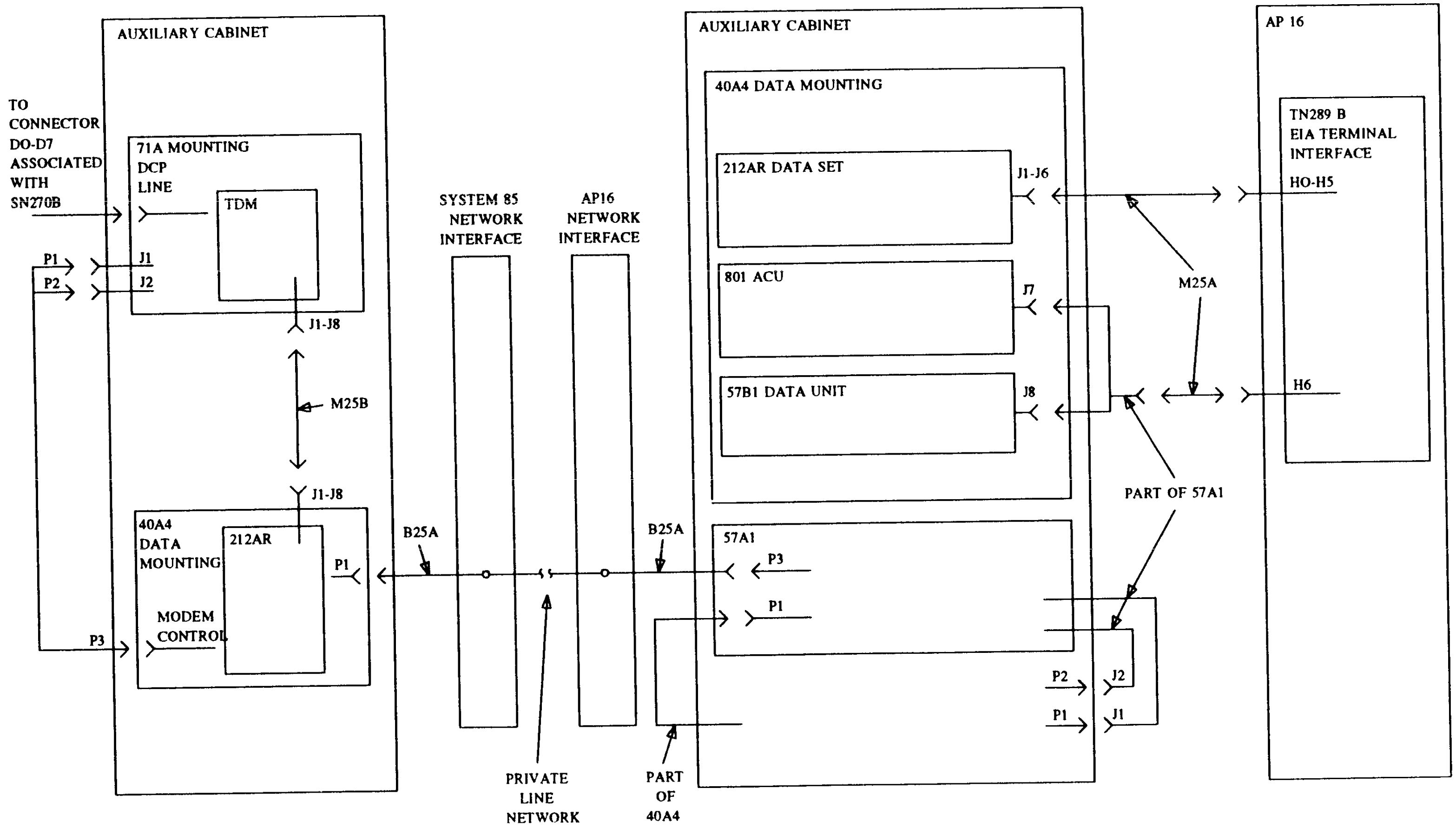


Figure 15-10. Dial Up Link Between the AP and System 85

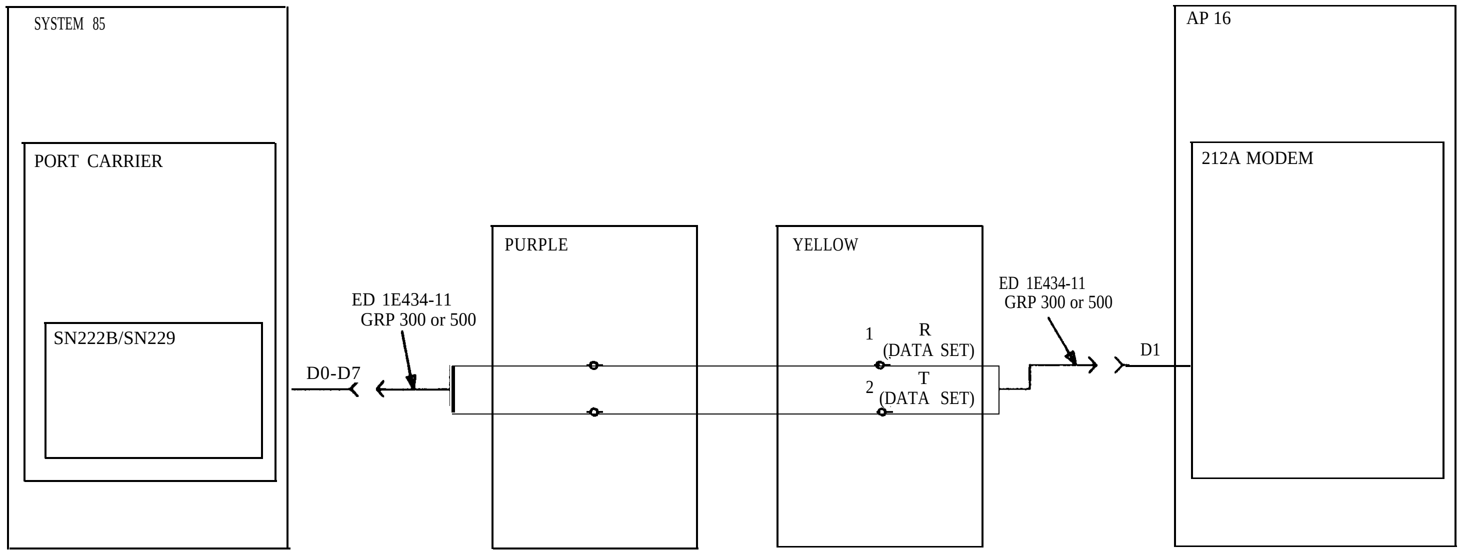
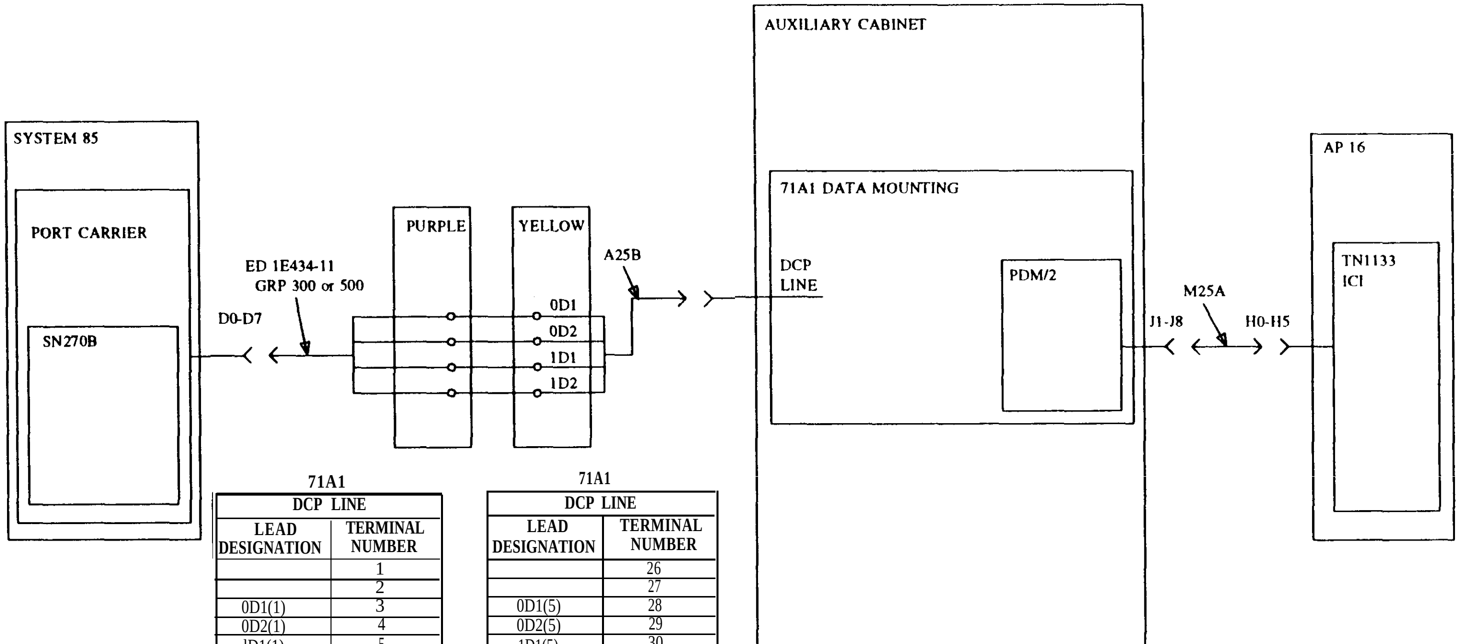


Figure 15-11. AP Maintenance Port



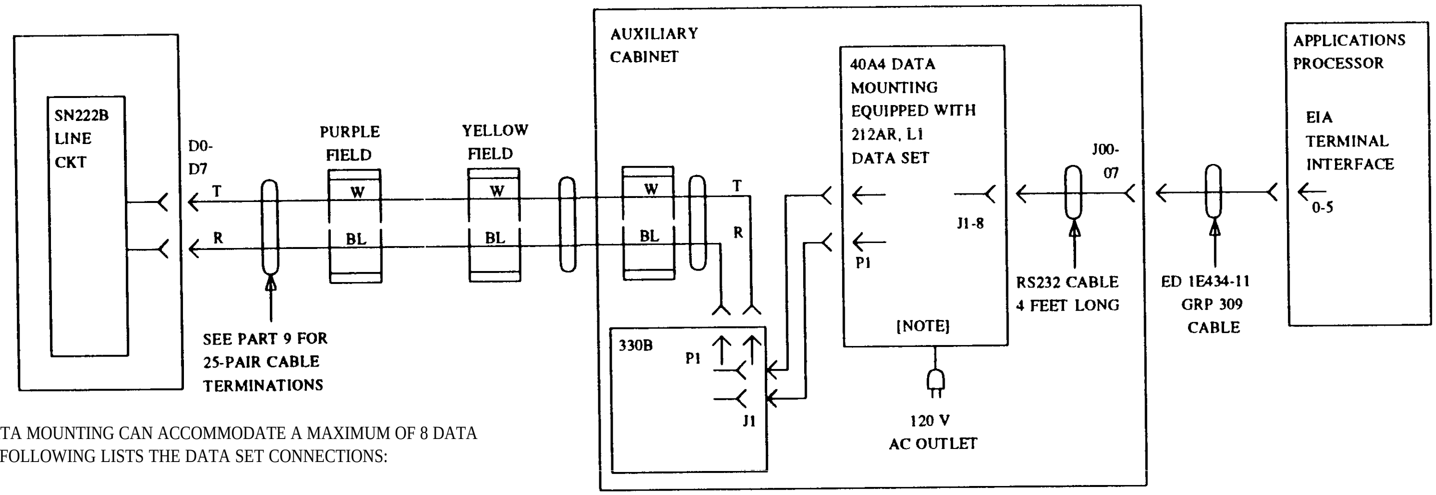
71A1

DCP LINE	
LEAD DESIGNATION	TERMINAL NUMBER
	1
	2
0D1(1)	3
0D2(1)	4
1D1(1)	5
1D2(1)	6
	7
	8
0D1(2)	9
0D2(2)	10
1D1(2)	11
1D2(2)	12
	13
	14
0D1(3)	15
0D2(3)	16
1D1(3)	17
1D2(3)	18
	19
	20
0D1(4)	21
0D2(4)	22
1D1(4)	23
1D2(4)	24
	25

71A1

DCP LINE	
LEAD DESIGNATION	TERMINAL NUMBER
	26
	27
0D1(5)	28
0D2(5)	29
1D1(5)	30
1D2(5)	31
	32
	33
0D1(6)	34
0D2(6)	35
1D1(6)	36
1D2(6)	37
	38
	39
0D1(7)	40
0D2(7)	41
1D1(7)	42
1D2(7)	43
	44
	45
0D1(8)	46
0D2(8)	47
101(8)	48
1D2(8)	49
	50

Figure 15-12. AP ICI Connections



NOTE:
A 40A4 DATA MOUNTING CAN ACCOMMODATE A MAXIMUM OF 8 DATA SETS THE FOLLOWING LISTS THE DATA SET CONNECTIONS:

LEAD NAME	PIN NO. OF P1 CONN ON 40A4	DATA SET SLOT	ASSOC RS232 CONN ON 40A4	ASSOC RS232 CONN ON BACK OF AUXILIARY CABINET
T	26	1	J1	J00
R	1			
T	27	2	J2	J01
R	2			
T	28	3	J3	J02
R	3			
T	29	4	J4	J03
R	4			
T	30	5	J5	J04
R	5			
T	31	6	J6	J05
R	6			
T	32	7	J7	J06
R	7			
T	33	8	J8	J07
R	8			

Figure 15-13. AP Traffic Connections

57A1 CONN P3 LEAD DESIGNATION	TERMINAL NUMBER
T(1)	1
R(1)	2
T(2)	3
R(2)	4
T(3)	5
R(3)	6
T(4)	7
R(4)	8
T(5)	9
R(5)	10
T(6)	11
R(6)	12
	13
	14
	15
	16
TSL1	17
RSL1	18
MB2(1)	19
MB1(1)	20
MB2(2)	21
MB1(2)	22
MB2(3)	23
MB1(3)	24

57A1 CONN P3 LEAD DESIGNATION	TERMINAL NUMBER
MB2(4)	25
MB1(4)	26
MB2(5)	27
MB1(5)	28
MB2(6)	29
MB1(6)	30
	31
	32
	33
	34
TSL0	35
RSL0	36
	37
	38
	39
	40
RD(5)	41
RD(1)	42
RD(6)	43
RD(2)	44
	45
RD(3)	46
	47
RD(4)	48
	49
	50

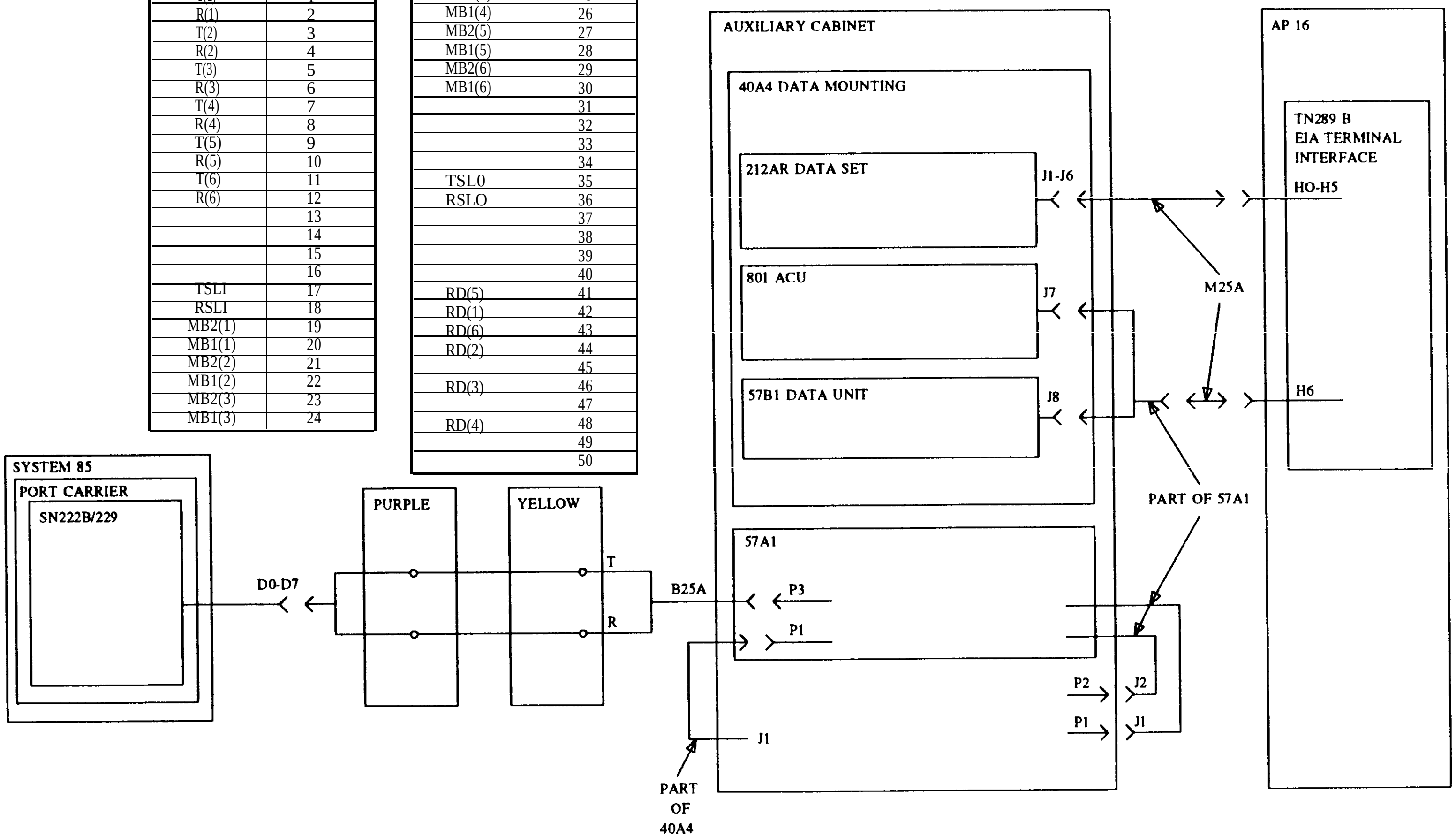


Figure 15-14. AP EIA/ACU Cabling to Data Sharing Unit

40A4 Options

To separate the frame and signal grounds, remove the strap from the rear of the power unit. The MB and SL toggle switches should be in the UP position for each slot containing a modem.

57B1 Options

The MB toggle switch should be set to the right for each slot containing a mode. DIP switch S10 should have all four rockers open for the first or only 57B1 associated with a 801C and closed for a second (if provided) 57B1 associated with the 801C.

16. POWER-UP SEQUENCE

INSPECTION 16-1
POWERING SYSTEM UP 16-3

LIST OF TABLES

Grounding Checklist for AC Powered System 16-2
Grounding Checklist for DC Powered System 16-2
Rectifier Output Voltages 16-3
Converter Output Voltages 16-4

INSPECTION

Set the AC disconnect switch to OFF.

At 309A/310A power unit or the Bulk OLS power supply in module control and port cabinets, set the AC input circuit breaker to OFF.

At the common control cabinet (if provided), set the 334A power unit or the Bulk OLS power supply AC input circuit breaker to OFF.

At power supply (if provided) in auxiliary cabinet(s), set AC input power switch to OFF.

At the cabinet containing the control carrier, set the memory holdover unit to OFF.

- Module control cabinet — 311A, J87462, L5, 6, or 7 or PEC 3965-2
- Common control cabinet — 312A, J87462, L5, 6, or 7 or PEC 3965-2

At the Universal Module Cabinet set AC input power switch on the distribution unit to OFF. Verify that:

- Circuit pack option settings are according to customer system document and PART 20
- All circuit packs are fully seated in proper slots
- All DC-DC converters are fully seated, all circuit breakers associated with the DC-DC converters to ON, and their switch latch is closed
- Power supply power tap is set to 208V

Ensure that:

- All fuse holders are equipped with correct fuses
- All connector cables are properly labeled, plugged into proper connectors, and secured
- All foreign materials have been removed from the cabinet

Using the two checklists provided, verify that all grounds are properly grounded. Table 16-1 is for an AC powered system and table 16-2 is for a DC powered system. If a discrepancy is found, return to the referenced figure or chapter and correct the problem.

TABLE 16-1. Grounding Checklist for AC Powered System

GROUND	DESCRIPTION	REFER TO	CORRECT	NOT CORRECT
System Ground	Connects single-point ground block to an approved ground	Figure 8-1		
Module Ground	Connects single-point ground to module control cabinet. Connects from module control cabinet to rectifier equipped cabinets.	Figures 8-2 through 8-7		
Circuit Ground	Connects two adjoining cabinets sharing a rectifier	Figure 8-8		
TMS Ground	Connects TMS cabinet to nearest cabinet with rectifier. Also connects TMS cabinet 0 and TMS cabinet 1	Figure 8-9		
Lightning Ground	Connects single-point ground to common control cabinet and onto each port cabinet	Figure 8-10		
Coupled Bonding Connector	Connects single-point ground to CBC terminal block at cross-connect field	Figure 8-15		
Bonding Straps	Connects adjoining cabinets	Figure 8-16		
Auxiliary, SMDR and AP Grounding	Green wire grounding, no other grounds should be attached			
Colocated Dimension Switch	No physical contact allowed	Figure 8-17		
Terminal Protection	All exposed terminals must be equipped with appropriate protection			
Ground Tags	All approved ground connections must be identified with an E3013B or equivalent ground tag	Chapter 8		

TABLE 16-2. Grounding Checklist for DC Powered System

GROUND	DESCRIPTION	REFER TO	CORRECT	NOT CORRECT
System Ground	Connects single-point ground (ground discharge bar) to an approved ground	Figure 9-1		
DC Ground	Connects battery plant to all cabinets	Figures 9-2 and 9-3		
Extended Power Reserve Equalizing Ground	Connects cabinets within a module	Figure 9-4		
Lightning Ground	Connects single-point ground to the common control cabinet and onto each port carrier	Figures 9-12 through 9-17		
Coupled Bonding Conductor Grounding	Connects single-point ground to CBC terminal block at cross-connect field	Figure 9-18		
Gutter-tapped Ground	Connects all cabinet frames to system single point ground	Figure 9-5		
Terminal Protection	All exposed terminals must be equipped with appropriate protection	Figures 1-64 through 1-66*		
Ground Tag	All approved ground connections must be identified with a E3013B or equivalent ground tag	Chapter 8		

* Auxiliary and Data Cabinets Installation, 555-104-106, Issue 1

Connect all cabinet AC power cords.

Set all cabinet circuit breakers to ON except the AC input circuit breaker on the 309A/310A power unit or the Bulk OLS power supply in the module control and port cabinets, the AC input circuit breaker on the 334A power unit or the Bulk OLS power supply in the common control cabinet (if provided), the AC input power switch on the auxiliary power supply, and the AC input circuit breaker on the AC distribution unit for the universal module cabinet.

POWERING SYSTEM UP

Connect all cabinet AC power cords. At alarm panel:

1. Set emergency transfer to NORMAL.
2. If equipped with duplicated common control, set common control to OFF.
3. Set go/halt to GO.

Place all AC circuit breakers in the system load center to ON, except the one on the applications processor (if provided).

Set the AC disconnect switch to ON.

At the common control cabinet (if provided), set the 334A power unit or the Bulk OLS power supply AC input circuit breaker to ON.

At the 309A/310A power unit or the Bulk OLS power supply in the module control cabinet, set the AC input circuit breaker to ON.

At the 309A/310A power unit or the Bulk OLS power supply in the port cabinet(s), set AC input circuit breaker to ON.

If the cabinet containing the common control carrier is equipped with a J87462 power unit, verify that the Model Selector switch is set to the correct list number.

At the cabinet containing the common control carrier, set the memory holdover unit to ON.

- Module control cabinet — 311A, J87462, L5, 6, or 7 or PEC 3965-2
- Common control cabinet — 312A, J87462, L5, 6, or 7 or PEC 3965-2

At auxiliary cabinet power supply (if provided), set AC input switch to ON.

At the universal module cabinet set the distribution unit AC input circuit breaker to ON.

Measure the rectifier output voltages. Allow for the tolerance of the multimeter when making measurements. The 309A/310A power unit, 334A power supply, and ITT 3947 power supplies have test points. The OLS units do not have test points. Measure the voltage at the end of the power supply leads where they attach to the bus bar for the OLS units. Refer to table 16-3.

TABLE 16-3. Rectifier Output Voltages

CABINET TYPE	POWER SUPPLY TYPE WITHOUT OLS	OLS POWER SUPPLY	VOLTAGE	MAX	MIN
Unduplicated Comm Cont.	NA	PEC 3965-1	-48 V	-50.5	-45.5
Duplicated Common Control	334A	NA	-48 V	-52	-46
RM1/TMS	334A	NA	-48V	-52	-46
MODULE CONTROL or PORT	309 A/310A		-48 V	-52	-46
		PEC 3965-1	-48V	-50.5	-45.5
Auxiliary	ITT 3947	NA	-48V	-52.6	-46

Measure the converter output voltages. Allow for the tolerance of the multimeter when making measurements. A red LED indicates a malfunction due to low voltage, high voltage, or overcurrent. Refer to table 16-4.

TABLE 16-4. Converter Output Voltages

CONVERTER	VOLTAGE	MINIMUM	MAXIMUM
490AA	5 V	4.9	5.3
494GA	5 V	4.9	5.3
495FA	5 V	4.9	5.3

At the front of each cabinet, remove any shipping bars from the carriers.

Install the plastic covers on each carrier. These covers must be in place to provide the air flow to cool the carrier components.

A liquid anti-static coating has been applied to the plastic covers to prevent Electric Static Discharge (ESD) damage to circuit components. If fingerprints and/or smudges appear on these covers, use only a soft, clean, dry cloth or tissue to clean the cover. Do not use any type of liquid cleaner. Do not attempt to clean the inside surface of the carrier cover.

17. CIRCUIT PACK DATA

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CAL1B Switch 17-35

INTRODUCTION

Chapter 17 describes the various circuit packs associated with the system and the carrier and slot position each circuit pack occupies. Some circuit packs have option switches that require setting. This section includes a list of those circuit packs and how to set their option switches.

WARNING

Some circuit packs use the new slide switches. They are either open or closed. Refer to figure 17-1 for rocker switch settings and 17-2 for slide switch settings. Tables in this chapter have been changed from D (down) to C (closed) and U(up) to O (open).

Option settings for rocker-type switches use the following convention:

D - Down (switch contacts are closed). C in tables.

U - Up (switch contacts are open). O in tables.

X - Not used (switch contacts are not used and may be set in either position)

Switch sections are set down (closed) when the rocker end adjacent to the number is depressed and up (open) when the rocker end away from the number is depressed.

NOTE

In figure 17-1, switch sections 2 and 5 are down (closed) and switch sections 1, 3, 4, and 6 are up (open).

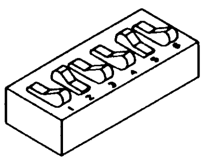
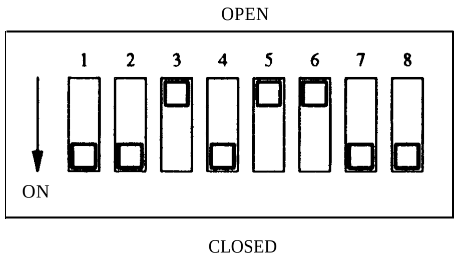


Figure 17-1. Rocker Switch



NOTE:
On red option switches, the “ON” position closes the switch.

Figure 17-2. Slide Switch

WARNING

Electrostatic discharge can damage circuit packs containing integrated circuits (ICs). Installation personnel must always attach wrist grounding straps before handling circuit packs.

Tables 17-1 through 17-6 show the various carriers and their associated circuit packs.

CC CARRIER CIRCUIT PACKS

TABLE 17-1. CC Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION R2V1-V4	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
00	TN370B	Sequencer	Contains the microstore and its logic	
01	UN151	ALU	Process and temporarily stores data	
02	UN152B	Instruction decoder	Contains special logic to accelerate the decoding of instruction fields	
03	UN153B	Bus interface	Interfaces the cache bus and the system bus	
04	TN369	Cache memory (optional)	Contains frequently accessed instruction and data	
05	TN514	Scamper interface		
06	TN368	Memory protect	Prevents write operations in protected memory, also, performs sanity timing, bus resolutions, and miscellaneous control functions	
07-09	TN392	1 Meg RAM memory	Provides 1 megaword (16-bit words of memory) (R2V1, R2V2 or early R2V3)	
07-09	TN394	4 Meg RAM memory	Provides 4 megaword (16-bit words of memory) (late R2V3 or R2V4)	
10-14	TN392	1 Meg RAM memory	Provides 1 megaword (16-bit words of memory) (R2V1, R2V2, or early R2V3)	
15	TN513	DCIU test support	Provides memory expansion for the DCIU	
16	TN406	DCIU processor memory	Provides the control and status registers used for passing information between the DCIU and processor	
17	TN405	DCIU system interface	Provides arbitration control for DCIU local bus and 128 Kbytes of RAM for data storage	
18	UN156	DCIU I/O	Provides interface between DCIU and an external processor	
19	UN158	Duplicated controller	Selects CC, passes data between the controllers	
20	TN563	SCSI host adapter	Connects the DTS to the processor for use with SAM	Slot 20 can also accommodate a TN430B tape interface to connect the HCMR to the processor for R2V1-V4 systems.
21	TN404	I/O buffer	Buffers data and control leads	

TABLE 17-1. CC Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION R2V1-V4	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
22	TN490	Alarm interface	Interfaces processor and alarm panel	
23 24 25 26	TN403	Dual speed data channels	Provides interfacc between the processor and peripherals	
24 25 26	TN474B	processor communication circuit	Provides connectivity to a 3B2 LSU R2V4 only	
27 28 29 30	TN402	4-MHz data channels	Provides 4 M bps I/O mechanism for communications between CC and distributed controllers in the network controllers and TMS	
31	TN491B	Diagnostic processor	Provides for common fault isolation to a single circuit pack and reports system failures	
32	TN492C	Remote interface	Providcs interface for the diagnostic processor to RMATS	

NOTE 1: For R2V4 these slots can accept TN403 or TN474 processor communication circuit. These packs are optional.

MC CARRIER CIRCUIT PACKS

TABLE 17-2. MC Carrier (J58888M-2) and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
TRADITIONAL MC				
00A	495FA	Power unit	DC-to-DC converter.	Provides +5V for left 1/2 MC carrier.
00B	494GA		DC-to-DC converter.	For a single module unsynchronized switch, slots 00B, 01, and 02 are empty and TN460 (module clock) is used in slot 03. For a single module synchronized switch, slots 00B and 01 are empty. TN463 or TN2131 is used in slot 02 and TN460C is used in slot 03. For a multi-module switch, slots 00B and 01 are empty, TN481 (lightguide interface) is used in slot 02, and TN441 (TMS intermodule data store) is used in slot 03. For a duplicated multimodule switch, 494GA power unit is used in slot 00B, TN481 is used in slot 01, slot 02 is empty, and TN441 is used in slot 03. The TN2131 converts composite clock signal from synchronization clock to 8KHz transistor transistor logic (TTL) signal for system For multi-module systems, TN2131 and TN463 reside in TMS or CC/TMS, slot 20. See chapter 30 for complete synchronization clock information.
01	TN481	TMS lightguide interface	Receives serial data from the intermodule data store and transmits it to TMS.	
02	TN481 or	TMS lightguide interface		
	TN463 or	System clock synchronizer	Provides synchronization of clock signals with an external clock.	
	TN2131	External clock interface		
03	TN441 or	TMS intermodule data store	Connects to the module buses and provides many functions for the intermodule calls.	
	TN460C	Module clock	Source of timing in the MC.	
06-11	TN440B	Port data store	Provides an interface between serial and parallel data.	PDS supports 265 port circuits or two standard port carriers.
12	TN446	TSI ALU	Stores switching instructions for the TSI arithmetic logic unit to execute, and provides error detection and control functions.	One required for each MC.
13	TN445	TSI P-store	Provides execution logic for the switching instructions stored in the time slot interchange p-store.	One required for each MC.
14	TN444B	Maintenance interface	Interfaces the scanner to all the circuits in the MC for most maintenance purposes.	One required for each MC.

TABLE 17-2. MC Carrier (J58888M-2) and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
15	TN530	Duplication/update channel	Provides the hardware to link duplicated MC carrier in a module.	One required for each MC unit - critical reliability application.
16		Unequipped		
17	TN380D TN380E	Module processor	Major control unit between the CC processor and the digital network.	One required for each MC unit. If system is duplicated both MC carriers must have identical circuit packs
18	TN512B	Test support	Provides a means of testing code and provides field support (a trouble-shooting tool).	Not required for system operation. Used only for system test and field support functions.
19 20 21	TN400B	I/O bus interface	Used to interface scanner to the port carrier.	One I/O bus interface supports four standard carriers or eight ETM port carriers.
25	TN456	RMI	Provides lightguide communication interface for a module at a remote location.	One required at each end of a fiber link
22	TN401 or TN401B	MC channel	Provides the digital network module side message handling functions.	One required for each MC. "B" version not required.
23	495 FA	Power unit	DC-to-DC converter	Provides +5V power to right half of a carrier.

PORT CARRIER CIRCUIT PACKS

This section identifies the circuit packs for traditional port carriers.

TABLE 17-3. Port Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
TRADITIONAL MODULE PORT CARRIER CIRCUIT PACKS				
04	TN454	Port data interface	Provides the timing necessary to synchronize the port PCM or data to the network time slot.	One port data interface for half a port carrier.
09	TN452C	Universal port control interface	Provides I/O bus signal control.	One required per port carrier.
10	494GA	Converter 50W ±5V	Provides power for one port group.	One required for right half port carrier.
11	494GA	Converter 50W ±5V	Same as position 10.	
17	TN454	Port data interface	Same as position 04.	
***	NOTE:	Carrier positions 00-03, 05-08, 13-16, 18-21 are universal port positions which can accept most port circuit packs - port circuit packs for use in these positions are described as follows:		
	ANN17B	Multifunctional analog terminal	Provides interface between digital switch and 7300S series voice terminal.	Cannot be used in slots 05 and 18, only four ports are used in a port carrier.
	SN221B or SN228B	Off-premises line circuit	Interface to analog telephone sets.	One SN221B or SN228B provides interface to eight ports for analog telephone sets for off-premises application.
	SN222B or SN229	On-premises line circuit	Interface to analog telephone sets.	One SN222B or SN229 provides interface to eight ports for analog telephone sets with message waiting capabilities.
	SN224B	Line circuit (MFET/MET)	Interface to MFET and MET sets.	One SN224B provides interface to four ports for electronic telephone sets.
	SN230B	Central office trunk (ground start)	Interface to CO trunks.	One SN230B provides four CO trunk ports.
	SN231	Auxiliary trunk	Interfaces with auxiliary units that require analog signaling.	One SN231 provides four trunk ports.
	SN232B	Direct inward dial trunk (DID)	Interfaces with DID CO trunks.	One SN232B provides four CO trunk ports.
	SN233C	Tie trunk/attendant interface	Interfaces the system to a tie trunk going to another system or to an attendant console.	One SN233C provides four port circuits.
	SN238	EIA port	Provides interface between the digital switch and general trade devices that employ an EIA-RS232C signaling protocol.	Provides four port interface circuits.

TABLE 17-3. Port Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
	SN241	Contact interface circuit	Provides the system a contact closure for use in features such as UCD.	One SN241 provides eight contact closures.
	SN243B	Data port circuit	Provides a loop signaling trunk with a line circuit function on the trunk side, includes ring, ring trip, dial tone, etc.	One SN243B provides four port circuits.
00,01 or 02	SN244	Automatic number identification data transmitter circuit	Transmits station and trunk numbers for calls that are to be identified for billing purposes.	Only carrier positions 00-02 can accept this pack.
	SN250	Call progress tone circuit	Provides eight call progress tones.	Two SN250s per module should be located on separate power supplies.
	SN251	Touch-tone dialing receiver unit	Provides the dual-tone multifrequency receiving capabilities.	One SN251 provides four touch-tone receiver circuits.
	SN252	Touch-tone dialing sender unit	Provides combination dual-tone multifrequency sender capability.	One SN252 provides four touch-tone sender circuits.
	SN253C	Auxiliary tone plant circuit	Provides four tones.	One SN253C required per system for code calling, radio paging, or recorded telephone dictation.
	SN254	Attendant conference circuit	Provides the system attendant with the ability to get up a conference of eight stations.	
	SN255	Tone detector 2	Detects tones necessary to provide terminal dialing.	
	SN261C	Facility test circuit	Provides transmission testing from the system to a remote testing facility.	One SN261C required per system. May have SN260 and SN261C in older systems.
	SN261C	Analog/digital facility test circuit		
	SN270B	General purpose port circuit	Provides an interface between the system and other digital devices including the digital terminal.	One SN270B provides four circuits.

Port carrier positions 00-03, 05-08, 13-16, 18-21 can accept the following SN-coded circuit packs:

TABLE 17-4. Port Carrier Codes and Names

CKT PACK CODE	CIRCUIT PACK NAME	CKT PACK CODE	CIRCUIT PACK NAME	CKT PACK CODE	CIRCUIT PACK NAME	CKT PACK CODE	CIRCUIT PACK NAME
SN224	MFET line port	SN232	DID trunk	SN250	Call progress tone	SN255	Tone detector 2
SN228	Off premises line	SN233	Tie trunk/attendant interface	SN251	Touch-tone receiver	SN261	Analog/digital facility test
SN229	On premises line	SN238	EIA interface	SN252	Touch-tone sender	SN270	GPP
SN230	CO trunk	SN241	Contact interface	SN253	Auxiliary tones		
SN231	Auxiliary trunk	SN243	Data port	SN254	Attendant conference		

DS-1/MFAT CARRIER CIRCUIT PACKS

TABLE 17-5. DS-1/MFAT Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
04	TN454	Port data interface	Provides the timing necessary to synchronize the port PCM or data to the network time slot.	One port data interface for half a port carrier.
09	TN452	Universal port control interface	Provides I/O bus signal control.	One required for left half port carrier.
10	494GA	Converter 50W ±5V	Provides power for one port group.	One required for right half port carrier.
11	494GA	Converter 50W ±5V	Same as position 10.	
17	TN454	Port data interface	Same as position 04.	
***	NOTE:	Carrier positions 00-03, 05-08, 13-16, 18-21 are universal port positions which can accept most port circuit packs - port circuit packs for use in these positions are described as follows:		
	ANN11E	DS-1 trunk interface	Provides connectivity between AT&T System 85 and other systems.	Used in slots 00, 05, 13, and 18 in the line only mode. Used in slots 05 and 18 in the line/trunk mode (see notes 1 and 2).
	ANN15B	RGI central location	Provides connectivity between AT&T System 85 and the remote carrier housing.	Can only be in slots 00, 05, 13, and 18 (See note 1).
	ANN17B	MFAT	Provides interface between digital switch and 7300S series voice terminals.	Can only be placed in slots 03 and 08 when ANNl1E in slot 05 and in slots 16 and 21 when ANNl1E in slot 18 (see note 2).
	ANN35	ISDN primary rate port	Provides ISDN and DMI interface to T1 from AT&T System 85 to ISDN networks.	Can only be placed in slots 05 and 18 (see note 2).
	SN221B or SN228B	Off-premises line to circuit	Interface to analog telephone sets.	One SN221B or SN228B provides interface eight ports for analog telephone sets for off-premises application.
	SN222B or SN229	On-premises line to circuit	Interface to analog telephone sets.	One SN222B or SN229 provides interface eight ports for analog telephone sets with message waiting capabilities.
	SN224B	Line circuit (MFET/MET)	Interface to MFET and MET sets.	One SN224B provides interface to four ports for electronic telephone sets.
	SN230B	CO trunk (ground start)	Interface to CO trunks.	One SN230B provides four CO trunk ports.
	SN231	Auxiliary trunk	Interfaces with auxiliary units that require analog signaling.	One SN231 provides four trunk ports.

TABLE 17-5. DS-1/MFAT Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
	SN232B	DID	Interfaces with DID CO trunks.	One SN232B provides four CO trunk ports.
	SN233C	Tie trunk/attendant interface	Interfaces the system to a tie trunk going to another system or to an attendant console.	One SN233B provides four port circuits.
	SN241	Contact interface circuit	Provides the system a contact closure for use in features such as UCD.	One SN241 provides eight contact closures.
	SN243B	Data port circuit	Provides a loop signaling trunk with a line circuit function on the trunk side, includes ring, ring trip, dial tone, etc.	One SN243B provides four port circuits.
	SN244	Automatic number identification data transmitter circuit	Transmits station and trunk numbers for calls that are to be identified for billing purposes.	Only carrier positions 00-02 can accept this pack.
	SN250	Call progress tone circuit	Provides eight call progress tones	Two SN250s per module should be located on separate power supplies.
	SN251	Touch-tone dialing receiver unit	Provides the dual tone multifrequency receiving capabilities.	One SN251 provides four touch-tone receiver circuits.
	SN252	Touch-tone dialing sender unit	Provides combination dual tone multifrequency sends capability.	One SN252 provides four touch-tone sender circuits.
	SN253C	Auxiliary tone plant circuit	Provides four tones.	One SN253C required per system used with centralized attendant services and code calling.
	SN254	Attendant conference circuit	Providess the system attendant with the ability to get up a conference of eight stations.	
	SN255	Tone detector 2	Detects all tone and tone pairs on the subscriber loop necessary for terminal dialing.	
	SN261C	Facility test circuit	Provides transmission testing from the system to a remote testing facility.	One SN261C required per system. May have SN260 and SN261C in older systems.
	SN261C	Analog/digital facility test circuit	Provides transmission testing for analog and digital switching from the system to a remote testing facility.	
	SN270B	GPP circuit	Provides an interface between the system and other digital devices including the digital terminal.	One SN270B provides four circuits.

NOTES

1. Carrier positions 00, 05, 13, and 18 can accept circuit pack ANN15 remote carrier local (RCL) or ANNl1 DS1 trunk interface. If ANN15 is used in slot 00, 05, 13, or 18, the next 2 adjacent slots to the right must be left vacant. ANN11 can be used in slots 00 and 13 in the line only mode and in slots 05 and 18 in the line+trunk mode.

2. Carrier positions 05 and 18 can accept circuit packs ANNl1 or ANN35.

   If ANNl1 or ANN35 is used in slot 5, then

   — slots 0001, 02, 06 and 07 cannot be used

   — Slots 03 and 08 can be used for ANN17 or any port circuit

   If ANNl1 or ANN35 is used in slot 18, then

   — slots 13, 14, 15, 19, and 20 cannot be used

   — slots 16 and 21 can be used for ANN17 or nay port circuit

3. The DS1/MFAT carrier is not intended to replace the port carrier. Use of SN port circuit packs in the DS1/MFAT carricr causes inefficient use of the wall field.

TMS CARRIER CIRCUIT PACKS

TABLE 17-6. TMS Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
00 01	494GA	Power unit	DC-DC converter	
02 03 04 05	TN480	Module interface	Receives data from and transmits data to the modules	One required per module.
06	TN473	Fanout	Distributes data from module interface to the multiplexer	
07	UN150	Fanin	Distributes data from module interface to the multiplexer	
08 09	TN470	MPX	Provides the half-connections which allow voice and data communications between modules	One TN470 required for first module and one TN470 for every two modules thereafter.
10	TN452C	Port control interface	Provides I/O bus signal control	
11	TN462	Local clock termination	Receives clock oscillator signals and distributes them from the TMS carrier	
12 13	TN470	MPX	Provides the half connections which allow voice and data communications between modules	Same as position 08.
14	UN150	Fanin	Distributes data from module interface to the multiplexer	
15	TN473	Fanout	Distributes data from module interface to the multiplexer	
16 17 18 19	TN480	Module interface	Receives data from and transmits data to the modules	Same as position 02. A TN480 may be installed in position 19 in the growth TMS carrier only.
20	TN463 or TN2131	System clock synchronizer External clock interface	Provides synchronization of clock signals with an external clock	In single module systems, resides in traditional MC slot 02. See chapter 30 for complete synchronization clock information.

TABLE 17-6. TMS Switch Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
21	TN461	Clock oscillator	Generates reference clock signals for multimodule system and serves as an interface between the system clock synchronizer or external clock interface and secondary clock signals.	Only in basic TMS carrier.
22	TN482	TMS maintenance interface	Provides test and maintenance access to TMS network.	Only in basic TMS carrier.
23	TN530	Duplicate/update channel	Links two MC carriers of duplicated MC system.	Only in basic TMS carrier.
24	TN512B	Test support	Used in field maintenance to provide extra memory for code testing.	Only in basic TMS carrier.
25	TN381	TMS processor	Provides control interface between the TMS and the CC.	Only in basic TMS carrier.
26	TN400B	I/O bus interface	Interfaces the module processor with the port control interface.	
27	TN401	MC channel	Interfaces between the CC and digital network.	
28	495FA	Power unit	DC-to-DC converter.	

CIRCUIT PACK SWITCH SETTINGS

ANN11E Circuit Pack

Figure 17-3 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

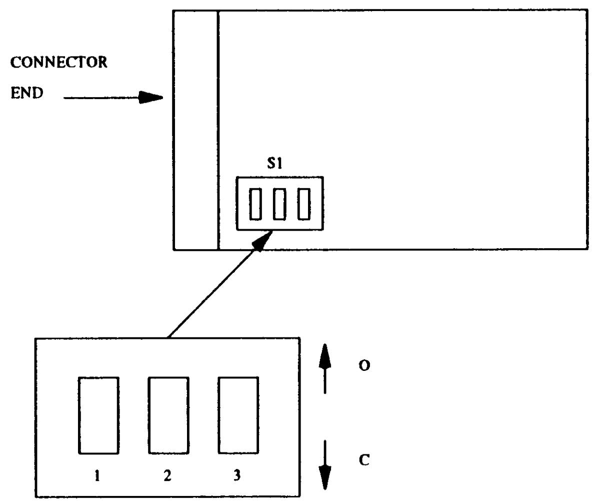


Figure 17-3. ANN11E S1 Switch

Use table 17-7 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from an AT&T System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the cable length distance. The options at both systems should be set for the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 17-7. ANN11E S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	C	C	O
133-266 feet	C	O	C
266-399 feet	C	O	O
399-533 feet	O	C	C
533-655 feet	O	C	O

ANN15B and ANN16B Circuit Packs

Figure 17-4 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

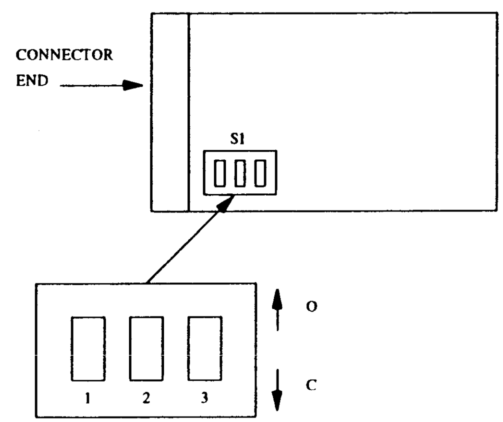


Figure 17-4. ANN15B and ANN16B S1 Switch

Use table 17-8 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from an AT&T System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the distance. The options at both systems should be set at the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 17-8. ANN15B and ANN16B S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	C	C	O
133-266 feet	C	O	C
266-399 feet	C	O	O
399-533 feet	O	C	C
533-655 feet	O	C	O

ANN35 Circuit Pack

Figure 17-5 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

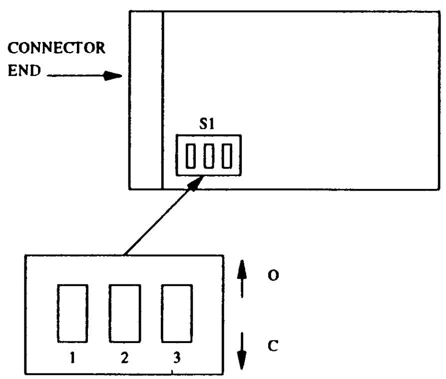


Figure 17-5. ANN35 S1 Switch

Use table 17-9 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from a System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the distance. The options at both systems should be set at the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 17-9. ANN35 S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	C	C	O
133-266 feet	C	O	C
266-399 feet	C	O	O
399-533 feet	O	C	C
533-655 feet	O	C	O

SN221B Circuit Pack

Figure 17-6 shows four, two-rocker switch packages, S1-S4 positioned on the circuit pack. Each switch package serves two of the eight port circuits provided on the pack.

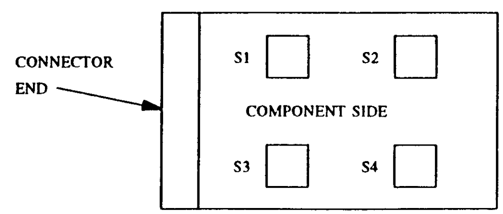


Figure 17-6. SN221B Switch Locations

Figure 17-7 identifies the two switch sections (1/2) in the single switch package.

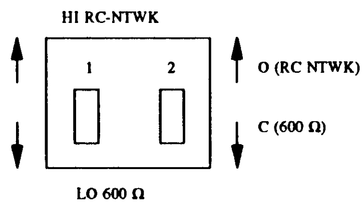


Figure 17-7. SN221B S1-S4 Switch

Refer to table 17-10 to select the required option for a port circuit. First, identify the switch package (S1-S4) associated with the port circuit (locate the package as shown in figure 17-6). Next, set the single switch section for that port as shown in table 17-10.

TABLE 17-10. SN221B Switch Settings

PORT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION POSITION*	
			OPTION 600 Ω	OPTION (RC-NTWK)
0	1	1	C	O
1	1	2	C	O
2	2	1	C	O
3	2	2	C	O
4	3	1	C	O
5	3	2	C	O
6	4	1	C	O
7	4	2	C	O

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK and option for loop length greater than 3500 feet.

SN224B Circuit Pack

A single shorting plug is provided to adapt the port circuits to interface with either multifunction electronic telephone (MFET) or multibutton electronic telephone (MET) sets. All four ports are altered by the single plug. Both MFET and MET sets can be used with the shorting plug in place (POSITION 1); however, the distance from station set to port is limited to 1,000 feet. For MFET set distances to 3,000 feet, the plug must be set to POSITION 2. (See figure 17-8 for Position 1 or 2 arrangements.) This makes the circuit pack incompatible with MET sets. Position 2 does nothing electrically to the circuit pack, it is just a method of storing the strap.

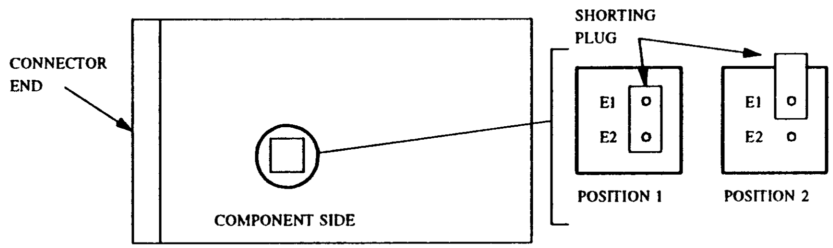


Figure 17-8. SN224B Shorting Plug Positions

When installing 106B Display Units, the shorting plug must be placed in position 1. This position dedicates all the port circuits to MET set or display unit operation and it makes the circuit pack incompatible with MFET sets.

SN228B Circuit Pack

Figure 17-9 shows eight, two-rocker switch packages S1-S8 positioned on the circuit pack. Each switch package serves one of the eight port circuits provided on the pack.

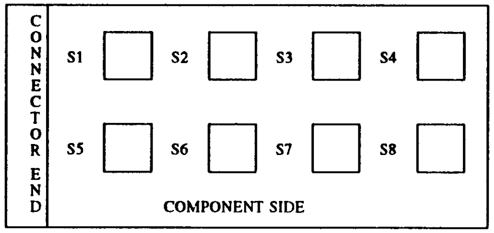


Figure 17-9. SN228B Switch Locations

Figure 17-10 shows a single switch package that identifies the two switch sections (1, 2) in the package.

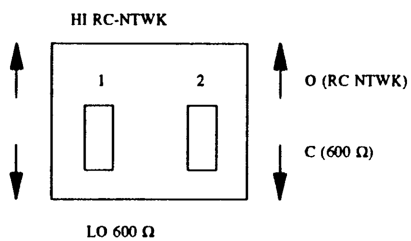


Figure 17-10. SN228B S1-S8 Switch

Use table 17-11 to select the required option for a port circuit. First, identify the switch package (S1-S8) associated with the port circuit (locate the package as shown on figure 17-9). Next use table 17-11 to set the single switch section for that port.

TABLE 17-11. SN228B Switch Settings

PORT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION POSITION*	
			OPTION 600 Ω AND LO	OPTION (RC-NTWK) AND HI
0	1	1 and 2	C	O
1	2	1 and 2	C	O
2	3	1 and 2	C	O
3	4	1 and 2	C	O
4	5	1 and 2	C	O
5	6	1 and 2	C	O
6	7	1 and 2	C	O
7	8	1 and 2	C	O

* Use 600Ω and LO options for loop length less than 3500 feet (about 600Ω without set). Use RC-NTWK and HI options for loop length greater than 3500 feet.

SN230B Circuit Pack

Figure 17-11 shows four, two-rocker switch packages positioned on the circuit pack. Each switch package is assigned to a single port circuit as identified in the diagram.

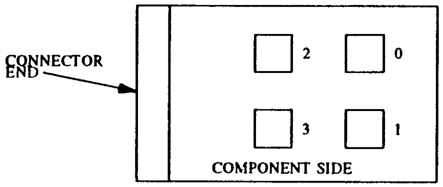


Figure 17-11. SN230B Switch Package Locations

Figure 17-12 shows a single switch package that identifies the two switch sections (1, 2) in the package.

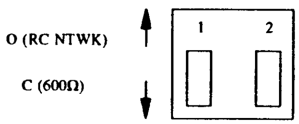


Figure 17-12. SN230B Switch Package

Refer to figure 17-11 to select the required option for a port circuit and identify the associated switch package. Then set the switch sections for that port as shown in table 17-12.

TABLE 17-12. SN230B Switch Settings

OPTION	TERMINATION	SWITCH 1	SECTION 2
W	RC BALANCE NETWORK	O	X
X	600 OHM	C	X

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC BALANCE NETWORK option for loop length greater than 3500 feet.

"X" denotes that switch section (2) is not used. The position of this switch section has no effect on circuit operation.

SN231 Circuit Pack

Four switch packages, each containing four (three for vintage 5) rocker switch sections, are positioned on the circuit pack. Each switch package is assigned to a single port circuit as identified in figures 17-13.

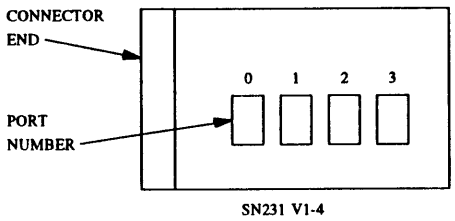


Figure 17-13. SN231 Switch Locations

Single switch packages are shown in figure 17-14 to identify the four rocker switch sections in vintage 1-4 circuit packs and the three rocker switch sections in vintage 5 circuit packs.

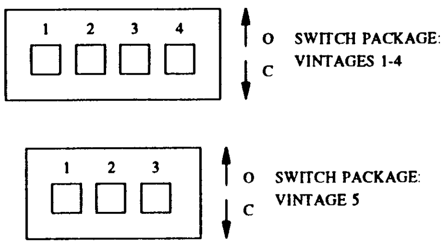


Figure 17-14. SN231 Switch Sections

To select the required transmission option for a port circuit, identify the associated switch package from the pack diagram. Then set switch sections for that port as shown in table 17-13. Use switch section columns 1, 2, and 3 for vintage 5 circuit packs.

TABLE 17-13. SN231 Switch Settings

OPTION	TRANSMISSION	SERVICE TYPE	SWITCH SECTION 1	2	3	4
S	ONE WAY INCOMING	RECORDED ANNOUNCEMENT	O	C	O	X
S	ONE WAY INCOMING	MUSIC ON HOLD	C	C	O	X
R	ONE WAY OUTGOING	PAGING WITHOUT TALKBACK	O	O	C	X
Q	TWO WAY	PAGING WITH TALKBACK	O	C	C	X
Q	TWO WAY	DICTATION TRUNKS	O	C	C	X
ZA	TWO WIRE SIGNALING	NOT APPLICABLE	C	X	X	X
ZB	FOUR WIRE SIGNALING	NOT APPLICABLE	O	X	X	X

An “X” indicates that a switch section is not used in the option and may remain in either position.

SN232B Circuit Pack

Figure 17-15 shows two, two-rocker switch packages S1 and S2 positioned on the circuit pack. Each package serves two port circuits.

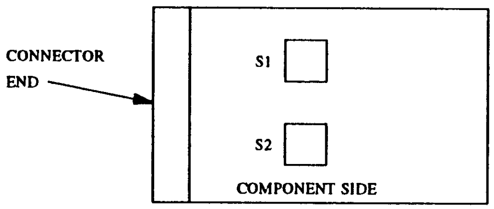


Figure 17-15. SN232B Switch Locations

Use table 17-14 to select the required option for a port circuit.

TABLE 17-14. SN232B Switch Settings

PORT CIRCUIT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION SETTING*	
			RC-NTWK	600 Ω
0	S1	1	O	C
		2	C	O
1	S2	1	O	C
		2	C	O
2	S1	3	O	C
		4	C	O
3	S2	3	O	C
		4	C	O

* Use 600 S2 option for loop length less than 3500 feet (about 600Ω without set). Use RC-NTWK option for loop length greater than 3500 feet.

SN233B Circuit Pack

Access to both transmit and receive transmission channels and to the E & M signaling leads for each port is provided by jacks on the front of the pack. The jack assignment is shown in figure 17-16. Plug insertion into the transmit or receive channel jack accesses the local end, opening the channel toward the distant end. Plug insertion into the signaling jack opens the signaling leads toward the distant ends unless on-board switches are set as described below.

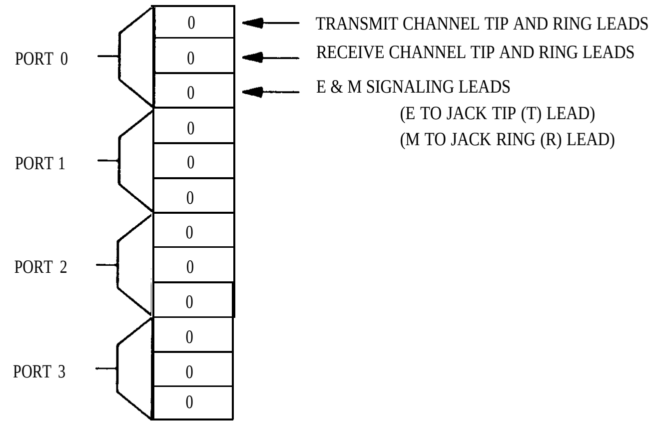


Figure 17-16. SN233B Jack Assignments

Figure 17-17 shows two, four-rocker switch packages S1 and S2. Switch settings determine the type access from the E & M lead jack. Table 17-15 shows the switch settings.

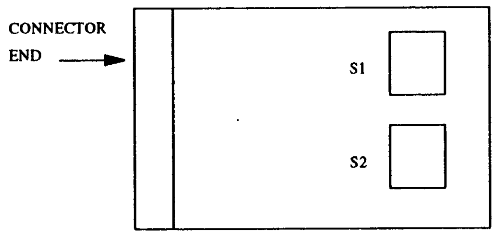


Figure 17-17. SN233B Switch Location

Figure 17-18 shows a single switch package.

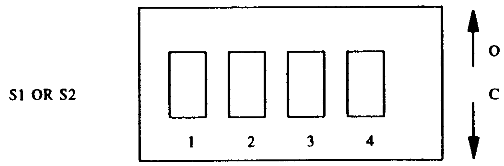


Figure 17-18. SN233B Switch Settings

TABLE 17-15. SN233B Switch Settings

PORT	LEAD	SWITCH	SECTION
0	M	1	1
	E		2
1	M	1	3
	E		4
2	M	2	1
	E		2
3	M	2	3
	E		4

SN233C Circuit Packs

Table 17-16 describes the type of signaling used on the port set by option switches. Four switch packages, S1 through S4, are located as shown in figure 17-19. S1 contains four rocker switch sections that are shared between Port 0 and Port 1. S3 also contains four rocker switch sections that are shared between Port 2 and Port 3. S2 contains 10 rocker switch sections that are shared between Port 0 and Port 1. S4 contains 10 rocker switch sections that are shared between Port 2 and Port 3. The switch settings determine the type and method of signaling used for the port and the code conversion mode. Figure 17-20 shows the switch settings for various signaling types for any port.

TABLE 17-16. SN233C Switch Settings

SWITCH SECTION	A a	B b	C c	D d	E e	F f
Standard E&M Type IA	C	C	C	C	O	O
IB	O	O	C	O	O	O
V	O	O	C	C	O	O
Protected Type IA	C	C	O	C	O	O
(NOTE 1) IB	O	O	O	O	O	O
V	O	O	O	C	O	O
Simplex Type IA	C	C	O	C	C	C
IB	O	O	O	O	C	C
V	O	O	O	C	C	C

Capital letters A through F = Port 0 and Port 2
Small letters A through F = Port 1 and Port 3
Set Switch M for appropriate conversion mode (NOTE 2):
  µlaw (Domestic) = 0
  alaw (International) = C
NOTE 1: The M lead when protected has series resistance added to provide for lightning protection.
NOTE 2: Some international countries use µlaw.

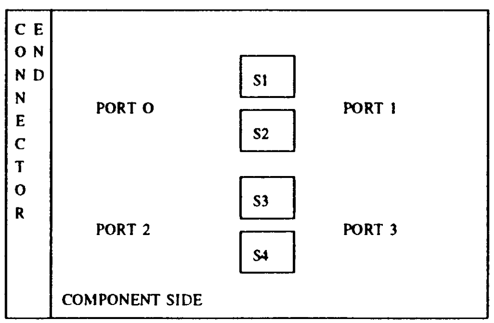


Figure 17-19. SN233C Switch Locations

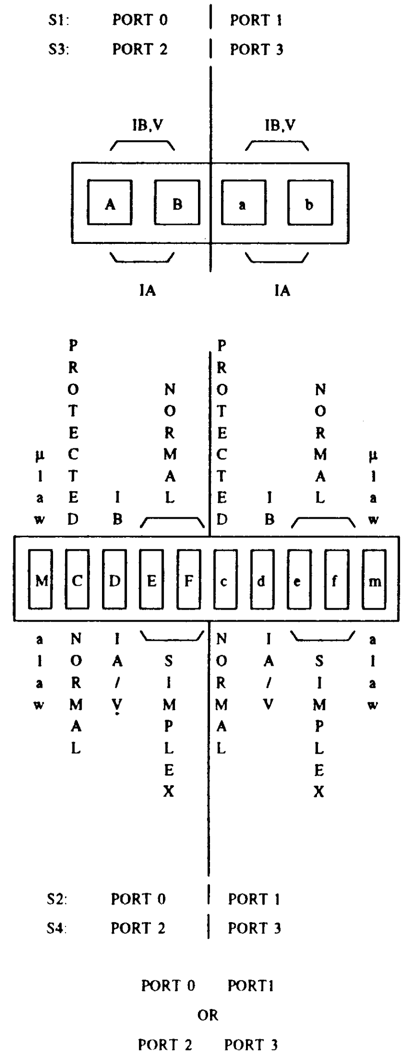


Figure 17-20. SN233C Port Settings

SN238 Circuit Pack

There are two switch packages each containing eight switch sections. Switch S1 is used to select odd or even parity, enable or disable parity, and to select a baud (data) rate. Switch S2 is used to enable or disable auto baud and auto parity for ports 0-3. S2 is also used to enable or disable keyboard dialing for Ports 0-3. See figure 17-21 for switch locations.

Figures 17-23 and 17-24 show single switch packages.

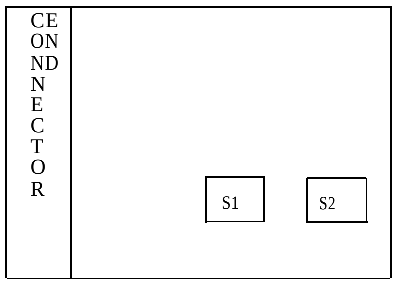


Figure 17-21. SN238 Switch Locations

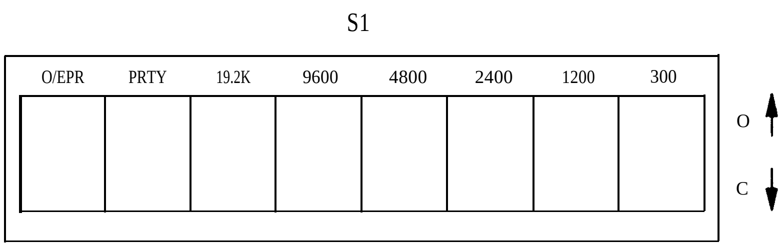


Figure 17-22. SN238 S1 Switch

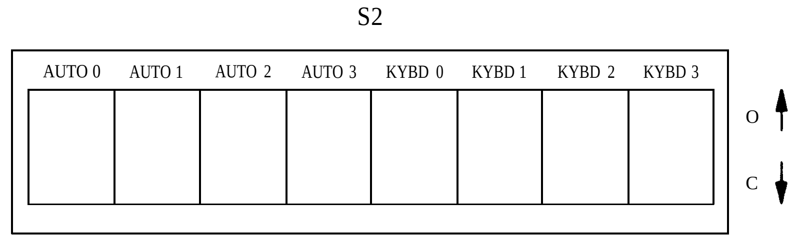


Figure 17-23. SN238 S2 Switch

S1 Option Setting

NOTE

If more than one baud rate is selected, the port board will determine the highest common baud rate with the distant end. When a call is disconnected or not initiated, the port board follows the highest baud rate selected on S1. See table 17-17 for S1 parity and baud settings.

TABLE 17-17. SN238 S1 Switch Settings

SWITCH	SETTING	FUNCTION
O/EPR	C	Odd parity
	O	Even parity
PRTY	C	Parity enabled
	O	Parity disabled
19.2K	C	19.2K baud
	O	Switch disabled
9600	C	9600 baud
	O	Switch disabled
4800	C	4800 baud
	O	Switch disabled
2400	C	2400 baud
	O	Switch disabled
1200	C	1200 baud
	O	Switch disabled
300	C	300 baud
	O	Switch disabled

TABLE 17-18. SN238 S2 Switch Settings

SWITCH	SETTING	FUNCTION
AUTO 0	C	Enables auto-baud and auto-parity for Port 0
	O	Disables auto-baud and auto-parity for Port 0
AUTO 1	C	Enables auto-baud and auto-parity for Port 1
	O	Disables auto-baud and auto-parity for Port 1
AUTO 2	C	Enables auto-baud and auto-parity for Port 2
	O	Disables auto-baud and auto-parity for Port 2
AUTO 3	C	Enables auto-baud and auto-parity for Port 3
	O	Disables auto-baud and auto-parity for Port 3
KYBD 0	C	Enables keyboard dialing for Port 0
	O	Disables keyboard dialing for Port 0
KYBD 1	C	Enables keyboard dialing for Port 1
	O	Disables keyboard dialing for Port 1
KYBD 2	C	Enables keyboard dialing for Port 2
	O	Disablcs keyboard dialing for Port 2
KYBD 3	C	Enables keybaord dialing for Port 3
	O	Disables keyboard dialing for Port 3

S2 Settings

NOTE

If auto-baud and auto-parity are enabled with S2, the option settings on S1 are ignored. If auto baud and auto parity are enabled for a port, keyboard dialing for the same port must be enabled. See table 17-18 for S2 parity and baud settings.

SN243B Circuit Pack

SN243B with a Single Switch

A switch package containing four rocker switch sections is located on the circuit pack as shown in figure 17-24.

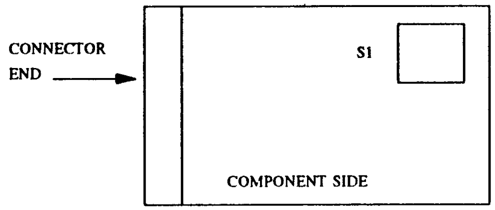


Figure 17-24. SN243B Switch Location

The switch package shown in figure 17-25 identifies the four switch sections and their settings.

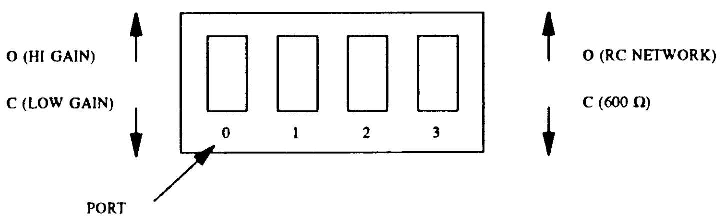


Figure 17-25. SN243B Switch

Use the 600Ω option for loop length less than 3500 feet (about 600 Ω without set). Use the RC NETWORK option for loop length greater than 3500 feet.

SN243B with Two Switches

Figure 17-26 shows two, two-rocker switch packages S1 and S2 positioned on the circuit pack. Each switch package serves two port circuits.

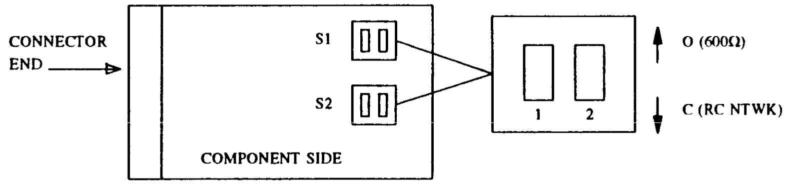


Figure 17-26. SN243 Switch and Location

Use table 17-19 to select the desired option for a port circuit.

TABLE 17-19. SN243B Switch Settings

PORT CIRCUIT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION SETTING*	
			600 Ω	RC NTWK
0	S1	1	O	C
1	S1	2	O	C
2	S2	1	O	C
3	S2	2	O	C

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK option for loop length greater than 3500 feet.

SN250 Circuit Pack

A switch package containing three rocker switch sections is located on the circuit pack as shown in figure 17-27.

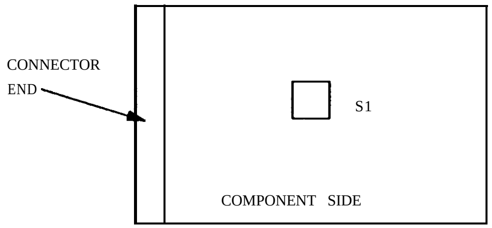


Figure 17-27. SN250 Switch Package Location

The switch package shown in figure 17-28 identifies the three switch sections. All of the switch sections should be depressed toward the numbers for use with this system.

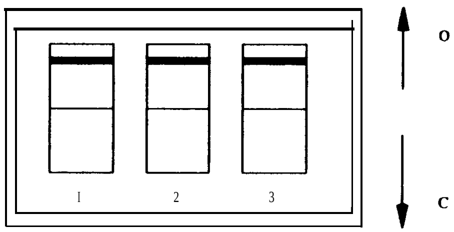


Figure 17-28. SN250 Switch Package

SN250 circuit packs identified as vintage 6 or later do not have this switch package and do not require option settings.

SN253C Circuit Pack

A switch package containing two rocker switch sections is located on the circuit pack as shown in figure 17-29.

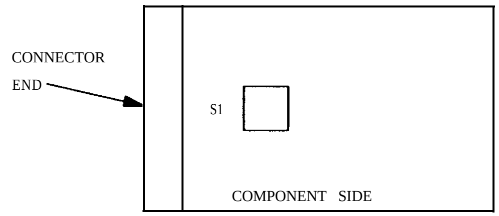


Figure 17-29. SN253C Switch Location

The switch package shown in figure 17-30 identifies the two switch sections.

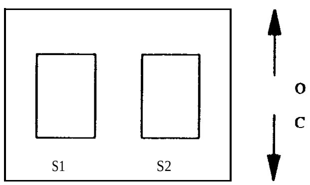


Figure 17-30. SN253C Switch Package

Table 17-20 indicates the switch section positions required for each option provided.

TABLE 17-20. SN253C Switch Settings

FUNCTION		OPTION	SWITCH S1	SWITCH S2
Internal system chime only (0.5 sec.)		K	O	O
External Chime period (sec.)	0.50	J	C	O
	1.00	G	O	C
	2.00	F	C	C

*Internal chime will operate also, at same rate chosen for external chime.

TN403 (Dual Speed Data Channels) Circuit Pack

Switch S1 (shown in figure 17-31) controls the data transmission rate for circuit pack channels 14 and 15. Figure 17-32 identifies the switch sections that control channels 14 and 15. Table 17-21 shows switch setting options.

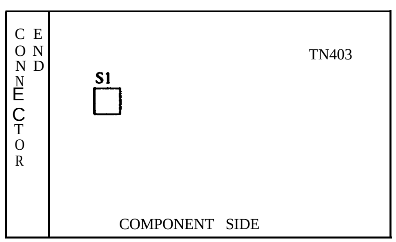


Figure 17-31. TN403 Switch Location

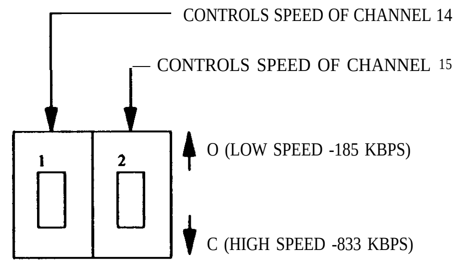


Figure 17-32. TN403 Switch

TABLE 17-21. TN403 Switch Settings

CARRIER SLOT NO.	CHANNEL NUMBERS	TN403 CHANNEL NUMBER	SWITCH SECTION	SWITCH POSITION
23	00-15	15	2	C
		14	1	C
24	16-31	15	2	O
		14	1	O
25	32-47	15	2	O
		14	1	O
26	46-63	15	2	O
		14	1	O
CHANNELS 0-13 ARE NOT SPEED OPTIONABLE, THEY WILL ONLY OPERATE AT LOW SPEED (185 KBPS).				

TN456 Circuit Pack

For Phase 1 systems, a TN456 circuit pack must be installed in slot 25 of each central and remote MC carrier that is associated with RMI. For Phase 2 systems, one TN456 (two if duplicated) circuit pack must be installed in the RMI carrier(s) for each remote MC carrier, and one TN456 must be installed in slot 25 of each remote MC carrier. The option switches must be set before the circuit pack is installed. Proceed as follows:

1. Locate the wrist strap (ground) and cable assembly in the bottom of the MC cabinet next to the AC distribution unit.
2. Attach the wrist strap to either wrist.
3. Connect the alligator clip to the screw that fastens the door latch to the frame.
4. Set option switches 1 and 2 (slide-type) on each TN456 circuit pack to **CENTRAL** or **REMOTE** for the location of the MC carrier where the circuit pack will be placed. Figure 17-33 shows the TN456 circuit pack and switch locations.
5. Install one TN456 circuit pack in the appropriate location as shown in the Customer System Document (CSD) for each remote MC carrier (J58888M).
6. Remove wrist strap and cable assembly. Replace them in the bottom of the MC cabinet for future use.

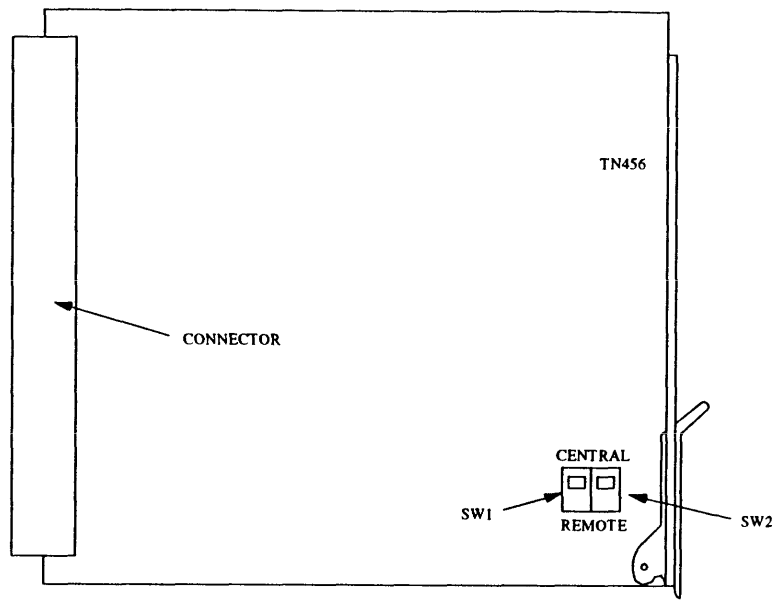


Figure 17-33. Option Switch Locations for TN456 Circuit Pack

TN492C Circuit Pack

Plug PL1 is located on the board as shown in figure 17-35. The plug must have the 4 terminals inserted in it (terminals keyed) at the time of battery installation. An amber LED in faceplate 17 will turn on if this connection is incorrect. Determine if battery connection is correct, if not, correct the connections.

The backup battery B1 must be replaced five years after the date of installation. See Note on next page.

The backup battery has a date label. Mark the battery replacement date on the label. Then, affix the label to the faceplate of circuit pack TN492C.

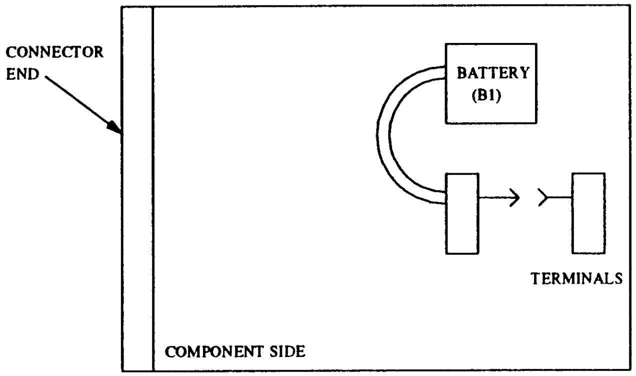


Figure 17-34. TN492C Circuit Pack Configuration

NOTE

Do not order the battery by KS number. It must be ordered as comcode 844665836, which consists of the battery (comcode 41561485) and a connector (comcode 86427-7).

TN513 Circuit Pack

Figure 17-35 shows two switch packages with seven switch sections allow configuration of the serial port hardware. Switch S1 is used to configure channel 0 USART and switch S2 is used to configure channel 1 USART.

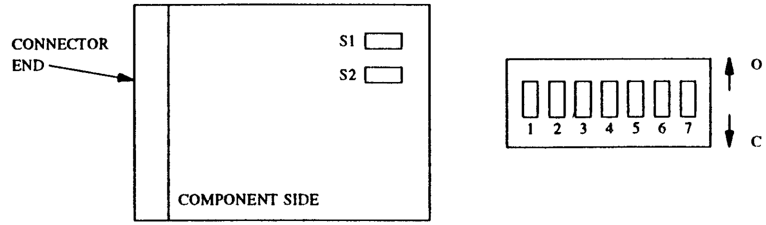


Figure 17-35. TN513 Switch Packages and Locations

Table 17-22 shows the S1 and S2 switch section positions required for each option provided.

TABLE 17-22. TN513 Switch Settings

FUNCTION	SWITCH	SWITCH SECTION	POSITION
RX/TX DIRECT MODE	1 OR 2	1,4	C
		2,3	O
RX/TX NULL MODE	1 OR 2	2,3	C
		1,4	O
SHORT CTS/RTS	1 OR 2	5	C
SHORT DTR/DSR	1 OR 2	6	C
LOGICALLY (AND) CH0	1	7	C
AND CH1 USART INTERRUPTS	2	7	O
INDEPENDENT CH0 AND	1	7	O
CH1 USART INTERRUPTS	2	7	C
DISABLE CHl USART	1	7	O
INTERRUPTS	2	7	O

AEH4 Alarm Board

AEH4 is located behind the DC fan assembly in the rear of each cabinet. See figure 17-36 for location of switches S1-S4 and table 17-23 for their settings.

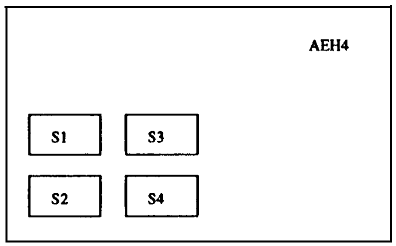


Figure 17-36. AEH4 Switch Locations

TABLE 17-23. AEH4 Switch Settings

AEH4 LOCATED IN THIS TYPE OF CABINET	SWITCH S1						SWITCH S2						SWITCH S3						SWITCH S4					
	SECTION						SECTION						SECTION						SECTION					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
UNDUPLICATED CC (501CC) (MAY CONTAIN PORT CIRCUITS)	O	C	C	O	O	C	C	O	O	O	O	O	O	O	O	O	O	O	C	C	O	O	O	C
DUPLICATED CC (501 CC)	O	C	C	O	O	C	C	O	O	O	O	C	O	O	O	C	C	O	O	O	O	C	C	C
MC WITH 309A/310A UNDUPLICATED 501CC SYSTEM	C	O	O	C	C	O	O	C	C	C	C	O	O	O	O	O	O	O	O	O	O	O	C	O
MC WITH 309A/310A DUPLICATED 501CC SYSTEM	C	O	O	C	C	O	O	C	C	C	C	O	O	O	C	O	O	C	C	C	O	O	C	O
PORT CABINET WITH 309A/310A	C	O	O	C	C	O	O	C	C	C	C	O	O	O	C	O	O	C	C	C	O	O	C	O
PORT CABINET WITHOUT 309A/310A	C	O	O	C	C	O	O	C	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	O
UNDUPLICATED TMS FOR UP TO 31 MODULES	C	O	O	C	C	O	O	C	C	C	C	C	C	C	C	O	O	C	C	C	C	O	C	O
DUPLICATED TMS - ONE CABINET FOR UP TO 15 MODULES	C	O	O	C	C	O	O	C	C	C	C	C	C	C	C	O	O	C	C	C	C	O	C	O
DUPLICATED TMS - TWO CABINETS FOR 16-31 MODULES	C	O	O	C	C	O	O	C	C	C	C	C	C	C	C	O	O	C	C	C	C	O	C	O
AUXILIARY CABINET WITH DC FAN ASSEMBLY	O	C	C	O	O	C	C	O	O	O	O	O	O	O	O	O	O	O	O	O	C	O	C	C
DUPLICATED MC CABINET WITH 2 BULK OLS POWER SUPPLIES	C	O	O	C	C	O	O	C	C	C	C	C	O	O	C	O	O	C	O	C	O	C	C	C

NOTE

All option settings and cable connections that have been made by the factory before shipping should be checked and verified since the cabling differs for different cabinet configurations.

CAL1B Circuit Pack

Figure 17-37 shows CAL1B dip switch location on the circuit board. Figure 17-38 shows various switch positions, and table 17-24 shows switch settings.

LOCATION OF DIP SWITCH ON CAL1B

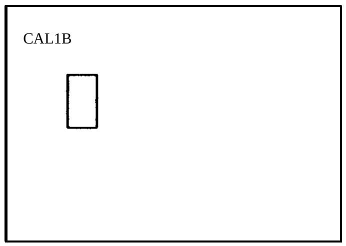
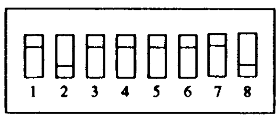


Figure 17-37. CAL1B Switch Location



NOTE:
A switch is closed when the rocker arm is depressed toward the switch pole number. A shown, poles 2 and 8 are closed.

Figure 17-38. CAL1B Switch

TABLE 17-24. CAL 1 B Switch Settings

POWER UNIT	SWITCH							
	1	2	3	4	5	6	7	8
OLS OR OBS	0	1	0	0	0	0	0	1
DC CONVERTER	0	1	0	0	0	1	1	0

1 = OPTION DIP SWITCH CLOSED
O = OPTION DIP SWITCH OPEN

PROCEDURES FOR REMOVING CIRCUIT PACKS FROM CC CARRIER

Unduplicated CC — Check to see if system is in emergency transfer mode at the alarm panel. If it is, set the emergency transfer switch to ACT. If the system is not in emergency transfer, set emergency switch to **INHIB.** Notify the customer that no new calls will be processed. Set the **GO/HALT** switch to **HALT.** At this point, circuit packs can be removed from the CC carrier. After replacing the circuit packs that were removed from the CC carrier, the system can be reactivated. If the emergency transfer switch is in the **ACT** position at the alarm panel, set the **GO/HALT** switch to **GO.** If the system appears to be functioning properly, set the emergency transfer switch to **NORMAL.** Notify the customer that emergency transfer service will be interrupted. Depress **RESET.** If the emergency transfer switch is in **INHIB** position, at the alarm panel, depress **RESET** and set **GO/HALT** switch to GO within 5 seconds after depressing **RESET.** Set emergency transfer switch to **NORMAL.**

Duplicated CC — Determine if the circuit pack being replaced is in the on-line or off-line carrier of the duplicated CC. If the circuit pack being replaced is in the on-line carrier of the duplicated CC, use PROC 613 Test 3 to soft switch the on-line CC to the off-line carrier. If the soft switch cannot be performed, replace circuit pack(s) in the on-line carrier using the steps for unduplicated CC carrier circuit pack replacement above. Set the **LOCK ON LINE** switch to active (on-line) CC position; i.e., **CC0** or **CC1.** At the off-line CC, remove the circuit pack being replaced. Verify option settings on replacement circuit pack are correct (if applicable). At the off-line CC, replace the circuit pack, and set the **GO/HALT** switch to **GO.** Set the **LOCK ON LINE** switch to **OFF.**

18. FEATURE BLOCK DIAGRAMS

GENERAL 18-2
ATTENDANT CONSOLE 18-3
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MISCELLANEOUS FEATURES 18-6

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GENERAL

This chapter provides a block diagram of each switch oriented feature and service that requires special cabling or peripheral hardware. The diagrams show general connectivity between the peripheral hardware, the cross-connect field, and the circuit packs required in the switch. Also shown are the circuit packs that require option settings.

Double-circled letter symbols (e.g., A) are used on the diagrams to direct the user to other sections of the manual. These sections provide detailed wiring instructions, circuit pack option settings if required, or other pertinent information. Symbols are not intended to reflect system options shown on schematic diagrams (SDS).

Cross-connections in this part are illustrated in figure 18-1. These can be 110-type, 66-type, or any other type of connecting blocks.

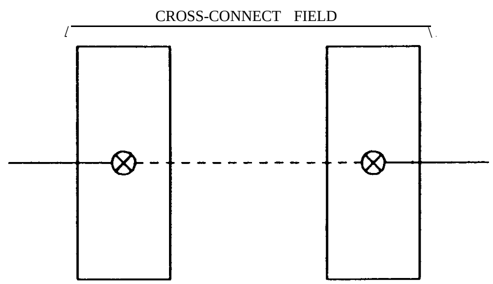


Figure 18-1. Cross-Connect Blocks

ATTENDANT CONSOLE

Figures 18-2 and 18-3 show feature block diagrams for local and remote Attendant Consoles. (Details are in chapter 14.)

Local Console

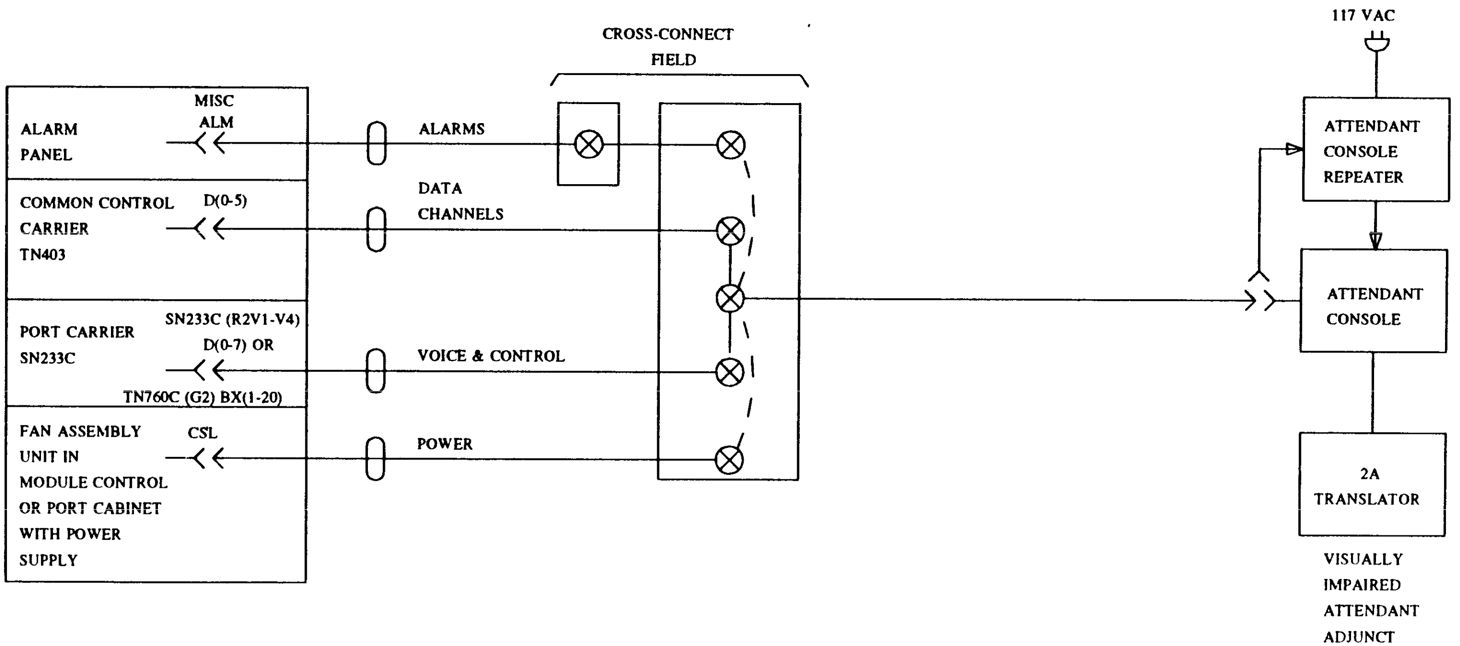


Figure 18-2. Attendant Console — Local

Remote Console

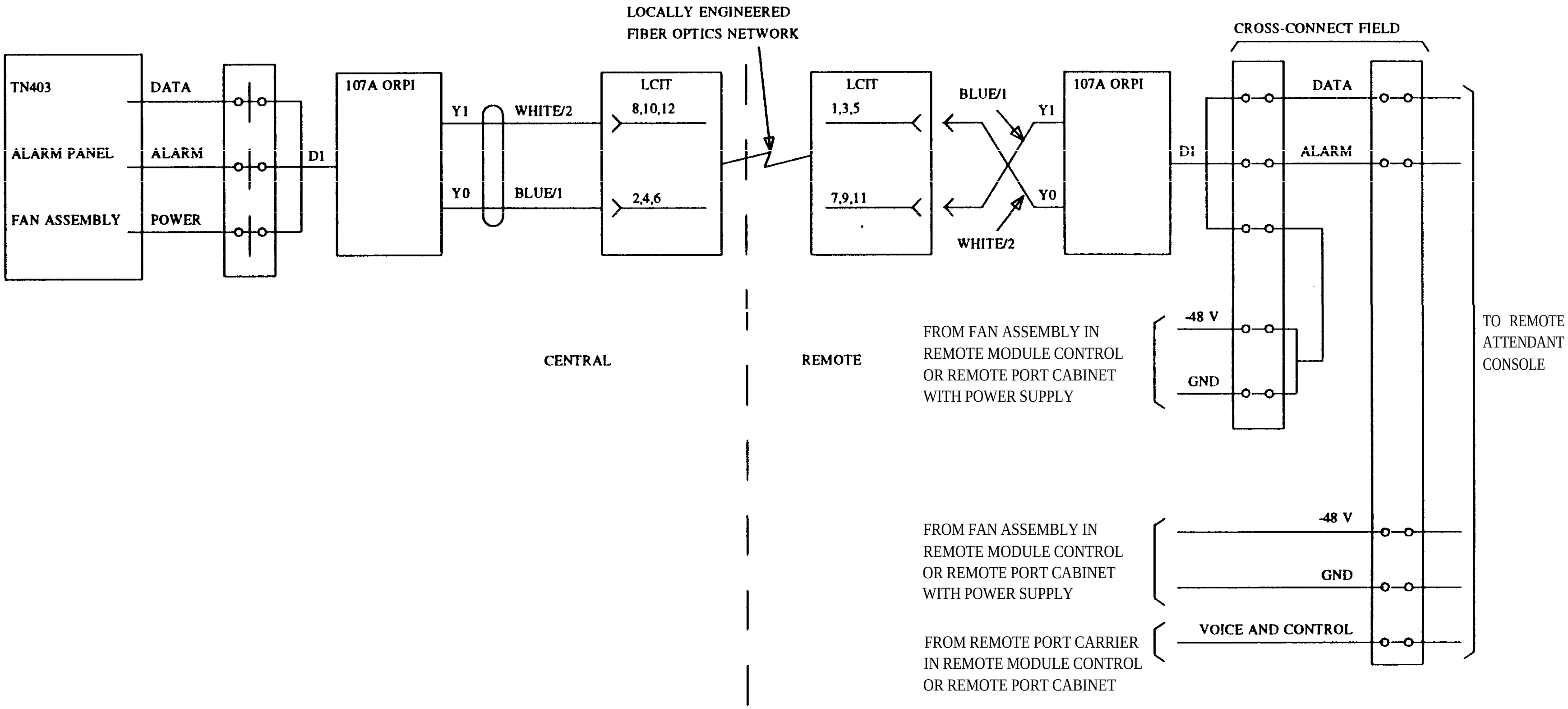


Figure 18-3. Attendant Console — Remote

BCT TERMINAL TYPES — 513/515

Figures 18-4 and 18-5 show feature block (R2V1-V4) diagrams for BCT terminals. See chapter 10 for SN270B circuit pack connections and terminations.

513 BCT

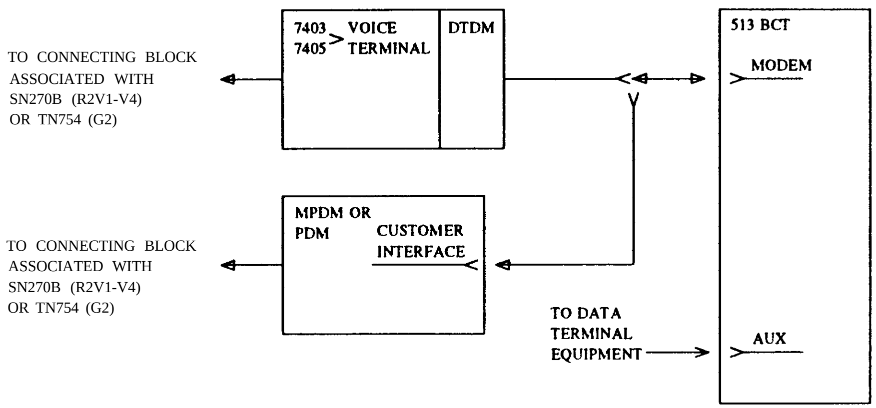


Figure 18-4. 513 BCT Terminal

515 BCT

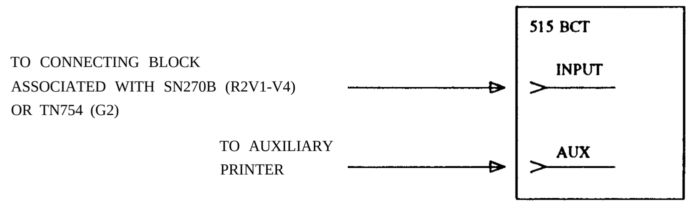


Figure 18-5. 515 BCT Terminal

MISCELLANEOUS FEATURES

Figure 18-6 shows a feature block diagram for a Calling Number Display to Station. See chapter 17 for circuit pack option settings.

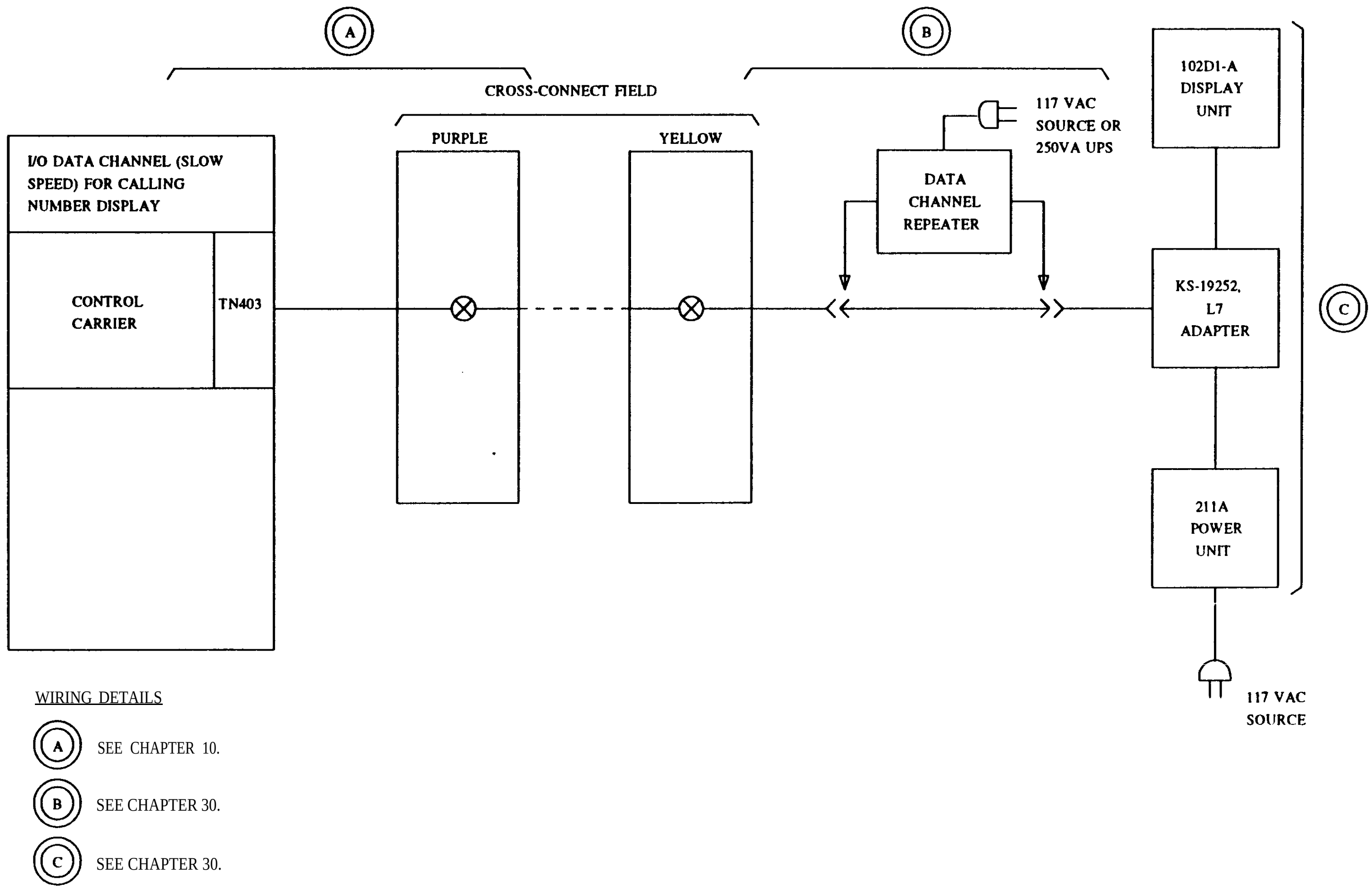


Figure 18-6. Calling Number Display to Station

Figure 18-7 shows a feature block diagram for Centralized Attendant Service. See chapter 17 for circuit pack option settings.

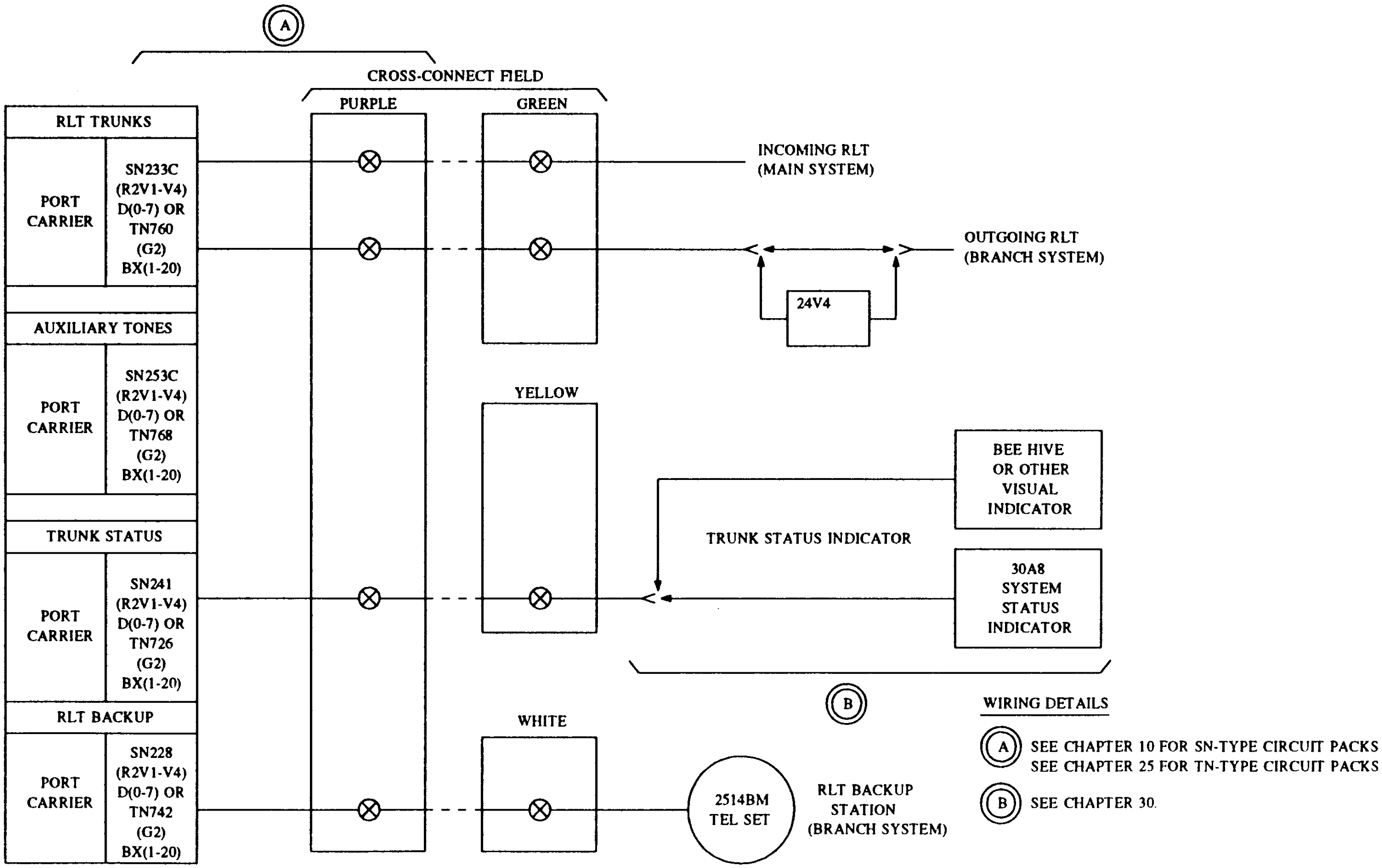


Figure 18-7. Centralized Attendant Service

Figure 18-8 shows a feature block diagram for Code Calling (Chime Paging).

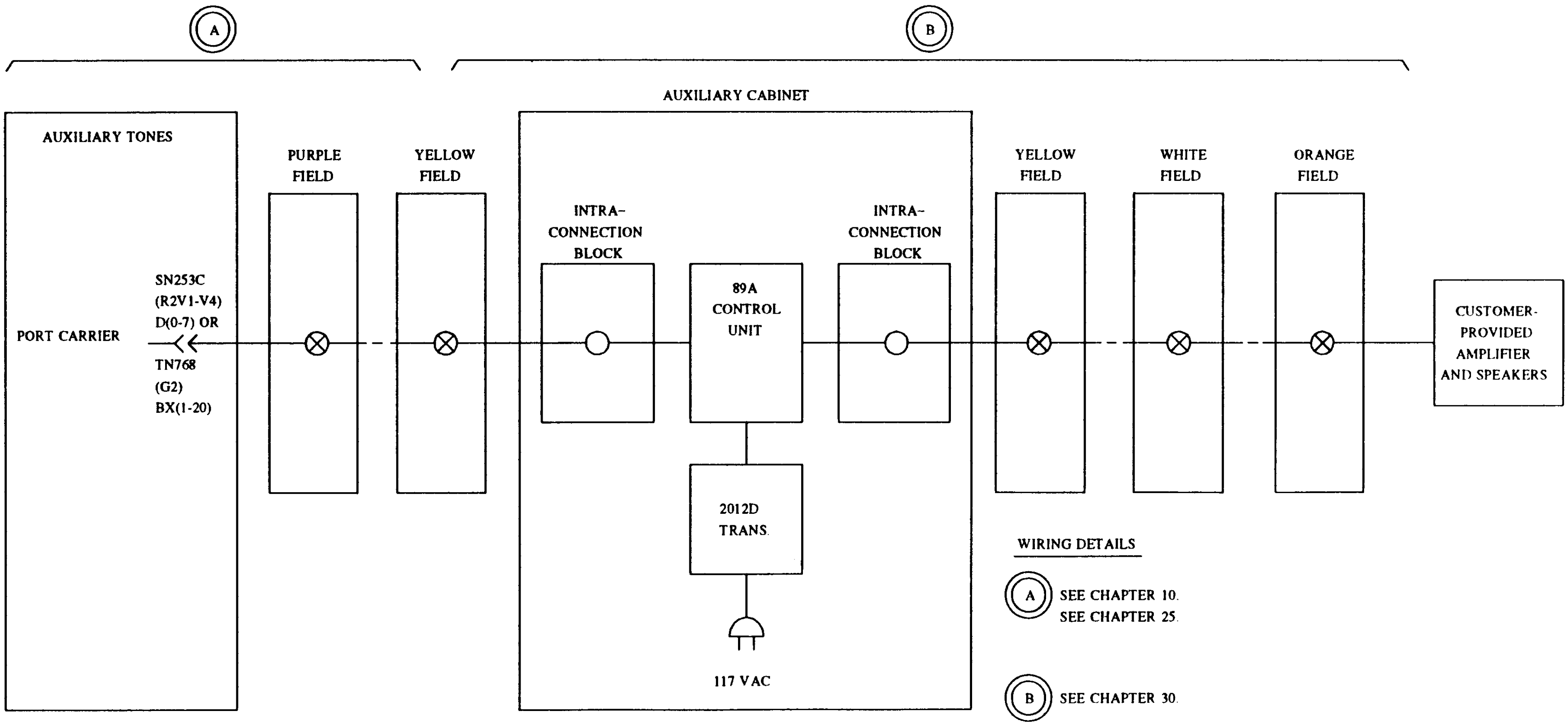
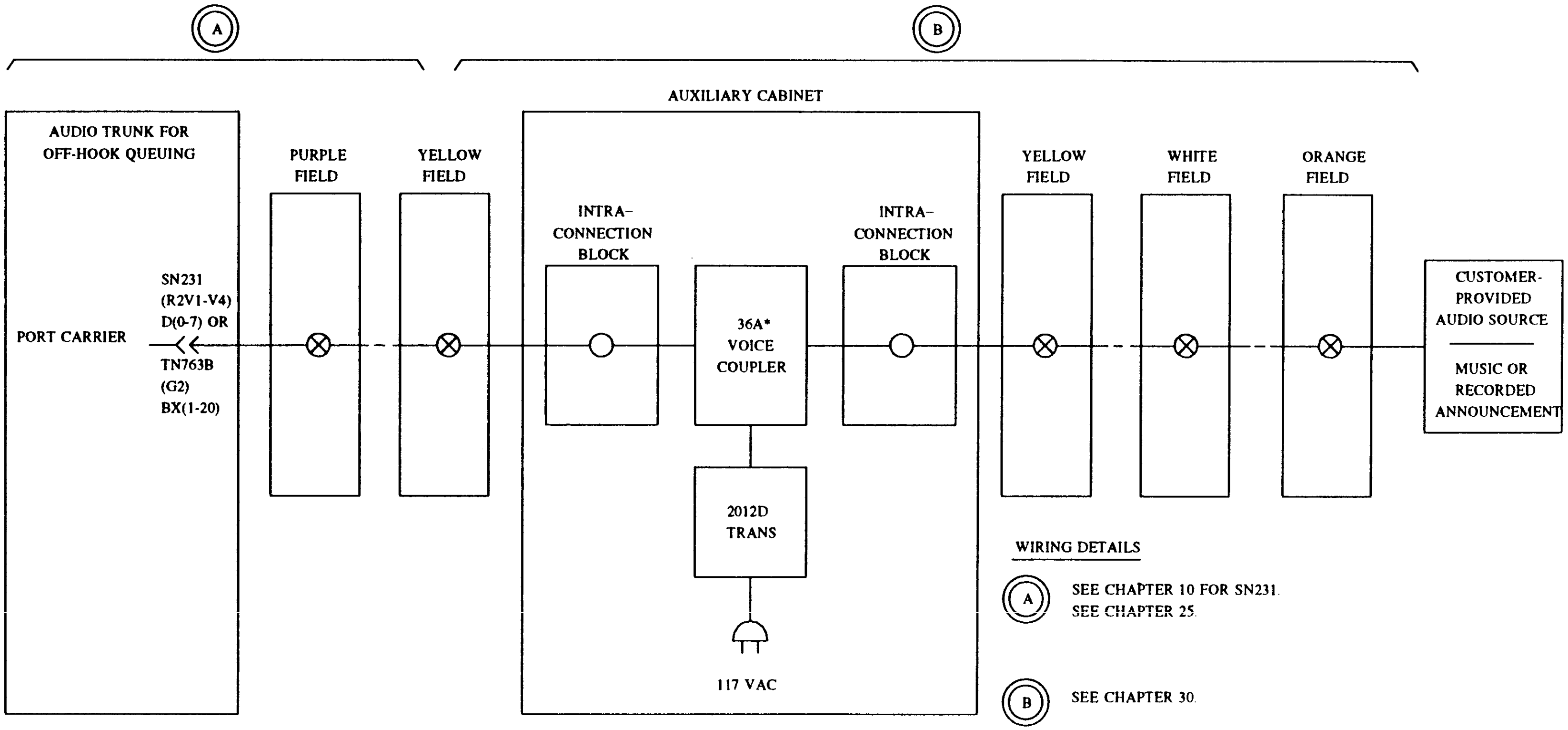


Figure 18-8. Code Calling (Chime Paging)

Figure 18-9 shows a feature block diagram for Deluxe Queuing. See chapter 17 for circuit pack option settings.



* REQUIRED IF CUSTOMER-PROVIDED EQUIPMENT IS NOT REGISTERED

NOTE:

If music source or recorded announcement source is provided, set SN231 option switches as specified for “One Way Incoming.”

Figure 18-9. Deluxe Queuing

Figure 18-10 shows a feature block diagram for Direct Department Calling (DDC)/Uniform Call Distribution (UCD). See chapter 17 for circuit pack option settings.

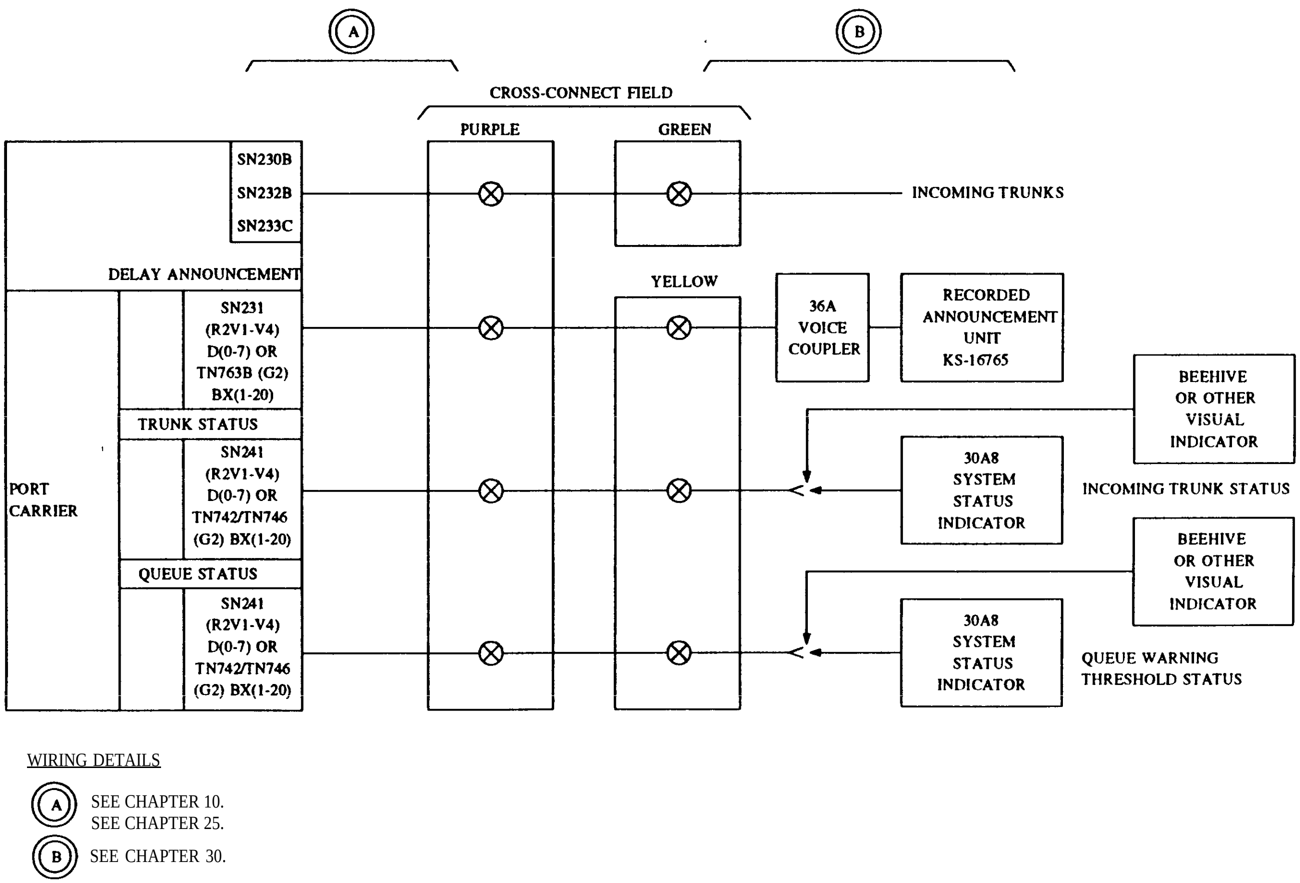
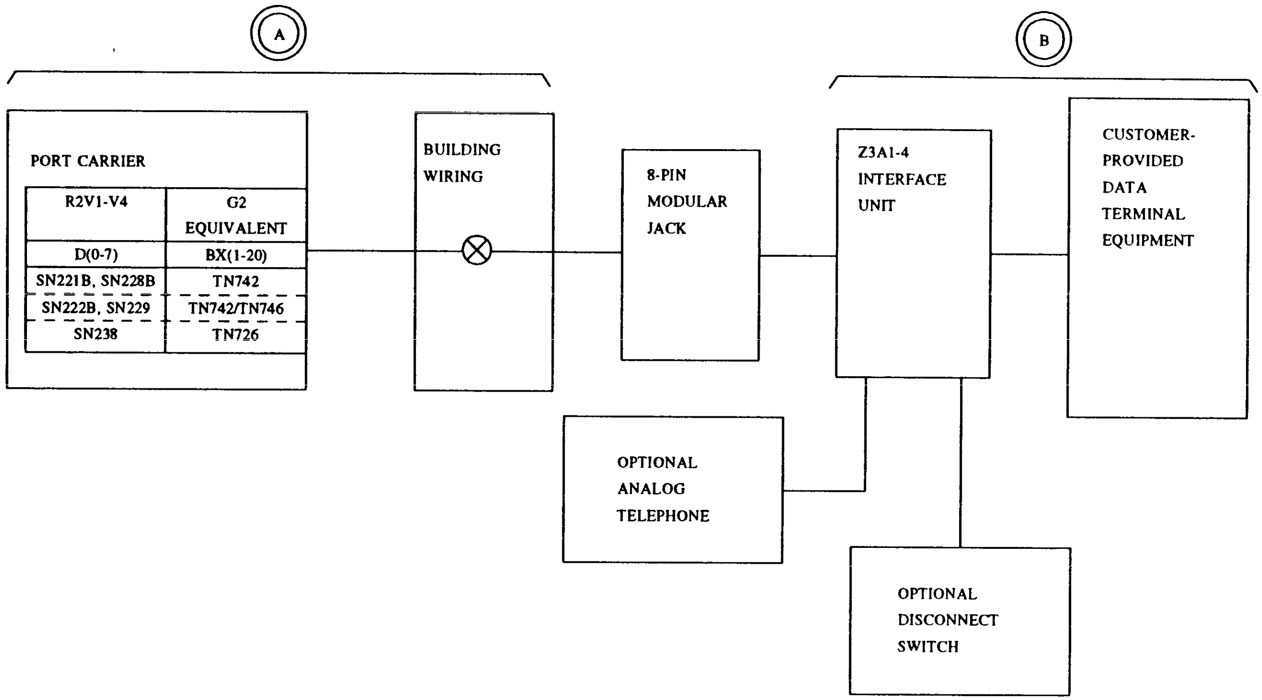


Figure 18-10. DDC/UCD

Figure 18-11 shows a feature block diagram with EIA Standard RS232C Interface to Customer-Provided Data Terminal Equipment. See chapter 17 for circuit pack option settings.



WIRING DETAILS

A SEE CHAPTER 10.
SEE CHAPTER 25.

B SEE CHAPTER 11.

Figure 18-11. EIA Standard RS232C Interface to Customer-Provided Data Terminal Equipment

Figure 18-12 shows a feature block diagram for Force Administration Data System (FADS). See chapter 17 for circuit pack option settings.

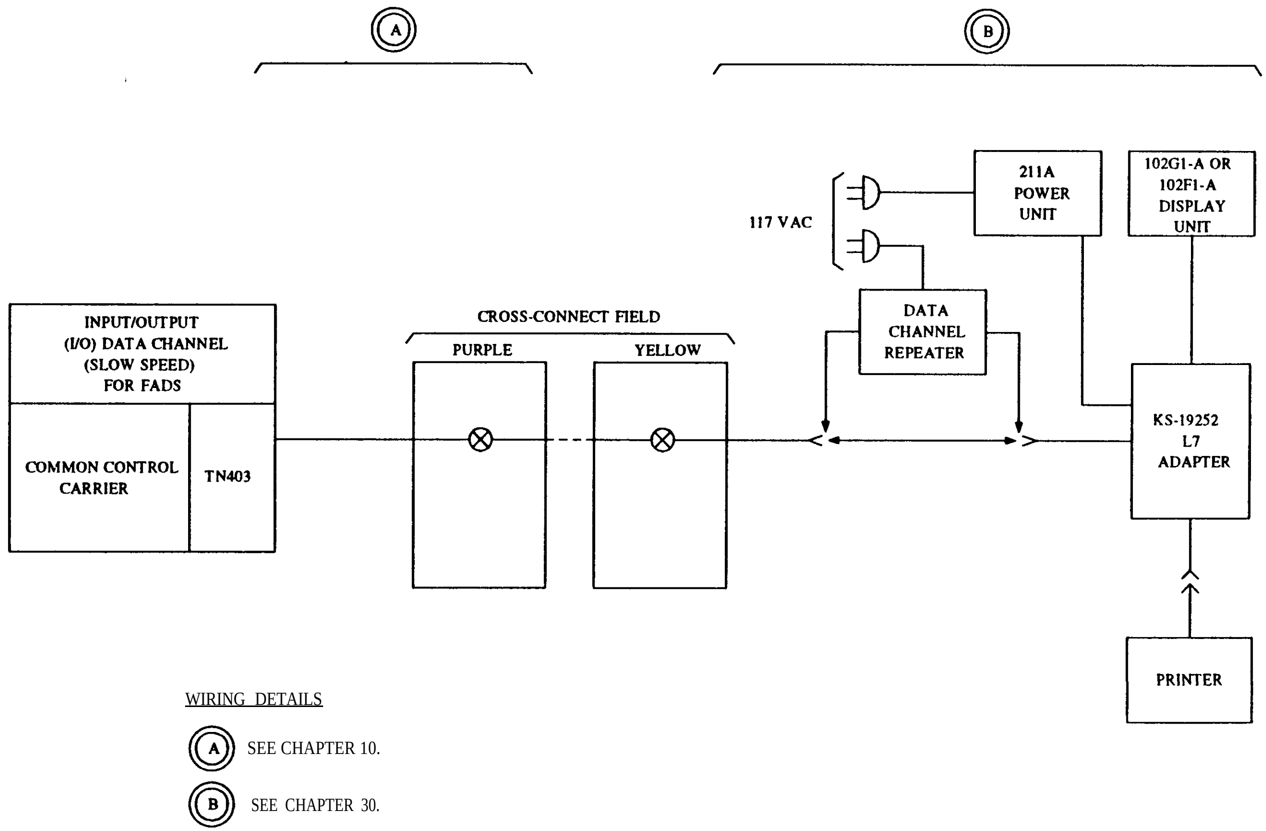


Figure 18-12. FADS

Figure 18-13 shows a feature block diagram for Information System Network. See chapter 17 for circuit pack option settings.

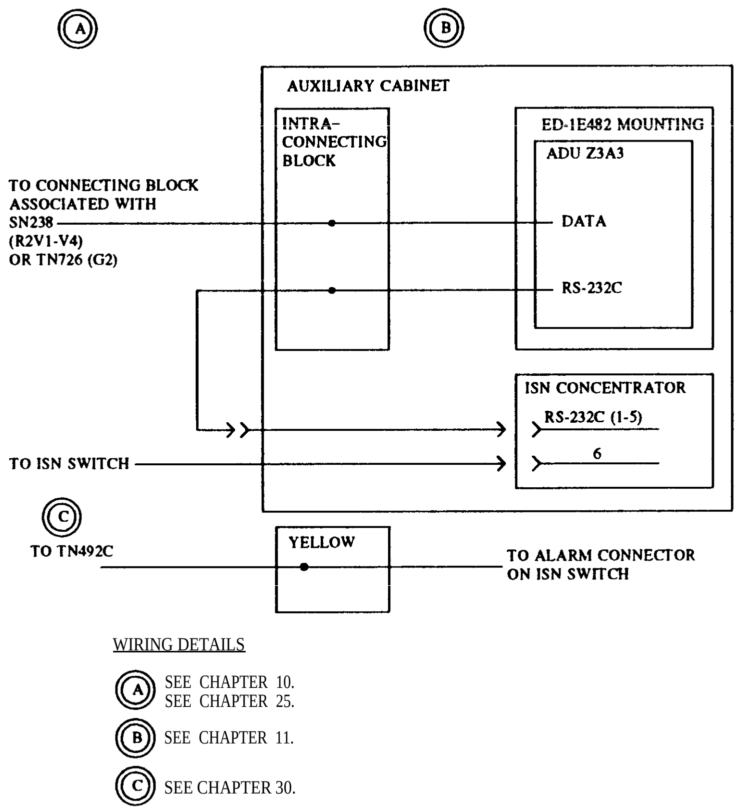


Figure 18-13. Information System Network — Using ADU and ISN Concentrator

Figure 18-14 shows an ISN using ADU circuit packs.

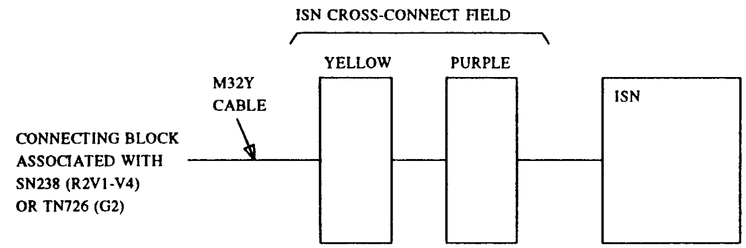
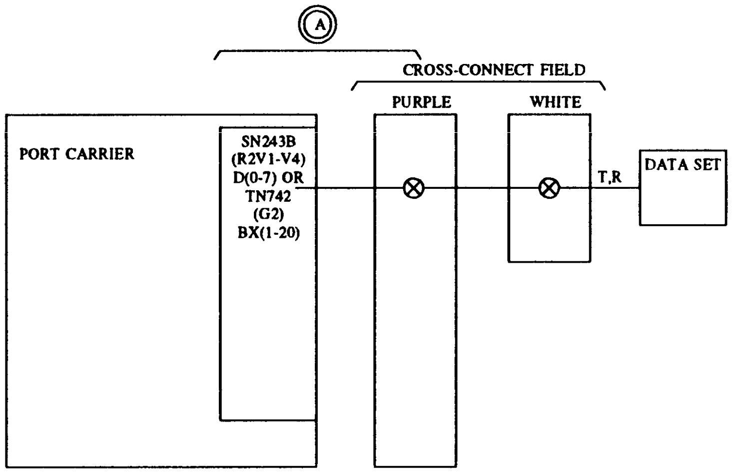


Figure 18-14. Information System Network — Using ADU Circuit Packs

Figure 18-15 shows a feature block diagram for Loop Signaling Interface Trunk (Data Port).



WIRING DETAILS

(A) SEE CHAPTER 10.
SEE CHAPTER 25.

Figure 18-15. Loop Signaling Interface Trunk (Data Port)

Figure 18-16 shows a feature block diagram for Loudspeaker Paging (Basic and Deluxe). See chapter 17 for circuit pack option settings.

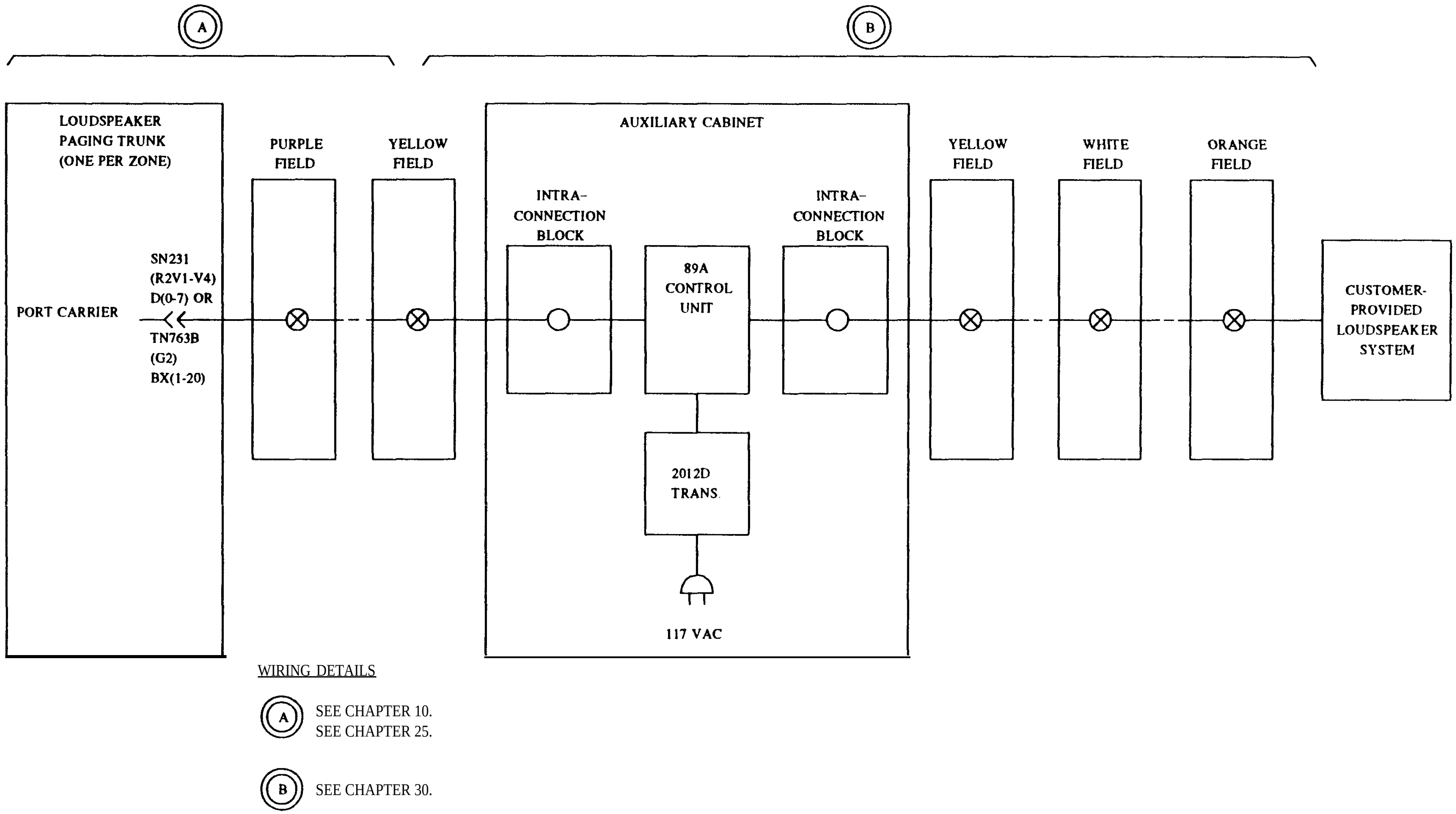
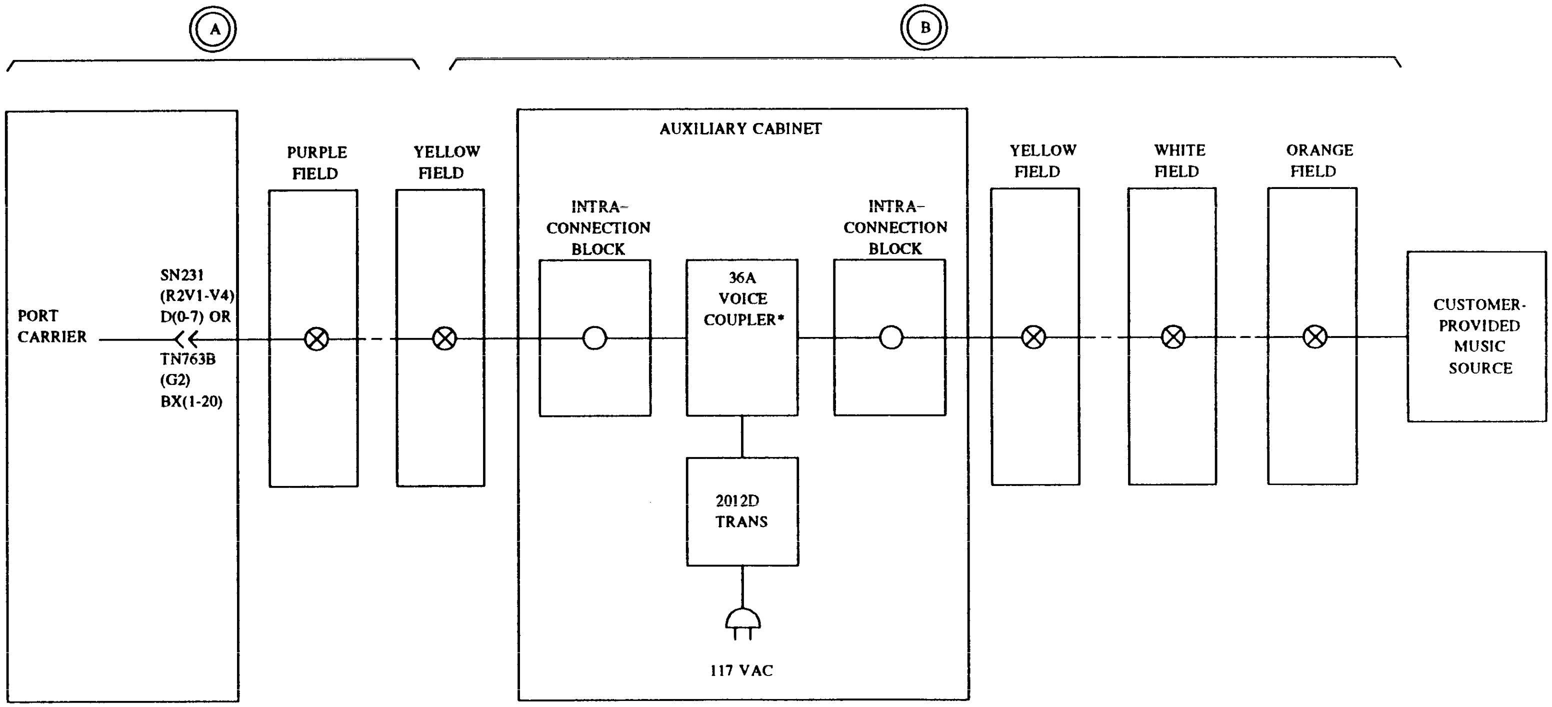


Figure 18-16. Loudspeaker Paging (Basic and Deluxe)

Figure 18-17 shows a feature block diagram for Music-on-Hold. See chapter 17 for circuit pack option settings.



WIRING DETAILS

A SEE CHAPTER 10.
SEE CHAPTER 25.

B SEE CHAPTER 30.

* REQUIRED IF CUSTOMER PROVIDED EQUIPMENT IS NOT REGISTERED

Figure 18-17. Music-on-Hold

Figure 18-18 shows a feature block diagram for Radio Paging. See chapter 17 for circuit pack option settings.

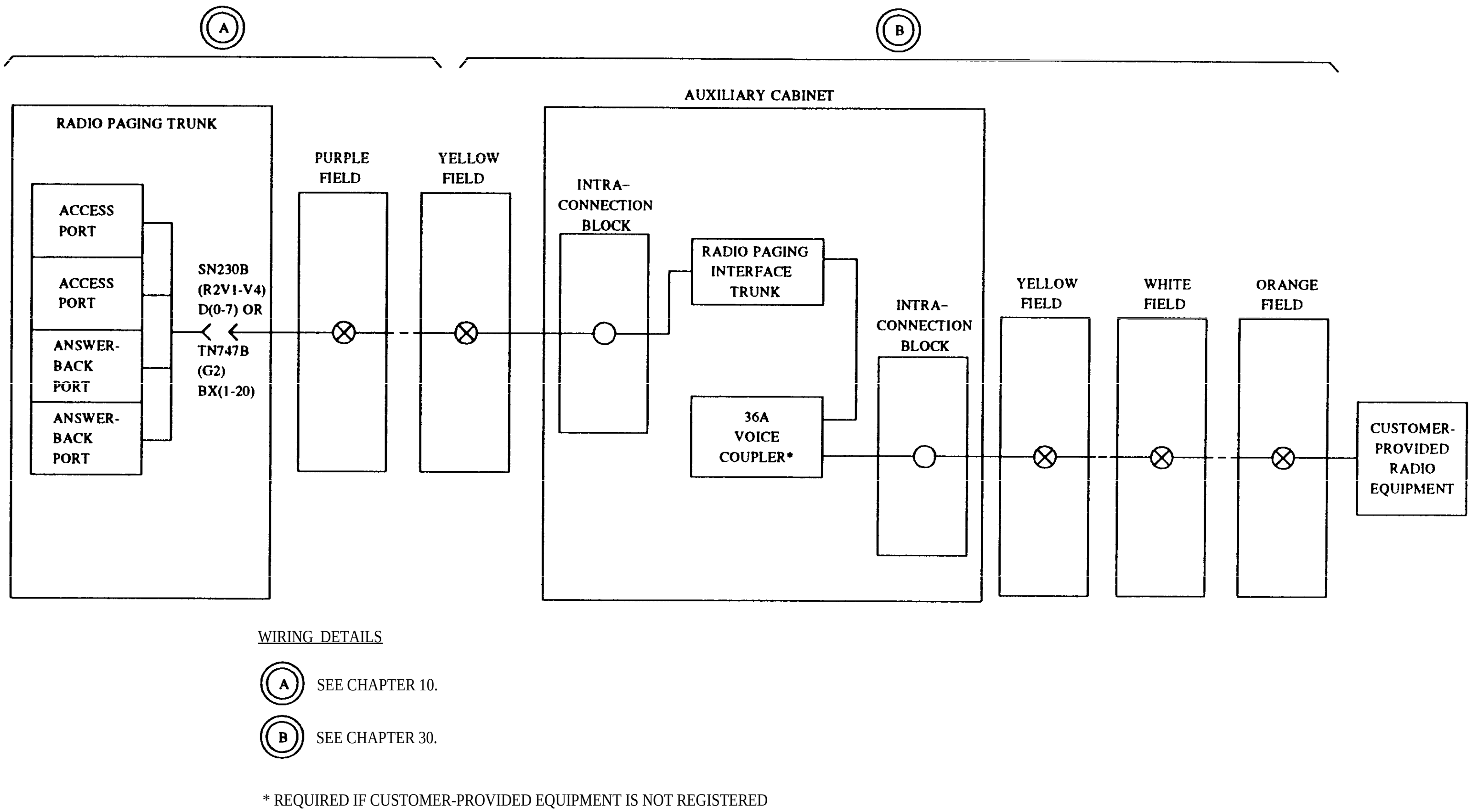


Figure 18-18. Radio Paging

Figure 18-19 shows a feature block diagram for Recorded Announcement Intercept. See chapter 17 for circuit pack option settings.

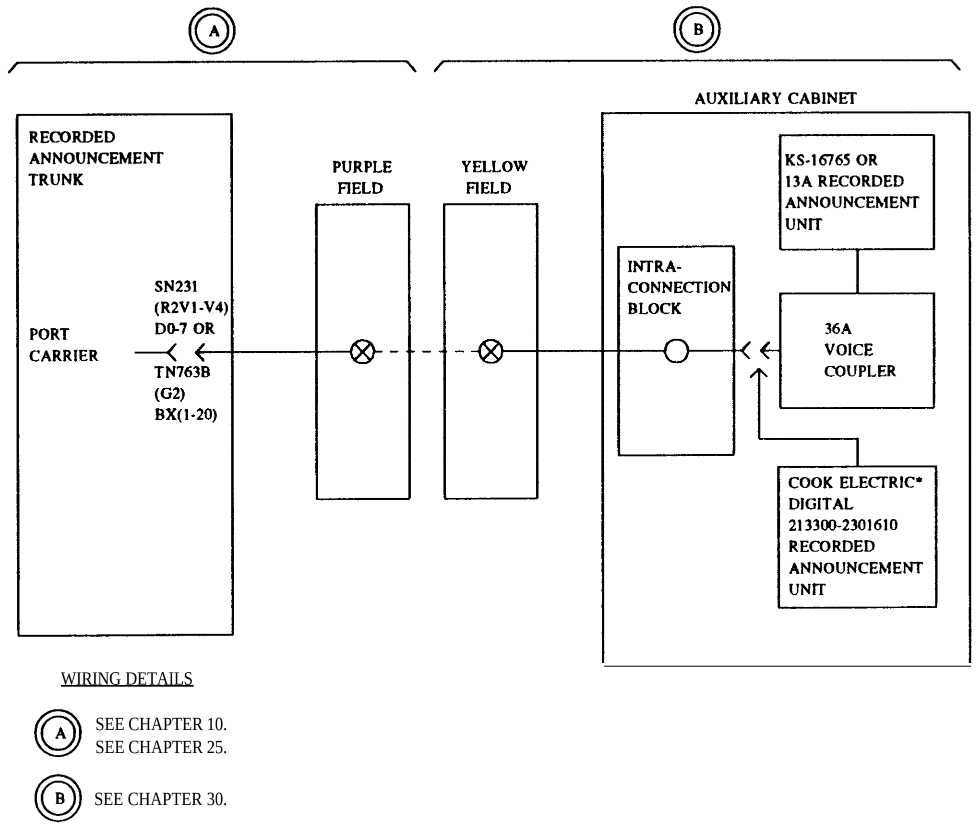


Figure 18-19. Recorded Announcement Intercept

Figure 18-20 shows a feature block diagram for Recorded Telephone Dictation. See chapter 17 for circuit pack option settings.

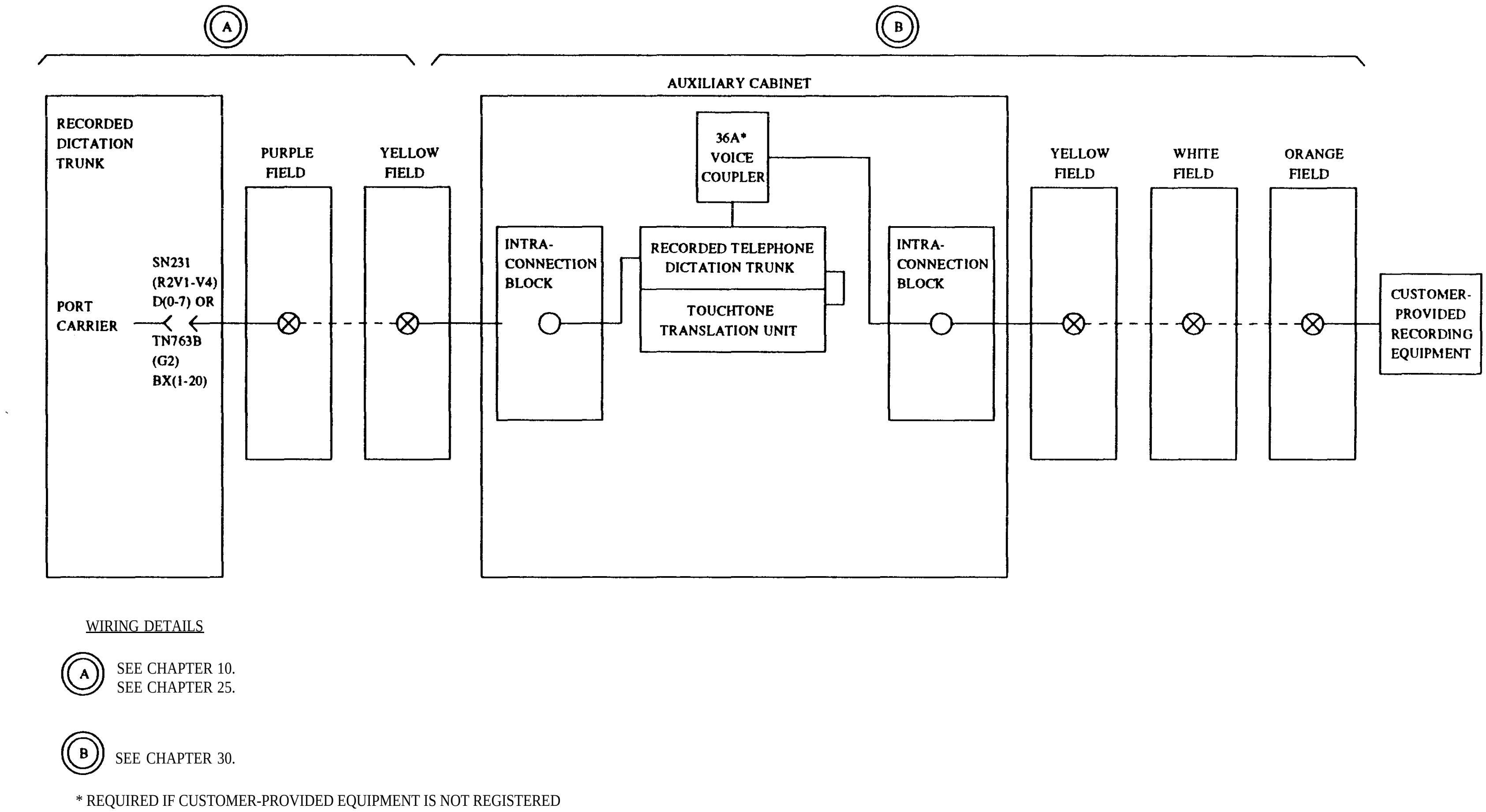


Figure 18-20. Recorded Telephone Dictation

Figure 18-21 shows a feature block diagram for Modem Pooling. See chapter 17 for circuit pack option settings.

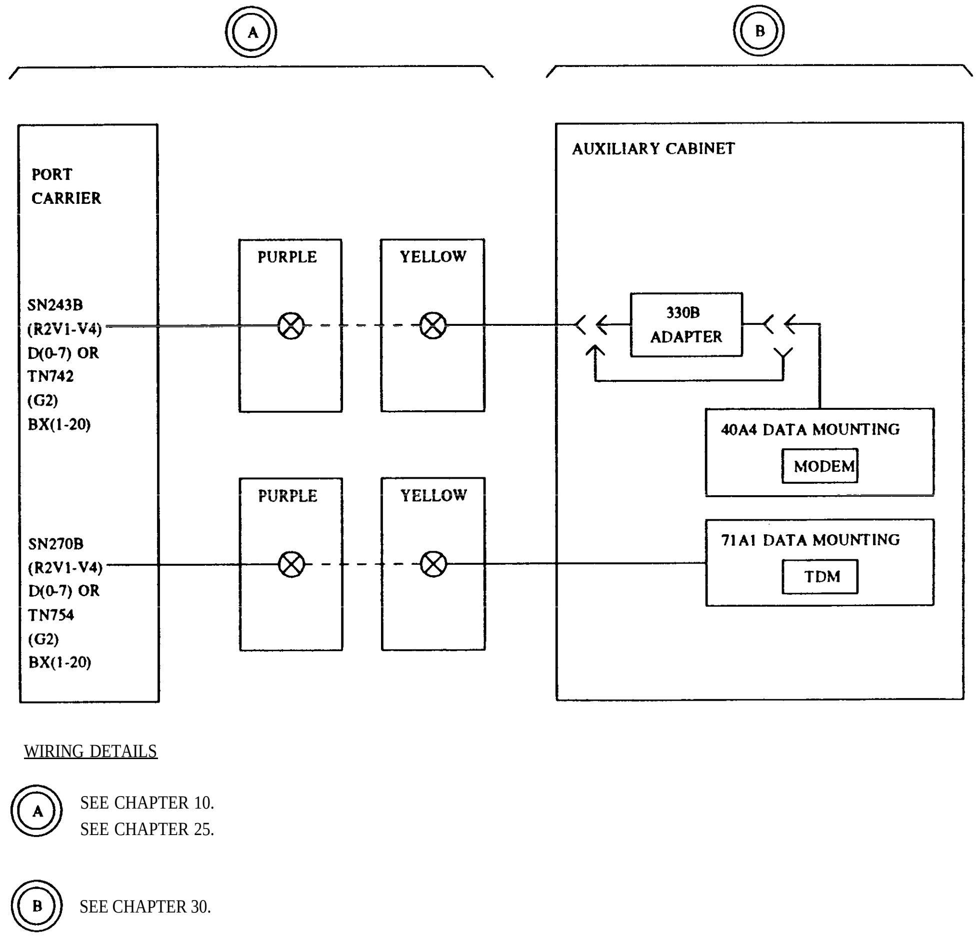
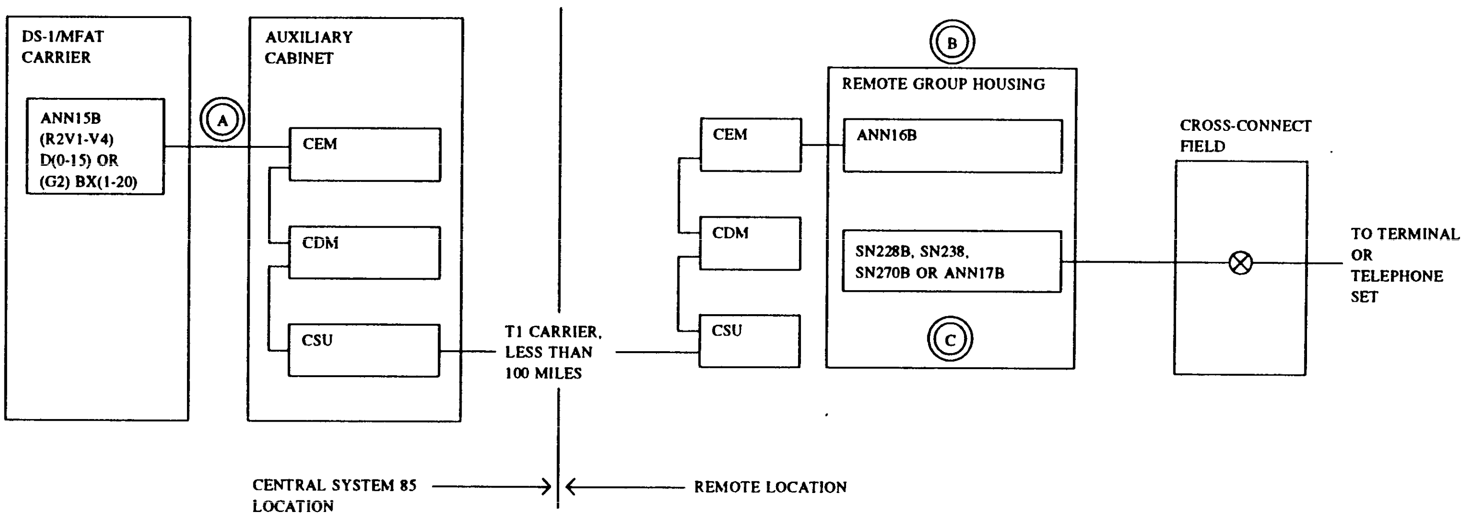


Figure 18-21. Modem Pooling

Figure 18-22 shows a feature block diagram for Remote Group Interface. See chpater 17 for circuit pack option settings.

NOTE	This block diagram shows a configuration using a CSU, CPM, and CEM. Various configurations of these components can be used. See chapter 13 for complete coverage.



WIRING DETAILS

A SEE CHAPTER 10.

B SEE CHAPTER 13.

C SEE CHAPTER 17.

Figure 18-22. RGI

Figure 18-23 shows a feature block diagram for PC 6300/7300 connection to System 85. See chapter 10 for SN-type circuit connections and terminations. See chapter 25 for TN-type circuit connections and terminations.

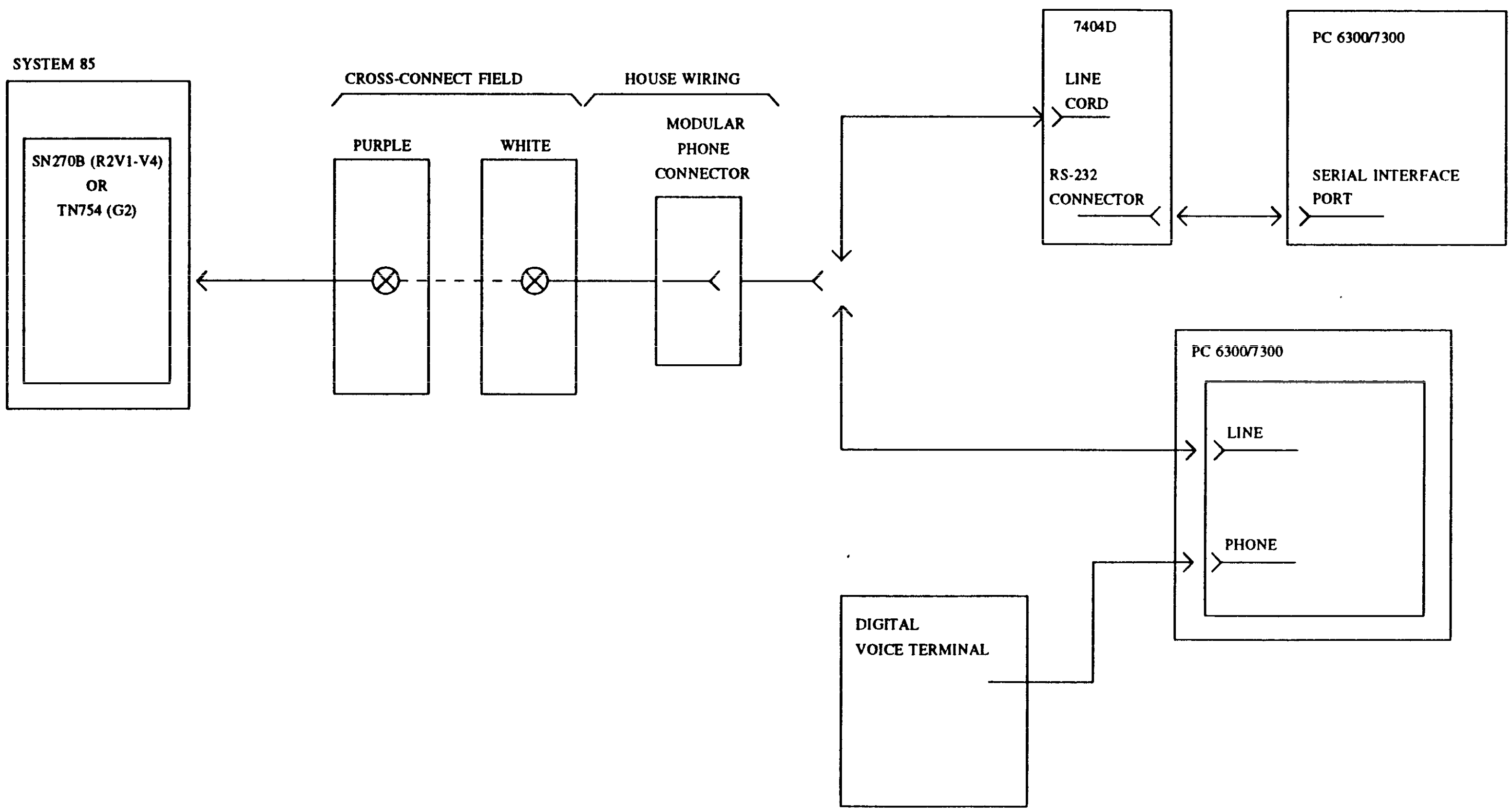


Figure 18-23. PC 6300/7300 Connections to System 85

Figure 18-24 shows a feature block diagram for Call Management System.

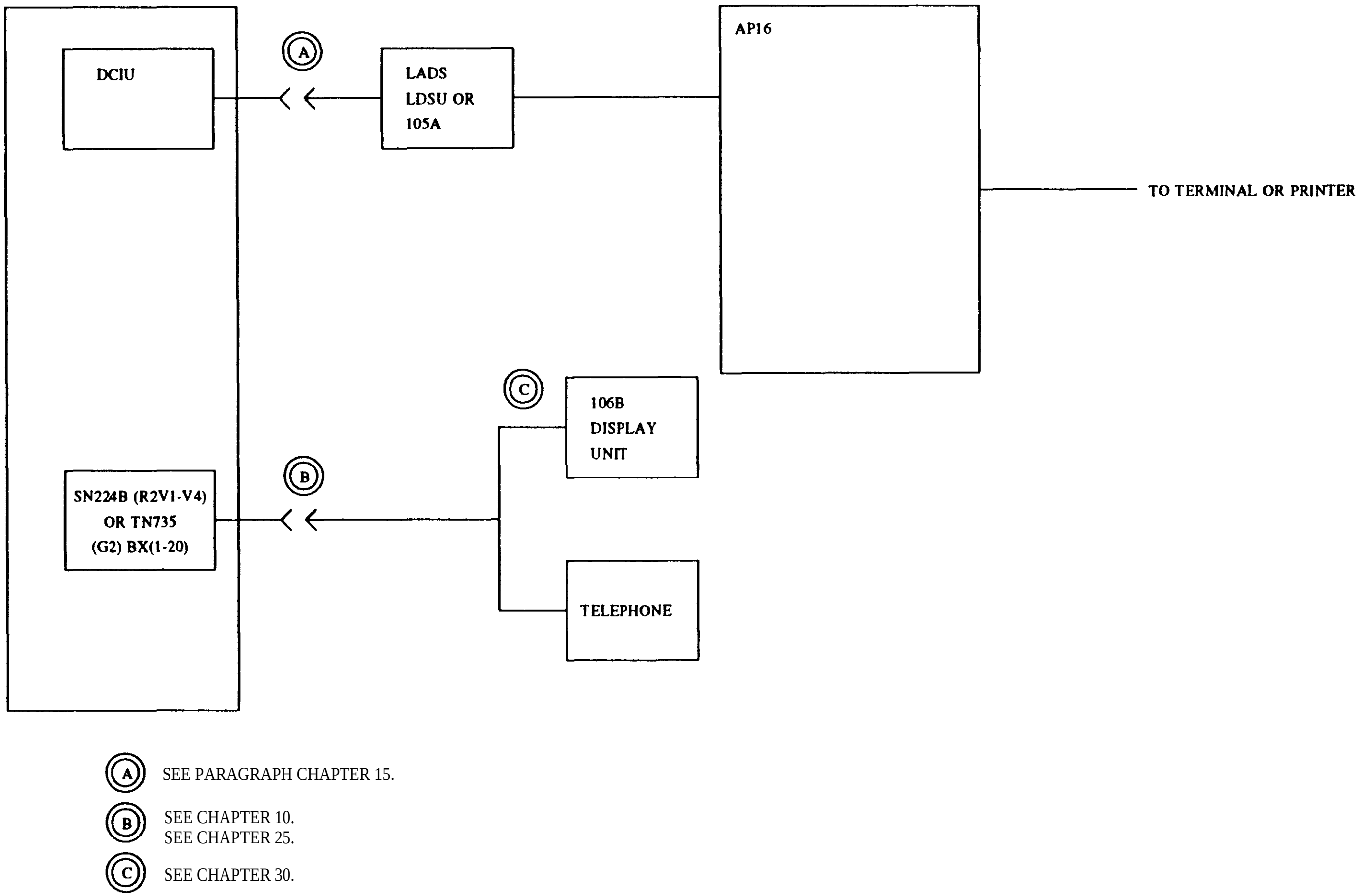
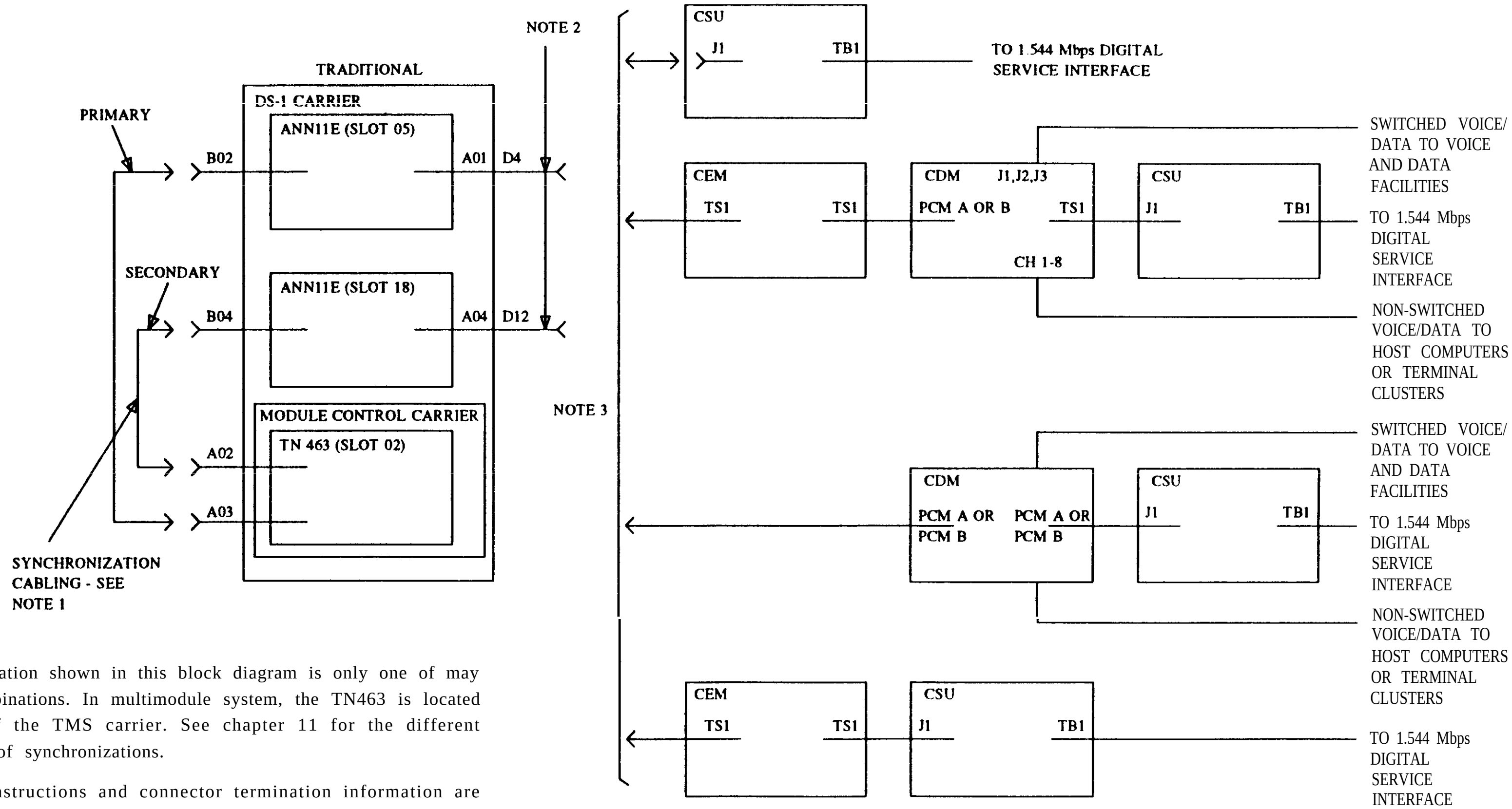


Figure 18-24. Call Management System

Figure 18-25 shows a feature block diagram for DS-1 Signaling Interface.



NOTES:

1. The synchronization shown in this block diagram is only one of may different combinations. In multimodule system, the TN463 is located in slot 20 of the TMS carrier. See chapter 11 for the different combinations of synchronizations.
2. The cabling instructions and connector termination information are shown in chapter 10.
3. The detailed connections of the different combinations of CSU, CDM, and CEM are shown in chapter 13.

Figure 18-25. DS-1 Signaling Interface

Figure 18-26, part 1 of 3, is a block diagram of some applications of System 85 DS-1 signaling. See *System 85 and System 75 DS-1 Interface Application Notes* (555-025-101) for a complete description. These diagrams show application for traditional configurations.

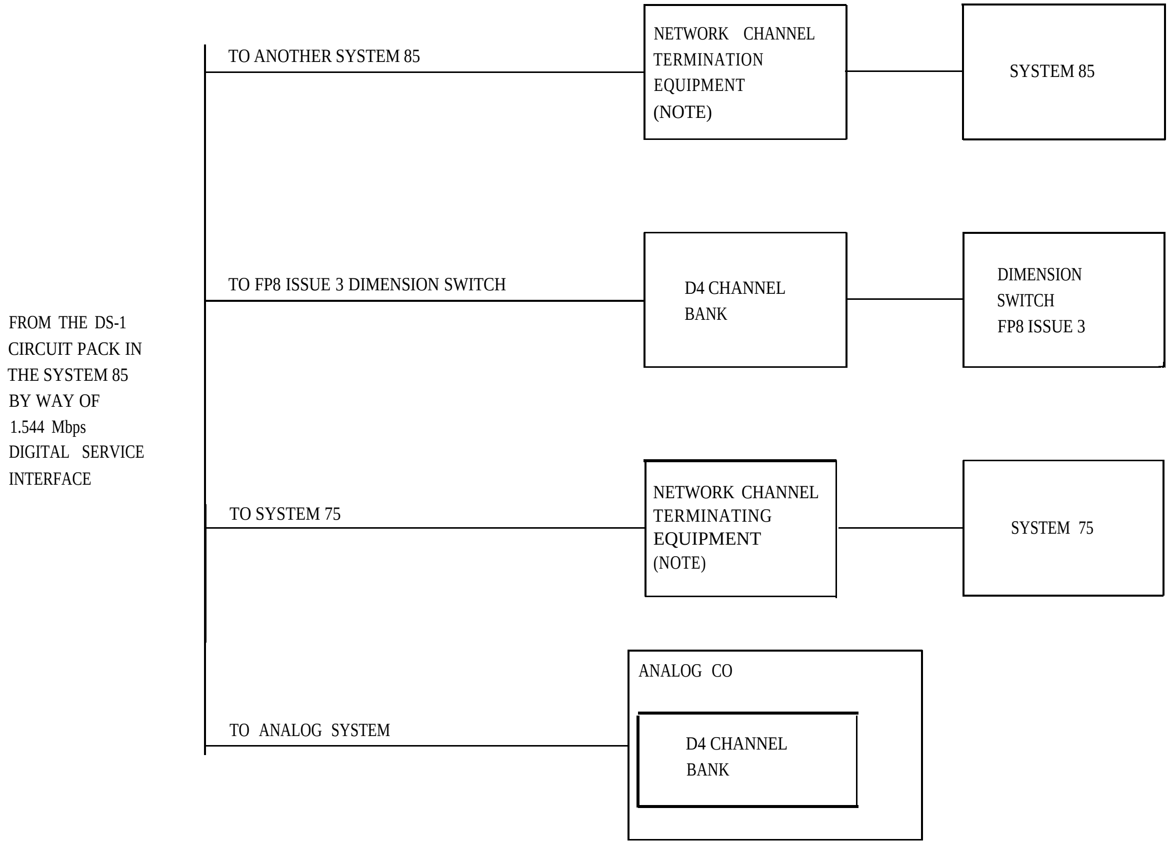


Figure 18-26. DS-1 Signaling System 85 Applications (Part 1 of 3)

Figure 18-26, part 2 of 3, is a block diagram of some applications of System 85 DS-1 signaling.

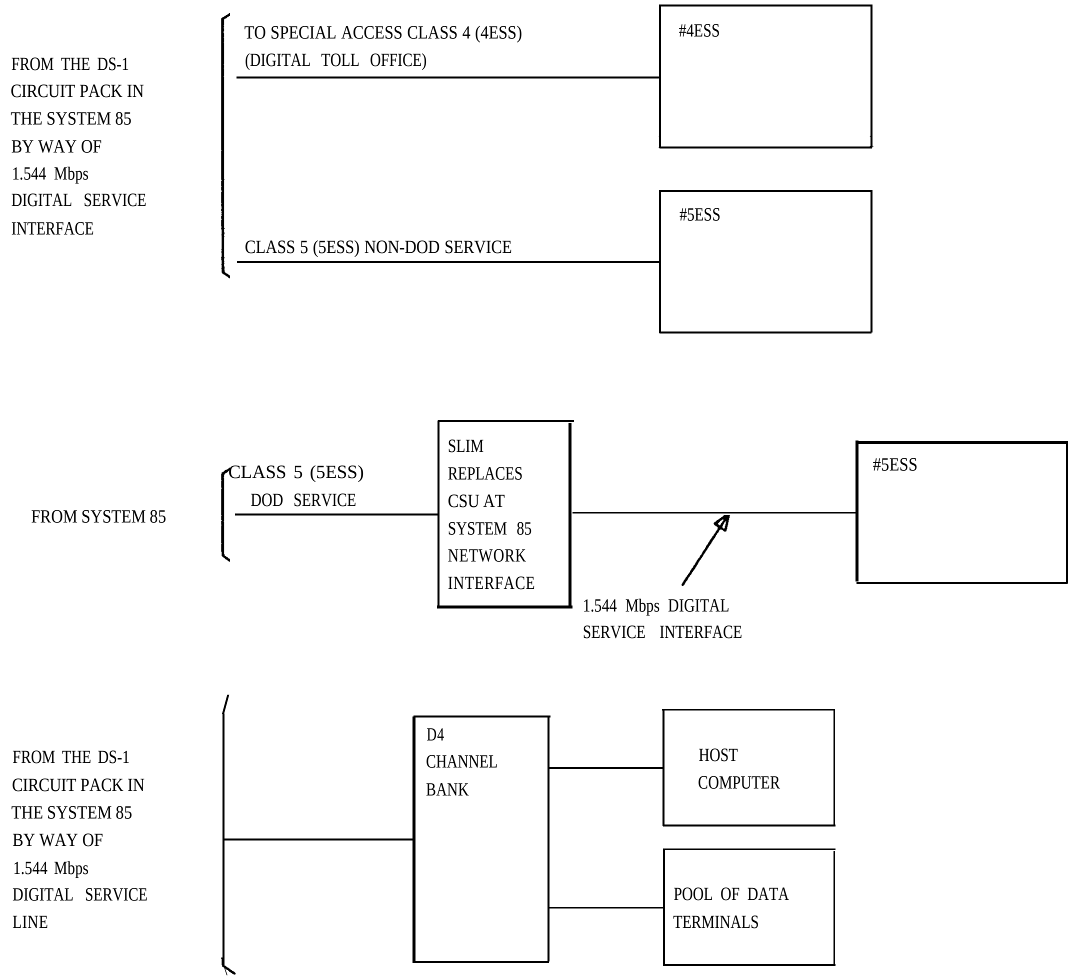
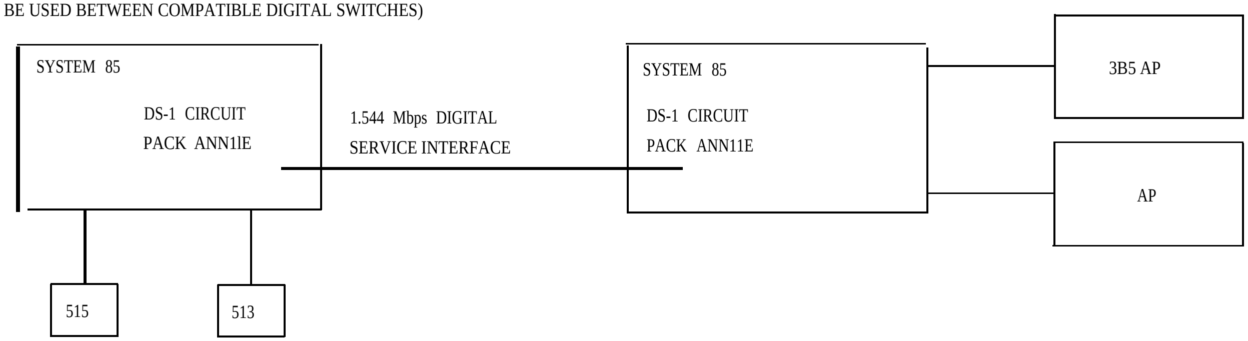


Figure 18-26. DS-1 Signaling System 85 Applications (Part 2 of 3)

Figure 18-26, part 3 of 3, is a block diagram of some applications of System 85 DS-1 signaling.

DS-1 interface WITH 64-Kbpa AVD CHANNEL
(CAN ONLY BE USED BETWEEN COMPATIBLE DIGITAL SWITCHES)



DS-1 INTERFACE USING DACS (DIGITAL ACCESS AND CROSS CONNECT)
SYSTEM AT ANALOG CO

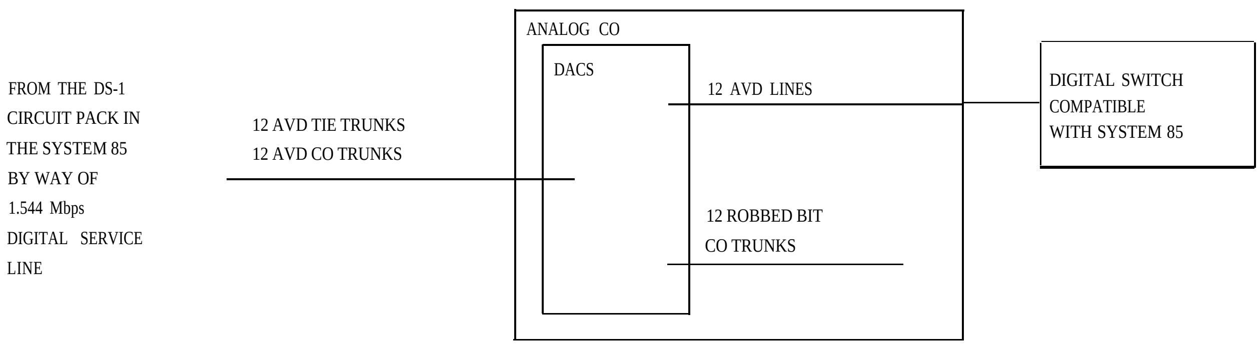


Figure 18-26. DS-1 Signaling System 85 Applications (Part 3 of 3)

Figure 18-27 shows a feature block diagram for Malicious Call Tracing.

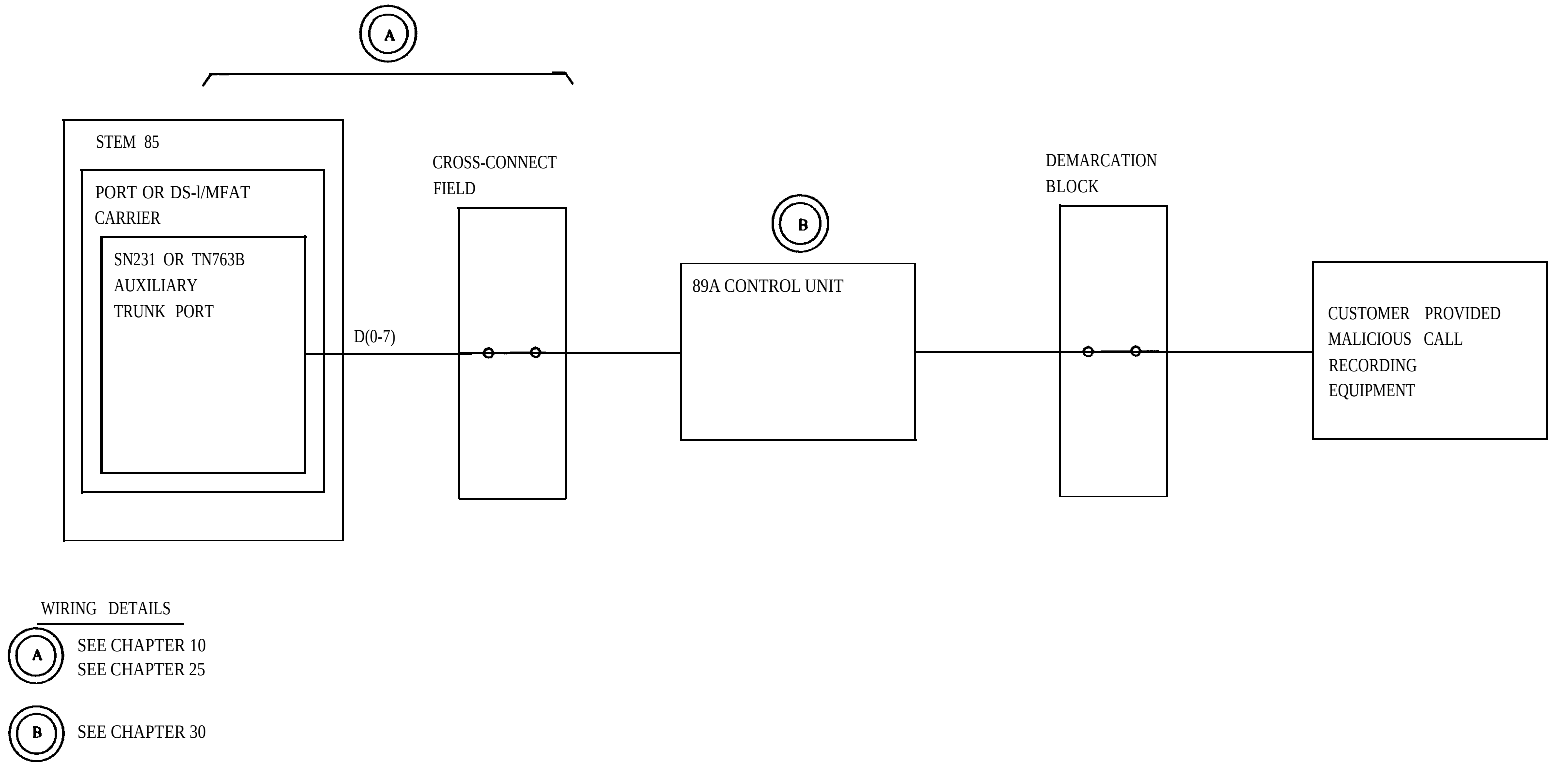


Figure 18-27. Malicious Call Tracing

Figure 18-28 shows a feature block diagram for CDR using 3B2 LSU.

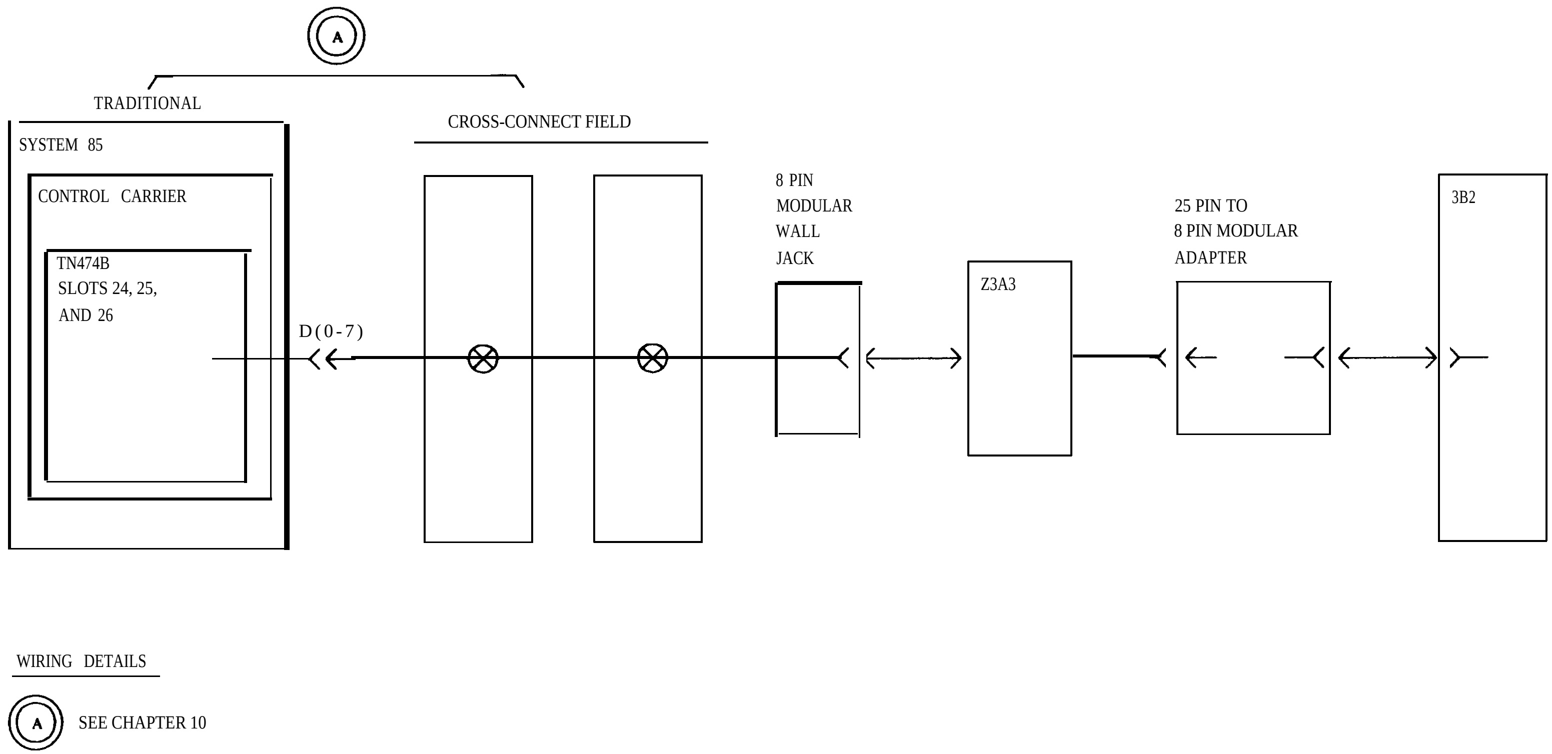


Figure 18-28. CDR Using 3B2 LSU

Figure 18-29 shows a feature block diagram for integrated services. Digital Network (ISDN) Interface.

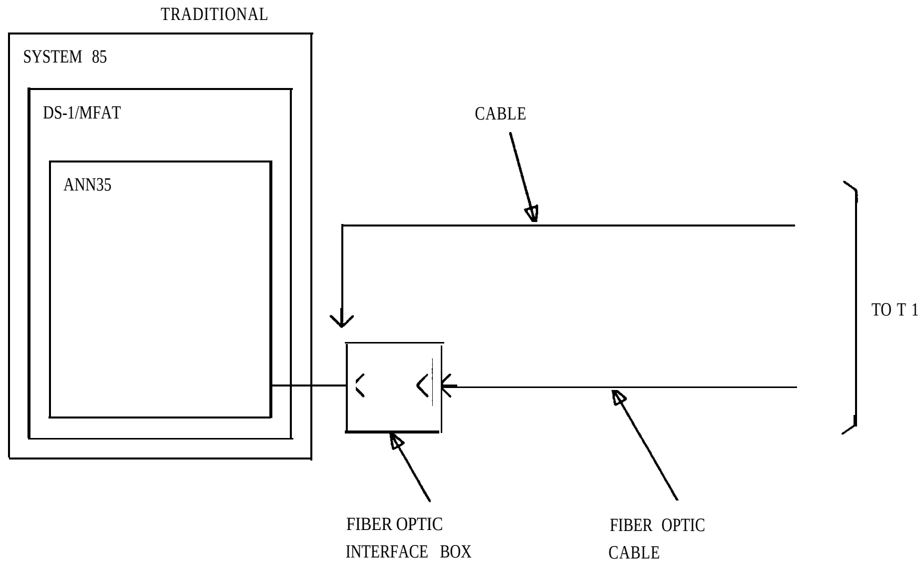
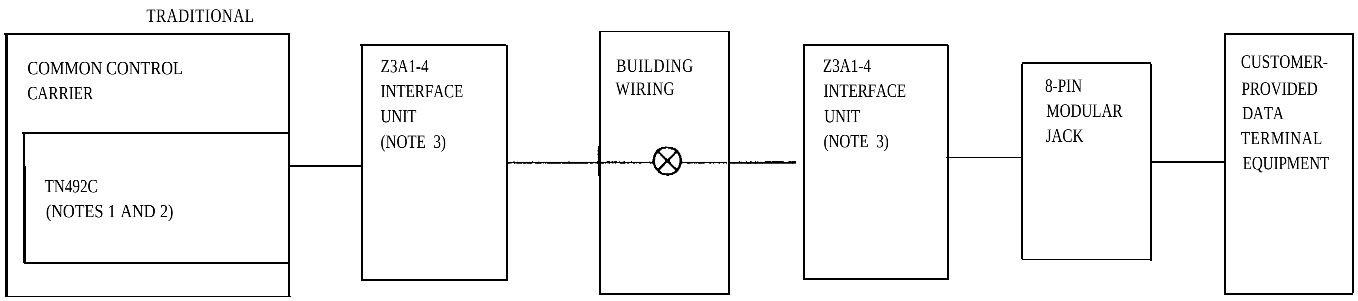


Figure 18-29. ISDN Interface

Figure 18-30 shows a feature block diagram for Isolation of Remote Interface (TN492C) from Customer-Provided Data Terminal Equipment.



NOTES:
1. SEE CHAPTER 10.
2. SEE CHAPTER 17.
3. SEE CHAPTER 11.

Figure 18-30. Isolation of Remote Interface from Customer-Provided Data Terminal Equipment

Figure 18-31 shows a feature block diagram for ISDN/BRI Universal DEFINITY Generic 2.

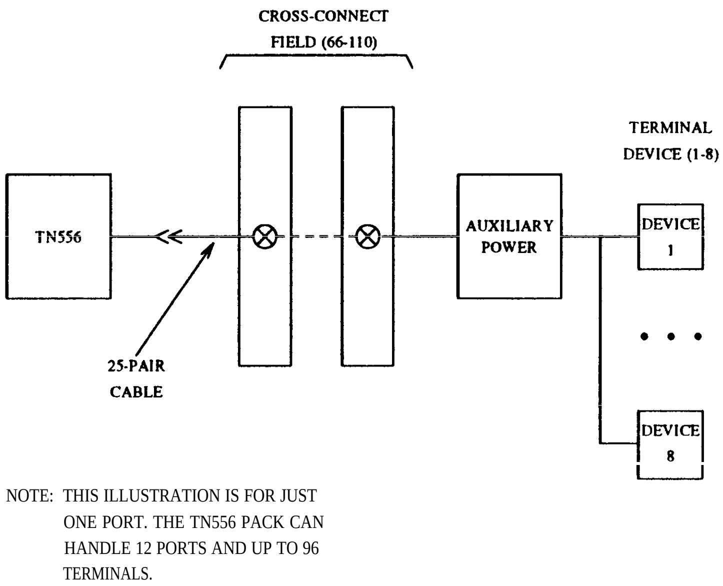


Figure 18-31. ISDN/BRI Universal DEFINITY Generic 2

Figure 18-32 shows a feature block diagram for ISDN/PRl Universal DEFINITY Generic 2.

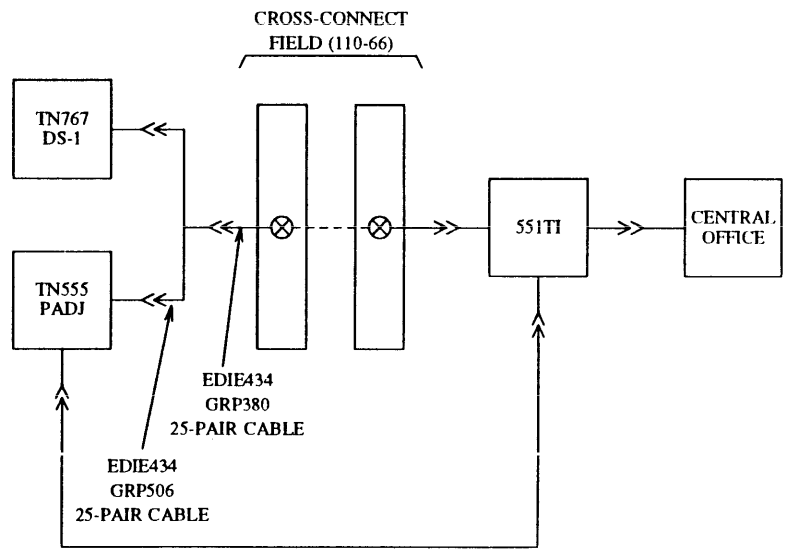


Figure 18-32. ISDN/PRI Universal DEFINITY Generic 2

19. SYSTEM ADDITIONS

Generic 2 system additions differ from upgrades: if you are upgrading a Generic 2 to a higher version (System 85 R2V4 to Generic 2.0, for example), use *DEFINITY® Communcations System Generic 2 and System 85 Upgrades, 555-104-111*.

If you are adding a module to an existing System 85 or Generic 2 system, contact your support organization for assistance.

20. SYSTEM REMOVALS

Generic 2 system removals are custom jobs: contact your support organization for assistance.

Lucent Technologies
Bell Labs Innovations

DEFINITY Generic 2 and System 85

Installation, Vol. 2

555-104-104
Issue 3
June 1992

Notice

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

Remote Access Feature: Security Considerations

AT&T has designed the Remote Access Feature incorporated in this product that, when properly administered by the customer, will enable the customer to minimize the ability of unauthorized persons to gain access to the network. It is the customer's responsibility to take the appropriate steps to properly implement the features, evaluate and administer the various restriction levels, protect access codes, and distribute them only to individuals who have been advised of the sensitive nature of the access information. Each authorized user should be instructed concerning the proper use and handling of access codes.

In rare instances, unauthorized individuals make connections to the telecommunications network through use of remote access features. In such event, applicable tariffs require that the customer pay all network charges for traffic. AT&T cannot be responsible for such charges, and will not make any allowance or give any credit for charges that result from unauthorized access.

FCC Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

Trademarks

DEFINITY is a trademark of AT&T. In this document, DEFINITY Communications System Generic 2 is often abbreviated to DEFINITY Generic 2 or Generic 2. Other trademarked terms may appear in this document as well. They are marked on first usage.

Ordering Information

The ordering number for this document is 555-104-104, Vol 1 and Vol 2. To order this document, call the AT&T Customer Information Center at 1-800-432-5600 (in Canada, 1-800-255-1242). For more information about AT&T documents, refer to the *Business Communications Systems Publications Catalog(*555-000-010).

Comments

To comment on this document, return the enclosed comment card.

Prepared by
AT&T Technical Publications Department
Denver, Colorado

21. THE UNIVERSAL MODULE CONTROL (UMC) CABINET

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CARRIER, CIRCUIT PACK, AND BACKPLANE INFORMATION 21-4
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GENERAL

This chapter provides you with general information on the universal module control (UMC) cabinet.

The UMC cabinet is used in the DEFINITY Communications System Generic 2. It replaces the traditional module control cabinet and port carrier cabinets that were used in System 85. Traditional modules can still be used with Generic 2 if System 85 R2V4 features are desired that are not supported by the UMC module. The UMC can also be added to an existing System 85 as part of a system upgrade at either a central or remote site. The traditional module ground lines cannot be interconnected to the unfiltered module ground lines of the UMC cabinet.

For new installations of DEFINITY Generic 2 systems, refer to the following chapter sequence:

- *Chapters 1-6*
- *Chapter 15*
- *Chapter 18*

- *Chapters 21-29*
- *Chapters 30-32* (if applicable)

CABINET DESCRIPTION

The UMC Cabinet is a new design, allowing for easier connection of cabling, a much smaller footprint than the traditional module and port cabinets, and interchangeability of circuit packs.

There is a new cable dressing scheme, using the cable troughs on the sides of the cabinet for dressing cables utilizing tie wraps. There is also a power cord cover that snaps into either side of the rear cable troughs used for dressing the cabinet power cord.

For DC cabinets, there is a conduit connector that allows conduit to be easily connected to the cabinet. This connector and its use is described in *Chapter 24, DC Power and Grounding.*

Access is much easier for installation and maintenance due to the changes in the rear doors.

The UMC cabinet uses much denser circuit packs, allowing the common port carriers (CPC) and the UMC carrier(s) to be combined in a single cabinet instead of a traditional module control cabinet and separate port cabinets. The two types of carriers in the UMC cabinet are:

- Universal module control carrier
- Common port carrier

The UMC cabinet must contain at least one universal module control carrier and one common port carrier (CPC).

Cabinet Power

For AC systems, the UMC cabinet uses an AC distribution unit that also contains a frequency generator and batteries. The batteries are connected to a battery charger to provide nominal holdover. There is also a cabinet transformer that steps the voltage down from 208 VAC to 120 VAC. The 120 VAC is supplied to the AC distribution unit and then to the carrier power units.

For DC systems, there is a DC distribution unit that provides power to the individual carrier power units.

Specific power and grounding connection information for both AC and DC systems is covered in Chapter 23 and Chapter 24 in this document.

Equipment and Carrier Positions

Figures 21-1 and 21-2 show the equipment and carrier level locations within the UMC cabinet for both AC and DC options. Note the designations (A-G) given for the carrier levels. Carrier levels A, C, F, and G are always equipped. Other levels that are not equipped are fitted with a blank cover (844173492) to insure proper air flow for cooling purposes.

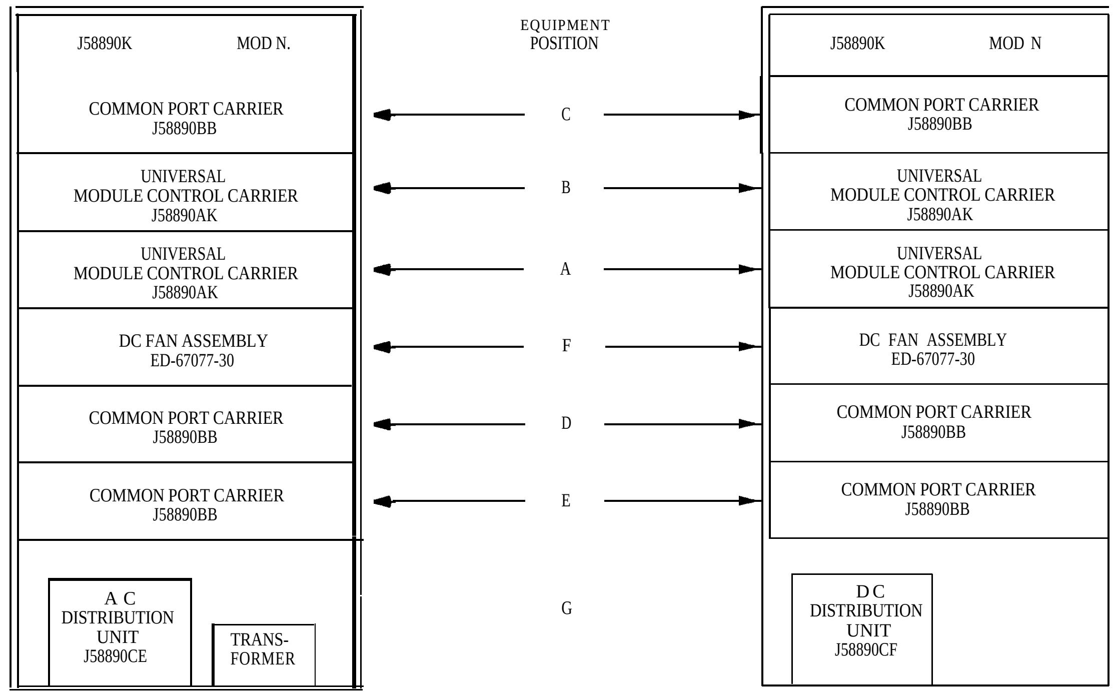


Figure 21-1. UMC Cabinet — AC Power

Figure 21-2. (JMC Cabinet — DC Power

CARRIER, CIRCUIT PACK, AND BACKPLANE INFORMATION

UMC Carrier and Circuit Packs

Figure 21-3 shows the location of circuit packs within the UMC carrier.

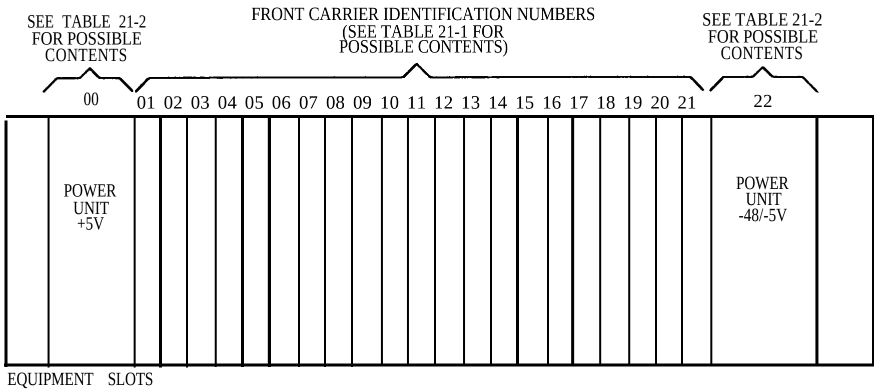


Figure 21-3. UMC Carrier (J58890AK) Circuit Pack Locations

TABLE 21-1. UMC Carrier Circuit Pack Slots 01-21

SLOT	CODE	DESCRIPTION
1	TN588	Module Control Channel
2	TN512B	Test Support Board
3	Blank	Requires ¾ in. Z100A Faceplate Cover
4	TN541	Duplication Update Channel
5	TN580	Universal Module Processor
6	TN444B	Maintenance Interface
7	UNl54B	Universal Bus Interface
8	Blank	Requires ¾ in. Z100A Faceplate Cover
9	RSVD	Reserved - Requires ¾ in. Z100A Faceplate Cover
10	RSVD	Reserved - Requires ¾ in. Z100A Faceplate Cover
11	TN445	Time Slot Interchange (TSI) Pstore
12	TN446	TSI ALU Time Slot Interchange Arithmetic Logic Unit
13	TN460C	Module Clock
	TN441	lntermodule Data Store (IDS)
14	TN463	System Clock Synchronizer
	TN481	Light Guide Interface (LGI)
	TN2131	Synchronization Clock
15-21	TN456	Remote Module Interface (RMI)

TABLE 21-2. UMC Cabinet Power Units (Slots 00 and 22)

SYSTEM	SLOT	POWER SUPPLY	OUTPUT
AC Cabinets	00	631DA1 supply (+5V)	DC Single Output Power
	22	631DB1 supply (-5v/-48v)	DC Dual Output Power
DC Cabinets	00	644A1 supply (+5V)	DC Single Output Power
	22	645B1 supply (-5V/-48V)	DC Dual Output Power

NOTE: This table applies to both the UMC and CPC power units.

UMC Carrier Backplane Connectors

Figure 21-4 shows the UMC carrier backplane connector panel.

The A level UMC carrier (UMC 0) is the only carrier that has the CFYI current limiter (CURL) board installed, even with duplicated UMC carriers.

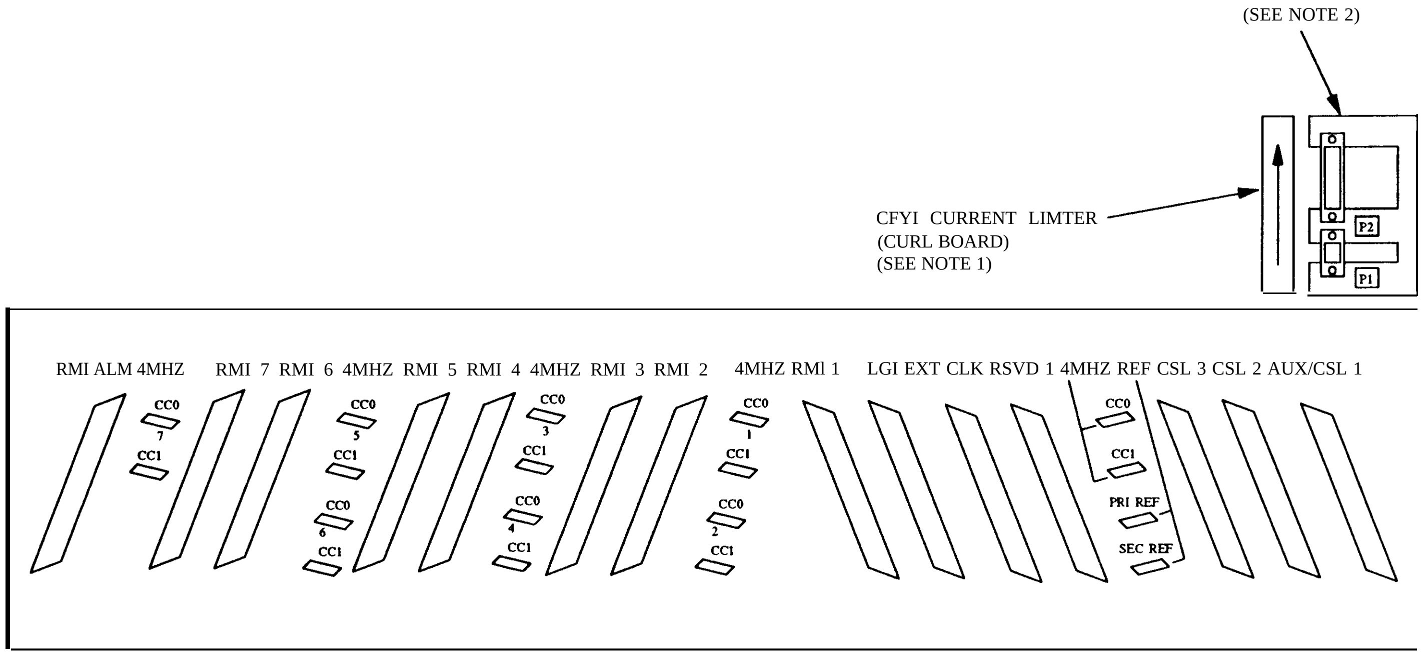
WARNING

Never install the CFYI (CURL) board in the B level UMC carrier. Installing it in the B level carrier will destroy circuit packs.

The UMC carriers are the only carriers that have both the P1 and P2 connectors. However, only the A level UMC carrier (UMC 0) uses both connectors. The B level UMC carrier uses only the P1 connector. The P2 connector for the B level UMC carrier is not used.

The CPC levels only have the P1 connector.

There are seven RMI connectors on the UMC backplane connector panel and three attendant console connectors. There are seven sets of CC connectors, with one CC0 and one CC1 connector per set. All of the connectors on the panel are labeled with the function of the individual connectors.



NOTE:

1. The CFYI Current Limiter (CURL board) is only used in the A level (UMC carrier 0) even if the cabinet has duplicated UMC carriers. Installing a CURL board in the B level carrier will destroy circuit packs. Ensure that the CURL board is installed with the arrow indicator pointing up.

2. Only the UMC carriers have both the P1 and P2 connectors on the mounting bracket. but only the A level (UMC 0) uses both the P1 and P2 connectors. The B level UMC carrier does not have a P2 connector on its harness and neither do any of CPCs.

Figure 21-4. Universal Module Control Carrier Backplane Connector Panel

Common Port Carrier (CPC) and Circuit Packs

The common port slots refer to the slot numbers on the front of the common port carrier. The equipment slots refer to the numbers on the rear of the carrier. Common port slots number 1-20. Equipment slots number 2-21.

Table 21-3 shows the relationship between the common port slots, the equipment slots, and the BX backplane connectors.

The CPC circuit packs may go into any of the common port slots except for the following instances:

- The TN555 and TN767 circuit packs must be located in adjacent slots for ISDN/PRI applications.
- The TN748C circuit pack should be located in the service slot if it is available.
- The TN768 circuit pack must be located in equipment slot 1 of the C level carrier if unduplicated tones are required.
- The TN768 circuit pack must be located in equipment slot 1 of both the C level and D level carriers if duplicate tones are required.

Figure 21-5 shows the CPC circuit pack locations within the UMC cabinet. Tables 21-2 and 21-4 show the possible contents for the CPC.

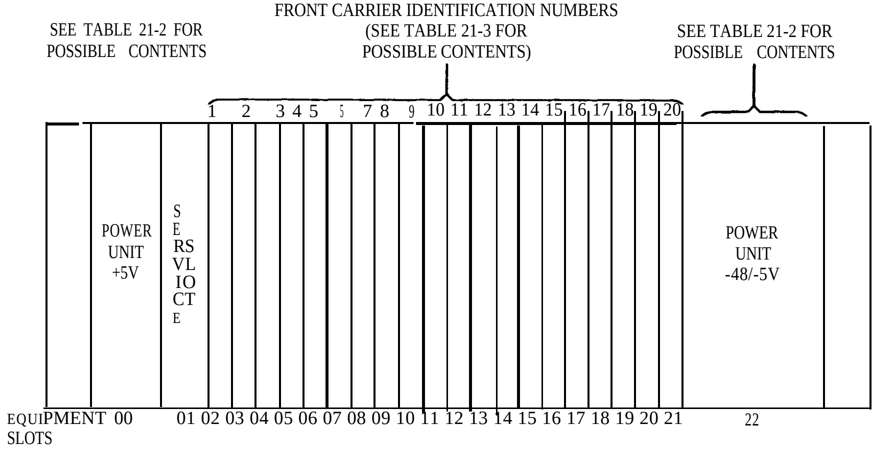


Figure 21-5. CPC (J58890BB) Circuit Pack Locations

NOTES:

1. If common port slot (1-20) is empty, it must have a Z100A (¾ in.) blank faceplate over the slot.
2. If the. service slot has a CPC circuit pack in it, it requires a Z100C (½ in.) blank faceplate be used with the circuit pack.

TABLE 21-3. Common Port Slot, Equipment Slot, and Backplane Panel Connections

COMMON PORT SLOT	EQUIP-MENT SLOT	MATCHING BACKPLANE CONNECTOR
1	2	BX 1
2	3	B X 2
3	4	BX 3
4	5	BX 4
5	6	BX 5
6	7	BX 6
7	8	BX 7
8	9	BX 8
9	10	BX 9
10	11	BX 10
11	12	BX 11
12	13	BX 12
13	14	BX 13
14	15	BX 14
15	16	BX 15
16	17	BX 16
17	18	BX 17
18	19	BX 18
19	20	BX 19
20	21	BX 20

TABLE 21-4. Common Port Carrier Circuit Pack Slots 01-20

CODE	CIRCUIT PACK	CODE	CIRCUIT PACK
*TN555	DS-1 Packet Adjunct (ISDN/PRI)	TN753	DID Trunk
TN556	ISDN BRI Line	TN754	Digital Line (MFDT)
TN726	Data Line (EIA)	TN760C	Tie Trunk
TN735	MET Line	TN762B	Hybrid Line (MFAT)
TN742	Analog Line (OPS, ONS, OPX, Test)	TN763C	Auxiliary Trunk
TN746	Analog Line (ONS only)	*TN767	DS-1 Interface
TN747B	CO Trunk	‡TN768	Tone Clock
†TN748C	Tone Detector		

* The TN555 and TN767 must be located in adjacent slots for ISDN/PRI applications.
† The TN748C should be located in the service slot if available.
‡ The TN768 must be located in Slot 1 of the C level if unduplicated tones are required. The TN768 must be in Slot 1 in both C and D levels if duplicate tones are required.

CPC Backplane Connectors

The CPC backplane connector panel provides for panel connections instead of direct backplane connections as was done on the System 85 carriers. There are 20 connectors labeled BX1 through BX20.

Figure 21-6 shows the common port carrier backplane connector panel.

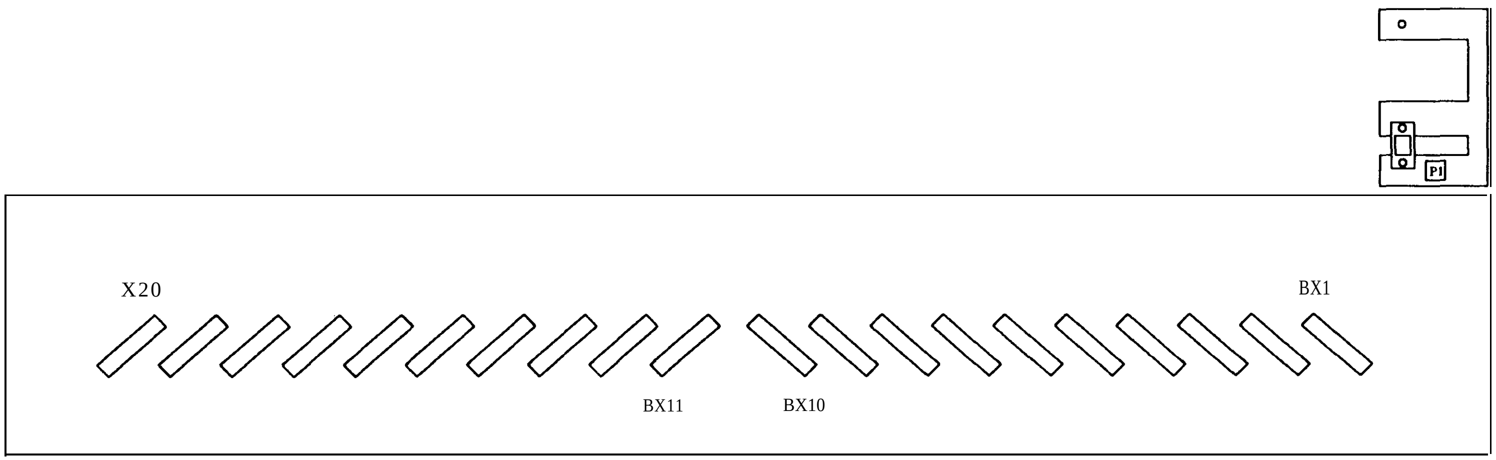


Figure 21-6. Common Port Carrier Backplane Connector Panel

CABINET LINEUPS

Figures 21-7, 21-8, and 21-9 show the cabinet lineups for the UMC and common control/time multiplexed switch (CC/TMS) cabinets. The lineups are the same for both AC and DC systems, since the only changes between the two types of systems have to do with the power and ground connections.

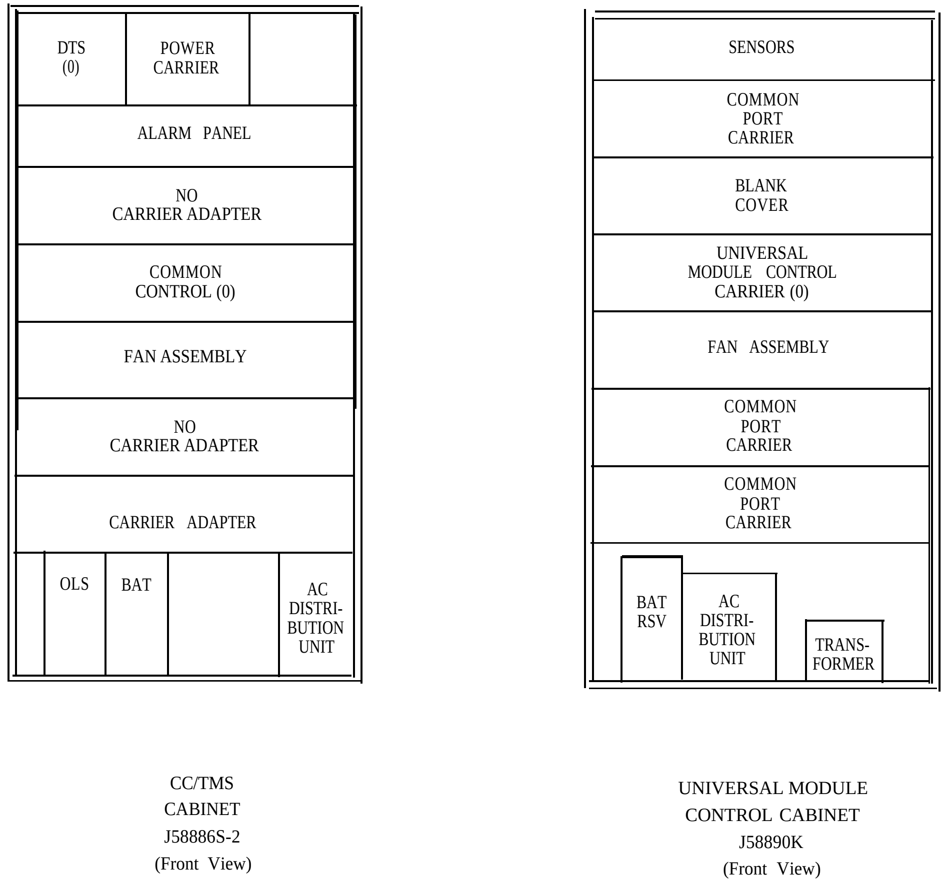


Figure 21-7. CC/TMS and UMC Cabinets - No Duplication, Single Module

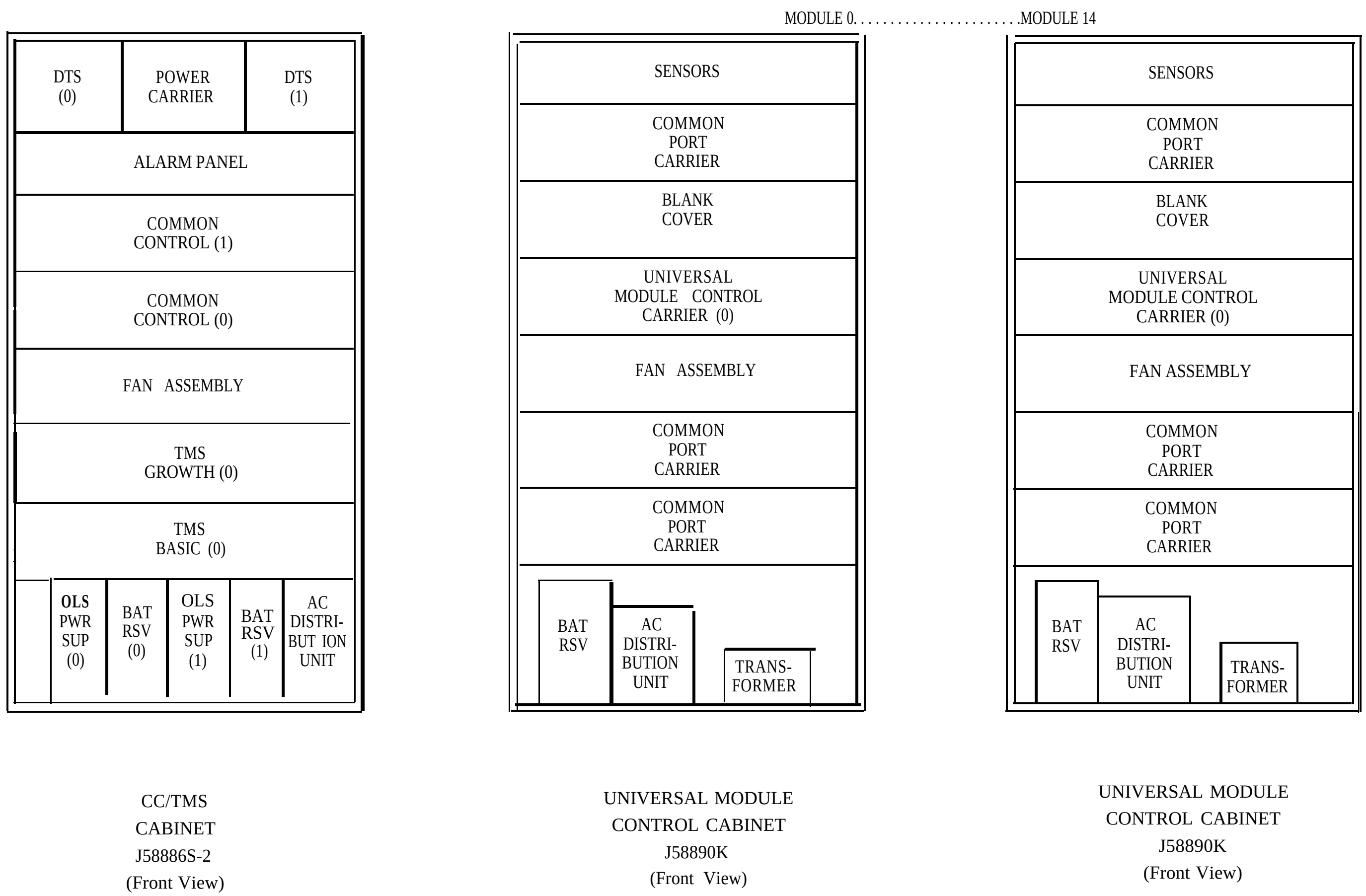


Figure 21-8. CC/TMS and UMC Cabinets - Duplicated CC and Unduplicated TMS, Multimodule

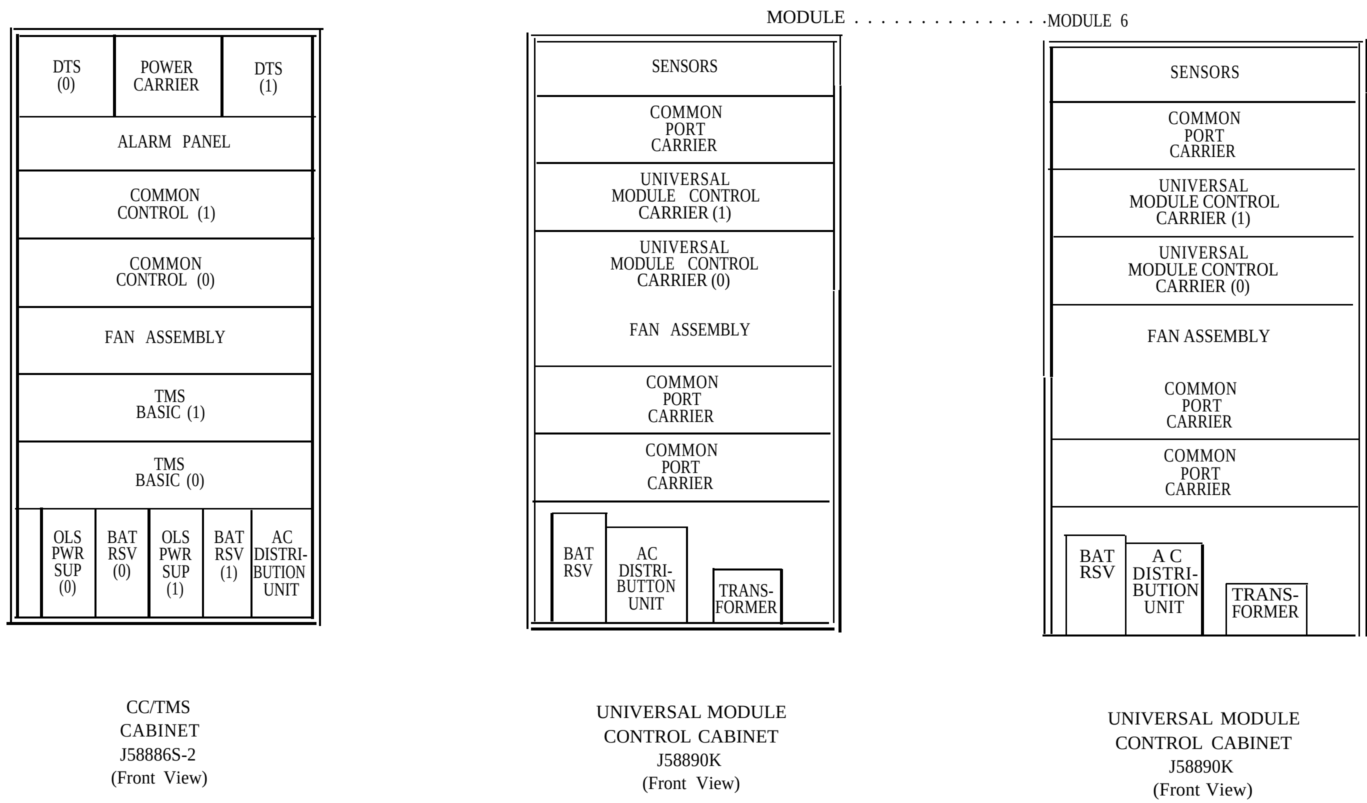


Figure 21-9. CC/TMS and UMC Cabinets - Complete Duplication, Multimodule

22. COMMON CONTROL/TIME MULTIPLEXED SWITCH (CC/TMS) CABINET

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GENERAL

This chapter only applies to the common control/time multiplexed switch (CC/TMS) cabinet

The CC/TMS cabinet replaces the System 85 traditional CC and TMS cabinets for DEFINITY Generic 2 as the cabinet of choice, although traditional CC and TMS cabinets can also be used with DEFINITY Generic 2.

Installation instructions on the traditional CC and TMS cabinets can be found in *Chapter 10* and *Chapter 11*.

The cabling connections between the CC and TMS carriers are the same in the CC/TMS cabinet as in the traditional CC and TMS cabinets. The only differences are some of the intracabinet cable code and/or group numbers due to the change in the length of the cables.

Cabling information is contained in *Chapter 25*.

The power and grounding connections for the CC/TMS cabinet are different than the traditional CC and TMS cabinets connections. The CC/TMS cabinet power and ground connections are covered in this section in *Chapter 23* and *Chapter 24*.

CABINET DESCRIPTION

The CC/TMS cabinet is designated cabinet 99-0 in the system lineup for the CC portion of the cabinet and 99-1 for the TMS portion of the cabinet. This is because the software views the CC/TMS cabinet as two separate cabinets.

If the cabinet is used for both the CC and TMS functions, it is designated system cabinet 0/1. If it is used only for the CC function, it is designated system cabinet 0.

The 99-1 designation only applies to the TMS portion of the CC/TMS cabinet if there are no additional TMS/RMI cabinets in the lineup. The specific carrier level designations for both hardware and software is covered in this section.

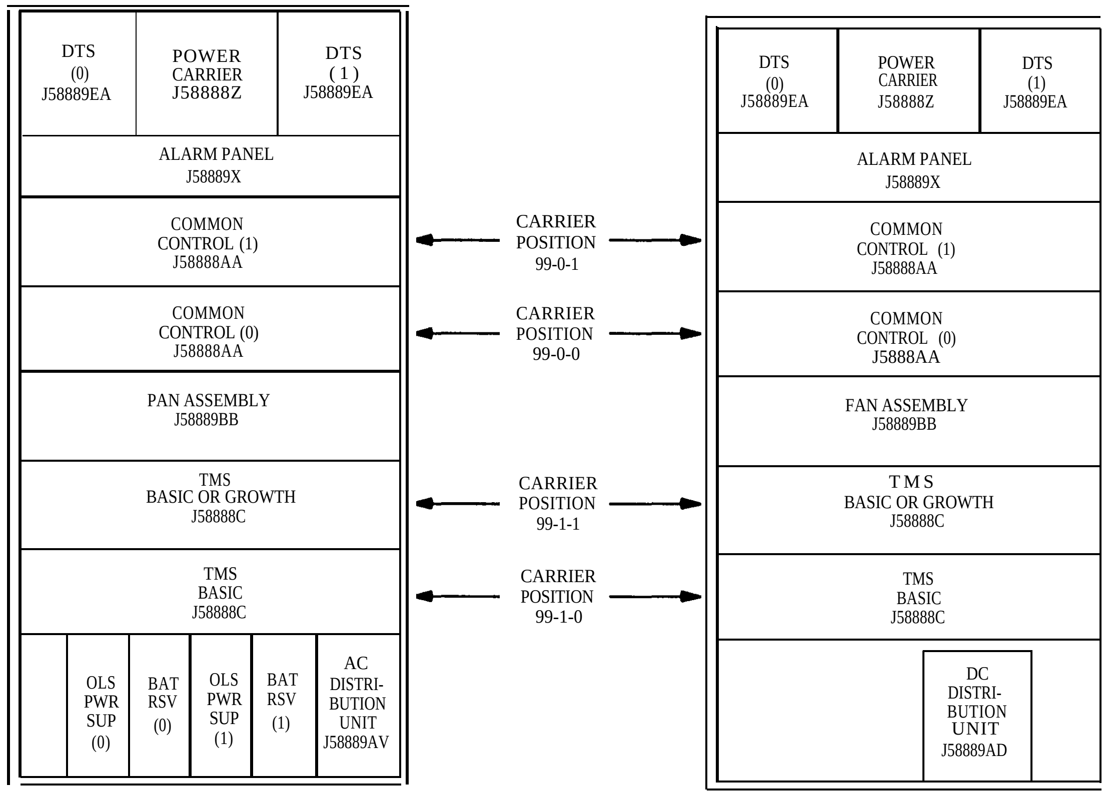
The CC/TMS contains the following:

- CC carriers
- TMS carriers
- Disk Tape Subsystem (DTS) units
- Power carrier
- Fan assembly
- OLS power supplies with battery reserves

Figures 22-10 through 22-14 show the AC and DC versions of the cabinet, equipment levels, and carrier position designations.

REDESIGNED CC/TMS CABINET

Specifics for the redesigned J58886S-3 CC/TMS cabinet begin on page 22-15.



CC/TMS
CABINET-AC
J58886S-2
(Front View)

CC/TMS
CABINET-DC
J58886S-2
(Front View)

Figure 22-1. CC/TMS Cabinet — AC and DC

CC Carriers

The CC/TMS cabinet can be used with either single or multimodule systems. The CC carriers can be either duplicated or unduplicated for both single and multimodule systems.

Carrier designations for the CC are 99-0-0 for the first CC carrier. The duplicated carrier is designated 99-0-1.

The CC carriers in the CC/TMS cabinet have new external connector panels that have the same connection points and labels as in the traditional CC cabinets, but a different physical location. The CC external connections are shown in figure 22-2.

The 4-MHz cable connectivity is the same as in the traditional CC.

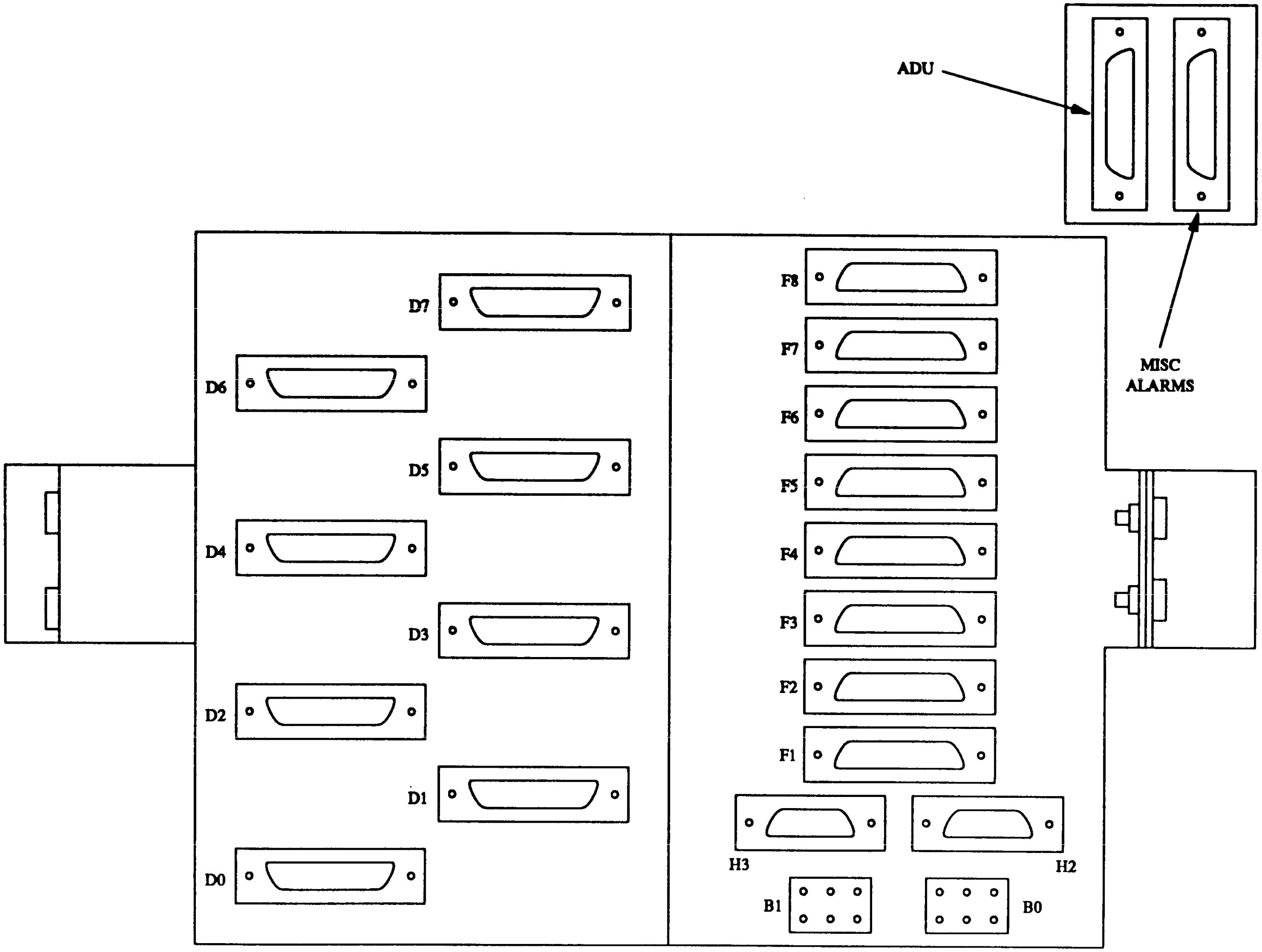


Figure 22-2. CC Backplane Connectors (CC/TMS Cabinet)

TMS Carriers

There are no TMS carriers in single module systems. If there are no TMS carriers in the cabinet, the TMS carrier levels have no carrier adapters in them to allow proper air flow for cooling.

The TMS carriers can be either duplicated or unduplicated in a multimodule system.

TMS carrier to TMS carrier and fiber optic connections in the CC/TMS cabinet are the same as in traditional TMS cabinets.

Unduplicated TMS Carriers

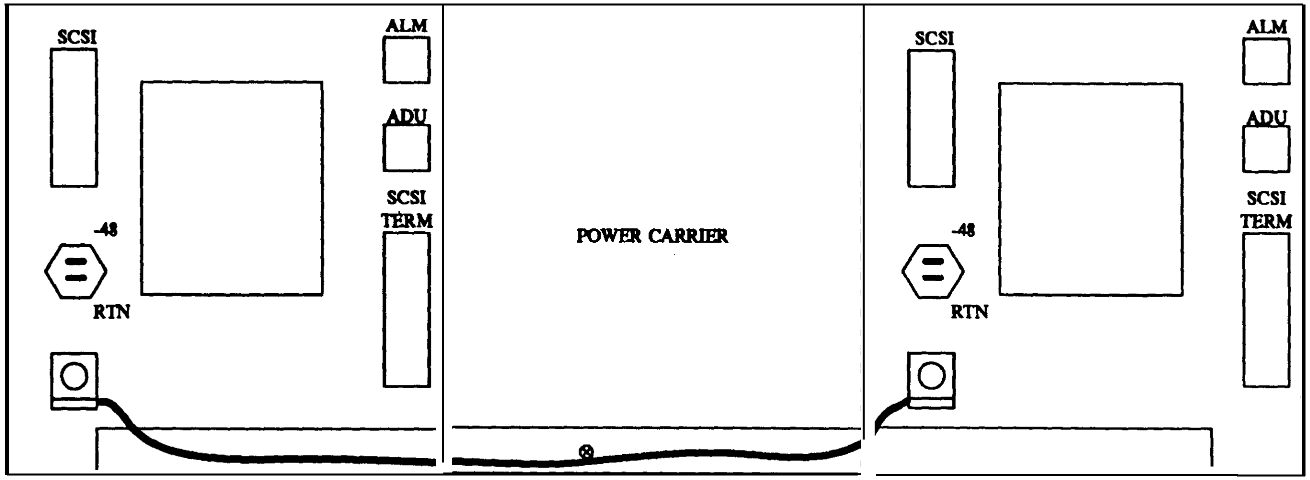
The TMS carriers can handle switching for up to 15 modules without duplication. In an unduplicated system with more than 15 modules, a traditional TMS/RMI cabinet is added to the lineup to provide the necessary TMS coverage and the CC/TMS cabinet is used only as a CC cabinet.

Duplicated TMS Carriers

In a duplicated system, the TMS carriers can provide switching for up to seven modules. If more than seven duplicated modules are in a system, the TMS carriers are installed in a TMS/RMI cabinet at the factory, leaving only the CC carriers in the CC/TMS cabinet. An additional TMS/RMI cabinet is added when there are more than 15 duplicated modules.

DTS Units

The DTS units replace the high capacity mini-recorder. There is one DTS unit in an unduplicated CC system and two DTS units in a duplicated CC system. The DTS units are located in the equipment level at the top of the cabinet. Figure 22-3 shows the DTS locations and their intracabinet connection points.



DTS (1) DTS (0)

(REAR VIEW)

Figure 22-3. DTS Connectors and Power Carrier

Power Carrier

There is a power carrier located at the top of the cabinet on the same equipment level as the DTS units. The location of the power carrier is shown in figure 22-3.

Cabinet Power

The CC/TMS cabinet has one OLS power supply with battery reserve required for the CC 0 carrier and the TMS basic carrier. If a duplicated CC 1 carrier is installed, a second OLS power supply with battery reserve is required. Installation of a second TMS carrier without duplication of the CC does not require a second OLS supply.

In addition to the power supplies, there is also an AC distribution unit in the base of the cabinet.

Specific power and grounding connection information for both AC and DC systems is covered in *Chapter 23* and *Chapter 24.*

CC/TMS INTRACABINET CABLING

Figure 22-4 shows the intracabinet cabling connections for the CC/TMS AC cabinet.

Figure 22-5 shows the DC frame filter that is used in the DC version of the CC/TMS cabinet. The DC frame filter replaces the OLS power supplies, battery reserves, AC distribution unit, and the MODGRD block. The connection points are discussed in the notes for figure 22-4.

NOTES FOR FIGURE 22-4:

1. This figure shows intracabinet cabling for an AC cabinet. For a DC cabinet, the following changes are made:

   — The OLS power supplies, battery reserves, AC distribution unit, and the MODGRD block are removed

   — A DC frame filter is added for power supply connections (see figure 22-5)

   — The DC frame filter is connected to the circuit ground block instead of the the GRD (0) and (1) connections at the bottom of the bus bar

   — The -48V (0) and (1) at the bottom of the bus bar are connected to the DC frame filter

2. The bus bar is located on the left wall at the rear of the cabinet.

3. If the second TMS carrier is a growth carrier, connect the carrier cable to -48(0) and GRD(0) on the bus bar. If the second carrier is a basic carrier, connect the carrier cable to -48(1) and GRD(l) on the bus bar.

4. This is part of the power carrier local cable, LCJ58888Z-1B, G1.

5. This is part of the alarm panel local cable.

6. These are part of the CC 1 carrier local cable.

7. These are part of the CC 0 carrier local cable.

8. The GRDD connecting wire connects to a lug on CC O and passes around a ferrite core three times before being connected to the circuit ground block.

9. The circuit ground block provides a low impedance ground connection for GRDD. It is insulated from the cabinet frame by plastic washers inserted between the circuit ground block and the frame. Plastic washers are also inserted between the heads of the block mounting screws and the block. The circuit ground block is connected to the MODGRD block in the rear of the cabinet base by a 10 AWG ground connecting wire when the cabinet is AC powered.

10. This is part of the TMS carrier local cable.

11. These are the GRDD bypass straps. They are 14 AWG and bypass the unused carrier levels and the fan assembly for GRDD continuity.

12. The MODGRD block is connected directly to the frame of the cabinet. It is connected to the circuit ground block by a 10 AWG ground connection wire. It is also connected to any newly manufactured traditional TMS/RMI cabinet that also contains a MODGRD block in the rear of the cabinet base, as well as any UMC cabinet. If the CC/TMS cabinet is the closest cabinet to the SPGT, the MODGRD block is also connected to the SPGT by a 6 AWG wire that is labeled MODGRDU. No traditional cabinets of any type that do not have a MODGRD block (not the fan level circuit ground block) are interconnected to those cabinets that do have a MODGRD block.

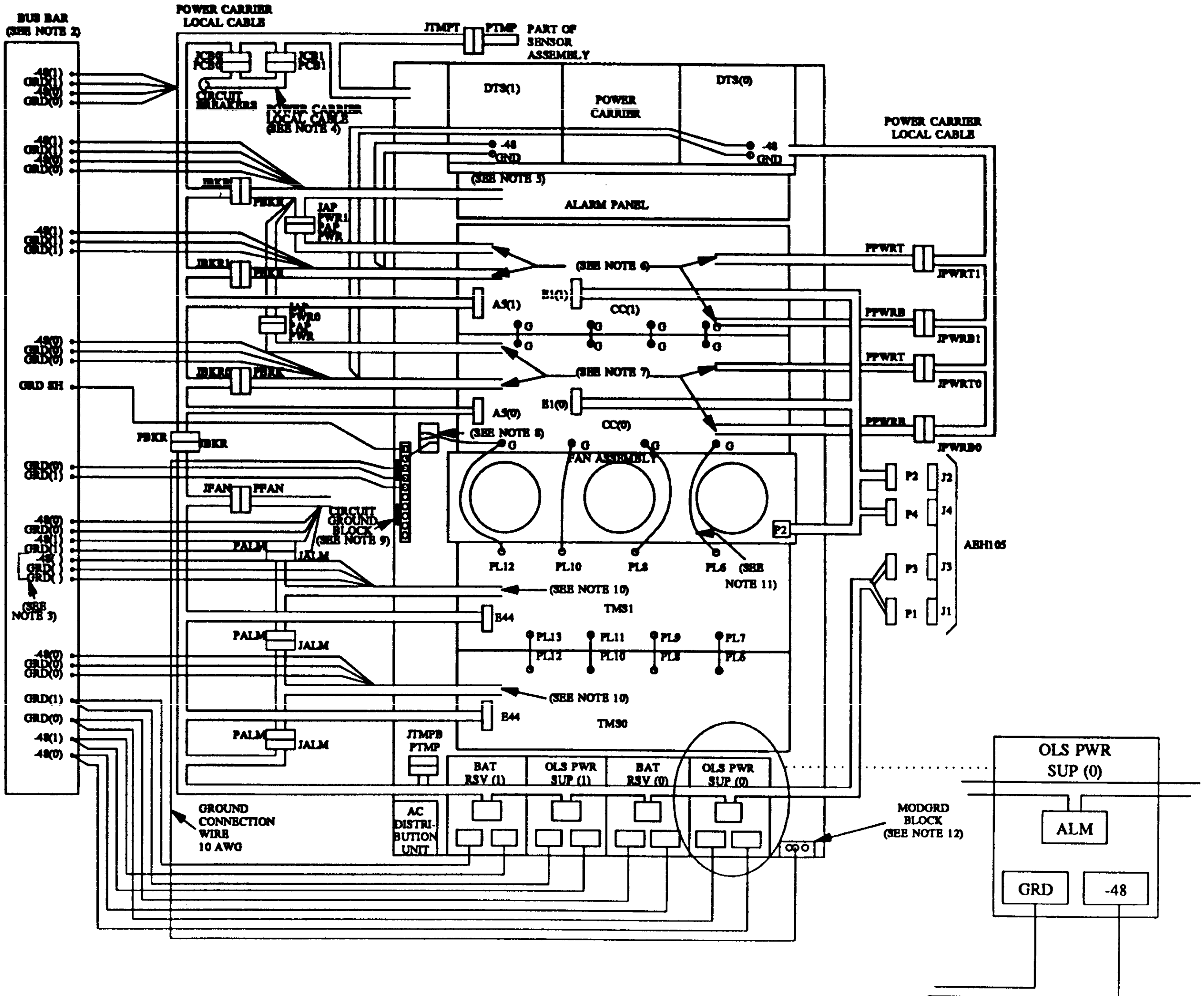
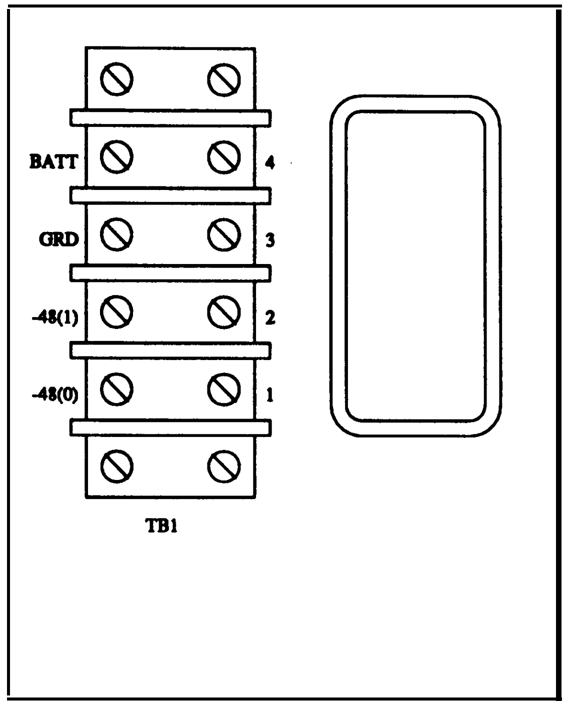


Figure 22-4. CC/TMS Intracabinet Power and Alarm Cabling — AC



NOTES:

1. Connect the cabinet input -48V power lines and the DC GRD return line to the numbered terminal connections on the right side of TB1.
2. If only one -48V power line is used, connect it to tcrminal 1. Use terminal 2 if a second -48V power line is used.

Figure 22-5. DC Frame Filter

CC/TMS BACKPLANE CONNECTORS

Figure 22-6 shows the CC backplane connectors for the CC/TMS cabinet as well as the CC to CC and CC to alarm panel connectivity. Figure 22-7 shows the TMS backplane connectors for the CC/TMS cabinet and the TMS to TMS carrier connectivity.

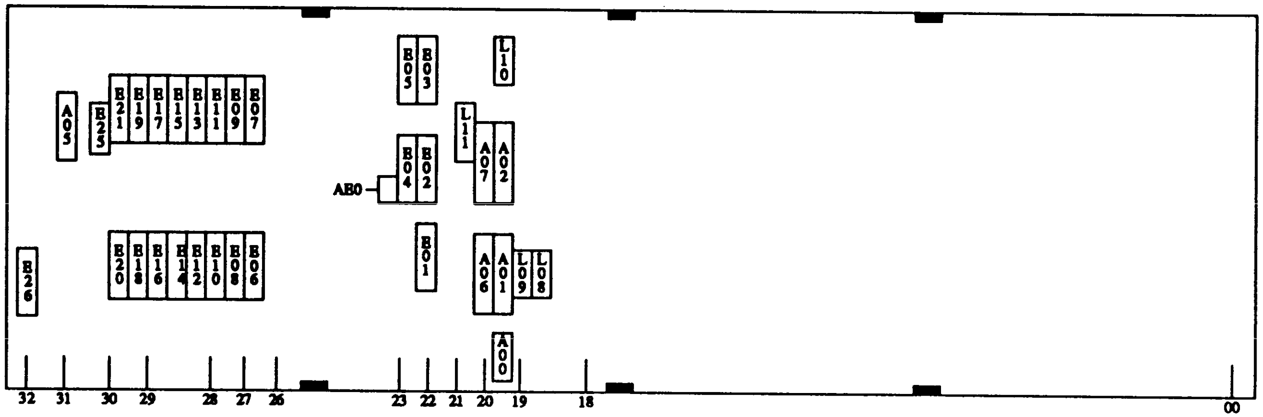


Figure 22-6. J58888E CC Carrier Connector Locations (Backplane)

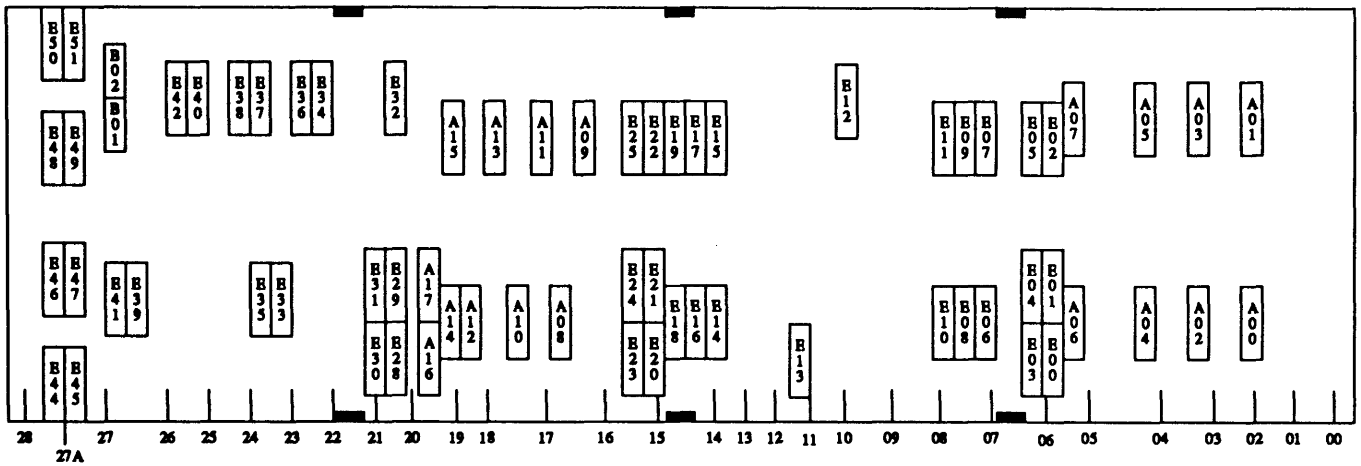


Figure 22-7. J58888C TMS Carrier Connector Locations (Backplane)

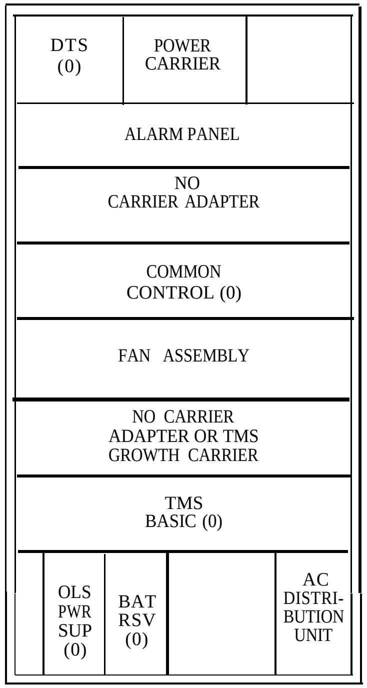
CABINET LINEUPS

The CC/TMS cabinet is designated 99-0 for CC functions and 99-1 for TMS functions. If a traditional TMS cabinet is in the system, there are no TMS carriers in the CC/TMS cabinet and the TMS cabinet is designated 99-1. In this case, the CC/TMS cabinet retains the 99-0 designation. The addition of other traditional TMS cabinets results in their designations incrementing from 99-1 to 99-2.

Figure 22-8 shows a CC/TMS cabinet without any duplication. The TMS can provide switching for up to 15 unduplicated modules.

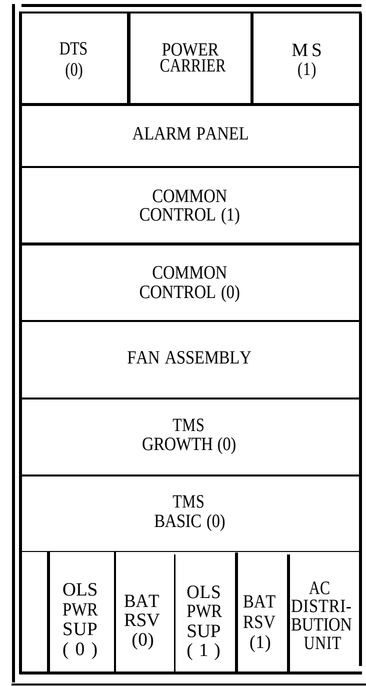
Figure 22-9 shows a CC/TMS cabinet for a multimodule system with duplication of the CC but no duplication of the TMS carriers. This configuration could provide switching for up to 15 unduplicated modules.

Figure 22-10 shows a CC/TMS cabinet for a multimodule system with duplication of the CC and TMS. This configuration could provide switching for up to seven duplicated modules.



CC/TMS
CABINET
J58886S-2
(Front View)

Figure 22-8. CC/TMS Cabinet — No Duplication



CC/TMS
CABINET
J58886S-2
(Front View)

Figure 22-9. CC/TMS Cabinet — Duplicated CC and Unduplicated TMS (Up to 15 Unduplicated Modules)

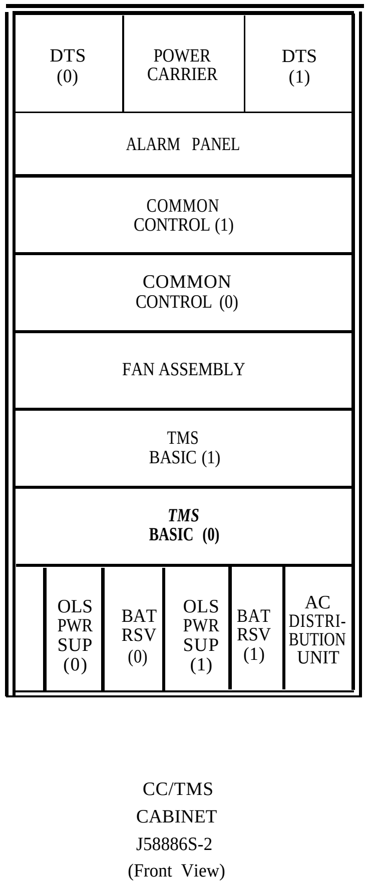


Figure 22-10. CC/TMS Cabinet — Duplicated CC and Duplicated TMS (Up to 7 Duplicated Modules)

CC/TMS CABINET J58886S-3

The CC/TMS cabinet, J58886S-3, integrates 5V power into the CC carrier and improves alarm panel manufacturability. *No functional difference exists between this redesigned cabinet and the J58886S-2 cabinet currently in use in the field. System level connectivity and intercabinet cabling for the redesigned cabinet is identical to that currently being used.*

Although these modifications do not require changes to current installation procedures, they do present a different cabinet look and are therefore provided to ensure that installation of the redesigned cabinet proceeds smoothly.

CC/TMS Configuration Options

The following configuration options are supported for the J58886S-3 cabinet

- Unduplicated CC and simplex TMS for Generic 2 systems up to 15 modules
- Duplicated CC and unduplicated TMS for Generic 2 systems up to 15 modules
- Duplicated CC and duplicated TMS for Generic 2 systems up to 7 modules
- Unduplicated CC for Generic 2 systems when a standard TMS cabinet (J58886F) is desired
- Duplicated CC for Generic 2 systems where use of the standard TMS cabinet is desired

For each configuration above, cabinet power can be provided by either 208 VAC or -48 VDC.

The following sections detail CC/TMS redesign specifics. Please review these sections before you begin cabinet installation.

CC/TMS Cabinet Design and Connectivity: AC Systems

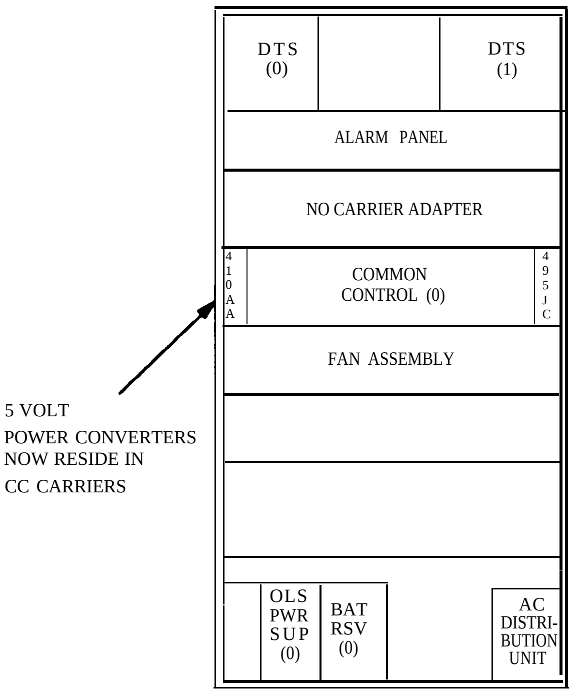


Figure 22-11. Unduplicated CC/TMS Cabinet with AC Power (Front View)

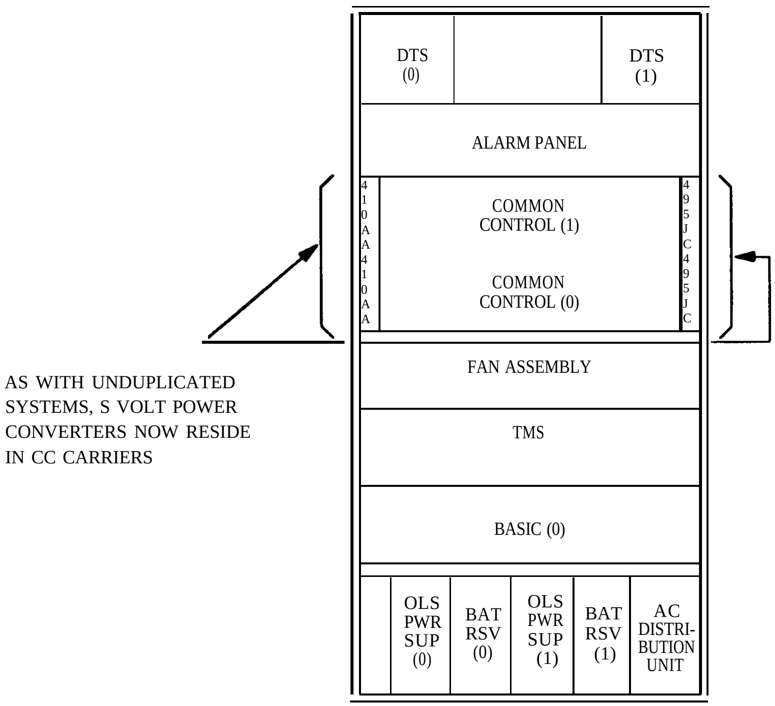


Figure 22-12. Duplicated CC/TMS Cabinet with AC Power (Front View)

TABLE 22-1. Duplicated CC Carrier Connection: CC0 to CC1

ED1E434-11	CC	SLOT	CONNECTOR	CC	SLOT	CONNECTOR
GROUP 38	00	19	L10	01	19	L10
GROUP 38	00	19	L8	01	19	L9
GROUP 38	00	19	L9	01	19	L8
GROUP 36	00	19	A0	01	19	A0
GROUP 36	00	19	A1	01	19	A1
GROUP 36	00	19	A2	01	19	A2
GROUP 32	00	32	E26	01	19	E26

CC/TMS Cabinet Design and Connectivity: DC Systems

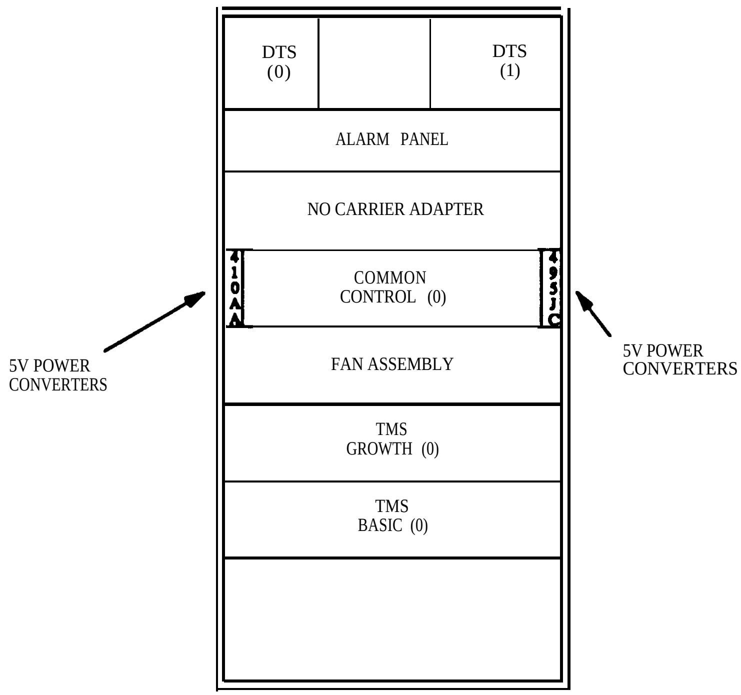


Figure 22-13. Unduplicated CC/TMS Cabinet with DC Power (Front View)

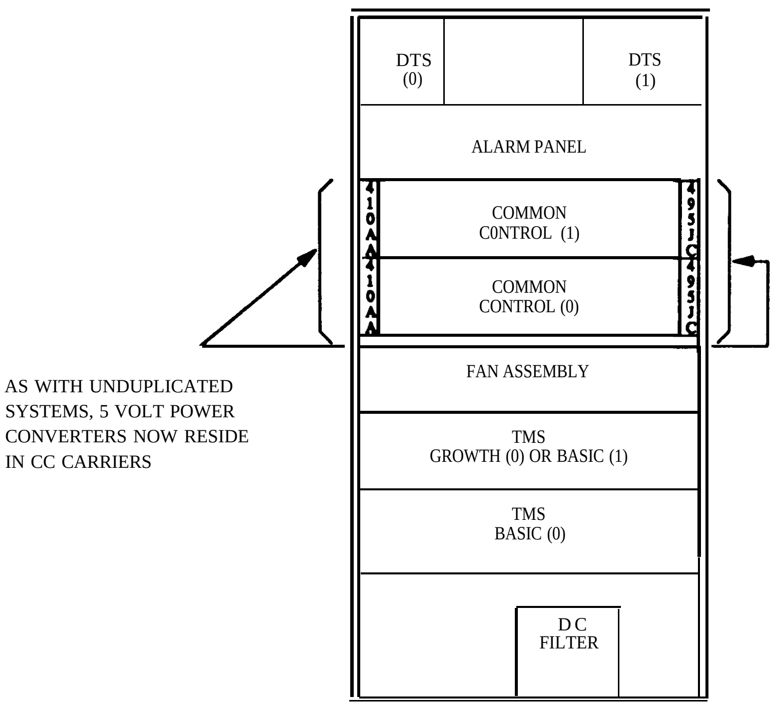


Figure 22-14. Duplicated CC/TMS Cabinet with DC Power (Front View)

CC/TMS Alarm Panel Connectivity: AC and DC Power

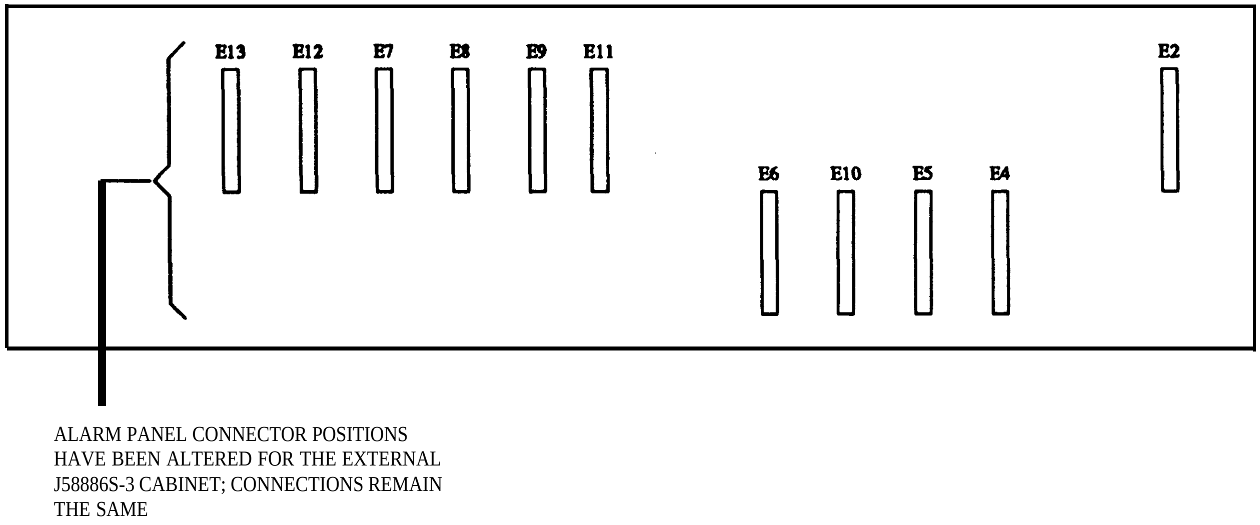


Figure 22-15. AC/DC Alarm Panel Connections (Rear View)

Duplicated Common Control Carrier to Alarm Panel Connectivity

TABLE 22-2. Duplicated CC Carrier to Alarm Panel Connections

ED1E434-11	Common Control	Slot	Connector	Alarm Panel	Slot	Connector
Group 44	00	22	E2			E4
Group 44	00	22	E3			E5
Group 44	00	22	E4			E6
Group 44	00	22	E5			E10
Group 44	00	31	E25			E12
Group 527	01	22	E2			E11
Group 526	01	22	E3			E9
Group 527	01	22	E4			E7
Group 526	01	22	ES			E8
Group 527	01	31	E25			E13

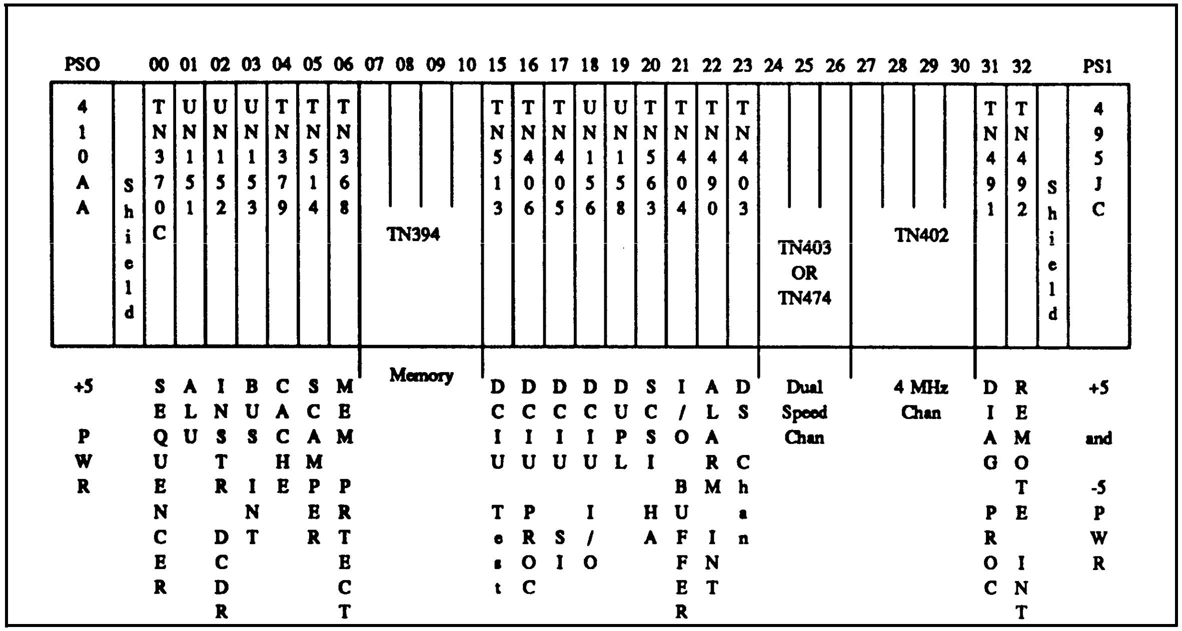


Figure 22-16. CC/TMS J58888AB-1 CC Circuit Pack Locations

TABLE 22-3. CC/TMS Components: Cabinets J58886S-2 and J58886S-3

J58886S-2 Major Subassemblies	J58886S-3 Major Subassemblies	Comments
DTS J58889EA-1	DTS J58889EA-1	No change
Power Carrier J58889EA-1	....	Not Required in J8886S-3
Alarm panel J58889X-1, L5	Alarm panel J58889BC-1	Functionally the same, J58889BC is backward compatible with J58886S-2
CC carrier J58888AA-1	CC carrier J58888AB-1	J58888AB includes DC/DC converters, otherwise functionally the same, is backward compatible with J58886S-1
CC carrier related DC/DC converter 410AA, (2 required per carrier) 494GA, (1 required per carrier)	410AA, (1 required per carrier) 495JC, (1 required per carrier)	In J58886S-2 the DC/DC converters are mounted in power carrier J58888Z In J58886S-3 the DC/DC converters are mounted in the CC carrier J58888AB
Fan carrier J58889BB-1	Fan carrier J58889BB-1	No change
TMS carrier, J58888C-2	TMS carrier, J58888C-2	No change
ACD unit J58889AV	ACD unit J58889AV	No change
DC filter J58889AD	DC filter J58889AD	No change
OLS and Battery reserve units	OLS and Battery reserve units	No change
Cabinet frame and doors	Cabinet frame and doors	No change
AEH105 cabinet alarm circuit	AEH105 cabinet alarm circuit	No change
846206241 sensor assembly	846206241 sensor assembly	No change

23. AC POWER AND GROUNDING

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GENERAL

The information in this chapter only applies to the DEFINITY Communications System Generic 2.

The AC service to the system provides 120-volt and 208-volt rms, 60-Hz power from a 3-phase, 4-wire, grounded wye configuration (figure 23-1), or 120-volt and 240-volt rms, 60-Hz power from a single-phase, 3-wire configuration (figure 23-2). These two wiring configurations are for International Telephone and Telegraph Consultative Committee (CCITT), North American (60-Hz) Standard Feature Applications.

If site power is single-phase, 3-wire configuration (240 VAC), a stepdown transformer is required at the equipment site. This transformer is supplied by the customer and steps the 240 VAC voltage down to 208 VAC for use by the DEFINITY Generic 2.

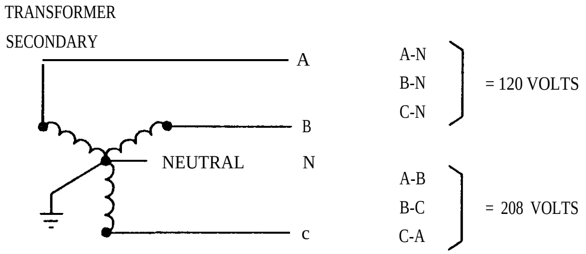


Figure 23-1. Three-Phase, 4-Wire, Grounded Wye Configuration

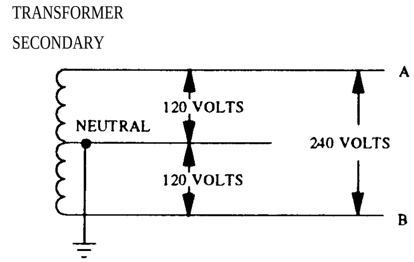


Figure 23-2. Single-Phase, 3-Wire Configuration

Cabinet installation for uninterruptible power source (UPS) systems is the same as for other AC powered cabinets. Consequently, use the information in this chapter for installation of a UPS power supplied cabinet. Installation of the UPS is covered in *Chapter 24.*

REQUIREMENTS

The system is powered by a dedicated AC power distribution system consisting of the following:

- nonfusible disconnect switch
- AC protector cabinet(s) with a single-point ground terminal (SPGT)
- AC load center equipped with appropriate circuit breakers
- AC duct assembly installed on top rear of cabinets
- associated power and grounding cabling
- receptacles

Power flows from the nonfusible disconnect switch to the AC protector cabinet, then to the AC load center where it branches to receptacles located in the AC duct assembly.

Power distribution for an AC system is illustrated in figure 23-3.

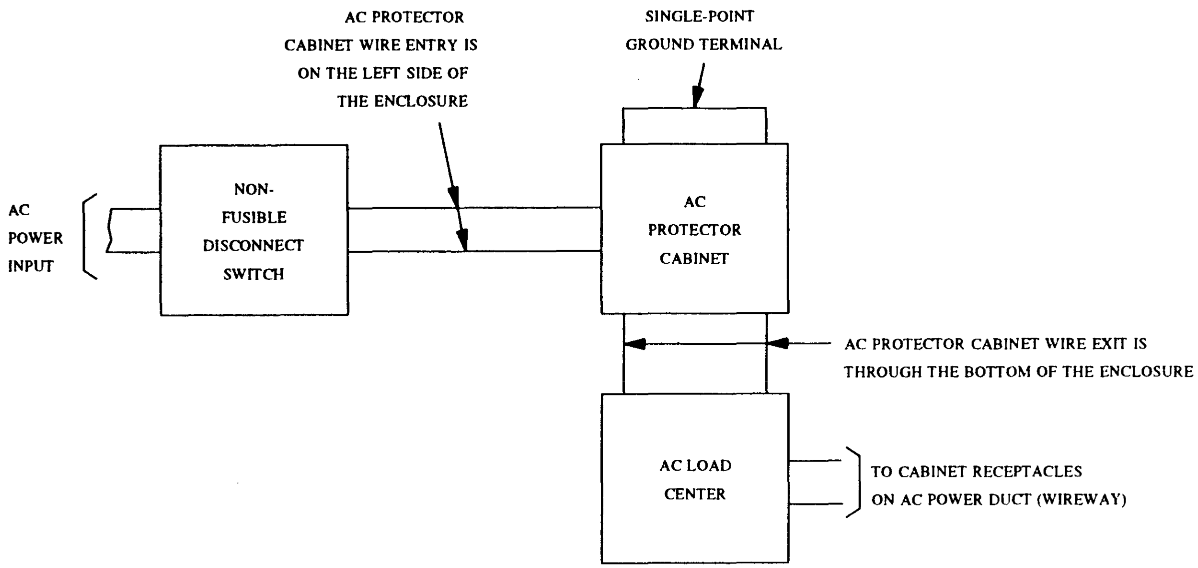
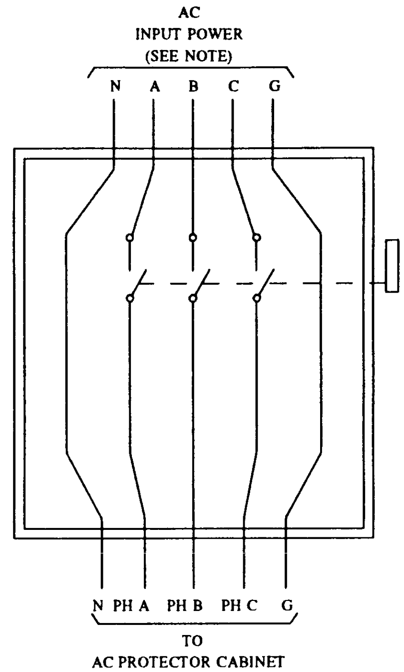


Figure 23-3. Power Distribution Block Diagram

NONFUSIBLE DISCONNECT SWITCH

The nonfusible disconnect switch provides a means to remove AC power from the system. If 3-phase power is used, the disconnect switch is a 3-pole type. If single-phase power is used, the disconnect switch can be either a double-pole type or a 3-pole type. If a 3-pole type is used, one pole (phase C) has no connection.

The nonfusible switch connections are illustrated in figure 23-4.



NOTE:

When system is arranged for single-phase 120 and 240 VAC, connect the input power to phases A and B only. Phase C has no connection.

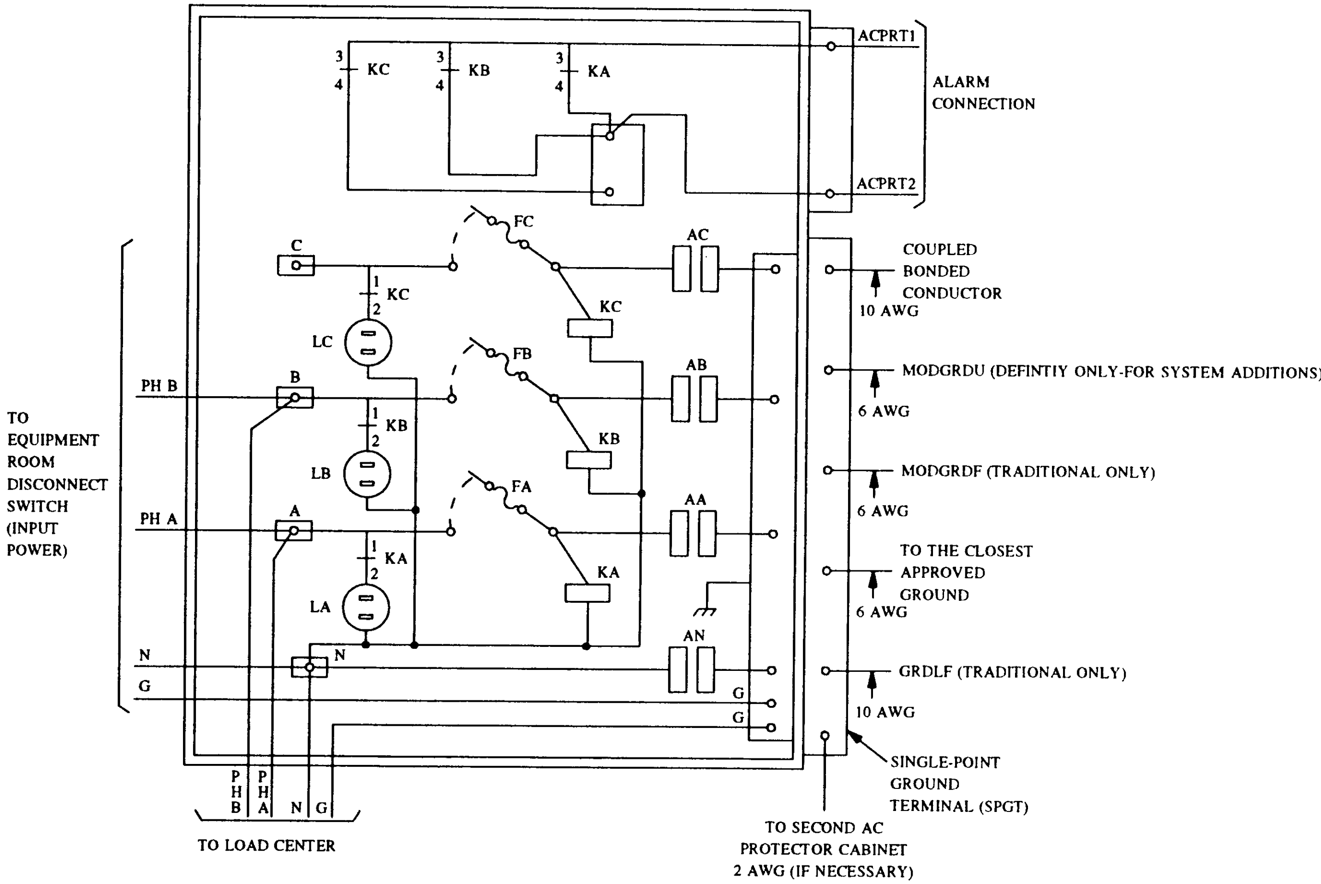
Figure 23-4. Nonfusible Disconnect Switch Connections

AC PROTECTOR CABINET

- lightning arresters
- fuses and alarm relays
- alarm lamps
- single-point ground terminal (SPGT)

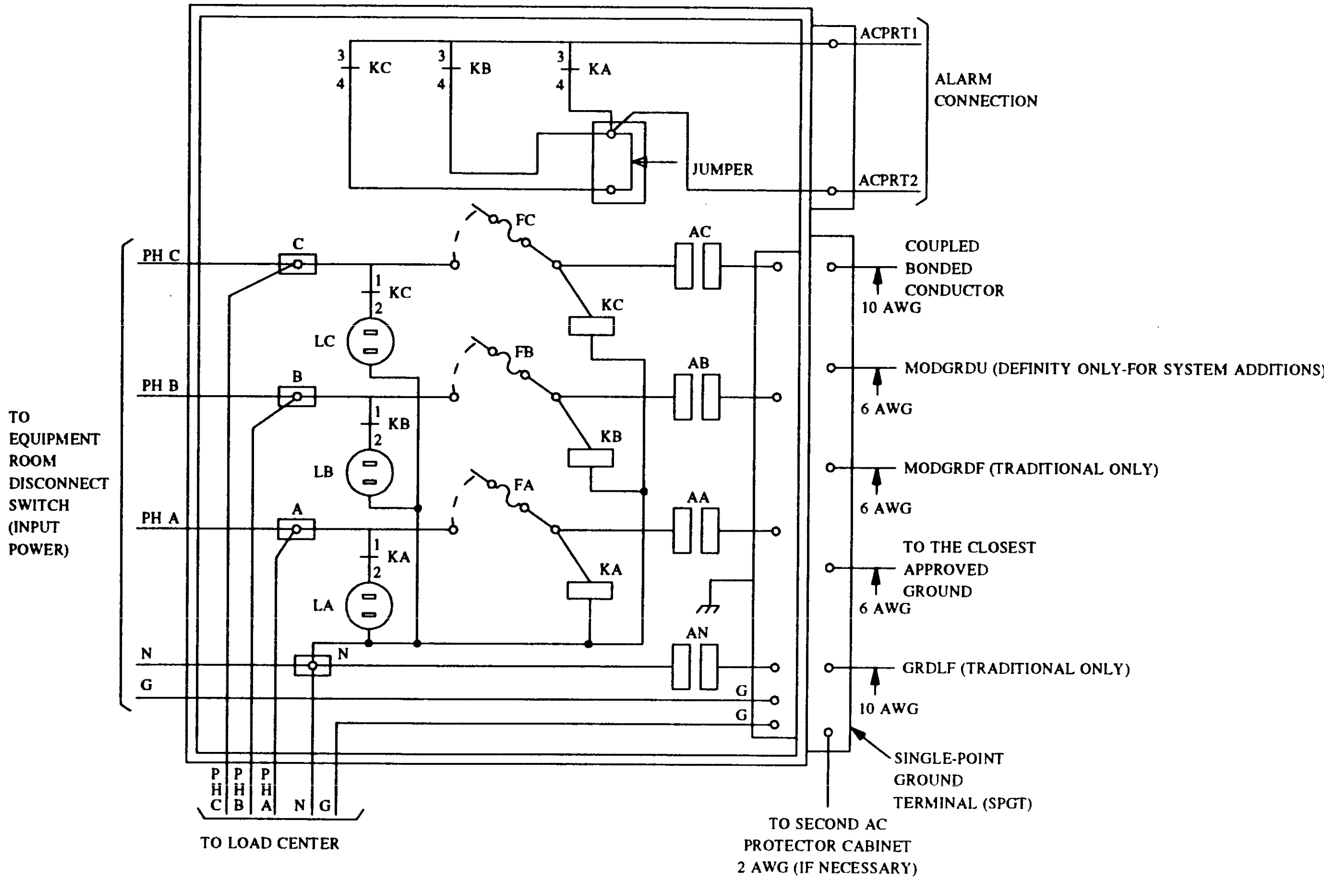
If the arrester fails (becomes short circuited), an associated fuse opens and a relay releases. The released relay operates an alarm light on the AC protector cabinet and signals the common control. The SPGT provides the system connection to the closest approved ground. It also provides the connection for grounds within the system.

Only one AC protector cabinet is required for small systems. A typical AC protector cabinet for 240 VAC systems is illustrated in figure 23-5. A typical AC protector cabinet for 208 VAC systems is illustrated in figure 23-6.



NOTE: Connect input power to phases A and B only. Phase C has no connection.

Figure 23-5. Typical AC Protector Cabinet Connections — Single Phase (240 VAC)



NOTE: Connect input power to phases A, B, and C.

Figure 23-6. Typical AC Protector Cabinet Connections — Three Phase (208 VAC)

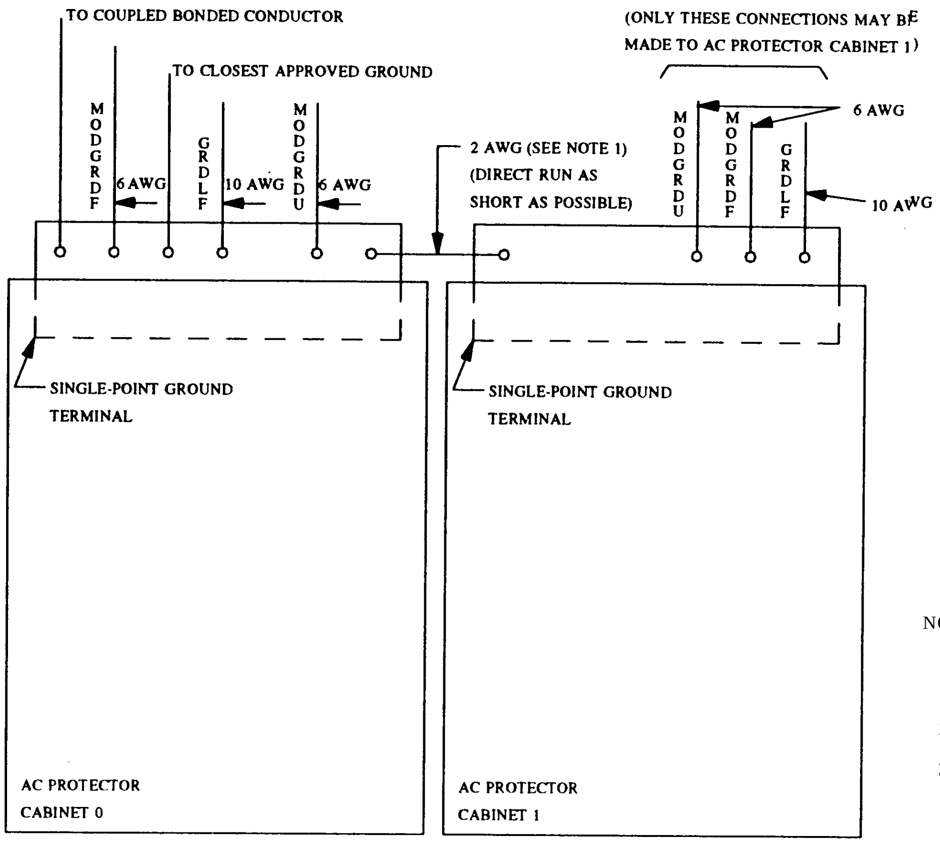
Second AC Protector Cabinet

A second AC protector cabinet is required in any of the following situations:

- when the system has more than 11 modules
- when the terminal points (holes) in the SPGT of the first AC protector cabinet are all used
- when the total number of modules exceeds the 200 ampere rating of he AC protector cabinet

In systems with two AC protector cabinets, internal wiring connections for both cabinets are the same. Figures 23-5 and 23-6 show the typical internal wiring for single-phase and three-phase AC protector cabinets.

Mount multiple AC protector cabinets side-by-side or as close as possible, but not more than three feet apart. A 2 AWG ground wire is used to connect both SPGTs of the two AC protector cabinets. Figure 23-7 shows a two AC protector cabinet arrangement.



NOTE:

1. Terminate both ends with ILSCO #SLSl25 or equivalent solderless terminal lugs and fasten to the single-point ground terminal mounting bar bolts.
2. MODGRDU is only connected to UMC and CC/TMS cabinets for system additions.
3. MODGRDF and GRDLF are only connected to traditional cabinets.

Figure 23-7. Two AC Protector Cabinet Arrangement

AC LOAD CENTER

The AC load center provides the AC power distribution and overcurrent protection through the system circuit breakers. It distributes power through cables that run in conduit from the load center to the AC duct assembly on the top rear of the cabinets. This duct assembly provides receptacles for connection to the cabinet AC distribution units. Utility receptacles are also provided for craft use. Other 120 VAC receptacles are also provided in the ductwork for powering aux and data cabinets when necessary.

If an AP cabinet is in the lineup of system switch cabinets, the 120 VAC power for the AP must be supplied from the same AC load center as the switch cabinets.

If the auxiliary cabinet is equipped with a PEC 3947 power unit, refer to the top of the unit for the 50-Hz and 60-Hz strapping options.

System Circuit Breakers

Common Control/Time Multiplexed Switch (CC/TMS) Circuit Breakers

The DEFINITY Generic 2 requires two single-pole, 20-ampere circuit breakers for the CC/TMS cabinet when duplicated. If unduplicated, only a single-pole, 30-ampere circuit breaker is required for the CC/TMS cabinet.

Time Multiplexed Switch/Remote Module Interface (TMS/RMI) Circuit Breakers

If traditional TMS/RMI cabinets are required in a DEFINITY Generic 2 system, each traditional TMS/RMI cabinet requires a single-pole, 20-ampere circuit breaker if unduplicated. Two single-pole, 20-ampere circuit breakers are required for duplicated traditional TMS/RMI cabinets.

Universal Module Control (UMC) Circuit Breakers

The UMC cabinet requires a double-pole, 30-ampere circuit breaker for each UMC cabinet within an AC system, regardless of the duplication of the universal module control carriers.

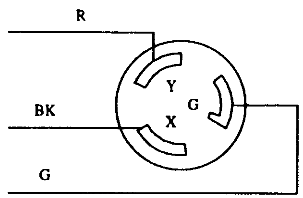
AC POWER RECEPTACLES

CC/TMS and TMS/RMI Receptacles

The CC/TMS cabinet requires a 208 VAC, 20 amp input. The receptaclc required is a NEMA L6-20R. Two of these receptacles are required for a duplicated CC/TMS. These receptacles are also used for traditional TMS/RMI cabinets used with DEFINITY Generic 2. The connections for this receptacle are illustrated in figure 23-8.

UMC Receptacles

The UMC cabinet requires a 208 VAC, 30 amp input. The receptacle is a NEMA L6-30R. The connection points for this receptacle are the same as for the CC/TMS receptacle and are also illustrated in figure 23-8.



NOTE: The connection points shown apply to the NEMA L6-20R and L6-30R. The difference between the receptacles is the size.

Figure 23-8. 208 VAC Cabinet Receptacle Connections

Utility and Auxiliary Receptacle Connections

Utility and auxiliary receptacles in the wireway require a NEMA 5-20R receptacle. The connections for this type of receptacle are shown in figure 23-9.

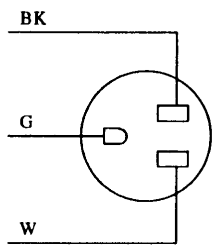


Figure 23-9. Utility and Auxiliary Receptacle Connections

NOMINAL HOLDOVER (BATTERY RESERVE)

Nominal holdover is the battery back-up unit that is installed in individual cabinets in AC systems. In the event of an AC power loss to the system, the battery provides power to the system. Power is normally available from the battery for approximately five to ten minutes, depending on the type of cabinet and the load on the system. Nominal holdover is included in all CC/TMS and UMC cabinets. It is also required in traditional TMS cabinets used in a DEFINITY Generic 2 system that are duplicated. Although not required in traditional TMS cabinets that are not duplicated, it is recommended.

There are no connections required for the nominal holdover unit in the CC/TMS cabinet. However, the UMC cabinet does require field wiring connections.

WARNING

The battery connections for the UMC cabinet must be done in a specific order and under certain operating conditions. The specific process is detailed in *Chapter 29, Power-Up Sequence.*

CABINET GROUNDING

The DEFINITY Generic 2 cabinets are grounded differently than the System 85 cabinets. Below are a list of the grounds in the DEFINITY Generic 2:

- Digital ground (GRDD)
- Frame ground (GRDFR)
- Unfiltered module ground (MODGRDU)
- Module ground (MODGRD-used only with traditional cabinets in a DEFINITY) system

There is no lightning ground, traditional module ground connected to an EMC filter (unless there is a traditional module or port cabinet), nor a cabinet bonding ground in the DEFINITY Generic 2. Except for traditional cabinets, there are no EMC filters in any of the cabinets in the DEFINITY Generic 2. The following sections of this chapter detail the specific grounding configurations for the individual cabinets in the DEFINITY Generic 2.

CC/TMS Cabinets

The CC/TMS cabinet has two ground blocks in an AC system, the circuit ground block and the MODGRD block.

The circuit ground block is located in the rear of the cabinet on the left side of the frame at the fan assembly level. The circuit ground block is insulated from the cabinet frame by the mounting hardware. Plastic washers are located between the block and the cabinet frame and are also located between the mounting screw heads and the block itself. This allows for a low impedance ground connection for GRDD and GRDFR. The circuit ground block is connected to the MODGRD block by a 10 AWG ground connection wire.

The GRDD connections for the CC/TMS are part of the busbar/local power carrier harness connections. Consequently, there is no need for verification of factory installed wiring.

The module ground (MODGRD) block is located at the lower right rear of the cabinet. Unlike the circuit ground block, the MODGRD block is not insulated from the cabinet frame. The MODGRD block provides the connection point for unfiltered module ground (MODGRDU) between cabinets and the system SPGT. The MODGRDU connection between cabinets is a daisy-chain configuration. MODGRDU connects the CC/TMS cabinet (and any newly manufactured traditional TMS/RMI cabinets in the system) to the UMC cabinets.

NOTE

There is no ground connection between traditional module and port cabinets and the CC/TMS cabinet.

Traditional TMS/RMI Cabinets in DEFINITY Generic 2

Certain DEFINITY Generic 2 systems require a traditional TMS/RMI cabinet as part of the system due to size and configuration requirements.

The same grounding scheme (insulated circuit ground block and frame mounted MODGRD block) is found in newly manufactured traditional TMS/RMI cabinets. Only these types of TMS/RMI cabinets are interconnected to the CC/TMS and UMC cabinets with ground wires. The old traditional TMS/RMI cabinets that do not have a MODGRD block in the base of the cabinet must not be interconnected to any DEFINITY Generic 2 cabinets. These types of cabinets require System 85 grounding. If you install a traditional TMS/RMI cabinet with a DEFINITY Generic 2, check that there is a MODGRD block in the base of the cabinet. If there is, this is a newly manufactured TMS/RMI cabinet and it must be connected to the CC/TMS cabinet and the UMC cabinets. If there is not a MODGRD block in the base of the cabinet, do not connect the traditional TMS/RMI cabinet to the rest of the lineup. Refer to *Chapter 8* for the correct grounding scheme. Figure 23-17 shows the grounding of traditional CC and TMS cabinets that do not have newly installed MODGRD block in the base of the cabinet.

UMC Cabinets

The most significant differences in the grounding arrangements between the UMC cabinet and traditional switch cabinets are:

- The UMC cabinet does not have a lightning ground, a cabinet bonding ground, or an EMC filter.
- The UMC cabinet does not have an insulated circuit ground at the DC fan assembly.
- The GRDD, module, and circuit grounds are isolated from green wire ground in a traditional switch cabinet, but they are electrically connected at the cabinet MODGRD block in the UMC cabinet.
- Unfiltered module ground (MODGRDU) is used with the UMC cabinet (and the CC/TMS cabinet) instead of the traditional filtered module ground (MODGRDF). These two grounds are not interconnected.

Figures 23-10 through 23-14 show factory installed wiring that you should verify as part of your power and grounding checklist before proceeding with the power up sequence.

The module ground (MODGRD) block is located at the lower right rear of the cabinet. Unlike the circuit ground block, the MODGRD block is not insulated from the cabinet frame. The MODGRD block provides the connection point for unfiltered module ground (MODGRDU) between cabinets and the system SPGT. The MODGRDU connection between cabinets is a daisy-chain configuration. MODGRDU connects the CC/TMS cabinet (and any newly manufactured traditional TMS/RMI cabinets in the system) to the UMC cabinets.

If a cabinet lineup has more than one UMC cabinet, a MODGRDU wire is connected between each of the UMC cabinets. The closest DEFINITY Generic 2 cabinet (either CC/TMS or UMC) is then connected to the SPGT. However, if a UMC cabinet is added to a lineup with traditional cabinets, there is no MODGRD or MODGRDU connection between the UMC and the traditional cabinets.

Figure 23-15 shows newly manufactured CC and TMS cabinets in a lineup with a UMC cabinet. Both the CC and TMS cabinets have the MODGRD block in the base of the cabinet. There is only a MODGRDU connection in this system, with all three cabinets interconnected, with a connection to the SPGT from the closest cabinet in the lineup.

Figure 23-16 shows the grounding arrangement for an AC-powered UMC cabinet with a CC/TMS cabinet. Note that it also has the MODGRDU ground connection.

Traditional Module, CC, and TMS Cabinets

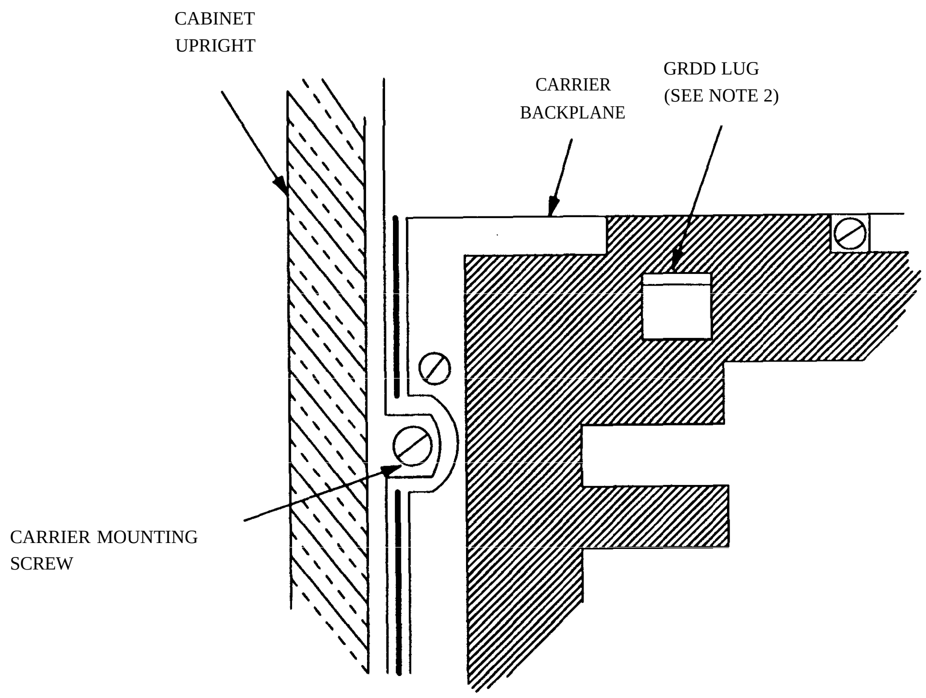
If traditional module and port cabinets are part of a DEFINITY system, a MODGRDF line is also run to the SPGT that is separate from the MODGRDU line. The MODGRD line is only connected to the traditional module, CC, and TMS cabinets at the fan assembly level circuit ground block. The MODGRDU line is only connected to the MODGRD blocks in the rear of the base of the non-traditional module, CC, and TMS cabinets.

Figure 23-17 shows the MODGRD and MODGRDU connections for traditional module and port cabinets in a DEFINITY system.

Figure 23-18 shows the MODGRD, MODGRDF and MODGRDU connections for UMC, traditional CC, TMS, and module cabinets in a DEFINITY system.

NOTE

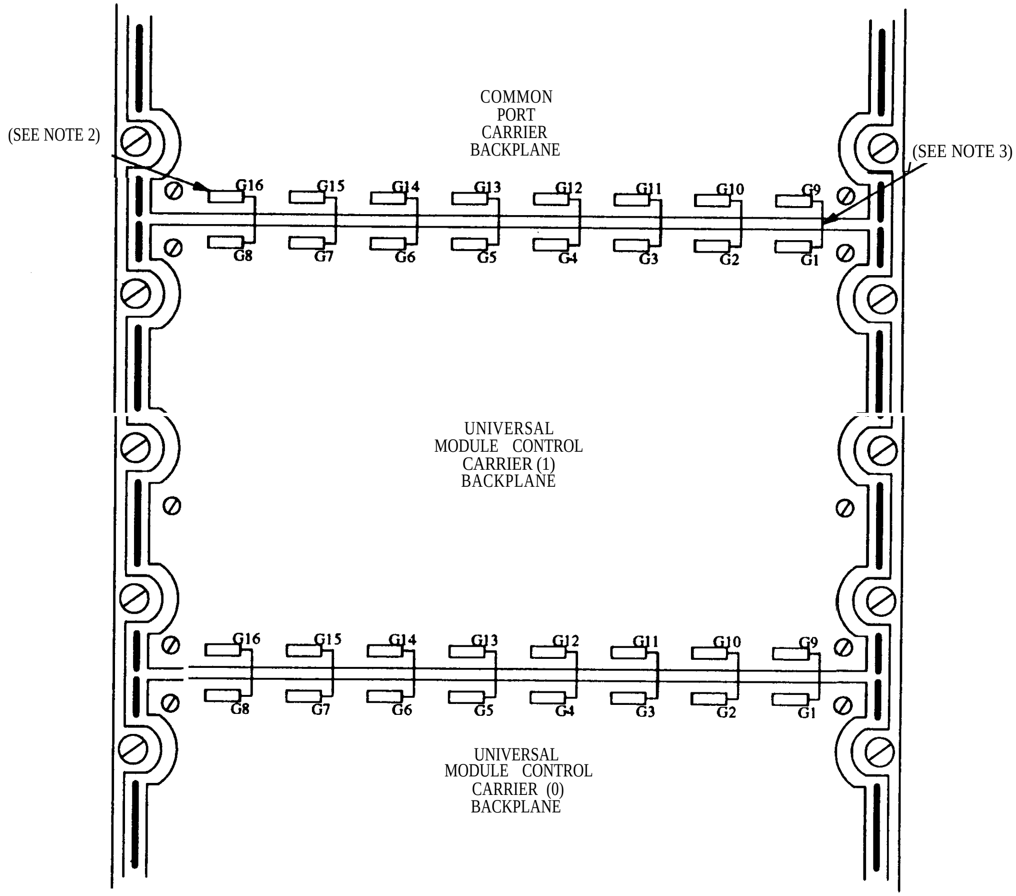
There is no ground connection between traditional module and port cabinets and the UMC cabinet.



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. There are 16 GRDD lugs on the backplane, eight on the top of the backplane and eight on the bottom of the backplane. They are labled G1 through G16, from right to left, top to bottom.

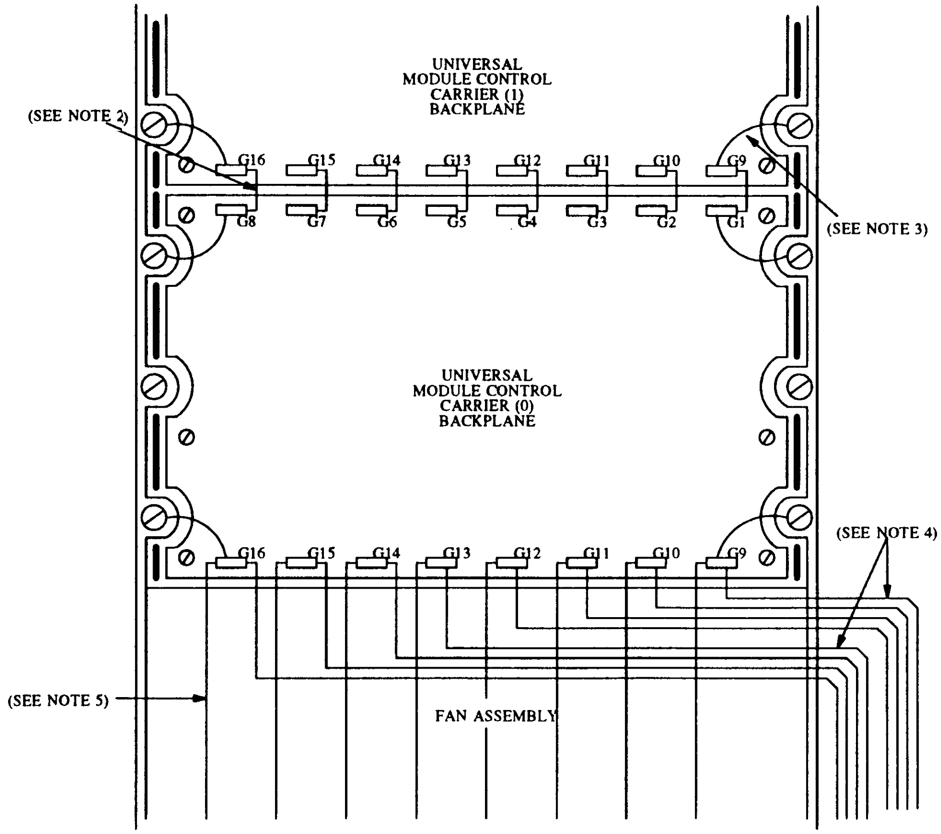
Figure 23-10. GRDD Backplane Connections



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD connecting lugs. There are 16 on each carrier backplane, labeled G1 through G16.
3. These are the GRDDD straps, They are 18 AWG wires.

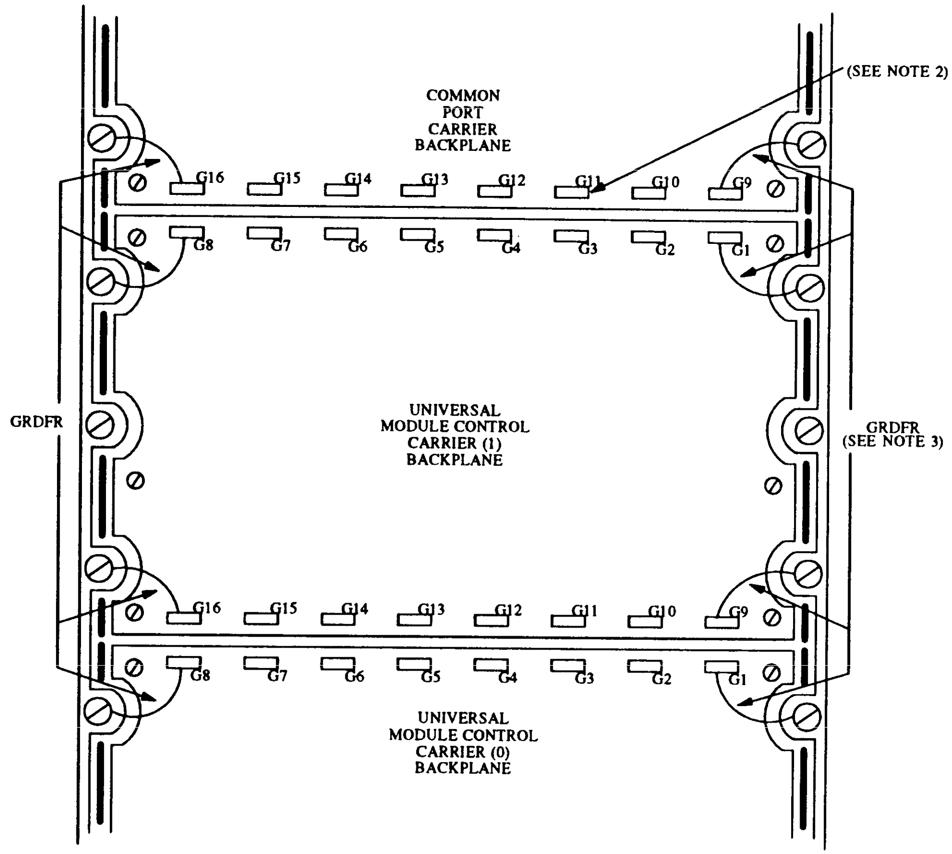
Figure 23-11. UMC GRDD Carrier Connections



NOTES:

1. There is no installation crew wiring required for the connations shown in this figure.
2. These are the GRDD straps. They are 18 AWG.
3. These are the GRDFR straps. They are 14 AWG.
4. These are 14 AWG wires connected to each of the GRDD lugs on the bottom section of the UMC 0 carrier backplane. The eight wires are gathered into two bundles (four wires each) and connected to the MODGRI) block in the bottom rear of the cabinet.
5. These are the GRDD Bypass straps. They are 14 AWG and are used to bypass the Fan Assembly and No Carrier Adapters to the next equipment level.

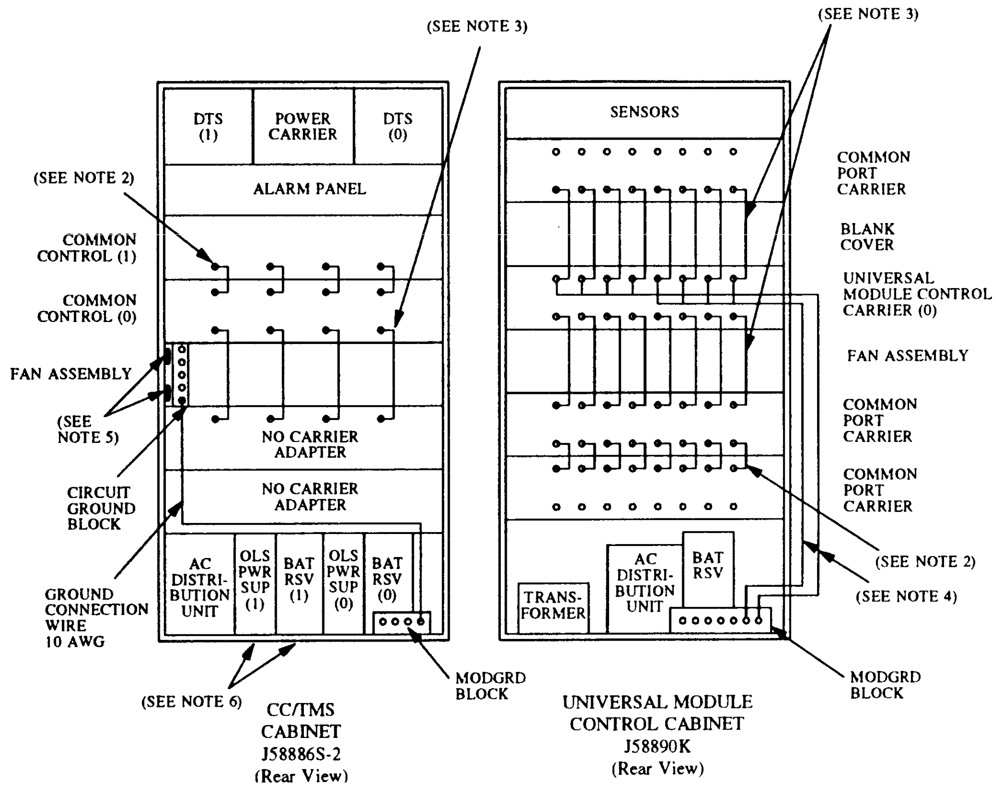
Figure 23-12. UMC GRDD, Frame Ground, and Fan Assembly Bypass Carrier Connections — AC



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. These arc the GRDD connecting lugs. There are 16 on each carrier backplane, labeled G1 through G16.
3. These are the GRDFR straps. They are 14 AWG wires. They connect to the GRDD connecting lugs and the backplane carrier mounting screws. There is no GRDFR wiring in DC powered systems.

Figure 23-13. UMC GRDFR Backplane Connections — AC



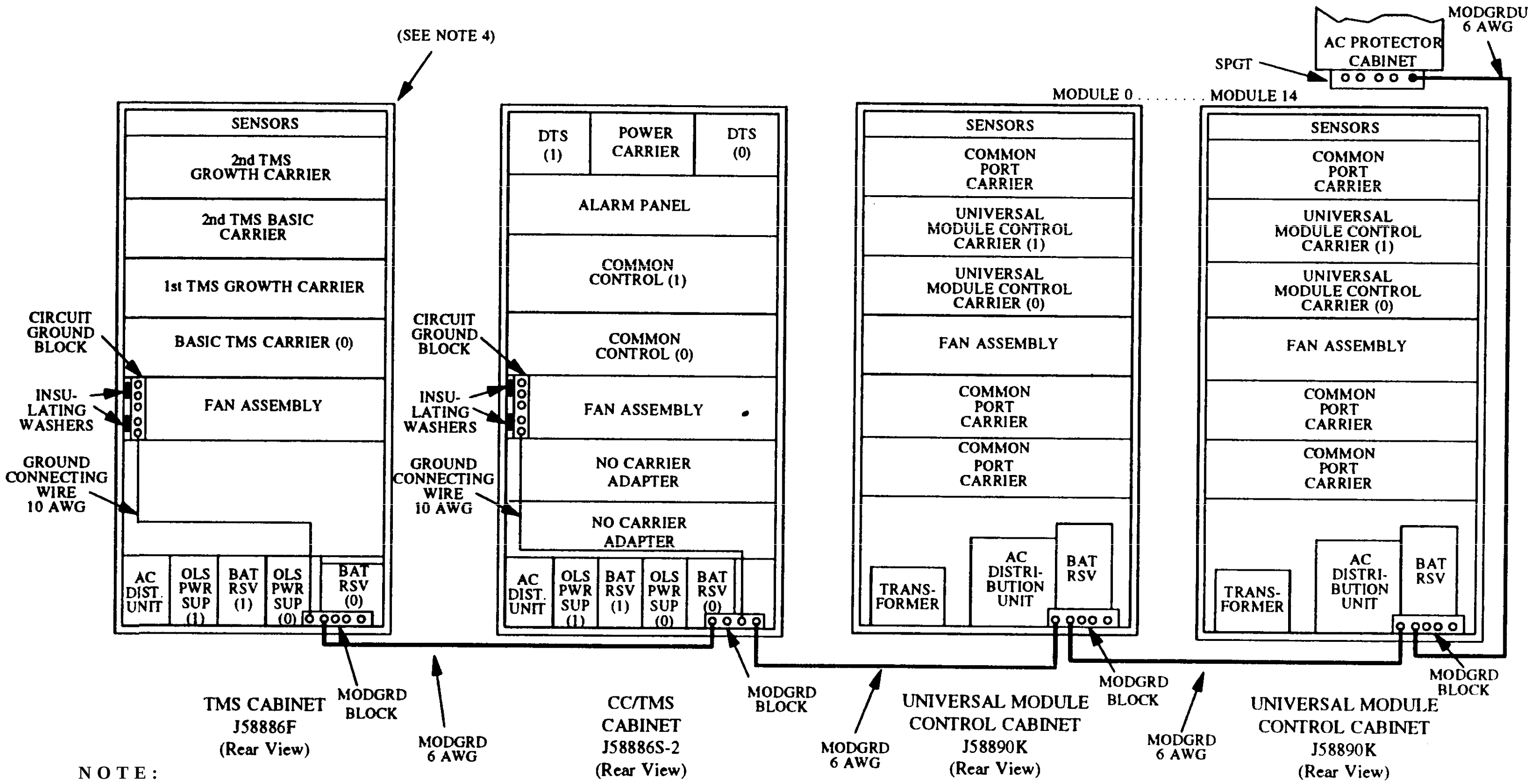
NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD straps. They are 18 AWG in the UMC and 14 AWG in the CC/TMS.
3. These are the GRDD bypass straps. They are 14 AWG in the UMC and 10 AWG in the CC/TMS. They are used to bypass the fan assembly and the blank cover to the next equipment level.
4. In addition to the GRDD bypass straps, a 14 AWG wire is connected to each of the GRDD lugs on the bottom section of the UMC backplane (G9-G16). These eight wires are gathered into two bundles (four wires each) and connected to the MODGRD block in the bottom rear of the cabinet.

s. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the mounting screws and the block. and the block and the frame.

6. The second OLS power supply and battery reserve are only required in duplicated CC/TMS cabinets

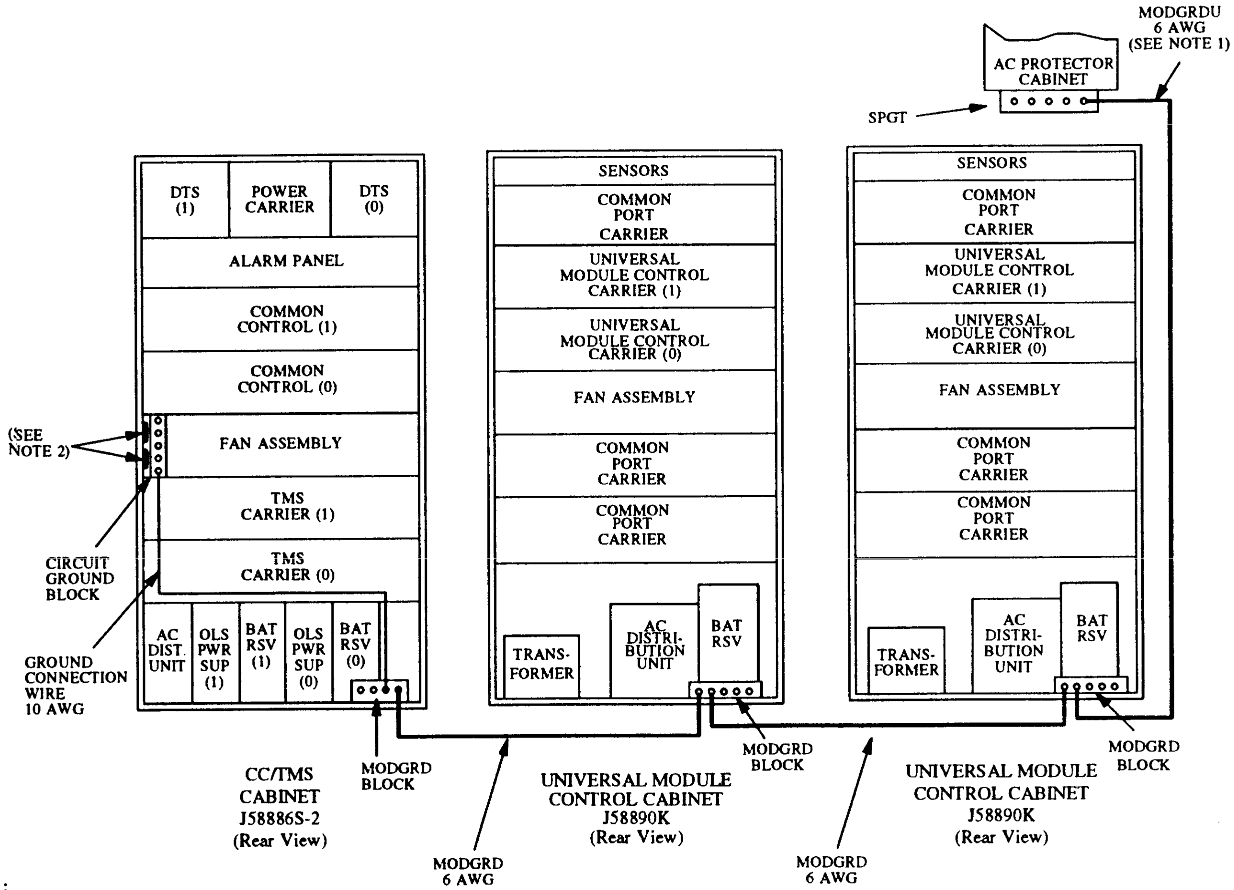
Figure 23-14. GRDD Cabinet Connections for the CC/TMS and UMC Cabinets — AC



N O T E :

1. Green wire ground for the AC power cords is connected to the AC Distribution Unit, and is connected to the frame through the mounting bolts.
2. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the mounting screws and the block, and the block and the frame.
3. MODGRDU is routed from the MODGRD block of the cabinet closest to the SPGT.
4. These are newly manufactured TMS and CC cabinets containing MODGRD blocks in the rear of the cabinet base. If a traditional CC and TMS cabinet do not have the MODGRD block. hut only the fan assembly level circuit ground block, do not connect them to the UMC cabinet.

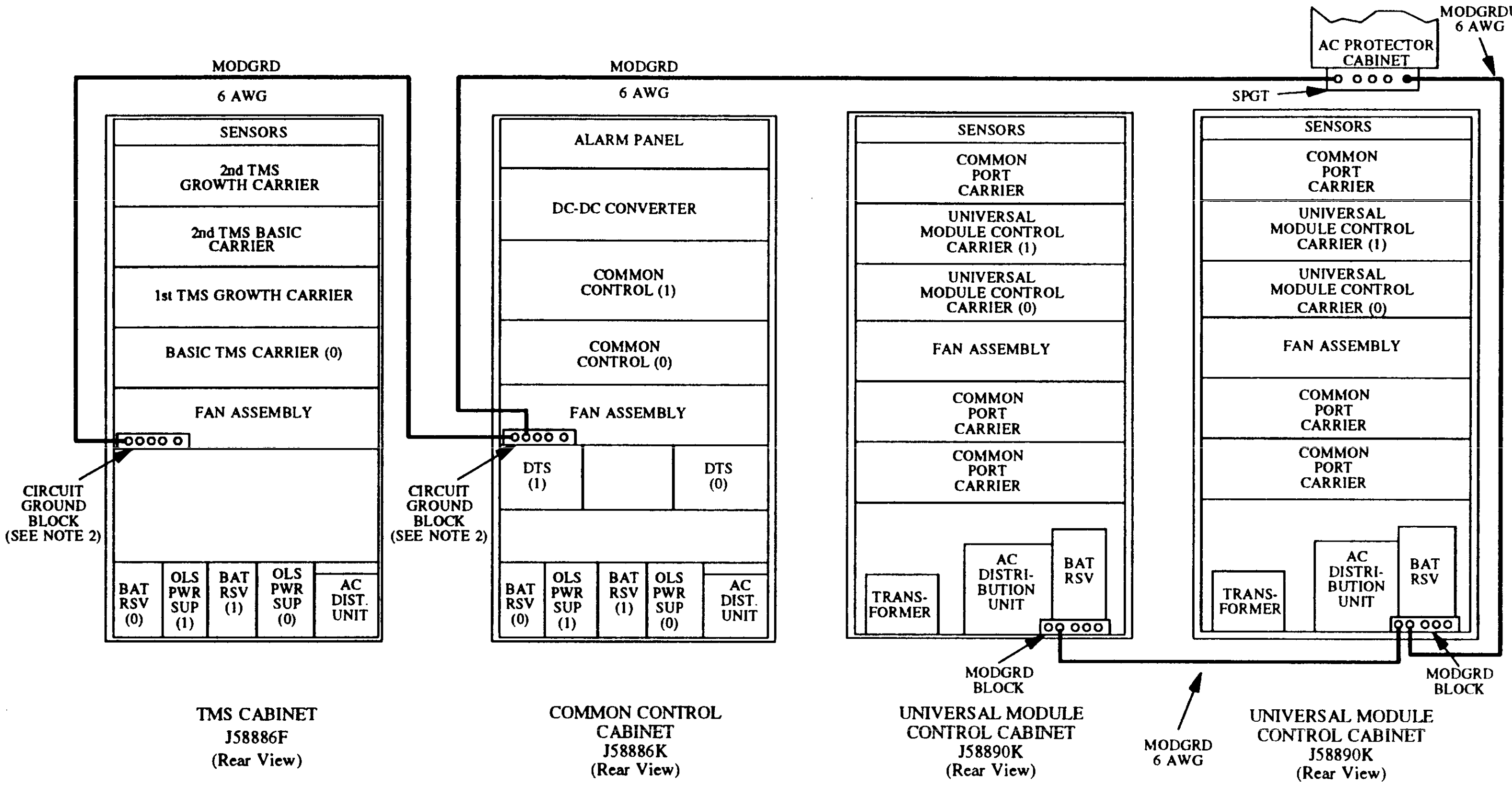
Figure 23-15. MODGRDU for CC/TMS, UMC, and New TMS Cabinets



NOTE:

1. MODGRDU is routed from the MODGRD block of the cabinet closest to the SPGT.
2. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the mounting screws and the block, and the block and the frame.

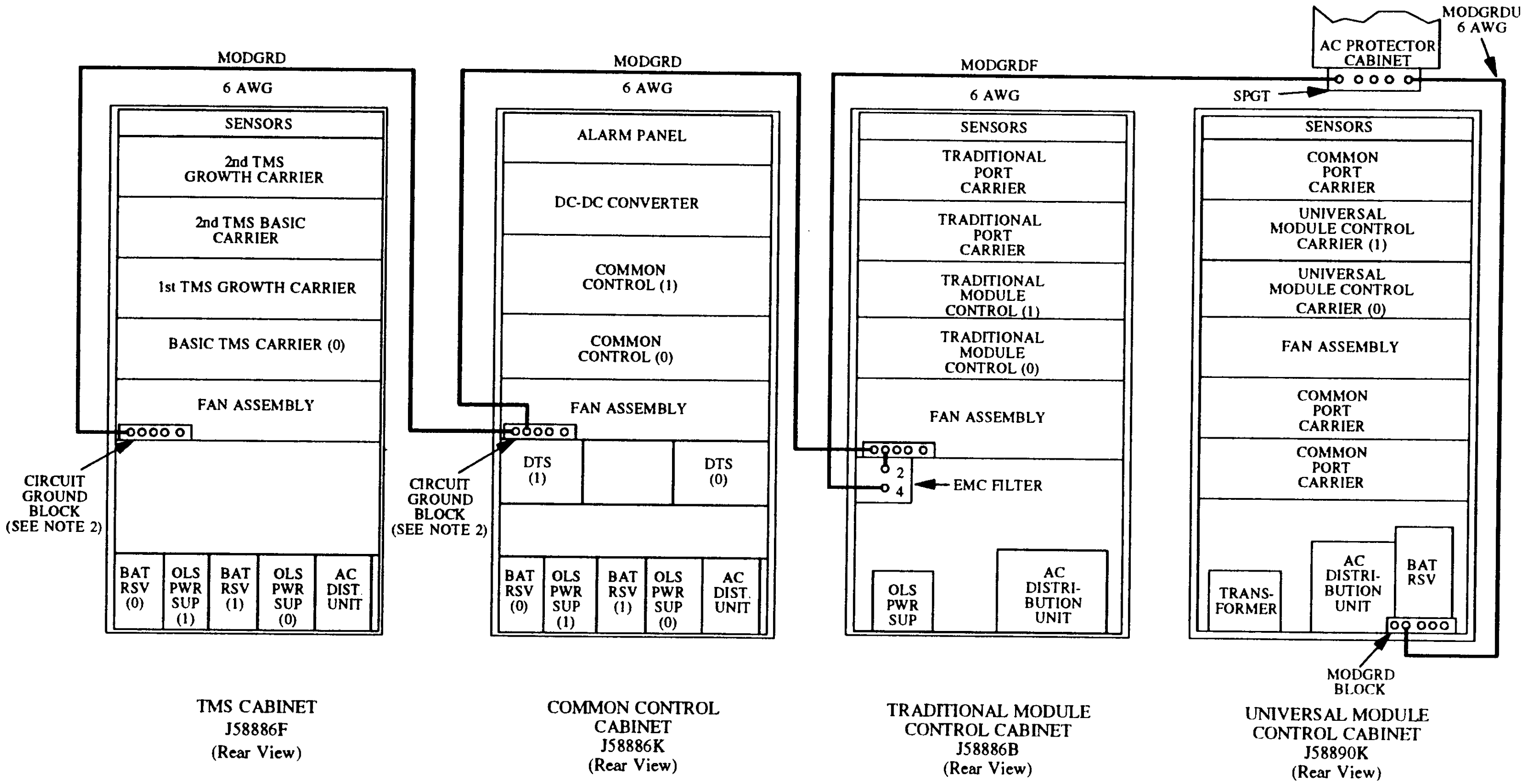
Figure 23-16. MODGRDU for CC/TMS and UMC Cabinets



NOTE:

1. Green wire ground for the AC power cords is connected to the AC Distribution Unit, and is connected to the frame through the mounting bolts in UMC cabinets.
2. MODGRD is routed from the circuit ground block of the nearest traditional cabinet to the SPGT.
3. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the mounting screws and the block, and the block and the frame.
4. MODGRDU is routed from the MODGRD block of the UMC cabinet closest to the SPGT.

Figure 23-17. MODGRDU and MODGRD for UMC, Traditional CC, and TMS Cabinets



NOTE:

1. Green wire ground for the AC power cords is connected to the AC Distribution Unit, and is connected to the frame through the mounting bolts in UMC cabinets.
2. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the mounting screws and the block, and the block and the frame,
3. MODGRDU is routed from the MODGRD block of the UMC cabinet closest to the SPGT.
4. MODGRDF is routed from the circuit ground block of the nearest traditional cabinet to the SPGT.
5. MODGRD is only connected between traditional cabinets and the SPGT. It is never connected to UMC cabinets.

Figure 23-18. MODGRDU, MODGRD, and MODGRDF for UMC, Traditional CC, TMS, and Module Cabinets

24. DC POWER AND GROUNDING

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GENERAL INFORMATION ON STANDBY POWER SYSTEMS

Standby Power Systems were formerly known as Extended Power Reserve systems. There are two types of Standby Power systems:

- Uninterruptible Power System (UPS)
- Direct Current Standby Power Systems (DCSPS)

There are only minor differences between the installation of DC power wires for System 85 and DEFINITY Generic 2. However, there are major grounding differences between the two systems for Standby power. Do not attempt the installation of a Generic 2 system by basing the installation on past experience with System 85.

UPS Systems

The UPS system normally operates from a commercial AC input supply and provides AC power, rather than DC power, to the system.

The AC input supply is normally supplemented by some type of power backup, usually an AC generator or battery cabinet.

If the system has a generator, it automatically goes into operation if the commercial AC input supply is lost, providing backup AC power to the system.

If the system has a battery cabinet for backup, it provides backup DC power to a set of AC inverters that converts the DC input to AC output.

The information on UPS systems is included in this chapter because the back-up power for the system may be provided by a DC power source (battery plant). However, since the cabinet connections are AC, follow the instructions in Chapter 23 for cabinet power and ground connections. Since each of the types of UPS systems have variations, to install the actual UPS and its power backup system (either the battery cabinet or generator), refer to the accompanying system documentation.

These documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-429-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

A point-to-point wiring connection check for power and ground cables, as well as for the connections to the generator or battery cabinet, is mandatory.

The remaining information in this chapter is based on the installation of a complete DCSPS.

DCSPS Systems

The DCSPS normally operates from a commercial AC input supply. The input supply is connected to a set of batteries. The batteries are in parallel with rectifiers that convert the AC input to a DC output.

AC inverters may be connected to the battery supply through suitable circuit breakers for cabinets that require AC power.

As long as the AC input supply is available, the system operates off the AC powered rectifiers with a DC output. If the AC input supply is not available for any reason, the system immediately begins to draw power directly from the batteries. The powered system continues to operate until the AC input supply is restored or the battery voltage falls below 43.00 volts.

These documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-429-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

BATTERY PLANT

The battery plant typically consists of the following items:

- DC control cabinet
- Battery cabinets
- Rectifier cabinets
- System controller
- Inverter cabinet (if necessary)

There are variations for each type of system, including type of equipment and terminology. Ensure that you use the correct documentation for installing the equipment at your site since the information in this chapter is only typical of a DC system.

A typical battery plant is shown in figure 24-1. Refer to this figure while reading the following sections for identifying the battery plant components.

DC Control Cabinet

The DC control cabinet contains the ground discharge bar (GRDB), the charge ground bus (which is connected to the GRDB by a shunt), the DC circuit breaker panel, the battery bus, and the AC load center (if necessary). It controls the power supplied to the cabinets. For example, if the AC input supply is available, it ensures cabinet power is supplied from the rectifier cabinets, but if the AC input supply is lost, the system switches over to the battery cabinets for power.

Battery Cabinets

The battery cabinets contain the batteries for back-up power if the AC input power supply is lost. The number of battery cabinets is dependent on the number of batteries required for the load and the amount of time that back-up power must be available.

The positive terminals of the individual batteries are connected to the charge ground bus through a DC circuit breaker. The negative terminals of the individual batteries are directly connected to the battery bus.

Rectifier Cabinets

The rectifier cabinets receive the AC input supply and convert it to a DC output.

The positive terminals of the individual rectifiers connect to the charge ground bus. The negative terminals of the individual rectifiers connect to the battery bus. The rectifiers are in parallel with the batteries.

System Controller

The AC input supply is connected to the system controller. The AC output of the controller is supplied to the inputs of the individual rectifiers.

Inverter Cabinet

The inverter cabinet is only included in a system that requires AC power for auxiliary and data cabinets.

An inverter cabinet is normally powered by the DC output of the rectifiers unless system input power is lost. If this happens, the inverter cabinet is provided with power from the batteries. In either case, the inverter input power is DC and the output power is AC.

The positive terminal of the inverter input is directly connected to the charge ground bus. The negative terminal of the inverter input is connected to the battery bus through a DC circuit breaker. The inverter is connected to the cabinet lineup through an AC load center located in the DC control cabinet.

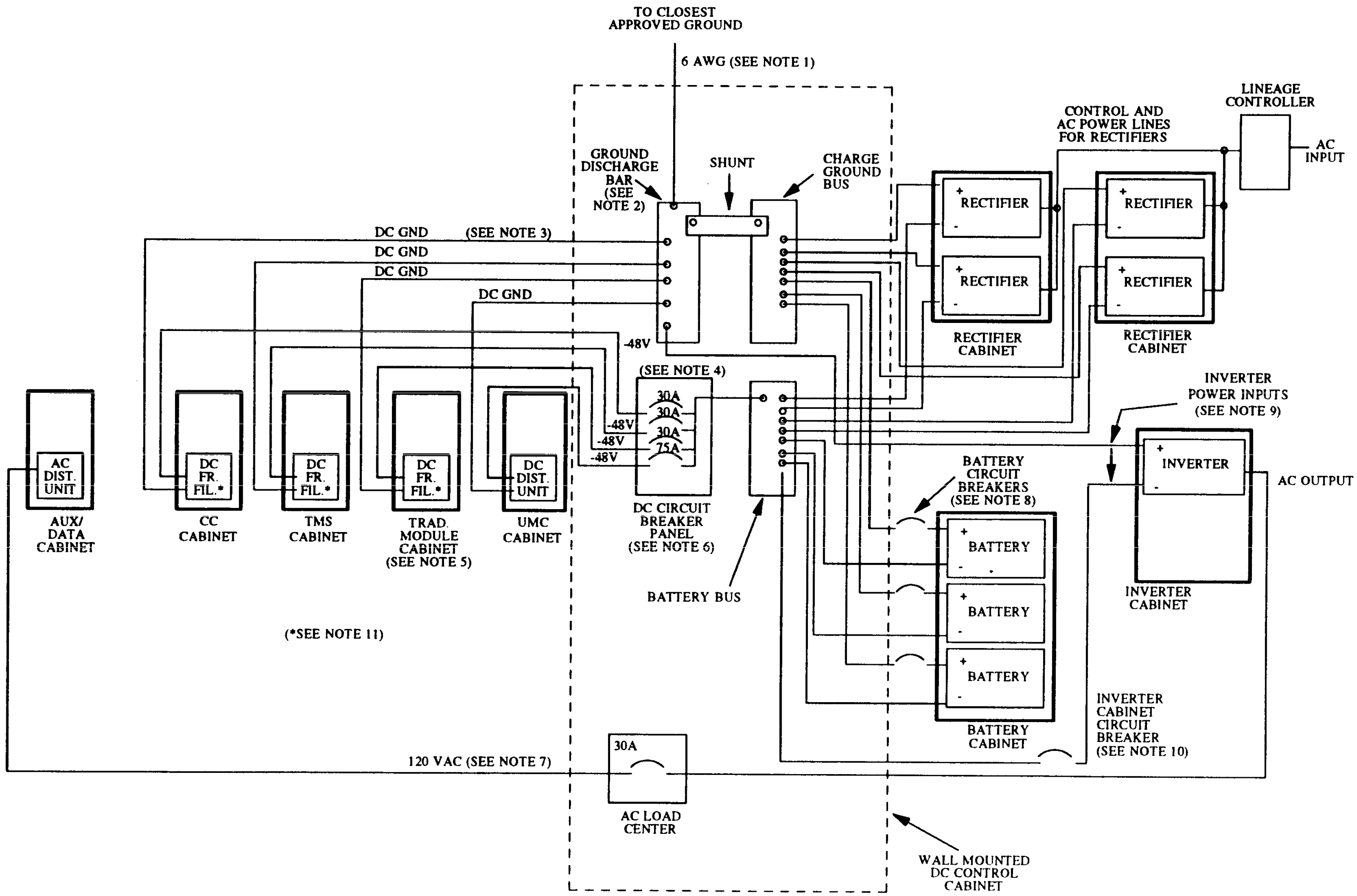


Figure 24-1. Typical Battery Plant for DC Systems

NOTES FOR FIGURE 24-1:

1. The size of the ground wire must be the same size as the largest conductor in the system, but no smaller than 6 AWG. For example, if the -48V power wire is a 2 AWG and that is the largest conductor in the system, then the ground wire from the ground discharge bar to the closest approved ground would be changed from 6 AWG to 2 AWG.
2. The ground discharge bar serves as the system single point ground for DC systems.
3. There is a DC GRD wire connected to the DC frame filter in all cabinets that connects back to the ground discharge bar except for the UMC cabinet. The UMC cabinet contains a DC distribution unit instead of a DC frame filter. The gauge of the DC GRD wire is 1 AWG for the UMC and CC/TMS cabinets. The gauge of the DC GRD wire is 2 AWG for the traditional module cabinets and the separate CC and TMS cabinets.
4. There is a -48V power wire connected to the DC frame filter or DC distribution unit in each cabinet that connects to the DC circuit breaker panel. There is an additional -48V power wire if the cabinet has a duplicated DC frame filter. There is only one -48V power wire for duplicated UMC cabinets. The gauge of the -48V power wire is 1 AWG for the UMC and CC/TMS cabinets. The gauge of the -48V power wire is 2 AWG for the traditional module cabinets and the separate CC and TMS cabinets.
5. Only one traditional module cabinet is shown in this figure due to space constraints.
6. The DC circuit breaker panel consists of 30 amp circuit breakers for traditional module cabinets and the CC and TMS cabinets. For traditional modules that contain more than 40 MFAT/DS1 circuit packs, a 50 amp circuit breaker is required. There is an 75 amp circuit breaker for the UMC cabinet. There is one circuit breaker for each power wire suppled to a cabinet. There is an additional breaker for cabinets with duplicated power wires.
7. The 120 VAC power wire only connects to aux/data cabinets in a DCSPS. The amperage of the AC circuit breaker is typically 30 amps, but varies depending on load requirements. The power wire connects to an AC distribution unit in the cabinet. If there are no aux/data cabinets in the system, the AC load center and the inverter are not included in the battery plant.
8. The battery circuit breakers are ganged together and their amperage varies depending on the load requirements.
9. The inverter is DC powered via the charge ground bus and the battery bus and has an AC output only for aux/data cabinets.
10. There is an inverter circuit breaker with an amperage rating that varies with load requirements.
11. DC FR. FIL. represents the DC frame filter. The DC frame filter provides the power and ground connection points in DC powered systems except for the UMC cabinet.

SYSTEM GROUNDING

The system single-point ground for a DC system consists of the ground discharge bar (GRDB) in the battery plant. The GRDB is physically located within the wall mounted DC control cabinet. It is connected to the closest approved ground with a conductor no smaller than the largest conductor within the system, but never smaller than a 6 AWG wire. For example, if the -48 V power wire is a 2 AWG conductor, then the wire from the GRDB to the closest approved ground must be no smaller than 2 AWG. However, that wire must never be smaller than 6 AWG if the largest conductor in the system is smaller than 6 AWG.

Figure 24-2 shows the ground wire tag that must be connected to the ground connection.

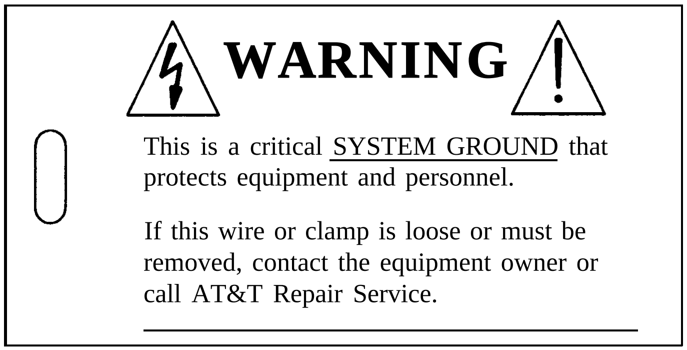


Figure 24-2. AT&T Ground Wire Tag

Each DC cabinet must be connected to the GRDB by an individual DC GRD return wire. The GRDB is connected by a shunt to the charge ground bus.

The charge ground bus is directly connected to the positive terminals of the rectifiers and to the positive terminals of the batteries through DC circuit breakers.

The GRDB is also connected to the closest approved ground. The connection wire size is dependent on size of the largest conductor within the system. For example, if the -48V power wire is the largest conductor within the system, and it is a 2 AWG wire, then the connection wire from the GRDB to the closest approved ground must be no smaller than 2 AWG. In no circumstances must the connection wire be smaller than 6 AWG, even if the largest conductor within the system is smaller than 6 AWG.

Traditional module and port cabinets that are used with DEFINITY have the same power and ground connections as System 85 cabinets. Refer to *Chapter 9* for the correct grounding scheme for these cabinets.

Newly manufactured TMS/RMI cabinets designed to be used with DEFINITY have the same power and grounding scheme as the CC/TMS cabinet.

VERIFICATION OF GROUND ISOLATION

The verification of ground isolation in the cabinets must be done before you connect the -48V power wires and DC GRD return wires.

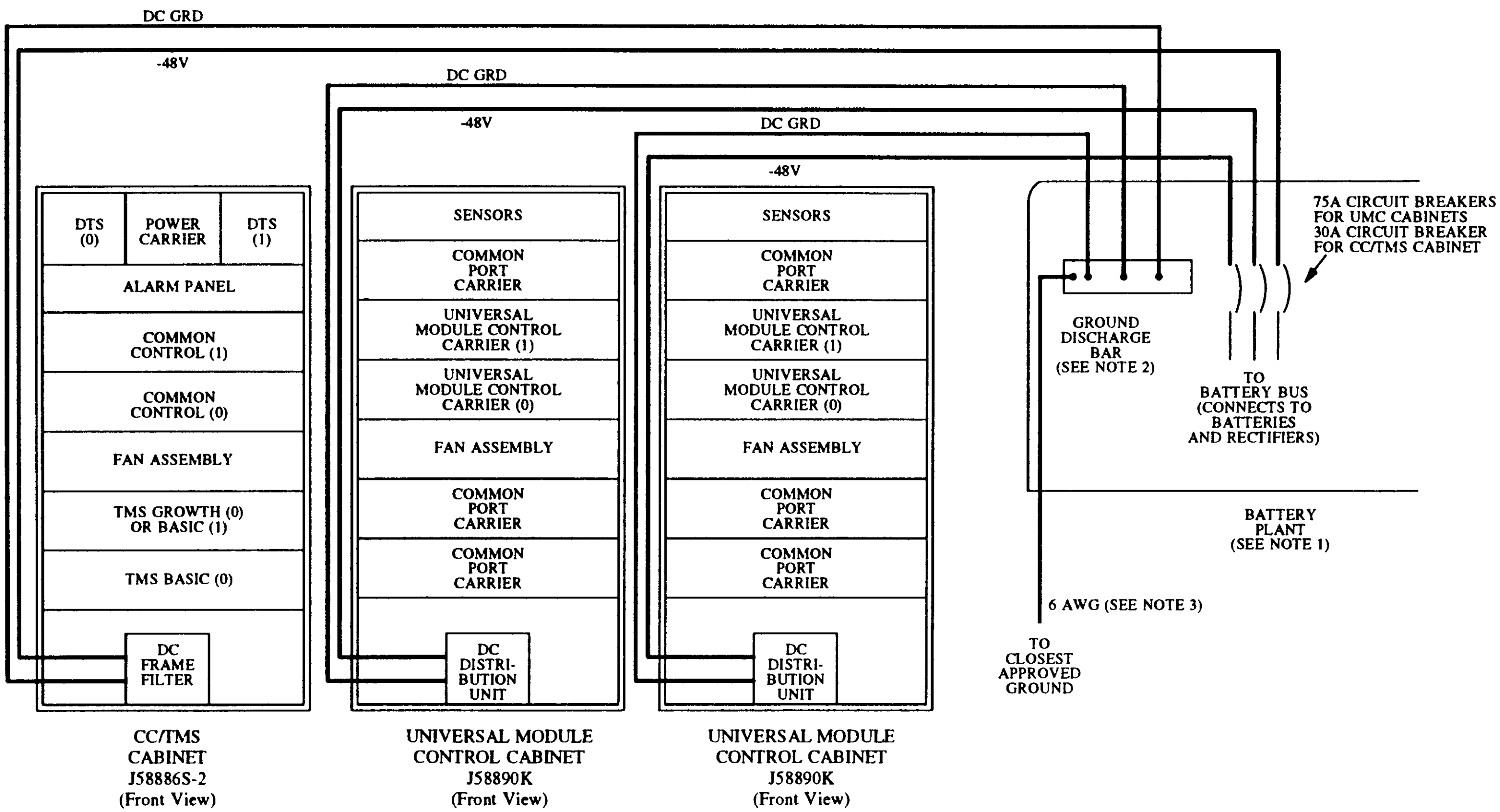
The verification is done by doing a continuity test between the circuit ground block and the frame in the CC/TMS cabinet and the equalization ground block and the frame in the UMC cabinet. There should be an "open" reading on the ohmmeter if the system is correctly isolated.

If there is continuity between the ground blocks and the frame, do not proceed with the installation until the problem is corrected. Check with your FAST representative for methods to correct this problem.

POWER AND GROUNDING WIRES

All DC cabinets have individual -48V power and DC GRD return wires. For some cabinets with high power consumption, there may be two -48V power wires, but in these cases, there is still only one DC GRD return wire.

Figure 24-3 shows a typical routing scheme for -48V power and DC GRD return wires.



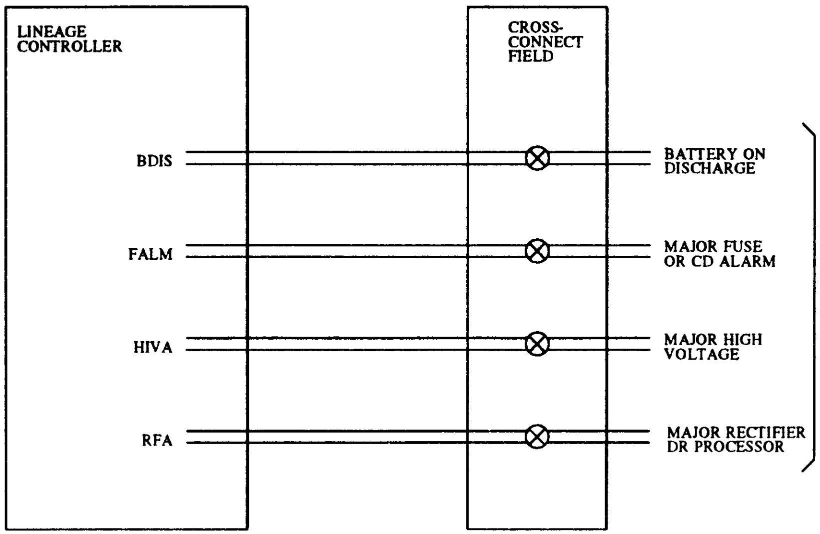
NOTES:

1. This is only a partial view of the battery plant. For a detailed view showing the total system, see figure 24-1.
2. The ground discharge bar serves as the system single point ground terminal for DC systems.
3. The size of the ground wire must be the same size as the largest conductor in the system, but no smaller than 6 AWG. For example, if the -48V power wire is a 2 AWG and that is the largest conductor in the system, then the ground wire from the ground discharge bar to the closest approved ground would be changed from 6 AWG to 2 AWG.

Figure 24-3. DC Power and Ground Wire Routing

BATTERY PLANT ALARM CONNECTIONS

Typical alarm connections for battery plants are shown in figure 24-4.



See the "External Alarms" part of the auxiliary and data cabinet installation manual for the remote alarm connections to the TN492C remote interface circuit.

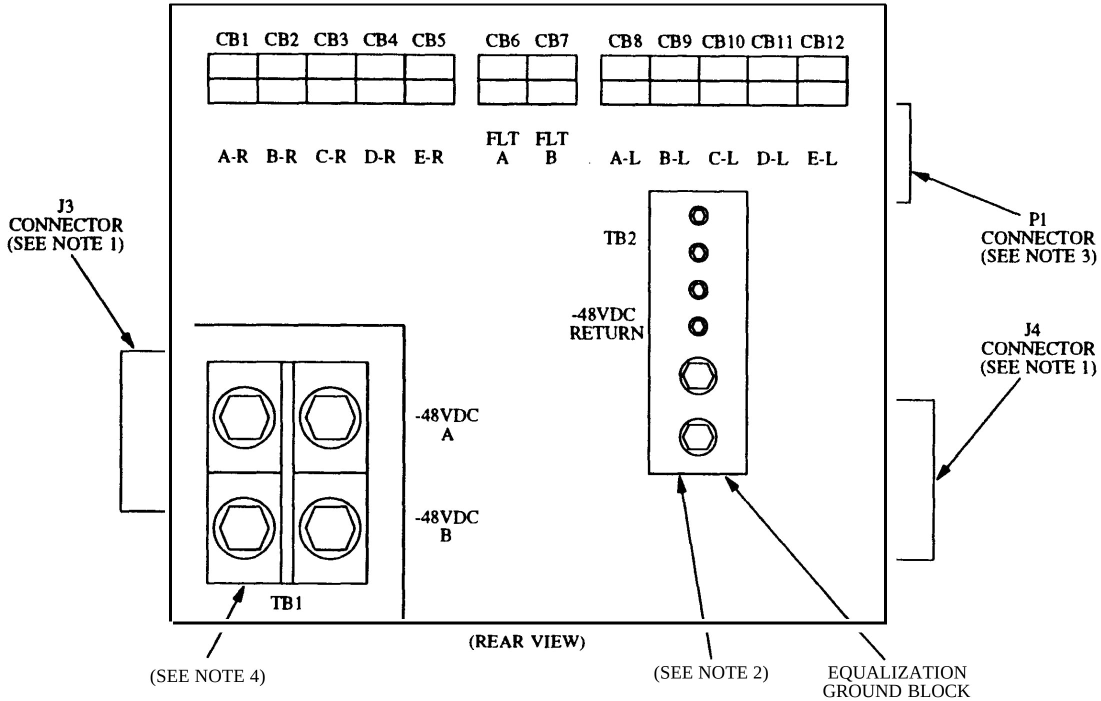
Figure 24-4. Battery Plant Alarm Connections

UMC CABINET POWER AND GROUNDING

The most significant differences in the grounding arrangement between the UMC cabinet and a traditional module or port cabinet are:

- The UMC cabinets do not have a lightning ground
- The UMC cabinets do not have an equalization ground wire interconnecting cabinets
- There are no EMC filters in the UMC cabinets
- Circuit ground (GRDD) is isolated from the cabinet frame in the DC-powered UMC cabinets
- The equalization ground block located on the rear of the DC distribution unit is isolated from frame ground
- The UMC cabinets use a DC distribution unit instead of a DC frame filter for power and ground connections

Only one -48V power wire and one DC GRD return wire are used for UMC cabinets. The -48V power wire connects to the -48VDC A terminal on TB1 of the DC distribution unit. Do not use the -48VDC B terminal on TB1 for power wire connections. The DC GRD return wire connects to the equalization ground block (-48VDC RETURN). Figure 24-5 shows the DC distribution unit.



NOTES

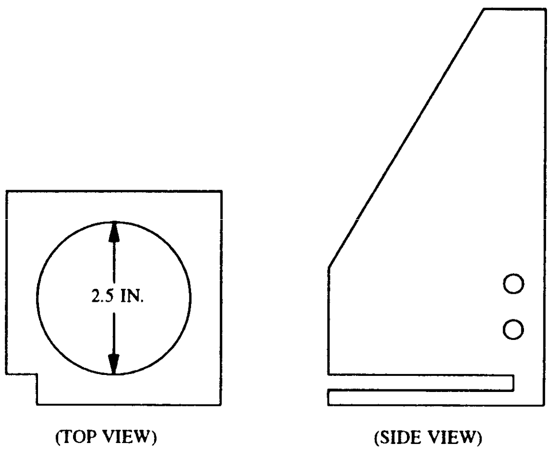
1. These connect to the cabinet power harnesses,
2. The equalization ground block is insulated from the cabinet frame inside the DC distribution unit.
3. This connects to the alarm cable harness.
4. Connect the -48V power line to the left terminal of the -48VDC A connectors on TB1.
5. Connect the DC GRD return line to either of the two large terminals on the equalization ground block (TB2).

Figure 24-5. DC Distribution Unit

DC Conduit Connector

The UMC cabinet contains a DC conduit connector. This connector has a 2.5 inch opening that allows you to use locally procured reducer rings to connect various sizes of conduit to the cabinet. Connect the reducer ring to the conduit connector and then connect the power and ground wire conduit to the reducer ring.

Figure 24-6 shows the conduit connector. Figure 24-7 shows how the connector is inserted into the power cable trough at the rear of the cabinet. Fasten the connector in place with the provided hardware.



NOTE:
Reducer rings must be locally procured for sizing the conduit connector to the conduit used for power and ground cables.

Figure 24-6. DC Conduit Connector

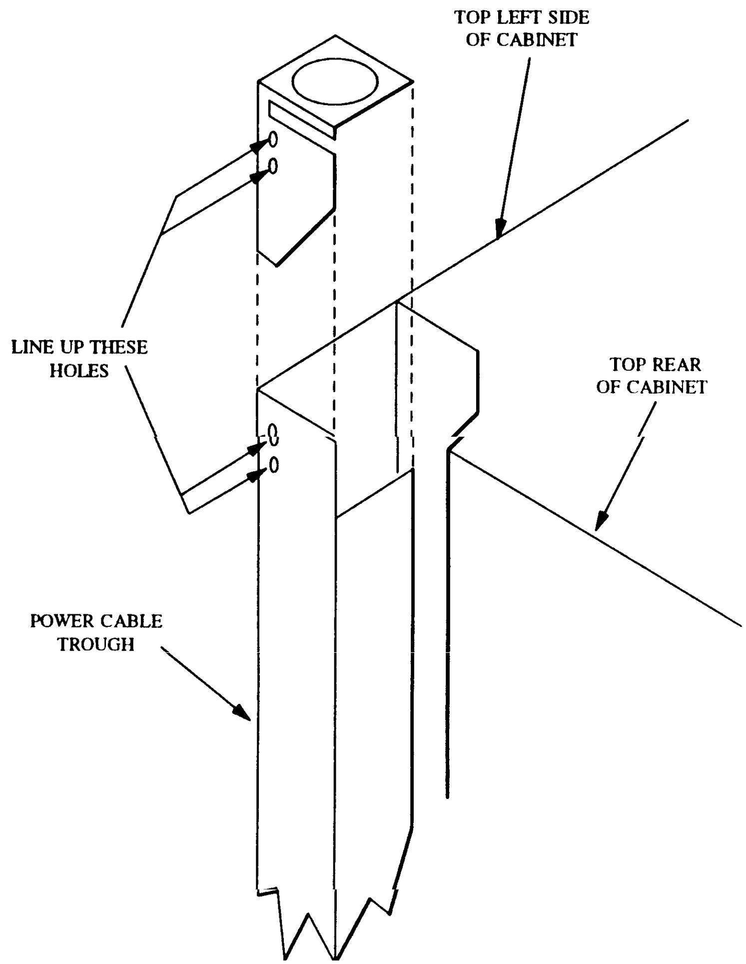
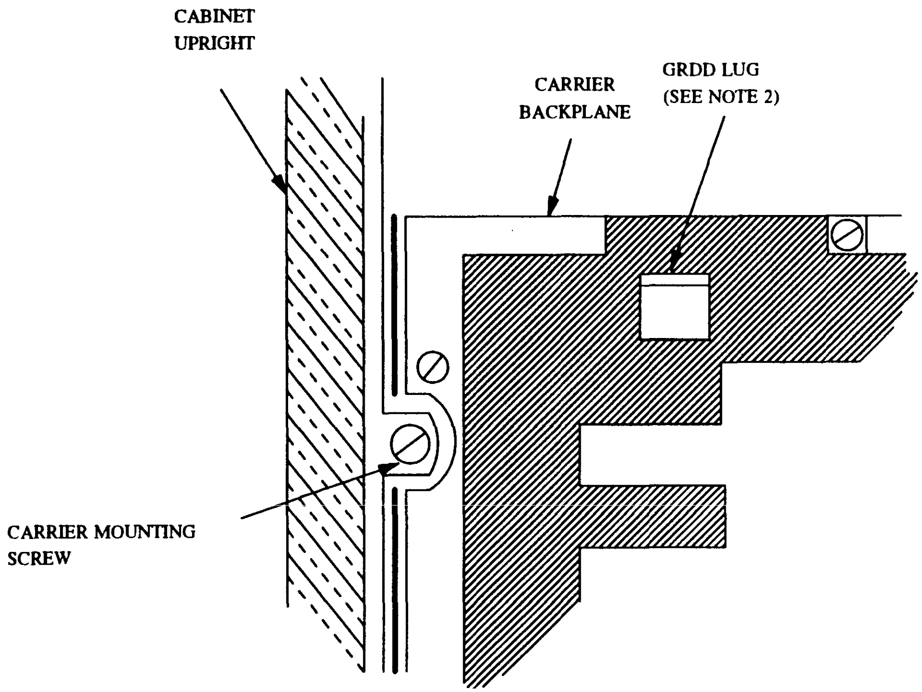


Figure 24-7. Mounting the DC Conduit Connector (Left Rear-Facing)

UMC Cabinet GRDD Connections

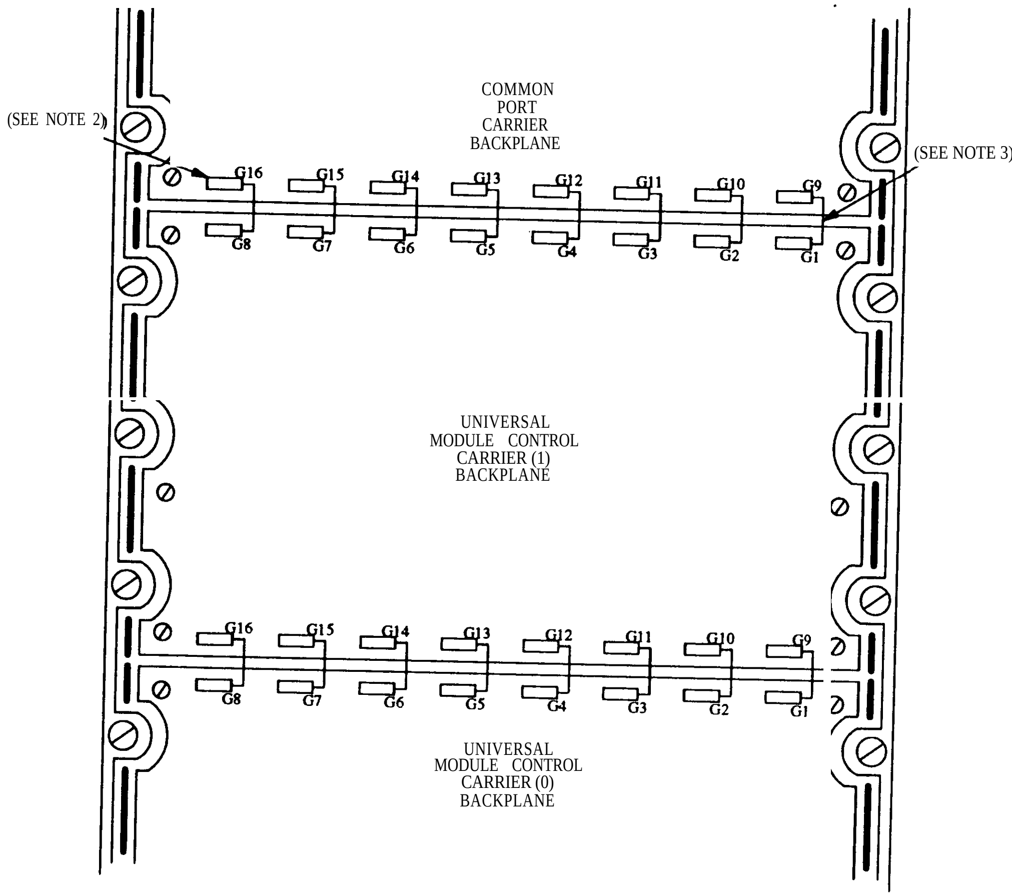
Figures 24-8 through 24-11 show the GRDD connection points and GRDD wiring scheme for the UMC cabinet. The wiring is factory installed, but should be verified during the installation.



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. There are 16 GRDD lugs on the backplane, eight on the top of the backplane and eight on the bottom of the backplane. They are labled G1 through G16, from right to left, top to bottom.

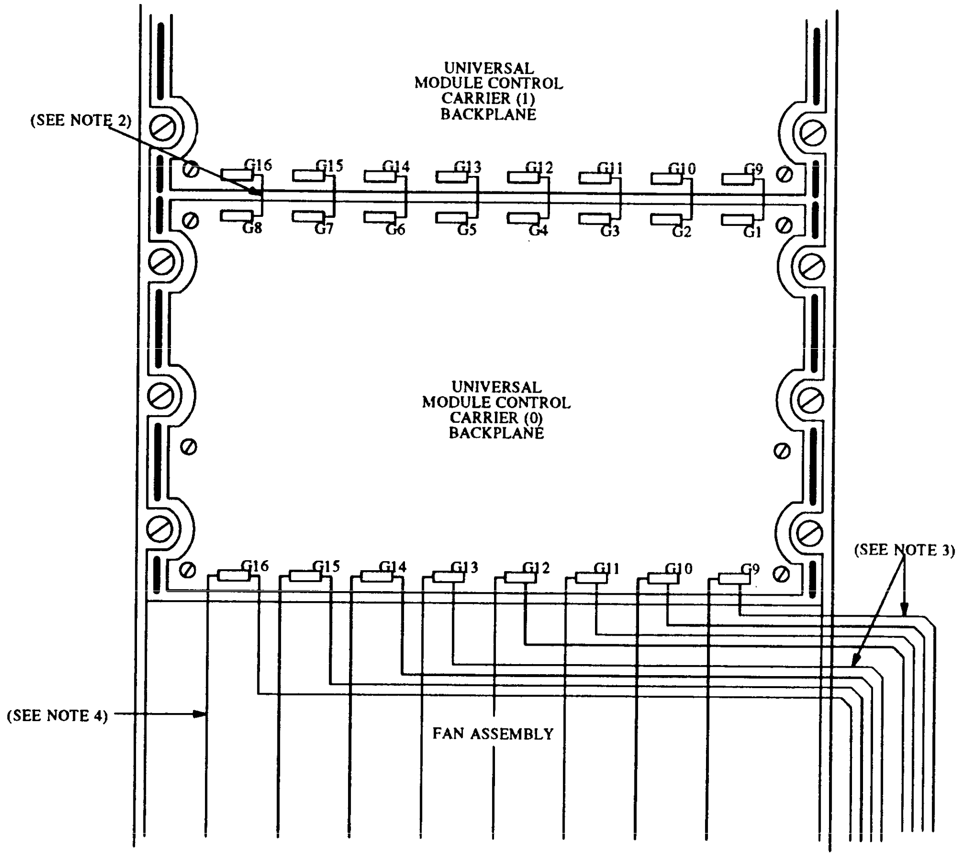
Figure 24-8. GRDD Backplane Connections



NOTES:

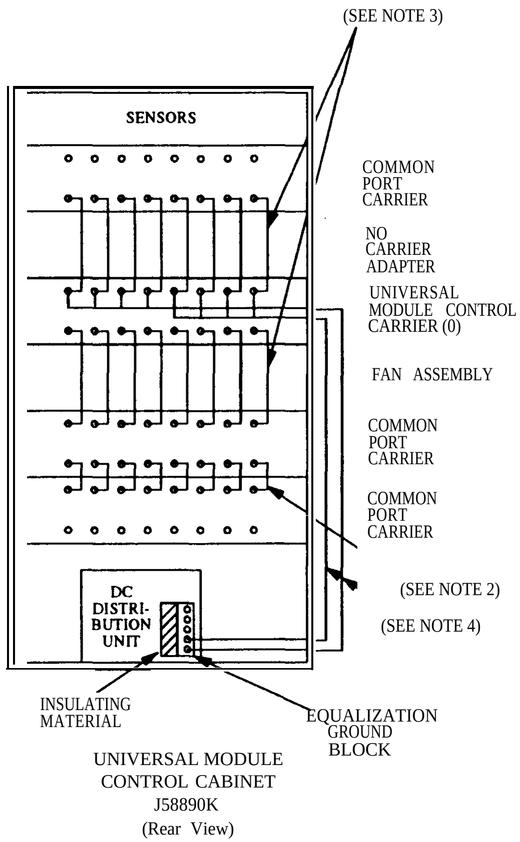
1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD connecting lugs. There are 16 on each carrier backplane, labeled G1 through G16.
3. These are the GRDDD straps. They are 18 AWG wires.

Figure 24-9. UMC GRDD Carrier Connections



1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD straps. They are 18 AWG.
3. These are 14 AWG wires connected to each of the GRDD lugs on the bottom section of the UMC 0 carrier backplane. The eight wires are gathered into two bundles (four wires each) and connected to the equalization ground block in the bottom rear of the cabinet on the DC Distribution Unit.
4. These are the GRDD bypass straps. They are 14 AWG and are used to bypass the fan assembly and no carrier adapters to the next equipment level.

Figure 24-10. UMC GRDD and Fan Assembly Bypass Carrier Connections — DC



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD straps. They are 18 AWG.
3. These are the GRDD bypass straps. They are 14 AWG and are used to bypass the fan assembly and the no carrier adapters to the next equipment level.
4. In addition to the GRDD Bypass straps, a 14 AWG wire is connected to each of the GRDD lugs on the bottom section of the UMC carrier (0) backplane (G9-G16). These eight wires are gathered into two bundles (four wires each) and connected to the equalization ground block in the bottom rear of the cabinet on the DC Distribution Unit.

Figure 24-11. UMC Cabinet GRDD Connections — DC

CC/TMS POWER AND GROUNDING

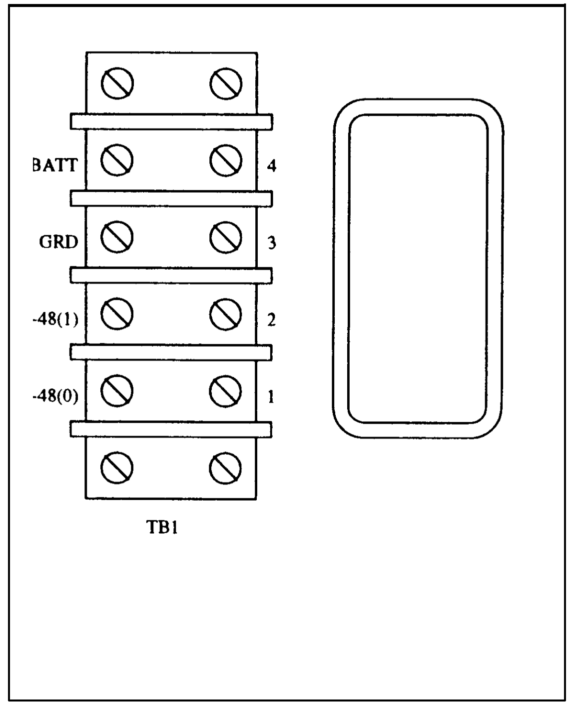
The CC/TMS cabinet has a different power and grounding scheme than the UMC cabinet.

The CC/TMS cabinet uses a DC frame filter instead of a DC distribution unit. It also has an insulated circuit ground block at the fan assembly level. Internal wiring connects to this block, which in turn connects to the ground terminal on the DC frame filter.

The CC/TMS cabinet does not have a DC conduit connector. The power and ground wires are run directly into the cabinet and connected to the DC frame filter.

Figure 24-12 shows the terminal connections for power and ground wires on the DC frame filter.

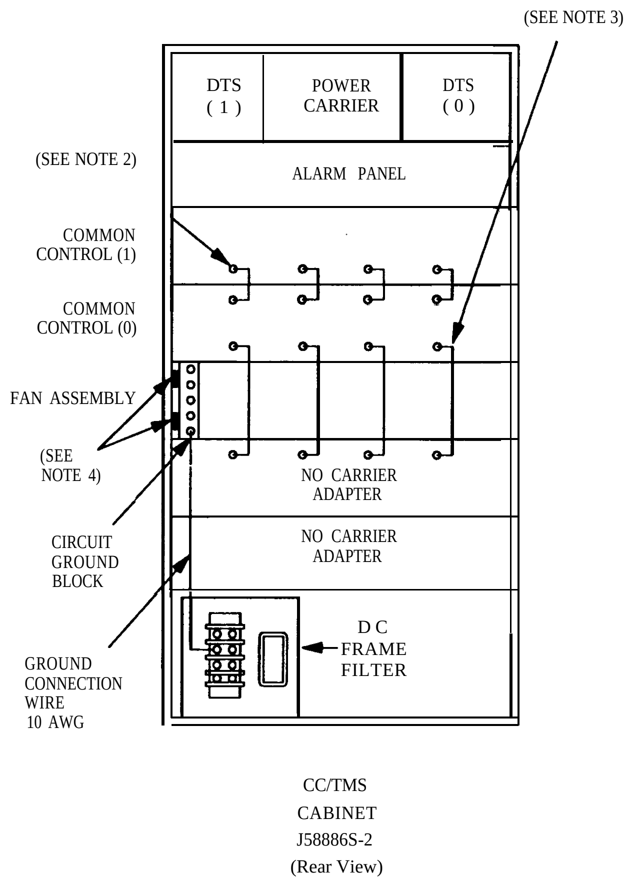
Figure 24-13 shows the CC/TMS cabinet GRDD connections.



NOTES:

1. Connect -48V power wires and the DC GRD return wires to the numbered terminal connections on the right side of TB1,
2. If only one -48V power wire is used, connect it to terminal 1. Use terminal 2 if a second -48V power wire is used, Connect both DC GRD return wires to terminal three.

Figure 24-12. DC Frame Filter



NOTES:

1. There is no installation crew wiring required for the connections shown in this figure.
2. These are the GRDD straps. They are 14 AWG.
3. These arc the GRDD bypass straps. They are 10 AWG and are used to bypass the fan assembly and the no carrier adapters to the next equipment level.
4. The circuit ground block is insulated from the cabinet frame by plastic mounting washers between the block and frame and between the head of the mounting screws and the block.

Figure 24-13. CC/TMS Internal Ground Connections — DC

INTERCABINET GROUNDING

Frame Ground

The frame ground connects all cabinets in a DC system together and then to the GRDB.

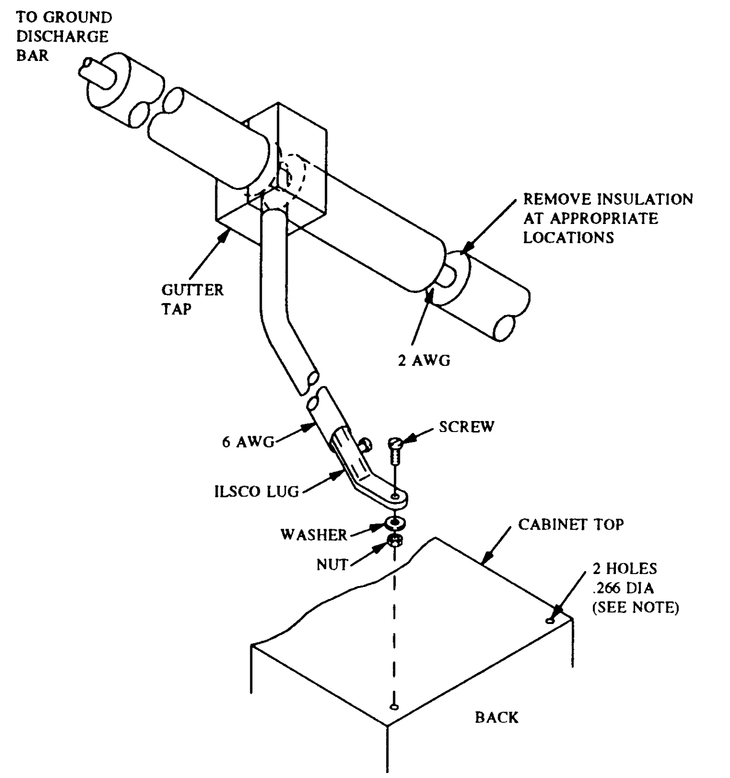
There are two sections of the frame ground. The first is a 6 AWG wire that connects the cabinet frame to the gutter tap. The second part is the gutter tap, which is a Tee shaped connector that allows you to connect two different sizes of wire. The third part is a 2 AWG wire that connects the gutter tap to the GRDB. Both the 2 and 6 AWG wires are insulated.

The connection of the 6 AWG wire to the cabinet frame requires a special connector, an ILSCO lug. Figure 24-14 shows the connection of the frame ground to a typical cabinet.

Figure 24-15 shows the interconnection of the frame ground between cabinets and the GRDB.

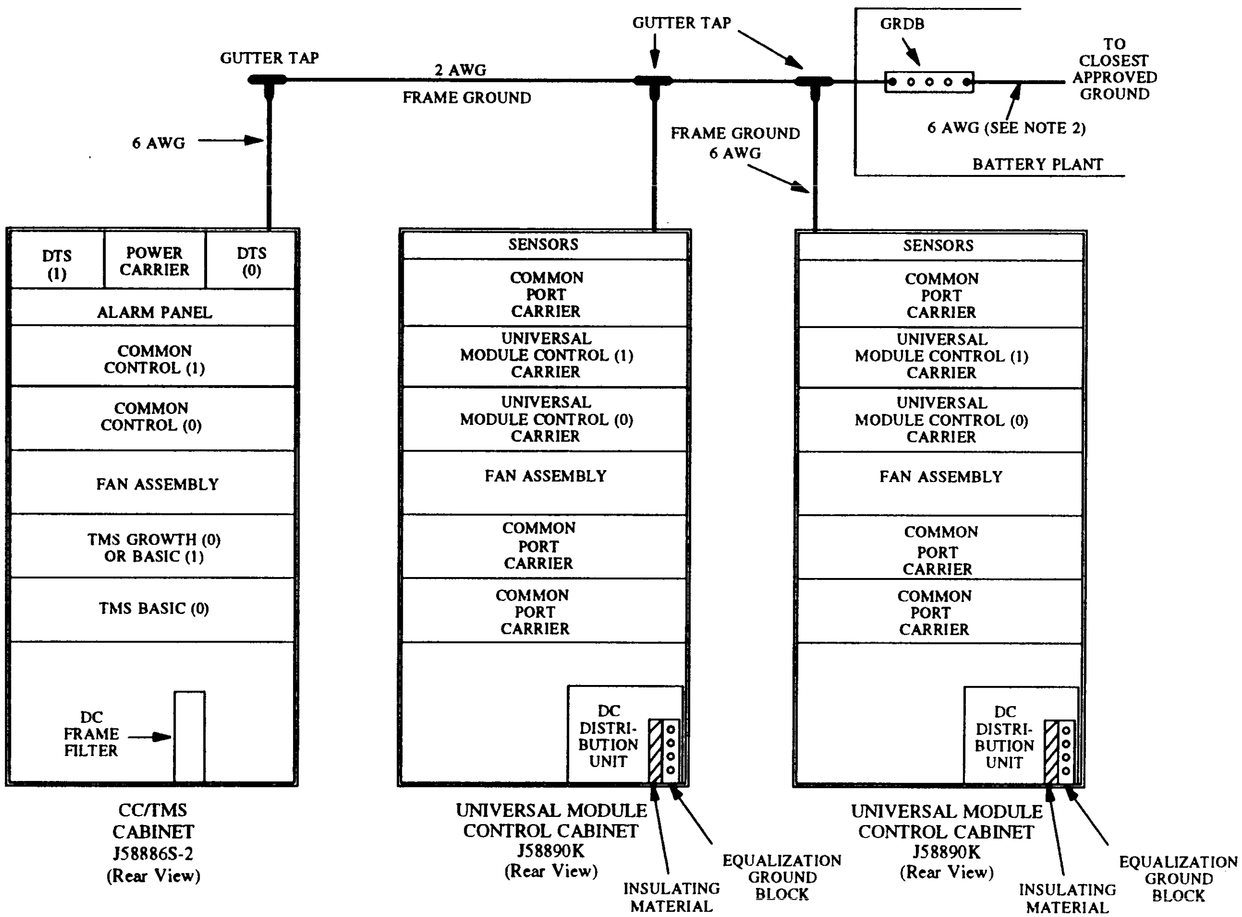
Typical DC Grounding Scheme

Figure 24-16 shows a typical DC grounding scheme that includes all of the DC power and grounding wires that you must install for the cabinets during a typical installation.



NOTE: Either hole on cabinet top may be used to connect ILSCO lug

Figure 24-14. Frame Ground Cabinet Connections



NOTE:

1. There is no frame ground for AC systems.
2. The size of the approved ground connector wire is no smaller than the largest conductor in the system, but no less than 6 AWG.

Figure 24-15. Frame Ground for CC/TMS and UMC Cabinets

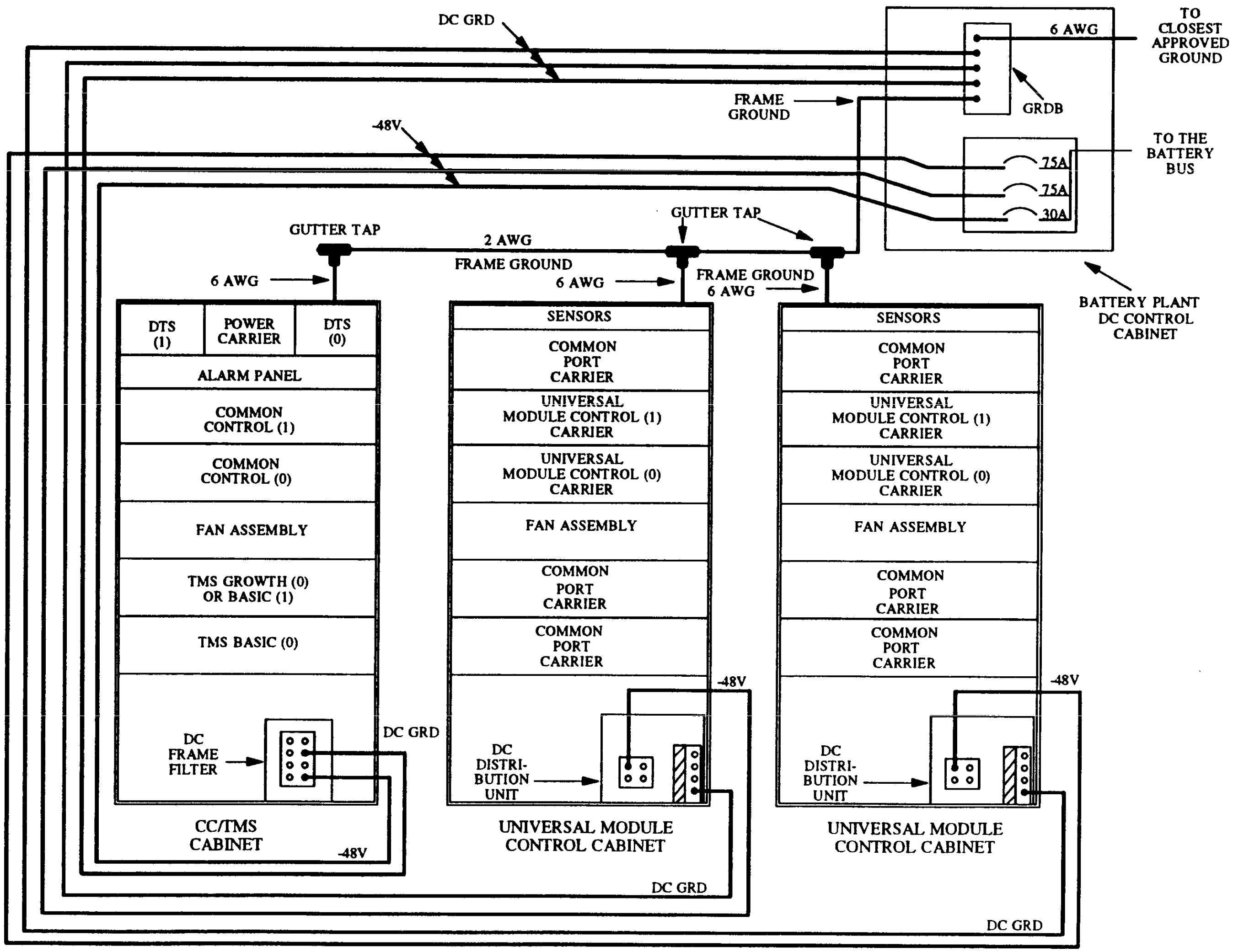


Figure 24-16. Typical DC Power and Grounding Scheme for DEFINITY Generic 2 (illustrated)

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GENERAL INFORMATION

This chapter provides general cabling information on DEFINITY G2. The information is presented by cabinet connections, rather than cabling types, such as intra-, inter-, and I/O cabling.

Centrally located universal module control cabinets (UMC) and traditional modulecontrol cabinets used G2 systems, communicate with the common control (CC) through 4-MHz cables and with the time multiplexed switch (TMS) through fiber optic links (and shielded cables for DS1 synchronization).

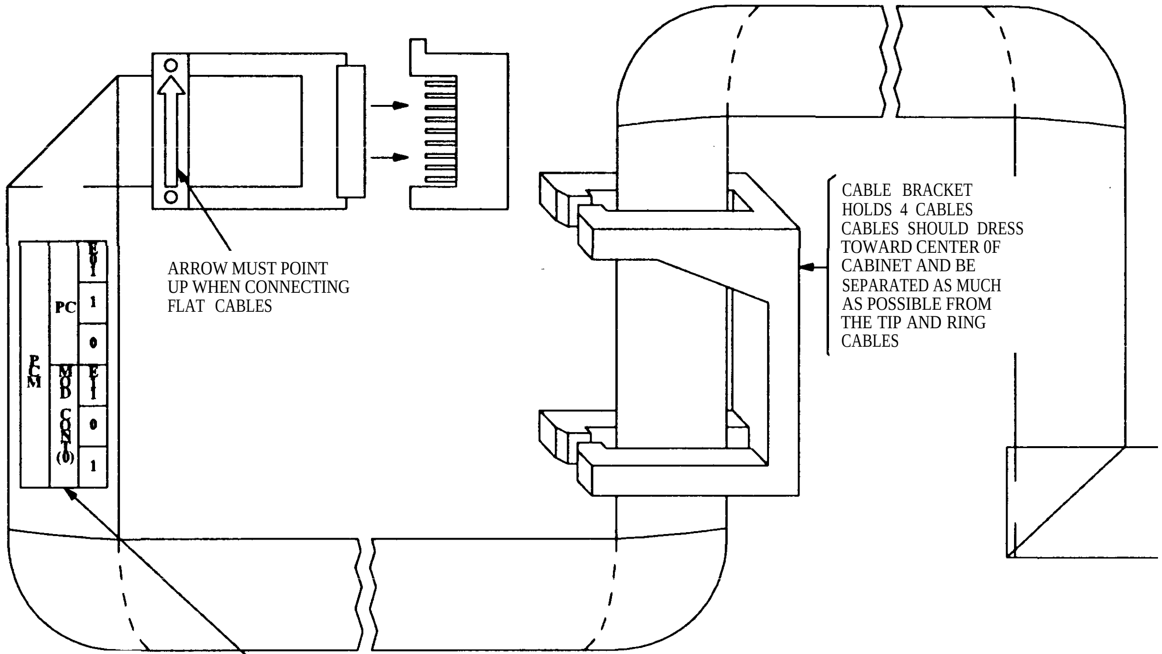
I/O cables are also used, as are alarm cables, TDM/LAN cables, and duplication cables for the UMC and traditional MC.

Other miscellaneous cabling information is also presented.

Cabling information is provided for both the CC/TMS cabinet and standalone CC and TMS cabinets. The connections for the carrier cables are the same as for the standalone CC and TMS cabinets, but there are changes in codes, and in some cases, in group numbers. Consequently, the cabling information is provided for both.

NOTE	Remote module cabling information for DEFINITY Generic 2 is provided in Chapter 26 of this document.

Figure 25-1 shows a typical flat cable setup.



PCM CABLE					
TO			**FROM**		
MOD CONTROL CARRIER(0)			**PORT CARRIER**		
Cabinet Number	Carrier Physical Location	Connector Desig-nation	Cabinet Number	Carrier Physical Location	Connector Desig-nation
1	0	Ell	0	1	E01

Figure 25-1. Flat Cable Labels, Dress, and Connectors

Labels that identify the physical location of a circuit pack are installed on each connector hood as shown in figure 25-2.

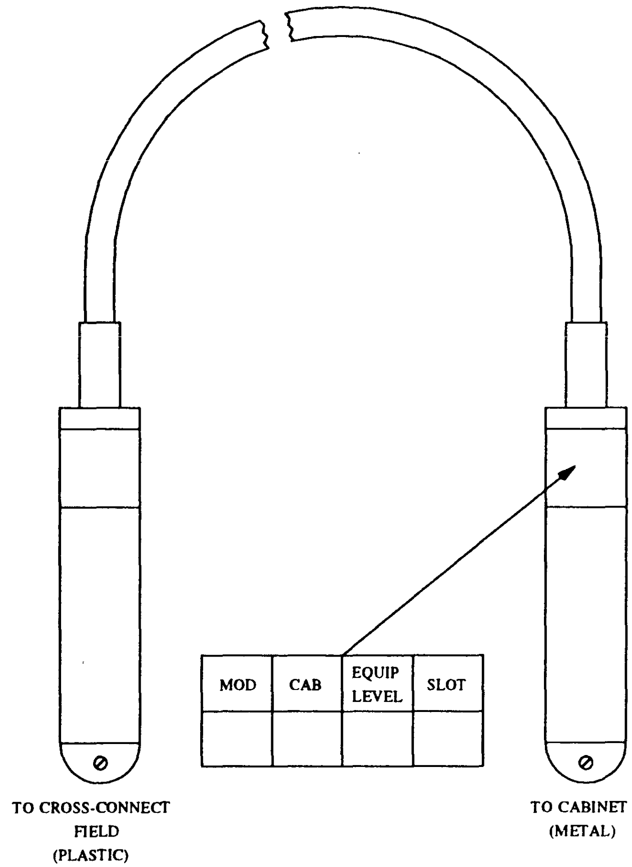


Figure 25-2. Circuit Pack Location Label on Connector Hood

TERMINATIONS FOR 25-PAIR CONNECTOR CABLES

Table 25-1 shows the relationship between the 50-pin connector on the cabinet, the 25-pair connector cable, and the 110-type connector block terminals.

TABLE 25-1. 25-Pair Connector Cable Pinout

50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL	50-PIN CONNECTOR ON CABINET SKIN	LEAD COLOR	CONNECTING BLOCK TERMINAL
26	W-BL	1	13	GR-BK	26
1	BL-W	2	39	BK-BR	27
27	W - O	3	14	BR-BK	28
2	O - W	4	40	BK-SL	29
28	W-GR	5	15	SL-BK	30
3	GR-W	6	41	Y-BL	31
29	W-BR	7	16	BL-Y	32
4	BR-W	8	42	Y-O	33
30	W-SL	9	17	O-Y	34
5	SL-W	10	43	Y-GR	35
31	R-BL	11	18	GR-Y	36
6	BL-R	12	44	Y-BR	37
32	R-O	13	19	BR-Y	38
7	O-R	14	45	Y-SL	39
33	R-GR	15	20	SL-Y	40
a	GR-R	16	46	V-BL	41
34	R-BR	17	21	BL-V	42
9	BR-R	18	47	V-O	43
35	R-SL	19	22	O-V	44
10	SL-R	20	48	V-GR	45
36	BK-BL	21	23	GR-V	46
11	BL-BK	22	49	V-BR	47
37	BK-O	23	24	BR-V	48
12	O-BK	24	50	V-SL	49
38	BK-GR	25	25	SL-V	50

CC/TMS CABINET CABLING

The following tables provide the cabling information for CC and TMS carriers within the CC/TMS cabinet.

The connections for the carrier cables are the same as for the standalone CC and TMS cabinets. However, there are changes in codes and in some cases, in group numbers. Consequently, the cabling information is provided for both.

Tables 25-2 through 25-5 show the CC and TMS connections for the CC/TMS cabinet.

TABLE 25-2. Duplicated CC Connections for CC/TMS

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG	TO	CONN DESIG
COMMON CONTROL (0)	FLAT	36	A0	COMMON CONTROL (1)	A0
COMMON CONTROL (0)	FLAT	36	Al	COMMON CONTROL (1)	Al
COMMON CONTROL (0)	FLAT	3 6	A 2	COMMON CONTROL (1)	A2
COMMON CONTROL (0)	FLAT	3 8	L 8	COMMON CONTROL (1)	L 9
COMMON CONTROL (0)	FLAT	32	E26	COMMON CONTROL (1)	E26
COMMON CONTROL (0)	FLAT	38	L9	COMMON CONTROL (1)	L8
COMMON CONTROL (0)	FLAT	38	L10	COMMON CONTROL (1)	L10

TABLE 25-3. Alarm Panel Connections — Duplicated CC

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG.	TO	CONN. DESIG.
COMMON CONTROL (0)†	FLAT	514	E2	ALARM PANEL	E4
COMMON CONTROL (0)†	FLAT	514	E3	ALARM PANEL	ES
COMMON CONTROL (0)†	FLAT	514	E4	ALARM PANEL	E6
COMMON CONTROL (0)†	FLAT	517	E5	ALARM PANEL	E10
COMMON CONTROL (0)†	FLAT	518	E25	ALARM PANEL	E12
COMMON CONTROL (1)	FLAT	515	E2	ALARM PANEL	E11
COMMON CONTROL (1)	FLAT	513	E3	ALARM PANEL	E9
COMMON CONTROL (1)	FLAT	513	E4	ALARM PANEL	E7
COMMON CONTROL (1)	FLAT	513	Es	ALARM PANEL	E8
COMMON CONTROL (1)	FLAT	516	E25	ALARM PANEL	E13

† CC0 connections apply to both unduplicated and duplicated CC.

TABLE 25-4. Alarm Panel Connections — Unduplicated CC Only

From		Cable	To	
Carrier	Connector	Group	Carrier	Connector
CC0	Bus Bar Grd	H600-227-G1*	ALM PNL ALM PNL	E7 E8
ALM PNL	TBl	H600-247 G1	ALM PNL	TB3
ALM PNL	TB2	H600-247 G1	ALM PNL	TB4

*‘This is a “Y” cable, with only one connector at the CC0 end of the cable.

TABLE 25-5. TMS Intercarrier Cabling Connections

From			Cable Group	To			When Required
Carrier	Slot	Conn	ED-1E434-11	Carrier	Slot	Conn	
BASIC 00	10	E12	G29	BASIC 00	26	E40	ALWAYS REQUIRED
BASIC 00	11	E13	G404	BASIC 00	21	E28	FOR TMS BASIC 00
BASIC 01	10	E12	G29	BASIC 01	26	E40	REQUIRED FOR TMS
BASIC 01	11	E13	G404	BASIC 01	21	E28	BASIC 01
BASIC 00	23	E33	G1	BASIC 01	23	E33	
BASIC 00	23	E34	G1	BASIC 01	23	E34	DUPLICATED TMS
BASIC 00	23	E35	GI	BASIC 01	23	E35	BASIC 00 TO BASIC 01
BASIC 00	23	E36	G14	BASIC 01	23	E36	CONNECTIONS
BASIC 00	21	E32	G14	BASIC 01	21	E32	
BASIC 00	6	E0	G401	GROWTH 01	7	E6	
BASIC 00	6	E3	G402	GROWTH 01	7	E7	
BASIC 00	7	E6	G401	GROWTH 01	6	E0	UNDUPLICATED TMS
BASIC 00	7	E7	G400	GROWTH 01	6	E3	WITH GROWTH CARRIER
BASIC 00	14	E14	G401	GROWTH 01	15	E20	
BASIC 00	14	E15	G400	GROWTH 01	15	E23	BASIC 00 TO
BASIC 00	15	E20	G401	GROWTH 01	14	E14	GROWTH CARRIER
BASIC 00	15	E23	G402	GROWTH 01	14	E15	
BASIC 00	21	E30	G404	GROWTH 01	11	E13	
BASIC 00	26	E42	G27	GROWTH 01	10	E12	

CC CABINET CABLING

Tables 25-6 through 25-9 show duplicated and unduplicated CC connectors.

TABLE 25-6. Duplicated Common Control Connections

FROM	CABLE TYPE	ED-UM34-11 GROUP NUMBER	CONN DESIG	TO	CONN DESIG
COMMON CONTROL (0)	FLAT	36	A0	COMMON CONTROL (1)	A0
COMMON CONTROL (0)	FLAT	36	Al	COMMON CONTROL (1)	Al
COMMON CONTROL (0)	FLAT	36	A2	COMMON CONTROL (1)	A2
COMMON CONTROL (0)	FLAT	38	L8	COMMON CONTROL (1)	L9
COMMON CONTROL (0)	FLAT	32	E26	COMMON CONTROL (1)	E26
COMMON CONTROL (0)	FLAT	38	L9	COMMON CONTROL (1)	L8
COMMON CONTROL (0)	FLAT	38	L10	COMMON CONTROL (1)	L10
COMMON CONTROL (0)	WOVEN	43	A5	DC/DC CONVERTER	Al
COMMON CONTROL (1)	WOVEN	42	A5	DC/DC CONVERTER	A2

TABLE 25-7. Alarm Panel Connections — Unduplicated Common Control

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN. DESIG.	TO	CONN. DESIG.
REAR CONNECTOR PANEL	12-PAIR	106	D1	ALARM PANEL	E2
REAR CONNECTOR PANEL	12-PAIR	107	D5	ALARM PANEL	El
REAR CONNECTOR PANEL	12-PAIR	108	D6	ALARM PANEL	E3
COMMON CONTROL (0)	FLAT	26	E2	ALARM PANEL	E6
COMMON CONTROL (0)	FLAT	26	E3	ALARM PANEL	E7
COMMON CONTROL (0)	FLAT	26	E4	ALARM PANEL	E8
COMMON CONTROL (0)	FLAT	26	E5	ALARM PANEL	E9
COMMON CONTROL (0)	FLAT	26	E25	ALARM PANEL	E5

TABLE 25-8. Alarm Panel Connections — Duplicated Common Controls

FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG.	TO	CONN. DESIG.
REAR CONNECTOR PANEL	12-PAIR	124	D1	ALARM PANEL	E2
REAR CONNECTOR PANEL	12-PAIR	125	D5	ALARM PANEL	E1
REAR CONNECTOR PANEL	12-PAIR	126	D6	ALARM PANEL	E3
COMMON CONTROL (0)	FLAT	146	E2	ALARM PANEL	E4
COMMON CONTROL (0)	FLAT	146	E3	ALARM PANEL	E5
COMMON CONTROL (0)	FLAT	151	E4	ALARM PANEL	E6
COMMON CONTROL (0)	FLAT	148	E5	ALARM PANEL	E10
COMMON CONTROL (0)	FLAT	150	E25	ALARM PANEL	E12
COMMON CONTROL (1)	FLAT	149	E2	ALARM PANEL	E11
COMMON CONTROL (1)	FLAT	147	E3	ALARM PANEL	E9
COMMON CONTROL (1)	FLAT	147	E4	ALARM PANEL	E7
COMMON CONTROL (1)	FLAT	147	E5	ALARM PANEL	E8
COMMON CONTROL (1)	FLAT	146	E25	ALARM PANEL	E13

TABLE 25-9. CC Fan Connections

UNDUPLICATED COMMON CONTROL					
FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN DESIG.	TO	CONN. DESIG.
COMMON CONTROL (0)	FLAT	2	El	FAN (AEH4 CP)	E3
DUPLICATED COMMON CONTROL					
FROM	CABLE TYPE	ED-1E434-11 GROUP NUMBER	CONN. DESIG.	TO	CONN. DESIG.
COMMON CONTROL (0)	FLAT	2	El	FAN (AEH4 CP)	E3
COMMON CONTROL (1)	FLAT	4	El	FAN (AEH4 CP)	E4

Unduplicated CC Cabling to Unduplicated Universal MC and TMS

Table 25-10 shows 4-MHz cabling for unduplicated common control to unduplicated module control and unduplicated TMS for a maximum of 31 modules.

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

TABLE 25-10. 4-MHz Connections to Unduplicated Universal Module Control and TMS (Part 1 of 2)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
NET I	*00* (COMMON CONTROL 0)	27	E9	COAX	501*	 0	System 0† 0	00 00	27	CC0(B02)‡ 4MHZ-CC0	A C
			E1	COAX	501	1 2	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E8	COAX	501	3 4	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E6	COAX	501	5 6	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
		28	E13	COAX	501	7 8	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			El1	COAX	501	9 *10*	0 *0*	00 *00*		4MHZ-CC0 4MHZ-CC0	A C
			E12	COAX	501	11 12	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E10	COAX	501	13 14	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C

* Use the 4MHZ adapter (846189850 — H-600-217, G1) at the TMS end of the connection.
† For 15 modules or less, terminate cable at TMS cabinet 0, carrier 02.
‡ The 4MHZ adapter panel is connected to the B01 and B02 backplane connectors.

TABLE 25-10. 4-MHz Connections to Unduplicated Universal Module Control and TMS (Part 2 of 2)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
NET 1	00 (COMMON CONTROL 0)	29	E17	COAX	501	15 16	0 0	0 0 0 0		4MHZ-CC0 4MHZ-CC0	A C
			E15	COAX	501	17 18	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E16	COAX	501	19 20	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E14	COAX	501	21 22	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
		30	E21	COAX	501	23 24	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E19	COAX	501	25 26	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E20	COAX	501	27 28	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E18	COAX	501	29 30	0 0	00 00		4MHZ-CC0 4MHZ-CC0	A C

Duplicated CC Cabling to Unduplicated UMC and TMS

Table 25-11 shows 4-MHz cabling for duplicated common control to unduplicated module control and unduplicated TMS for a maximum of 31 modules.

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

TABLE 25-11. 4-MHz Connections to Unduplicated UMC and TMS (Part 1 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL o)	27	E9	COAX	501*		System 1†	00	27	CC0(B02)‡	A
						0	0	00		4MHZ-CC0	C
			E7	COAX	501	1	0	00		4MHZ-CC0	A
						2	0	00		4MHZ-CC0	C
			E8	COAX	501	3	0	00		4MHZ-CC0	A
						4	0	00		4MHZ-CC0	C
			E6	COAX	501	5	0	00		4MHZ-CC0	A
						6	0	00		4MHZCC0	C
		28	E13	COAX	501	7	0	00		4MHZ-CC0	A
						8	0	00		4MHZ-CC0	C
			E11	COAX	501	9	0	00		4MHZ-CC0	A
						10	0	00		4MHZ-CC0	C
			E12	COAX	501	11	0	00		4MHZ-CC0	A
						12	0	00		4MHZ-CC0	C
			E10	COAX	501	13	0	00		4MHZ-CC0	A
						14	0	00		4MHZ-CC0	C

*Use the 4MHZ adapter (846189850 — H-600-217, G1) at the TMS end of the connection.

† For 15 modules or less, terminate cable at system cabinet 1, carrier 02.
For more than 15 modules, terminate cable at system cabinet 1, carrier 00.

‡ The 4MHZ adapter panel is connected to the B01 and B02 backplane connectors,

TABLE 25-11. 4-MHz Connections to Unduplicated UMC and TMS (PART 2 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL 0)	29	E17	COAX	501	15 16	0 0	0 0 0 0		4MHZ-CC0 4MHZ-CC0	A C
			E15	COAX	501	17 18	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E16	COAX	501	19 20	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E14	COAX	501	21 22	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
		30	E21	COAX	501	23 24	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E19	COAX	501	25 26	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E20	COAX	501	27 28	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C
			E18	COAX	501	29 30	o 0	00 00		4MHZ-CC0 4MHZ-CC0	A C

TABLE 25-11. 4-MHz Connections to Unduplicated UMC and TMS (Part 3 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	27	E9	COAX	501*	 0	System 1† 0	0 0 0 0	2 7	CC1(B01)‡ 4MHZ-CC1	A C
			E7	COAX	501	1 2	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E8	COAX	501	3 4	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E6	COAX	501	5 6	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
		28	E13	COAX	501	7 8	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			El 1	COAX	501	9 10	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E12	COAX	501	11 12	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E10	COAX	501	13 14	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C

*Use the 4MHZ adapter (846189850 — H-600-217, G1) at the TMS end of the connection.
† For 15 modules or less, terminate cable at system cabinet 1, carrier 02.
For more than 15 modules, terminate cable at system cabinet 1, carrier 00.
‡ The 4MHZ adapter panel is connected to the B01 and B02 backplane connectors.

TABLE 25-11. 4-MHz Connections to Unduplicated UMC and TMS (Part 4 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	29	E17	COAX	501	15 16	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E15	COAX	501	17 18	o 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E16	COAX	501	19 20	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E14	COAX	501	21 22	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
		30	E21	COAX	501	23 24	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E19	COAX	501	25 26	o 0	00 00		4MHZ-CC1 4MHZ-CC1	A C
			E20	COAX	501	27 28	0 0	00 00		4MHZ-CCI 4MHZ-CCI	A C
			E18	COAX	501	29 30	0 0	00 00		4MHZ-CC1 4MHZ-CC1	A C

Duplicated CC Cabling Duplicated UMC and TMS

WARNING

The 4-MHz cable has a minimum bend radius of 0.75 inch.

Table 25-12 shows 4-MHz cabling for duplicated common control to duplicated module control and duplicated TMS for a maximum of 31 modules.

TABLE 25-12. 4-MHz Connections to Duplicated UMC and Duplicated TMS (Part 1 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00	27	E9	COAX	501*		System 1	00	27	CC0(B02)†	A
	(COMMON						System 1/2‡	02/00	27	CC0(B02)†	B
	CONTROL					o	o	00		4MHZ-CC0	C
	0)					0	0	01		4MHZ-CC0	D
			E7	COAX	501	1	0	00		4MHZ-CC0	A
						1	0	01		4MHZ-CC0	B
						2	o	00		4MHZ-CC0	C
						2	0	01		4MHZ-CC0	D
			E8	COAX	501	3	0	00		4MHZ-CC0	A
						3	0	01		4MHZ-CC0	B
						4	0	00		4MHZ-CC0	C
						4	0	01		4MHZ-CC0	D
			E6	COAX	501	5	0	00		4MHZ-CC0	A
						5	0	01		4MHZ-CC0	B
						6	0	00		4MHZ-CC0	C
						6	0	01		4MHZ-CC0	D
		28	E13	COAX	501	7	o	00		4MHZ-CC0	A
						7	0	01		4MHZ-CC0	B
						8	0	00		4MHZ-CC0	C
						8	0	01		4MHZ-CC0	D
			El 1	COAX	501	9	0	00		4MHZ-CC0	A
						9	0	01		4MHZ-CC0	B
						10	0	00		4MHZ-CC0	C
						10	0	01		4MHZ-CC0	D
			E12	COAX	501	11	0	00		4MHZ-CC0	A
						11	0	01		4MHZ-CC0	B
						12	0	00		4MHZ-CC0	C
						12	0	01		4MHZ-CC0	D
			E10	COAX	501	13	0	00		4MHZ-CC0	A
						13	0	01		4MHZ-CC0	B
						14	0	00		4MHZ-CC0	C
						14	0	01		4MHZ-CC0	D

* Use the 4MHZ adapter (846189850 — H-600-217, G1) at the TMS end of the connection.
† The 4MHZ adapter panel is connected to the B01 and B02 backplane connectors.
‡ For 15 modules or less, terminate cable at System cabinet 1, carrier 02.
For more than 15 modules, terminate cable at System cabinet 2, carrier 00.

TABLE 25-12. 4-MHz Connections to Duplicated UMC and Duplicated TMS (Part 2 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	00 (COMMON CONTROL o)	29	E17	COAX	501	15	o	00		4MHZ-CC0	A
						15	0	01		4MHZ-CC0	B
						16	0	00		4MHZ-CC0	C
						16	0	01		4MHZ-CC0	D
			E15	COAX	501	17	0	00		4MHZ-CC0	A
						17	0	01		4MHZ-CC0	B
						18	0	00		4MHZ-CC0	C
						18	0	01		4MHZ-CC0	D
			E16	COAX	501	19	0	00		4MHZ-CC0	A
						19	0	01		4MHZ-CC0	B
						20	0	00		4MHZ-CC0	C
						20	0	01		4MHZ-CC0	D
			E14	COAX	501	21	0	00		4MHZ-CC0	A
						21	0	01		4MHZ-CC0	B
						22	0	00		4MHZ-CC0	C
						22	0	01		4MHZ-CC0	D
		30	E21	COAX	501	23	0	00		4MHZ-CC0	A
						23	0	01		4MHZ-CC0	B
						24	0	00		4MHZ-CC0	C
						24	0	01		4MHZ-CC0	D
			E19	COAX	501	25	0	00		4MHZ-CC0	A
						25	0	01		4MHZ-CC0	B
						26	0	00		4MHZ-CC0	C
						26	0	01		4MHZ-CC0	D
			E20	COAX	501	27	0	00		4MHZ-CC0	A
						27	0	01		4MHZ-CC0	B
						28	0	00		4MHZ-CC0	C
						28	0	01		4MHZ-CC0	D
			E18	COAX	501	29	0	00		4MHZ-CC0	A
						29	0	01		4MHZ-CC0	B
						30	0	00		4MHZ-CC0	C
						30	0	01		4MHZ-CC0	D

TABLE 25-12. 4-MHz Connections to Duplicated UMC and Duplicated TMS (Part 3 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	27	E9	COAX	501"		System 1	00	27	CC1(B01)†	A
							System 1/2‡	02/00	27	CC1(B01)†	B
						0	o	00		4MHZ-CC1	C
						0	0	01		4MHZ-CC1	D
			E7	COAX	501	1	0	00		4MHZ-CC1	A
						1	0	01		4MHZ-CC1	B
						2	0	00		4MHZ-CC1	C
						2	0	01		4MHZ-CC1	D
			E8	COAX	501	3	0	00		4MHZ-CC1	A
						3	0	01		4MHZ-CC1	B
						4	0	00		4MHZ-CCI	C
						4	0	01		4MHZ-CCI	D
			E6	COAX	501	5	0	00		4MHZ-CC1	A
						5	0	01		4MHZ-CC1	B
						6	0	00		4MHZ-CCI	C
						6	0	01		4MHZ-CC1	D
		28	E13	COAX	501	7	0	00		4MHZ-CC1	A
						7	0	01		4MHZ-CC1	B
						8	0	00		4MHZ-CC1	C
						8	0	01		4MHZ-CC1	D
			El 1	COAX	501	9	0	00		4MHZ-CC1	A
						9	0	01		4MHZ-CC1	B
						10	0	00		4MHZ-CC1	C
						10	0	01		4MHZ-CC1	D
			E12	COAX	501	11	0	00		4MHZ-CC1	A
						11	0	01		4MHZ-CC1	B
						12	0	00		4MHZ-CC1	C
						12	0	01		4MHZ-CC1	D
			E10	COAX	501	13	0	00		4MHZ-CC1	A
						13	0	01		4MHZ-CC1	B
						14	0	00		4MHZ-CC1	C
						14	0	01		4MHZ-CC1	D

* Use the 4MHZ adapter (846189850 — H-600-217, G1) at the TMS end of the connection.
† The 4MHZ adapter panel is connected to the B01 and B02 backplane connectors.
‡ For 15 modules or less, terminate cable at System cabinet 1. carrier 02.
For more than 15 modules, terminate cable at System cabinet 2, carrier 00.

TABLE 25-12. 4-MHz Connections to Duplicated UMC and Duplicated TMS (Part 4 of 4)

FROM				CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO					CABLE CONN
CABINET	CARRIER	SLOT	CONN			MODULE	NETWORK CABINET	CARRIER	SLOT	CONN	
SYS0	01 (COMMON CONTROL 1)	29	E17	COAX	501	15	0	00		4MHZ-CC1	A
						15	0	01		4MHZ-CC1	B
						16	0	00		4MHZ-CC1	C
						16	0	01		4MHZ-CC1	D
			E15	COAX	501	17	0	00		4MHZ-CC1	A
						17	0	01		4MHZ-CC1	B
						18	0	00		4MHZ-CC1	C
						18	0	01		4MHZ-CC1	D
			E16	COAX	501	19	0	00		4MHZ-CC1	A
						19	0	01		4MHZ-CC1	B
						20	0	00		4MHZ-CC1	C
						20	0	01		4MHZ-CC1	D
			E14	COAX	501	21	0	00		4MHZ-CC1	A
						21	0	01		4MHZ-CC1	B
						22	0	00		4MHZ-CC1	C
						22	0	01		4MHZ-CC1	D
		30	E21	COAX	501	23	0	00		4MHZ-CC1	A
						23	0	01		4MHZ-CC1	B
						24	0	00		4MHZ-CC1	C
						24	0	01		4MHZ-CC1	D
			E19	COAX	501	25	0	00		4MHZ-CC1	A
						25	0	01		4MHZ-CC1	B
						26	0	00		4MHZ-CC1	C
						26	0	01		4MHZ-CC1	D
			E20	COAX	501	27	0	00		4MHZ-CC1	A
						27	0	01		4MHZ-CC1	B
						28	0	00		4MHZ-CC1	C
						28	0	01		4MHZ-CC1	D
			E18	COAX	501	29	0	00		4MHZ-CC1	A
						29	0	01		4MHZ-CC1	B
						30	0	00		4MHZ-CC1	C
						30	0	01		4MHZ-CC1	D

CONFIGURING RMATS AND PPG PORTS FOR SYSTEM MANAGEMENT (MANAGER II)

System management adjuncts are connected to the switch using the two RS232C-compatible RMATS ports provided by the TN492C circuit pack or through the two Asynchronous Data Unit (ADU) compatible PPG ports on the TN563 circuit pack. The sections below outline connection options using these four ports. These options are:

- RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access
- RMATS 1: Switched Analog Dial Access
- PPG 0: Switched Analog Dial Access
- PPG 1: Non-Switched Direct Access

Functionality, usage, equipment requirements, and connectivity diagrams for each port are detailed in the following sections.

RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access

Functionality

This port provides access to the system through the Diagnostic Processor (DP). The DP allows access to both the on-line and off-line processors in a duplicated system. This port also provides improved FASTMAAP performance. It does not provide access to the DTS and Switch Support Base (SSB).

Because a non-switched dedicated trunk is used in this configuration, the DP circuit pack can be accessed for maintenance even if the system is down.

Usage

This port is used for alarm origination to INADS or ACCUMASTER Trouble Tracker (TT), and remote maintenance by AT&T services personnel.

Equipment Requirements

Adjunct-side

- CEO modem (includes power transformer)
- cable

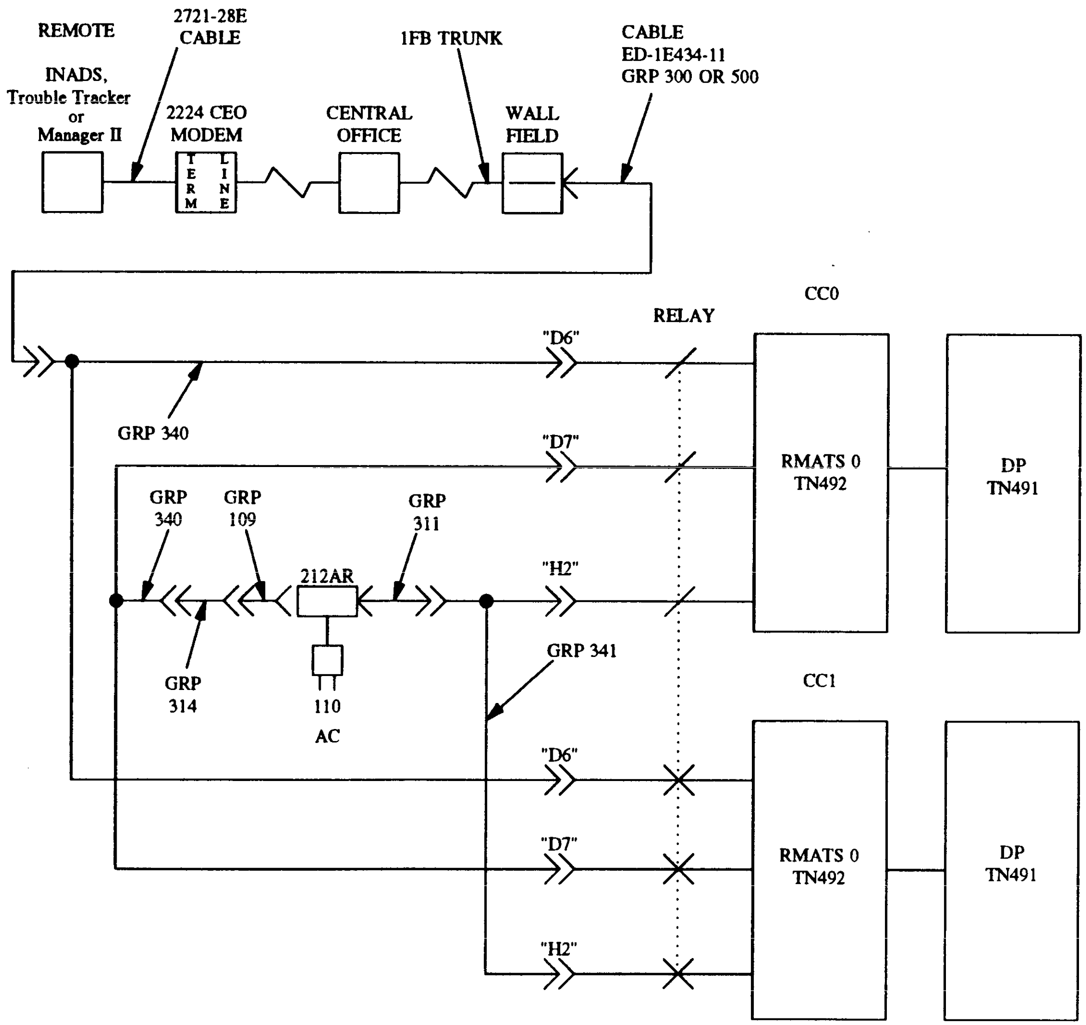
System-side:

- lFB-type trunk
- 212AR Modem (includes power transformer)
- Stand-alone housing for 212AR Modem
- ED- 1E434-11 Group 109, 500, 311, 314, 340 (2), and 341 cables for duplicated system, and Group 109, 500, 311, and 314 cables for unduplicated system

Figure 25-3 shows the Non-Switched Dedicated Trunk Analog Dial Access configuration for RMATS 0.

NOTE

If the RMATS port at connector H3 is not used and is not terminated a false alarm occurs (Fault Code 887). To prevent the false alarm use the RMATS port termination plug (H600-349) that is shipped loose with the common control cabinet (J58886S-3). If the CC is unduplicated, connect the plug to end A of cable ED-1E434-11 G311. If the common control is duplicated, connect it to end A of cable ED-1E434-11 G341.



NOTES:

1. Set 8 switches on front of 2224-CEO modem for adjunct-side down.

   Set 30 switches on 212AR modem for system-side as follows:

   - 5 switches on front of modem NOT pushed in
   - 1 screw switch inside modem fully open
   - 2 plug-in straps between terminals E1 and E2, and E3 and E4 inside modem
   - 22 switches inside modem as indicated in the table below, where O means open and C, closed.

2. For unduplicated systems, ignore connections to CC1 (don't use Group 340 and 341 cables).

Figure 25-3. RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access

RMATS 1: Switched Analog Dial Access

Functionality

This port provides access to the system through the DP. The DP allows access to both the on-line and off-line processors in a duplicated system. This port also provides improved FASTMAAP performance. It does not provide access to the DTS and SSB.

Because this port is not used for remote maintenance, a non-switched dedicated analog trunk connection is not necessary. Thus a switched analog trunk is provided.

Usage

This port is used primarily for local or remote traffic polling by Monitor I and secondarily for local or remote system administration by Manager II, III, or IV.

Equipment Requirements

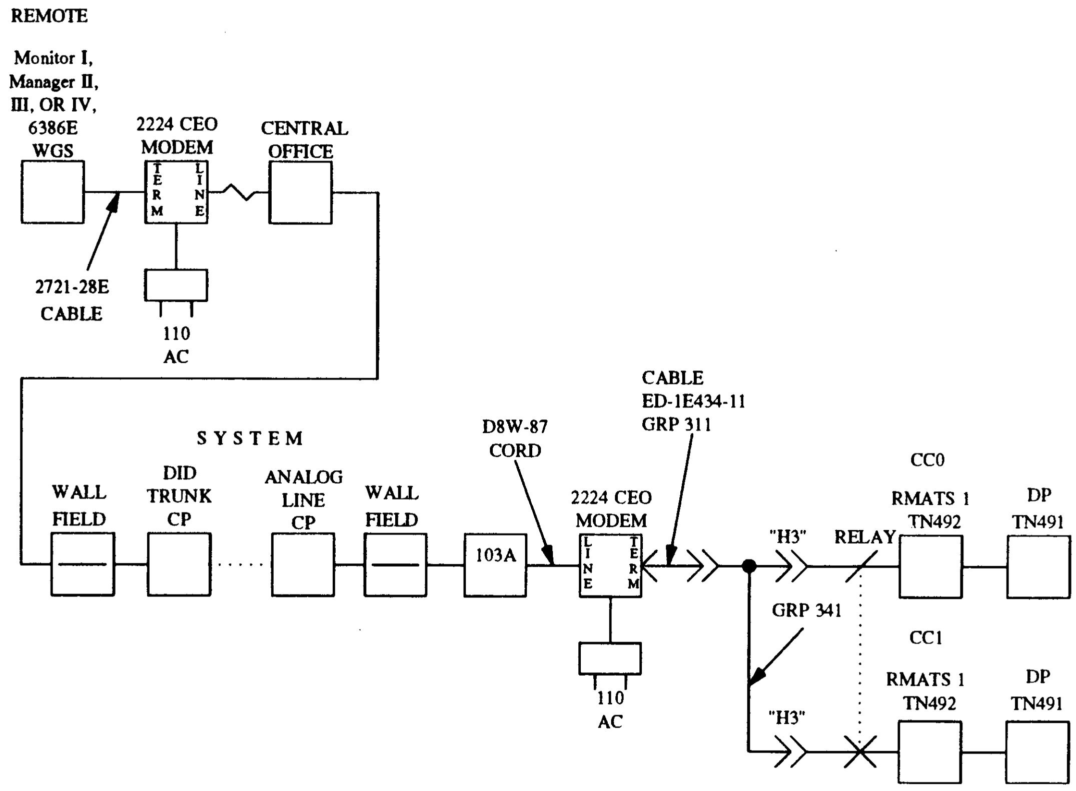
Adjunct-side:

- CEO modem (includes power transformer)
- cable

System-side:

- CEO modem (includes power transformer)
- D8W-87 cord
- 103A connecting block
- ED-1E434-11 Group 311 and 341 cables for duplicated system and only Group 311 for unduplicated system
- Analog line circuit packs:
  - — TN742: 8-port OPS/OPX analog line circuit pack (Universal Module)
  - — SN229: 8-port analog line circuit pack (Traditional Module)
- DID Trunk circuit packs:
  - — TN753: 8-port DID trunk circuit pack (Universal Module)
  - — SN232B: 4-port DID trunk circuit pack (Traditional Module)

Figure 25-4 shows the Switched Analog Dial Access configuration for RMATS 1.



NOTES:

1. Set 8 switches on front of 2224 CEO modem for adjunct-side down.

   Initialize 2224 CEO modem for switch-side as follows:

   - Cionnect the modem to COM1 port on the 6286 WGS PC using the 2721-28E cable.
   - On PC type imodem 2224ceo.mnp and set 8 switches on front of 2224 CEO modem per instructions (see Manager 11 MS-DOS Version Operation Manual 555-104-505).

2. The Local Manager II, III or IV shown in the figure 3-6 for PPG 0 could connect to RMATS 1 via analog line CP.

3. For unduplicated systems, ignore the connections to CC1 (don't use Group 341 cable).

Figure 25-4. RMATS 1: Switched Analog Dial Access

PPG 0: Switched Analog Dial Access

Functionality

This port provides access to the system through the Disk Tape System (DTS). This port also offers access to the Switch Support Base (SSB) on the DTS and the best FASTMAAP performance. It does not provide access to the DP or the offline processor in a duplicated system.

Because this port is accessed for remote maintenance of the SSB files, a switched analog connection is used.

Usage

This port is used primarily for local or remote administration by Manager II, III, and IV, and secondarily for remote maintenance of SSB files.

Equipment Requirements

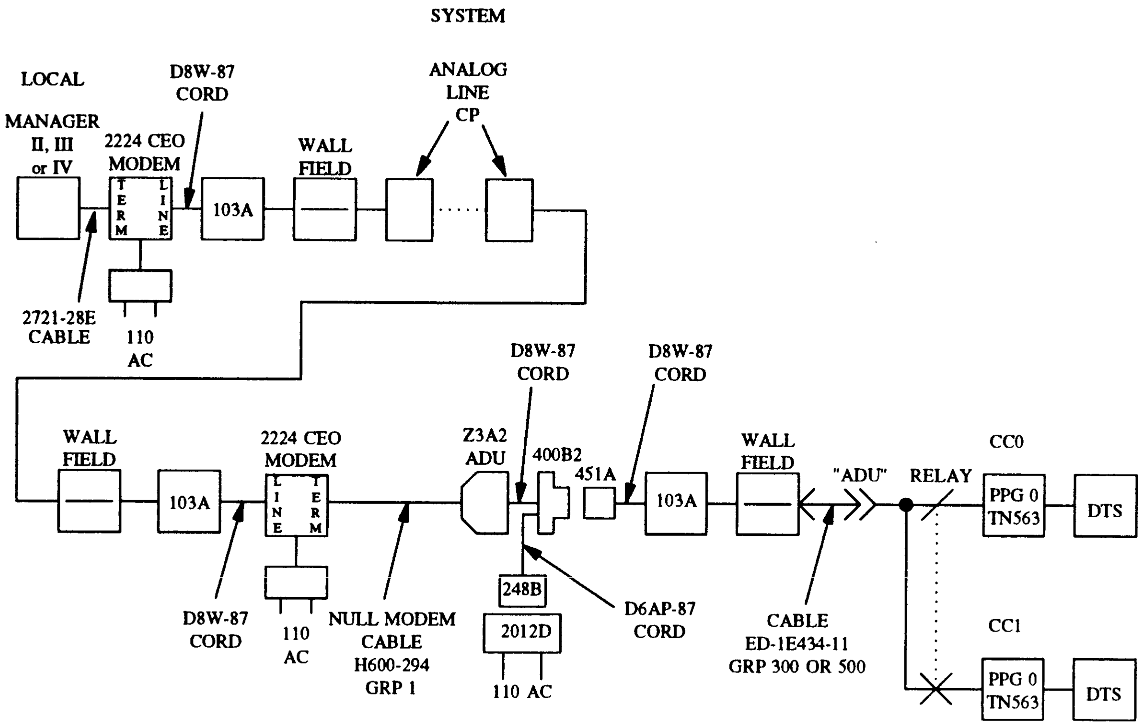
Adjunct-side:

- CEO modem
- cable
- D8W-87 cord
- 103A connecting block

System-side:

- CEO modem (includes power transformer)
- H600-294 Group 1 Null Modem cable
- Z3A2 ADU (see *Z3A Asynchronous Data Unit Product Manual* 555-401-708)
- ADU power system consisting of 2012D power transformer, 248B adapter, 400B2 adapter, and D6AP-87 power cord
- 451A adapter
- D8W-87 cords (3)
- 103A connecting block (2)
- ED-1E434-11 Group 500 cable
- Analog line circuit packs:
  - — TN742: 8-port OPS/OPX analog line circuit pack (Universal Module)
  - — SN229: 8-port analog line circuit pack (Traditional Module)

Figure 25-5 shows the switched analog dial access configuration for PPG 0.



NOTES:

1. Set 8 switches on front of 2224 CEO modem for adjunct-side down.

   Initialize 2224 CEO modem for switch-side as follows:

   - Connect the modem to COM1 port on the 6286 WGS PC using the 2721-28E cable.
   - On PC type `imodem 222 4ceo.mnp` and set 8 switches on front of 2224 CEO modem per instructions (see Manager H MS-DOS Version Operation Manual 555-104-505).

2. The Remote Manager II, III, or IV shown in figure 25-4 for RMATS 1 could connect to PPG 0 via a DID trunk and CP.
3. See figure 25-7 for the actual pin-to-pin connections between the 103A connecting block, wall field and ADU connector.
4. For unduplicated systems, ignore connections to CC 1.

Figure 25-5. PPG 0: Switched Analog Dial Access

PPG 1: Non-Switched Direct Access

Functionality

This port provides access to the system through the DTS. This port offers access to SSBs on the DTS and to broadcast messages from the DTS as well as improved FASTMAAP performance. It also provides access to the offline processor via the non-switched direct connection to the second PPG 1 port in a duplicated system. It does not provide access to the DP.

Because this port is used to display broadcast messages from the DTS, a non-switched direct connection is used.

Usage

This port is used for local administration and maintenance of the system by Manager II. The Manager II PC comes with the switch and can be shared by both the customer and AT&T services personnel.

Equipment Requirements

Adjunct-side:

- Z3A4 ADU consisting of Z3A2 ADU and M8AJ-87 cord (see *Z3A Asynchronous Data Unit Product Manual* 555-401-708).
- ADU power system consisting of 2012D power transformer, 248B adapter, 400B2 adapter, and D6AP-87 power cord
- 451 A adapter
- D8W-87 cord (2)
- 103A connecting block

NOTE

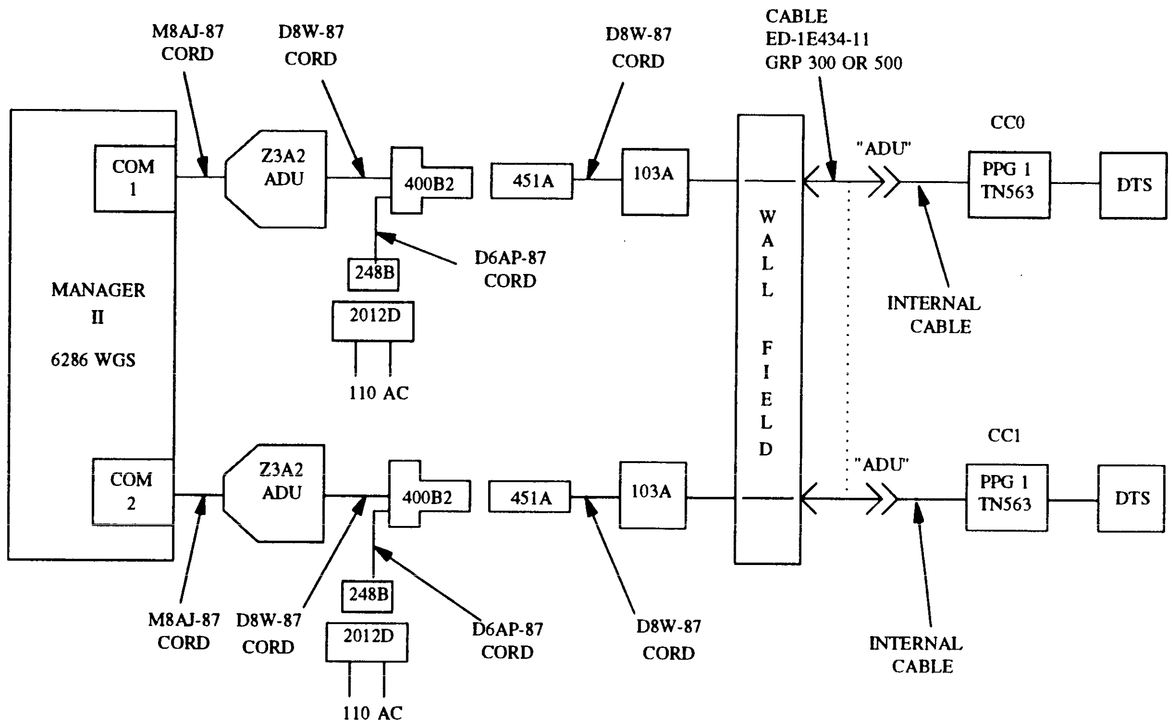
Two of each of the above items are required for a duplicated system.

- 6286 WGS PC with lMB RAM, 20MB hard disk, 3 1/2” floppy disk drive, VDC-400 CGA adapter, monochrome monitor (color optional but preferred), keyboard and one serial port. For duplicated systems, a second serial port board (COMCODE 405660457) is required. MS-DOS™ Version 3.2 or 3.3, Manager II MS-DOS Version 0.12 or later, and SSB Version 1.0 must be installed on the PC. *Manager II MS-DOS Version Operations Manual*, 555-104-505, explains installing Manager II™ and SSB files.

System-side:

- ED-1E434-11 Group 500 cable for a duplicated or unduplicated system.

Figure 25-6 shows the non-switched direct access configuration for PPG 1.



1. See figure 25-7 for the actual pin-to-pin connections between the 103A connecting block, wall field and ADU connector.
2. Connect PPG 1 to “ADU” connector by connecting “JADUB” connector to “PADUB”,
3. For unduplicated systems, ignore connections from COM2 to CC1.

Figure 25-6. PPG 1: Non-Switched Direct Access

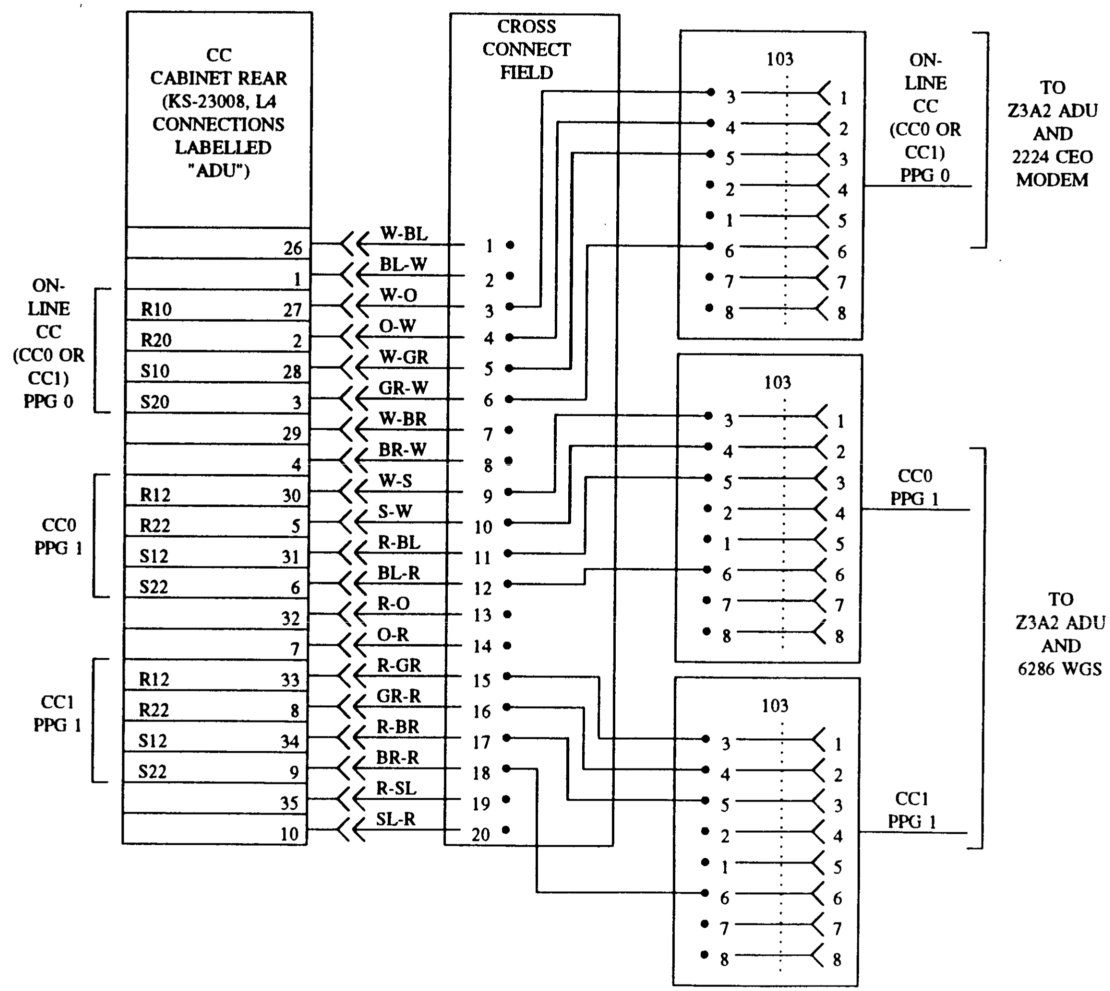


Figure 25-7. ADU Rear Connector and 103 Connections at Cross Connect Field — Duplicated System

Verifying Manager II System Connectivity

After connecting the Manager II PC to the system and installing the Manager II software, verify that the Manager II can be used to administer and maintain the system by completing the following procedures:

NOTE	Enter commands from the keyboard exactly as written in these procedures.

Unduplicated Systems:

1. Power-up the PC.
2. Start Manager II by typing *mgrii.*
3. Log into Manager II by typing *tech.*
4. Connect to the system by typing *con cc0.*
5. Set the administration, maintenance, and tape switch modes by typing *123.*
6. Access Procedure 600 to display alarms by typing *p600 x.*
7. Disconnect from the system by typing *disc.*
8. Exit Manager II by typing *quit.*

Duplicated Systems:

1. Power-up the PC.
2. Start Manager II by typing *mgrii.*
3. Log into Manager II by typing *tech.*
4. Connect to the first common control in the system by typing *con cc0.*
5. Set the administration, maintenance, and tape switch modes by typing *123.*
6. Access Procedure 600 to display alarms on CC0 by typing *p600 x.*
7. Connect to the second common control in the system by typing *con cc1* .
8. Set the administration, maintenance, and tape switch modes by typing *123.*
9. Access Procedure 600 to display CC1 alarms by typing *p600 x.*
10. Disconnect from both common controls by typing *disc* twice.
11. Exit Manager II by typing *quit.*

This completes the DEFINITY Communications System Generic 2 Manager II installation.

The hardware must run alarm-free.

Small Computer System Interface (SCSI)-CC to DTS

Table 25-13 shows connections between the CC and the DTS. Circuit Pack TN563, the SCSI/DTS interface inserts in slot 20 of the CC carrier and connects to the DTS through cable H600-171, Group 1. Connection options for both unduplicated and duplicated systems are identified.

TABLE 25-13. Small Computer System Interface (SCSI) — CC to DTS

FROM			VIA		TO	
COMMON CONTROL	CONNECTOR		CABLE H600 171 GRP2 OR 253 (USED FOR UPGRADES)		DTS	CONNECTOR LABEL
	SLOT	POSITION	CONNECTOR LABEL	CONNECTOR LABEL		
Unduplicated o	20 (TN563)	A06 A07	A06 A07	PTMP DTS SCSI	0 0	ALM SCSI
Duplicated o	20 (TN563)	A06 A07	A06 A07	PTMP DTS SCSI	0 0	ALM SCSI
Duplicated 1	20 (TN563)	A06 A07	A06 A07	PTMP DTS SCSI	1 1	ALM SCSI

NOTE: Connectors A06 and A07 arc located just to the right of Slot 20 as viewed from the rear of the CC.

DTS Connection Options

Table 25-14 shows connection routes for unduplicated and duplicated systems between the CC and ADU/DTS. For unduplicated systems, use connections shown for CC carrier 0. For duplicated systems, use both CC carrier routes for 0 and 1.

TABLE 25-14. Disk Tape System (DTS) Connection Options (Unduplicated and Dupliated Systems) — CC to ADU/DTS

FROM			VIA		TO	
COMMON CONTROL	SLOT	POSITION	CABLE H600-234 GRP 2‡ CONNECTOR	CONNECTOR	DTS	
0	20	L11	2x8	0	JADUA JADUB* or	 ADU†
1	20	L11	2x8	1	JADUA0 JADUB0* or JADUA1 (chained to CC0) JADUB1* or	 ADU† ADU†

* Connect for wall field ADU connections.

† Connect for DTS ADU direct connection.

‡ Use H600-234 G1 only for duplicated CC. Use H600-234 G1 for unduplicated CC.

TMS CABINET CABLING

This section provides information on the cabling for the TMS cabinet.

TMS Intracabinet Cabling

Table 25-15 shows TMS intracabinet cabling for duplicated basic carriers +1 growth carrier each (maximum of 15 modules).

TABLE 25-15. TMS Intracabinet Connections — Duplicated Basic Carrier

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER	SLOT	CONN			CARRIER	SLOT	CONN
00 (BASIC 0)	06	E00	FLAT	401	01 (GROWTH 0)	07	E06
		E03	FLAT	402	01 (GROWTH 0)	07	E07
	07	E06	FLAT	401	01 (GROWTH 0)	06	E00
		E07	FLAT	400	01 (GROWTH 0)	06	E03
	10	E12	902A	29	00 (BASIC 0)	26	E40
	11	E13	FLAT	404	00 (BASIC 0)	21	E28
	14	E14	FLAT	401	01 (GROWTH 0)	15	E20
		E15	FLAT	400	01 (GROWTH 0)	15	E23
	15	E20	FLAT	401	01 (GROWTH 0)	14	E14
		E23	FLAT	402	01 (GROWTH 0)	14	E15
	21	E30	FLAT	404	01 (GROWTH 0)	11	E13
		E32	902A	45	02 (BASIC 1)	21	E32
	23	E33	902A	44	02 (BASIC 1)	23	E33
		E34	902A	44	02 (BASIC 1)	23	E34
		E35	902A	44	02 (BASIC 1)	23	E35
		E36	902A	45	02 (BASIC 1)	23	E36
	26	E42	902A	27	01 (GROWTH 0)	10	E12
	27A	E44	902A	2	FAN ASSY	AEH4	E1

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO		
CARRIER	SLOT	CONN			CARRIER	SLOT	CONN
02 (BASIC 1)	06	E00	FLAT	401	03 (GROWTH 1)	07	E06
		E03	FLAT	402	03 (GROWTH 1)	07	E07
	07	E06	FLAT	401	03 (GROWTH 1)	06	E00
		E07	FLAT	400	03 (GROWTH 1)	06	E03
	10	E12	902A	29	02 (BASIC 1)	26	E40
	11	E13	FLAT	404	02 (BASIC 1)	21	E28
	14	E14	FLAT	401	03 (GROWTH 1)	15	E20
		E15	FLAT	400	03 (GROWTH 1)	15	E23
	15	E20	FLAT	401	03 (GROWTH 1)	14	E14
		E23	FLAT	402	03 (GROWTH 1)	14	E15
	21	E30	FLAT	404	03 (GROWTH 1)	11	E13
	26	E42	902A	27	03 (GROWTH 1)	10	E12
	27A	E44	902A	26	FAN ASSY	AEH4	E2

TMS Fiber Optic Interface Cabling — Duplicated TMS — One Cabinet

Table 25-16 shows TMS interface cabling (duplicated TMS one cabinet) for a maximum of 15 modules.

WARNING

This fiber optic cable has a minimum bend radius of 1.5 inch. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 25-16. TMS Interface Connections — One Cabinet (Part 1 of 2)

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS 1)					UNIVERSAL MODULE	NET CABINET	EQMN'T LEVEL	SLOT	CONN**	
CARRIER	CARRIER	SLOT								
00	18	A12(TX) A13(RX)	504	1 2	00	0	A	14	LGI LGI	RX TX
	17	A10(TX) All(RX)	504	1 2	01	0	A	14	LGI LGI	RX TX
	16	A08(TX) A09(RX)	504	1 2	02	0	A	14	LGI LGI	RX TX
	02	A00(TX) A01(RX)	504	1 2	03	0	A	14	LGI LGI	RX TX
	03	A02(TX) A03(RX)	504	1 2	04	0	A	14	LGI LGI	RX TX
	04	A04(TX) A05(RX)	504	1 2	05	0	A	14	LGI LGI	RX TX
	05	A06(TX) A07(RX)	504	1 2	06	0	A	14	LGI LGI	RX TX
01	19	A14(TX) A15(RX)	504	1 2	07	0	A	14	LGI LGI	RX TX
	18	A12(TX) A13(RX)	504	1 2	08	0	A	14	LGI LGI	RX TX
	17	A10(TX) A11(RX)	504	1 2	09	0	A	14	LGI LGI	RX TX
	16	A08(TX) A09(RX)	504	1 2	10	0	A	14	LGI LGI	RX TX
	02	A00(TX) A01(RX)	504	1 2	11	0	A	14	LGI LGI	RX TX
	03	A02(TX) A03(RX)	504	1 2	12	0	A	14	LGI LGI	RX TX
	04	A04(TX) A05(RX)	504	1 2	13	0	A	14	LGI LGI	RX TX
	05	A06(TX) A07(RX)	504	1 2	14	0	A	14	LGI LGI	RX TX

* Connections designated "TX" are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated "RX" use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TABLE 25-16. TMS Interface Connections — One Cabinet (Part 2 of 2)

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS 1)					UNIVERSAL MODULE	NET CABINET	EQMN'T LEVEL	SLOT	CONN**	
CARRIER	SLOT	CONN*								
02	18	A12(TX) A13(RX)	504	1 2	00	0	B	14	LGI LGI	RX TX
	17	A10(TX) A11(RX)	504	1 2	01	0	B	14	LGI LGI	RX TX
	16	A08(TX) A09(RX)	504	1 2	02	0	B	14	LGI LGI	RX TX
	02	A00(TX) A01(RX)	504	1 2	03	0	B	14	LGI LGI	RX TX
	03	A02(TX) A03(RX)	504	1 2	04	0	B	14	LGI LGI	RX TX
	04	A04(TX) A05(RX)	504	1 2	05	0	B	14	LGI LGI	RX TX
	05	A06(TX) A07(RX)	504	1 2	06	0	B	14	LGI LGI	RX TX
03	19	A14(TX) A15(RX)	504	1 2	07	0	B	14	LGI LGI	RX TX
	18	A12(TX) A13(RX)	504	1 2	08	0	B	14	LGI LGI	RX TX
	17	A10(TX) A11(RX)	504	1 2	09	0	B	14	LGI LGI	RX TX
	16	A08(TX) A09(RX)	504	1 2	10	0	B	14	LGI LGI	RX TX
	02	A00(TX) A01(RX)	504	1 2	11	0	B	14	LGI LGI	RX TX
	03	A02(TX) A03(RX)	504	1 2	12	0	B	14	LGI LGI	RX TX
	04	A04(TX) A05(RX)	504	1 2	13	0	B	14	LGI LGI	RX TX
	05	A06(TX) A07(RX)	504	1 2	14	0	B	14	LGI LGI	RX TX

* Connections designated “TX” are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.) Connectors designated “RX” use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982 NM (if module is farther than 4900 ft.).

** These connectors use transceivers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.),

TMS Fiber Optic Interface Cabling — Duplicated TMS — Two Cabinets

Table 25-17 shows TMS module interface cabling (duplicated TMS, two cabinets) for a maximum of 31 modules.

WARNING

This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 25-17. TMS Interface Connections — Two Cabinets (Part 1 of 4)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS)	**CARRIER**	**SLOT**	**CONN***			**UNIVERSAL MODULE**	**NET CABINET**	**EQMN'T LEVEL**	**SLOT**	**CONN****	
1	00	18	A12(TX) A13(RX)	504	1 2	00	0	A	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	01	0	A	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	02	0	A	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	03	0	A	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	04	0	A	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	05	0	A	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	06	0	A	14	LGI LGI	RX TX
1	01	19	A14(TX) A15(RX)	504	1 2	07	0	A	14	LGI LGI	RX TX
		18	A12(TX) A13(RX)	504	1 2	08	0	A	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	09	0	A	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	10	0	A	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	11	0	A	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	12	0	A	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	13	0	A	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	14	0	A	14	LGI LGI	RX TX

*Connections designated “TX” are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated “RX” use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TABLE 25-17. TMS Interface Connections — Two Cabinets (Part 2 of 4)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			UNIVERSAL MODULE	NET CABINET	EQMN'T LEVEL	SLOT	CONN**	
1	02	19	A14(TX) A15(RX)	504	1 2	15	0	A	01	LGI LGI	RX TX
		18	A12(TX) A13(RX)	504	1 2	16	0	A	01	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	17	0	A	01	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	18	0	A	01	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	19	0	A	01	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	20	0	A	01	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	21	0	A	01	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	22	0	A	01	LGI LGI	RX TX
1	03	19	A14(TX) A15(RX)	504	1 2	23	0	A	01	LGI LGI	RX TX
		18	A12(TX) A13(RX)	504	1 2	24	0	A	01	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	25	0	A	01	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	26	0	A	01	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	27	0	A	01	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	28	0	A	01	LGI LGI	RX TX
		04	A04(RX) A05(RX)	504	1 2	29	0	A	01	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	30	0	A	01	LGI LGI	RX TX

* Connections designated "TX" are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated "RX" use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TABLE 25-17. TMS Interface Connections — Two Cabinets (Part 3 of 4)

FROM				ED-IE434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			UNIVERSAL MODULE	NET CABINET	CARRIER	SLOT	CONN**	
2	00	18	A12(TX) A13(RX)	504	1 2	00	0	B	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	01	0	B	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	02	0	B	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	03	0	B	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	04	0	B	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	05	0	B	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	06	0	B	14	LGI LGI	RX TX
2	01	19	A14(TX) A15(RX)	504	1 2	07	0	B	14	LGI LGI	RX TX
		18	A12(TX) A13(RX)	504	1 2	08	0	B	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	09	0	B	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	10	0	B	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	11	0	B	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	12	0	B	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	13	0	B	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	14	0	B	14	LGI LGI	RX TX

*Connections designated “TX” are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated “RX” usc paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TABLE 25-17. TMS Interface Connections — Two Cabinets (Part 4 of 4)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS)	CARRIER	SLOT	CONN*			UNIVERSAL MODULE	NET CABINET	EQMN'T LEVEL	SLOT	CONN**	
2	02	19	A14(TX)	504	1	15	0	B	14	LGI	RX
					2					LGI	TX
		18	A12(TX)	504	1	16	0	B	14	LGI	RX
			A13(RX)		2					LGI	TX
		17	A10(TX)	504	1	17	0	B	14	LGI	RX
			A11(RX)		2					LGI	TX
		16	A08(TX)	504	1	18	0	B	14	LGI	RX
			A09(RX)		2					LGI	TX
		02	A00(TX)	504	1	19	0	B	14	LGI	RX
			A01(RX)		2					LGI	TX
		03	A02(TX)	504	1	20	0	B	14	LGI	RX
			A03(RX)		2					LGI	TX
		04	A04(TX)	504	1	21	0	B	14	LGI	RX
			A05(RX)		2					LGI	TX
		05	A06(TX)	504	1	22	0	B	14	LGI	RX
			A07(RX)		2					LGI	TX
2	03	19	A14(TX)	504	1	23	0	B	14	LGI	RX
			A15(RX)		2					LGI	TX
		18	A12(TX)	504	1	24	0	B	14	LGI	RX
			A13(RX)		2					LGI	TX
		17	A10(TX)	504	1	25	0	B	14	LGI	RX
			A11(RX)		2					LGI	TX
		16	A08(TX)	504	1	26	0	B	14	LGI	RX
			A09(RX)		2					LGI	TX
		02	A00(TX)	504	1	27	0	B	14	LGI	RX
			A01(RX)		2					LGI	TX
		03	A02(TX)	504	1	28	0	B	14	LGI	RX
			A03(RX)		2					LGI	TX
		04	A04(TX)	504	1	29	0	B	14	LGI	RX
			A05(RX)		2					LGI	TX
		05	A06(TX)	504	1	30	0	B	14	LGI	RX
			A07(RX)		2					LGI	TX

*Connections designated “TX” are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated “RX” use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TMS Fiber Optic Interface Cabling — Unduplicated TMS — One Cabinet

Table 25-18 shows TMS module interface cabling (unduplicated TMS, one cabinet) for a maximum of 15 modules.

WARNING

This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 25-18. TMS Interface Connections — One Cabinet — for up to 15 Modules

FROM			ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET (SYS 1)					UNIVERSAL MODULE	NET CABINET	EQMN'T LEVEL	SLOT	CONN**	
CARRIER	SLOT	CONN*								
00	18	A12(TX)	504	1	00	0	A	14	LGI	RX
		A13(RX)		2					LGI	TX
	17	A10(TX)	504	1	01	0	A	14	LGI	RX
		A11(RX)		2					LGI	TX
	16	A08(TX)	504	1	02	0	A	14	LGI	RX
		A09(RX)		2					LGI	TX
	02	A00(TX)	504	1	03	0	A	14	LGI	RX
		A01(RX)		2					LGI	TX
	03	A02(TX)	504	1	04	0	A	14	LGI	RX
		A03(RX)		2					LGI	TX
	04	A04(TX)	504	1	05	0	A	14	LGI	RX
		A05(RX)		2					LGI	TX
	05	A06(TX)	504	1	06	0	A	14	LGI	RX
		A07(RX)		2					LGI	TX
01	19	A14(TX)	504	1	07	0	A	14	LGI	RX
		A15(RX)		2					LGI	TX
	18	A12(TX)	504	1	08	0	A	14	LGI	RX
		A13(RX)		2					LGI	TX
	17	A10(TX)	504	1	09	0	A	14	LGI	RX
		A11(RX)		2					LGI	TX
	16	A08(TX)	504	1	10	0	A	14	LGI	RX
		A09(RX)		2					LGI	TX
	02	A00(TX)	504	1	11	0	A	14	LGI	RX
		A01(RX)		2					LGI	TX
	03	A02(TX)	504	1	12	0	A	14	LGI	RX
		A03(RX)		2					LGI	TX
	04	A04(TX)	504	1	13	0	A	14	LGI	RX
		A05(RX)		2					LGI	TX
	05	A06(TX)	504	1	14	0	A	14	LGI	RX
		A07(RX)		2					LGI	TX

*Connections designated "TX" are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated "RX" use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TMS Fiber Optic Interface Cabling — Unduplicated TMS — One Cabinet

Table 25-19 shows TMS module interface cabling (unduplicated TMS, one cabinet) for a maximum of 31 modules.

WARNING

This fiber-optic cable has a minimum bend radius of 1.5 inches. The cable must be loosely supported to prevent distortion in the fiber optic.

TABLE 25-19. TMS Interface Connections — One Cabinet for up to 31 Modules (Part 1 of 2)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO					
TMS CABINET SYS	CARRIER	SLOT	CONN*			UNIVERSAL MODULE	NET CABINET	CARRIER	SLOT	CONN**	
1	00	18	A12(TX) A13(RX)	504	1 2	00	0	A	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	01	0	A	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	02	0	A	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	03	0	A	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	04	0	A	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	05	0	A	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	06	0	A	14	LGI LGI	RX TX
1	01	19	A14(TX) A15(RX)	504	1 2	07	0	A	14	LGI LGI	RX TX
		18	A12(TX) A13(RX)	504	1 2	08	0	A	14	LGI LGI	RX TX
		17	A10(TX) A11(RX)	504	1 2	09	0	A	14	LGI LGI	RX TX
		16	A08(TX) A09(RX)	504	1 2	10	0	A	14	LGI LGI	RX TX
		02	A00(TX) A01(RX)	504	1 2	11	0	A	14	LGI LGI	RX TX
		03	A02(TX) A03(RX)	504	1 2	12	0	A	14	LGI LGI	RX TX
		04	A04(TX) A05(RX)	504	1 2	13	0	A	14	LGI LGI	RX TX
		05	A06(TX) A07(RX)	504	1 2	14	0	A	14	LGI LGI	RX TX

*Connections designated "TX" are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated "RX" use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

TABLE 25-19. TMS Interface Connections — One Cabinet forupto31 Modules (Part 2 of 2)

FROM				ED-1E434 -11, GROUP NUMBER	FIBER NUMBER	TO				
TMS CABINET SYS	CARRIER	SLOT	CONN*			UNIVERSAL MODULE	NET CABINET	EQPMN'T LEVEL	SLOT	CONN**
1	02	19	A14(TX) A15(RX)	504	1 2	15	0	00	14	LGI RX LGI TX
		18	A12(TX) A13(RX)	504	1 2	16	0	00	14	LGI RX LGI TX
		17	A10(TX) A11(RX)	504	1 2	17	0	00	14	LGI RX LGI TX
		16	A08(TX) A09(RX)	504	1 2	18	0	00	14	LGI RX LGI TX
		02	A00(TX) A01(RX)	504	1 2	19	0	00	14	LGI RX LGI TX
		03	A02(TX) A03(RX)	504	1 2	20	0	00	14	LGI RX LGI TX
		04	A04(TX) A05(RX)	504	1 2	21	0	00	14	LGI RX LGI TX
		05	A06(TX) A07(RX)	504	1 2	22	0	00	14	LGI RX LGI TX
1	03	19	A14(TX) A15(RX)	504	1 2	23	0	00	14	LGI RX LGI TX
		18	A12(TX) A13(RX)	504	1 2	24	0	00	14	LGI RX LGI TX
		17	A10(TX) A11(RX)	504	1 2	25	0	00	14	LGI RX LGI TX
		16	A08(TX) A09(RX)	504	1 2	26	0	00	14	LGI RX LGI TX
		02	A00OTX) A01(RX)	504	1 2	27	0	00	14	LGI RX LGI TX
		03	A02(TX) A03(RX)	504	1 2	28	0	00	14	LGI RX LGI TX
		04	A04(TX) A05(RX)	504	1 2	29	0	00	14	LGI RX LGI TX
		05	A06(TX) A07(RX)	504	1 2	30	0	00	14	LGI RX LGI TX

*Connections designated "TX" are paddleboard transmitter adapters 982NL (if module is less than 4900 ft. away) or 982NN (if module is farther than 4900 ft.). Connectors designated "RX" use paddleboard receiver adapters 982NK (if module is less than 4900 ft. away) or 982NM (if module is farther than 4900 ft.).

** These connectors use transcievers 9823A (module ≤ 4900 ft. away) or 9823B (module farther than 4900 ft.)

DS1 Clock Synchronization Cabling

Tables 25-20 through 25-23 show the connectivity options for the DS1 Clock Synchonization for the various systems.

TABLE 25-20. DS1 Clock Synchronization Connections for Duplicated, Multi-Module System

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO			
UNIVERSAL MODULE	CARRIER	CONN			MODULE	CARRIER	SLOT	CONN
X	MODULE CONTROL 0	PRI REF	SHIELDED	503	TMS	BASIC 0	20	A17
	MODULE CONTROL 1	PRI REF	SHIELDED	503	TMS	BASIC 1	20	A17
Y	MODULE CONTROL 0	SEC REF	SHIELDED	503	TMS	BASIC 0	20	A16
	MODULE CONTROL 1	SEC REF	SHIELDED	503	TMS	BASIC 1	20	A16

TABLE 25-21. DS1 Clock Synchronization Connections For Unduplicated, Multi-Module System

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO			
UNIVERSAL MODULE	CARRIER	CONN			MODULE	CARRIER	SLOT	CONN
X	MODULE CONTROL 0	PRI REF	SHIELDED	503	TMS	BASIC 0	20	A17
Y	MODULE CONTROL 0	SEC REF	SHIELDED	503	TMS	BASIC 0	20	A16

TABLE 25-22. DS1 Clock Synchronization Connections for Duplicated, Multi-Module System with One Central Module

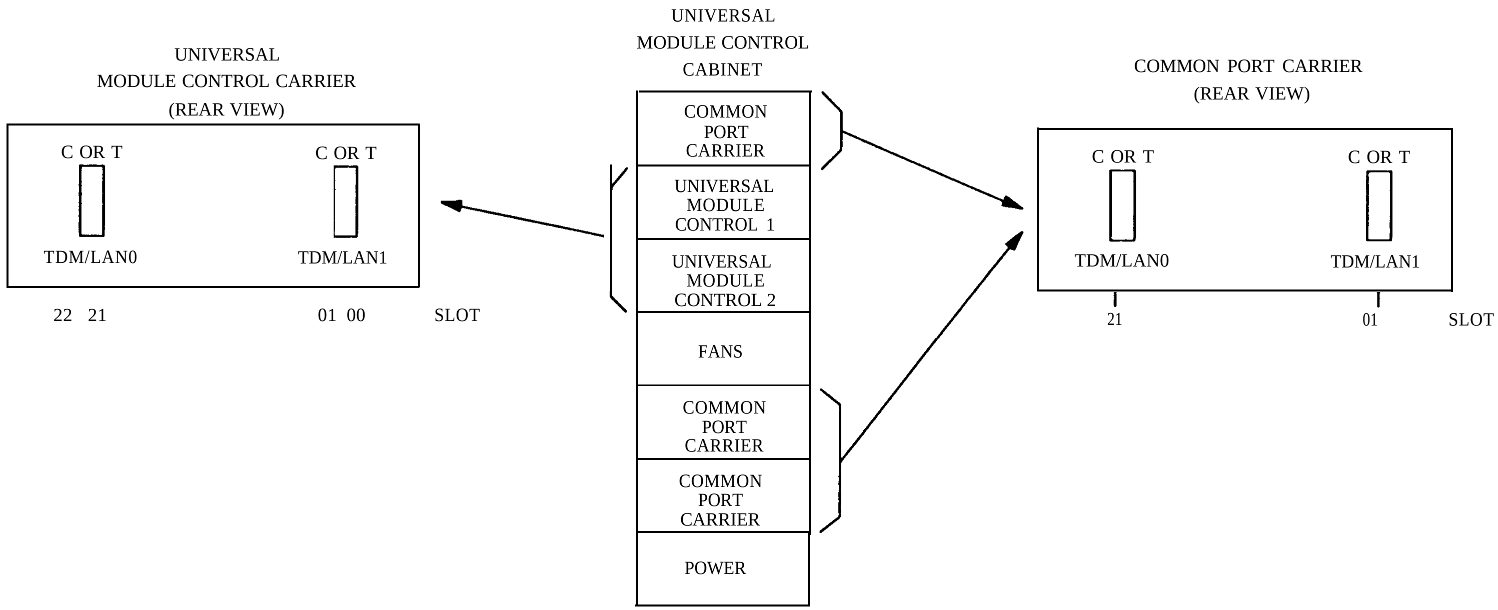
FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO			
UNIVERSAL MODULE	CARRIER	CONN			MODULE	CARRIER	SLOT	CONN
X	MODULE CONTROL 0	PRI REF	SHIELDED	503	TMS	BASIC 0	20	A17
	MODULE CONTROL 1	PRI REF	SHIELDED	503	TMS	BASIC 1	20	A17
	MODULE CONTROL 0	SEC REF	SHIELDED	503	TMS	BASIC 0	20	A16
	MODULE CONTROL 1	SEC REF	SHIELDED	503	TMS	BASIC 1	20	A16

TABLE 25-23. DS1 Clock Synchronization Connections for Unduplicated, Multi-Module System with One Central Module

FROM			CABLE TYPE	ED-1E434 -11, GROUP NUMBER	TO			
UNIVERSAL MODULE	CARRIER	CONN			MODULE	NET CARRIER	SLOT	CONN
x	MODULE CONTROL 0	PRI REF	SHIELDED	503	TMS	BASIC 0	20	A17
	MODULE CONTROL 0	SEC REF	SHIELDED	503	TMS	BASIC 0	20	A16

UMC CABINET CABLING

With the UMC cabinet, intracabinet communication is accomplished through the TDM/LAN, Duplicated Module Control, and Harness cables. The connection information is shown in figures 25-8, 25-9, and 25-10. Table 25-24 also shows connectivity information for the UMC cabinet.

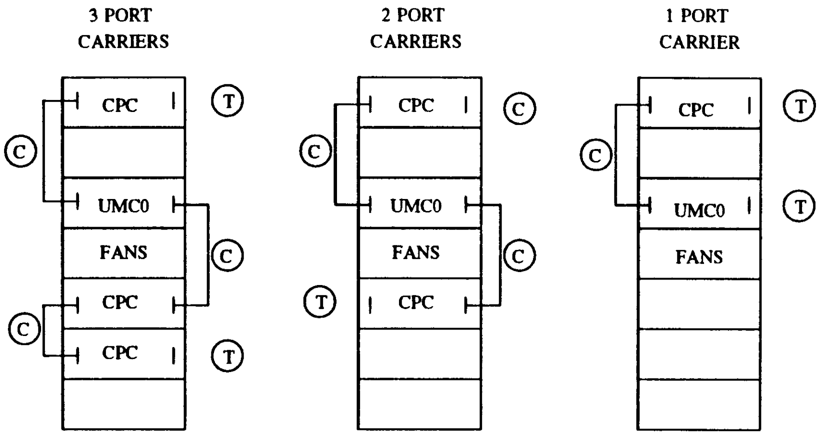


C - Represents bus extension cable connections. The cables used are theWP 91112 L1 (9 in.) or the WP 91112 L2 (32 in.) depending on the length of cable needed.

T - Represents bus terminator connections. The terminator used is the ZAHF4.

NOTE:
The TDM/LAN bus must run continuously through all carriers in a universal module control cabinet via the bus extension cable (C above). The TDM/LAN bus also requires the use of terminator packs at each end of the bus (T above).

Figure 25-8. TDM/LAN Cable and Terminator Backplane Connections

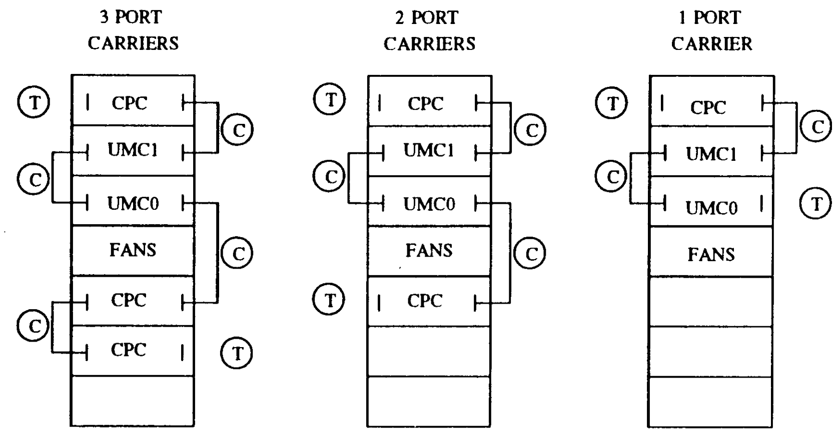


C - Represents bus extension cable connections. The cablcs used are the WP 91112 L1 (9 in.) or the WP 91112 L2 (32 in.) depending on the length of cable needed.

T- Represents bus terminator connections. The terminator used is the ZAHF4.

NOTE:
The TDM/LAN bus must run continuously through all carriers in a universal module control cabinet via the bus extension cable (C above). The TDM/LAN bus also requires the use of terminator packs at each end of the bus (T above).

Figure 25-9. TDM/LAN Cable and Terminator Connections — Unduplicated Universal Module Control (Rear View)

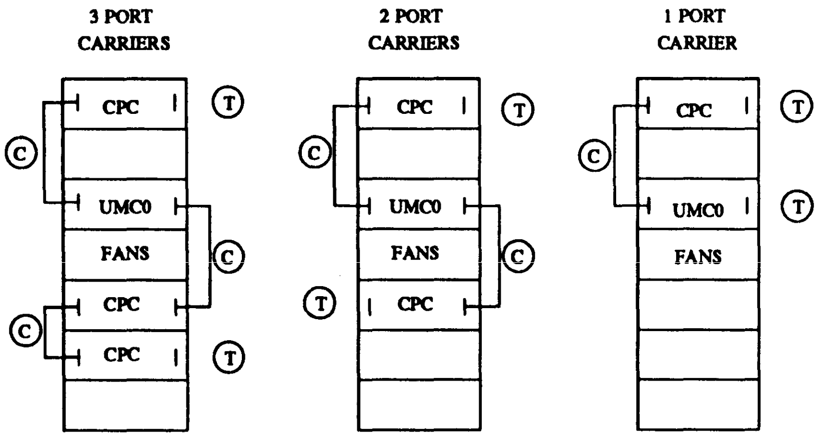


C - Represents bus extension cable connections. The cables used are the WP 91112 L1 (9 in.) or the WP 91112 L2 (32 in.) depending on the length of cable needed.

T - Represents bus terminator connections. The terminator used is the ZAHF4.

NOTE:
The TDM/LAN bus must run continuously through all carriers in a universal module control cabinet via the bus extension cable (C above). The TDM/LAN bus also requires the use of terminator packs at each end of the bus (T above).

Figure 25-10. TDM/LAN Cable and Terminator Connections — Duplicated Universal Module Control (Rear View)

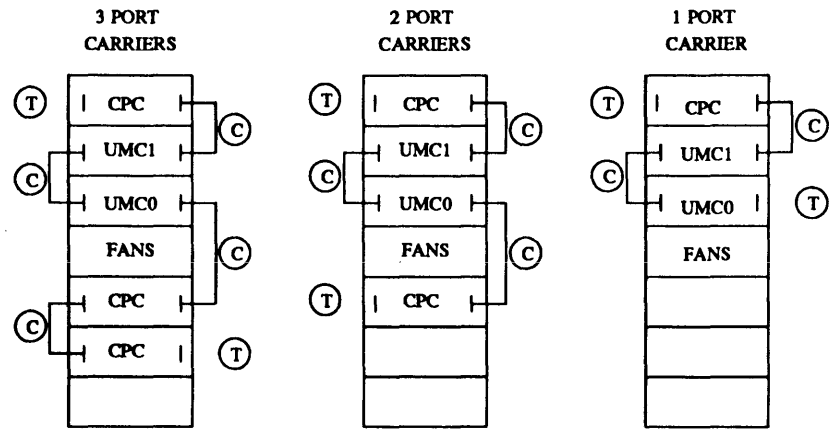


C - Represents bus extermination cable connections. The cables used are the WP 91112 L1 (9in.) or the WP 91112 L2 (32in) depending on the length of able needed.

T - Represents bus terminator connections. The terminator used is the ZAHF4.

NOTE:
The TDM/LAN bus must run continuously through all carriers in a universal module control cabinet via the bus extension cable (C above). The TDM/LAN bus also required the use of terminator packs at each end of the bus (T above).

Figure 25-9. TDM/LAN Cable and Terminator Connections — Unduplicated Universal Module Control (Rear View)

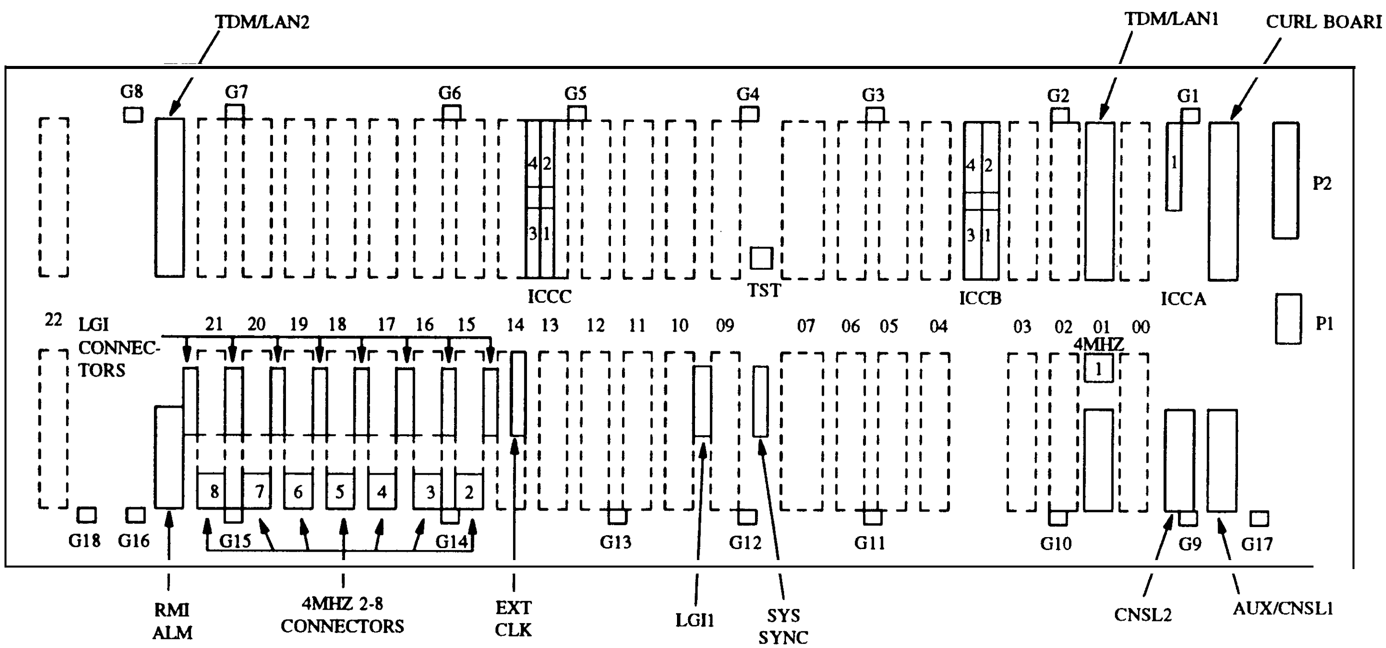


C - Represents bus extension cable connections. The cables used are the WP 91112 L1 (9in.) or the WP 91112 L2 (32in.) depending on the length of cable needed.

T - Represents bus terminator connections. The terminator used is the ZAHF4.

NOTE:
The TDM/LAN bus must run continuously through all carriers in a universal module control cabinet via the bus extension cable (C above). The TDM/LAN bus also required the use of terminator packs at each end of the bus (T above).

Figure 25-10. TDM/LAN Cable and Terminator Connections — Duplicated Universal Module Control (Rear View)



NOTE:

1. This figure represents the UMC carrier backplane without the connector panel attached.
2. The CURL board is only installed on UMC 0 at the A level regardless of duplication. Never install a CURL board on UMC 1 at the B level.
3. The P1 and P2 connectors are used only at the A level. If duplicated, only the P1 connector is used at level B.

Figure 25-11. UMC Carrier Backplane

COMMON PORT CARRIER CONNECTION INFORMATION

Table 25-25 shows the lead terminations for the common port carrier circuit packs within the UMC cabinet.

TABLE 25-25. Lead Designation for Common Port Carrier Circuit Packs (Part 1)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK TERMINAL	TN555† (DS1 PACKET ADJUNCT)	TN556 (ISDN BRI)	TN726 (EIA DATA)	TN735 (MET LINE)	TN742B (ANALOG LINE)	TN746 (ANALOG LINE)	TN747B (c o TRUNK)	TN753 (DID TRUNK)	TN754B (DIGITAL LINE)	TN760 (TE TRUNK)	TN762B (HYBRID LINE)
W-BL	1			PXR0		T0	TO	TO	TO	TO		TO	TO
BL-W	2			PXT0		RO	RO	RO	RO	RO		RO	RO
W-O	3	1		TXT0	TXT0	BT0		T1			TXT0	T1-0	TXT0
O-W	4			TXR0	TXR0	BR0		R1			TXR0	R1-0	TXR0
W-GR	5			PXR1	PXT0	LT0		T2			PXT0	E0	PXT0
GR-W	6			PXT1	PXR0	LR0		R2			PXR0	M0	PXR0
W-BR	7			TXT1		T1	T1	T3	T1	T1		T1	T1
BR-W	8			TXR1		R1	R1	R3	R1	R1		RI	R1
W-SL	9	2		PXR2	TXTl	BT1					TXT1	T1-1	TXT1
SL-W	10			PXT2	TXR1	BR1					TXR1	R1-1	TXR1
R-BL	11			TXT2	PXT1	LT1					PXT1	El	PXT1
BL-R	12			TXR2	PXR1	LR1					PXR1	Ml	PXR1
R-O	13			PXR3		T2	T2		T2	T2		T2	T2
O-R	14			PXT3		R2	R2		R2	R2		R2	R2
R-GR	15	3	RDATA	TXT3	TXT2	BT2					TXT2	T1-2	TXT2
GR-R	16		RDATA*	TXR3	TXR2	BR2					TXR2	R1-2	TXR2
R-BR	17		TDATA	PXR4	PXT2	LT2		T4			PXT2	E2	PXT2
BR-R	18		TDATA*	PXT4	PXR2	LR2		R4			PXR2	M2	PXR2
R-SL	19		TRSYNC	TXT4		T3	T3	T5	T3	T3		T3	T3
SL-R	20		TRSYNC*	TXR4		R3	R3	R5	R3	R3		R3	R3
BK-BL	21	4		PXR5	TXT3	BT3		T6			TXT3	T1-3	TXT3
BL-BK	22			TXT5	TXR3	BR3		R6			TXR3	R1-3	TXR3
BK-O	23		SCLK	TXT5	PXT3	LT3		T7			PXT3	E3	PXT3
O-BK	24		SCLK*	TXR5	PXR3	LR3		R7			PXR3	M3	PXR3
BK-GR	25			PXR6			T4	T8	T4	T4			T4
GR-BK	26			PXT6			R4	R8	R4	R4			R4
BK-BR	27	5		TXT6	TXT4			T9			TXT4		TXT4
BR-BK	28			TXR6	TXR4			R9			TXR4		TXR4
BK-SL	29			PXR7	PXT4			T10			PXT4		PXT4
SL-BK	30			PXT7	PXR7			R10			PXR4		PXR4

† The TN555 must be used with the TN767 for ISDN PRI applications. These two circuit packs must be located in adjacent slots for cabling purposes for ISDN PRI applications.

TABLE 25-25. Lead Designation for Common Port Carrier Circuit Packs (Part 1)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK TERMINAL	TN555† (DS1 PACKET ADJUNCT)	TN556 (ISDN BRI)	TN726 (EIA DATA)	TN735 (MET LINE)	TN742B (ANALOG LINE)	TN746 ANALOG LINE)	TN747B (CO TRUNK)	TN753 (DID TRUNK)	TN754B (DIGITAL LINE)	TN760 (TE TRUNK)	TN762B (HYBRID LINE)
Y-BL	31			TXT7			T5	T11	T5	T5			T5
BL-Y	32			TXR7			R5	R11	R5	R5			R5
Y-O	33	6		PXR8	TXT5						TXT5		TXT5
O-Y	34			PXT8	TXR5						TXR5		TXR5
Y-GR	35			TXT8	PXT5						PXT5		PXT5
GR-Y	36			TXR8	PXR5						PXR5		PXR5
Y-BR	37			PXR9			T6		T6	T6			T6
BR-Y	38			PXT9			R6		R6	R6			R6
Y-SL	39	7		TXT9	TXT6						TXT6		TXT6
SL-Y	40			TXR9	TXR6						TXR6		TXR6
V-BL	41			PXR1O	PXT6			T12			PXT6		PXT6
BL-V	42			PXT10	PXR6			R12			PXR6		PXR6
V-O	43			TXT10			T7	T13	T7	T7			T7
O-V	44			TXR10			R7	R13	R7	R7			R7
V-GR	45	8		PXR11	TXT7			T14			TXT7		TXT7
GR-V	46			PXT11	TXR7			R14			TXR7		TXR7
V-BR	47			TXT11	PXT7			T15			PXT7		PXT7
BR-V	48			TXR11	PXR7			R15			PXR7		PXR7
V-SL	49												
SL-V	50												

† The TN555 must be used with the TN767 for ISDN PRI applications. These two circuit packs must be located in adjacent slots for cabling purposes for ISDN PRI applications.

TABLE 25-25. Lead Designations for Common Port Carrier Circuit Packs (Part 2)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK TERMINAL	TN763B (AUXILIARY TRUNK)	TN767† (DS1 INTERFACE)	TN768 (TONE/CLOCK BOARD)
W-BL	1	1	TO		
BL-W	2		R0		
W-O	3		SZ-1		
O-W	4		SZ0-1		
W-GR	5		S-1		
GR-W	6		S0-1		
W-BR	7	2	T1		
BR-W	8		R1		
W-SL	9		SZ-2		
SL-W	10		SZ0-2		
R-BL	11		S - 2		
BL-R	12		SO-2		
R-O	13	3	T2		
O-R	14		R2		
R-GR	15		SZ-3		
GR-R	16		SZ0-3		
R-BR	17		S-3		
BR-R	18		S0-3		
R-SL	19	4	T3		
SL-R	20		R3		
BK-BL	21		SZ-4		
BL-BK	22		SZ0-4		
BK-O	23		S-4		
O-BK	24		S0-4		
BK-GR	25	5			
GR-BK	26				
BK-BR	27				
BR-BK	28				
BK-SL	29				
SL-BK	30				

† The TN555 must be used with the TN767 for ISDN PRI applications. These two circuit packs must be located in adjacent slots for cabling purposes for ISDN PRI applications.

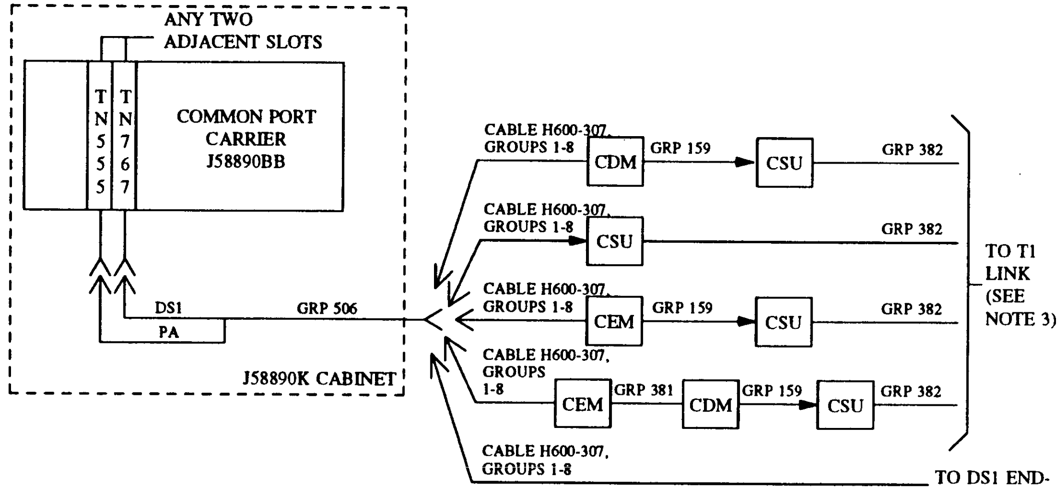
TABLE 25-25. Lead Designations for Common Port Carrier Circuit Packs (Part 2)

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK TERMINAL	TN763B (AUXILIARY TRUNK)	TN767† (DS1 INTERFACE)	TN768 (TONE/CLOCK BOARD)
Y-BL	31	6			
EL-Y	32				
Y-O	33				
O-Y Y-GR	34 35				EXTSYNCIR
GR-Y	36				EXTSYNCTT
Y-BR	37	7			
BR-Y	38				
Y-SL	39				
S L Y	40				
V-BL	41				EXTSYNCOT
BL-V	42				EXTSYNCOR
V0O	43	8		LI*	
O-V	44			LI	
V-GR	45			LO	
GR-V	46			LO*	
V-BR	47			LBACK2	
BR-V	48			LBACK1	
Y-SL	49				
SL-V	50				

† The TN555 must be used with the TN767 for ISDN PRI applications. These two circuit packs must be located in adjacent slots for cabling purposes for ISDN PRI applications.

ISDN PRI CONNECTIVITY

Figure 25-12 shows the connectivity information for ISDN PRI.



NOTES:

1. All group numbers refer to ED-1E434-11.

2. The TN767 and TN555 circuit packs must be in adjacent slots in the common port carrier. The GRP 506 cable is 8 feet long. This length allows connectivity from any two adjacent common port carrier slots of the J58890K UMC cabinet. The GRP 506 cable is only used in the J58890K UMC cabinet.

3. If this equipment is in the aux cabinet, GRP 381 may be replaced by GRP 358, and GRP 382 should be replaced by groups 115 and 118. Refer to SD-1E562-01 and the DS1/DMI interface document (555-025-101).

Figure 25-12. ISDN PRI Interconnections

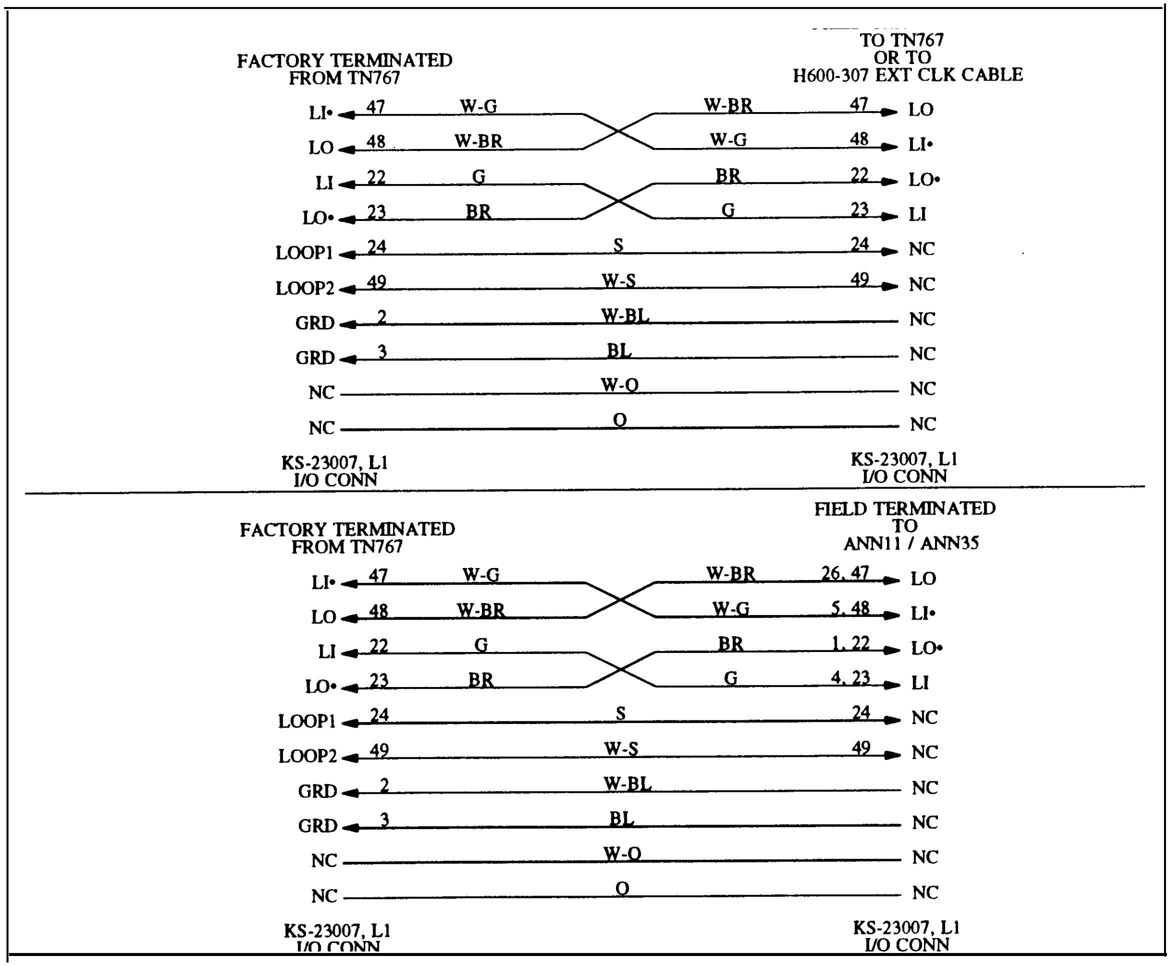


Figure 25-13. ISDN/PRI and DS1 Cable Terminations

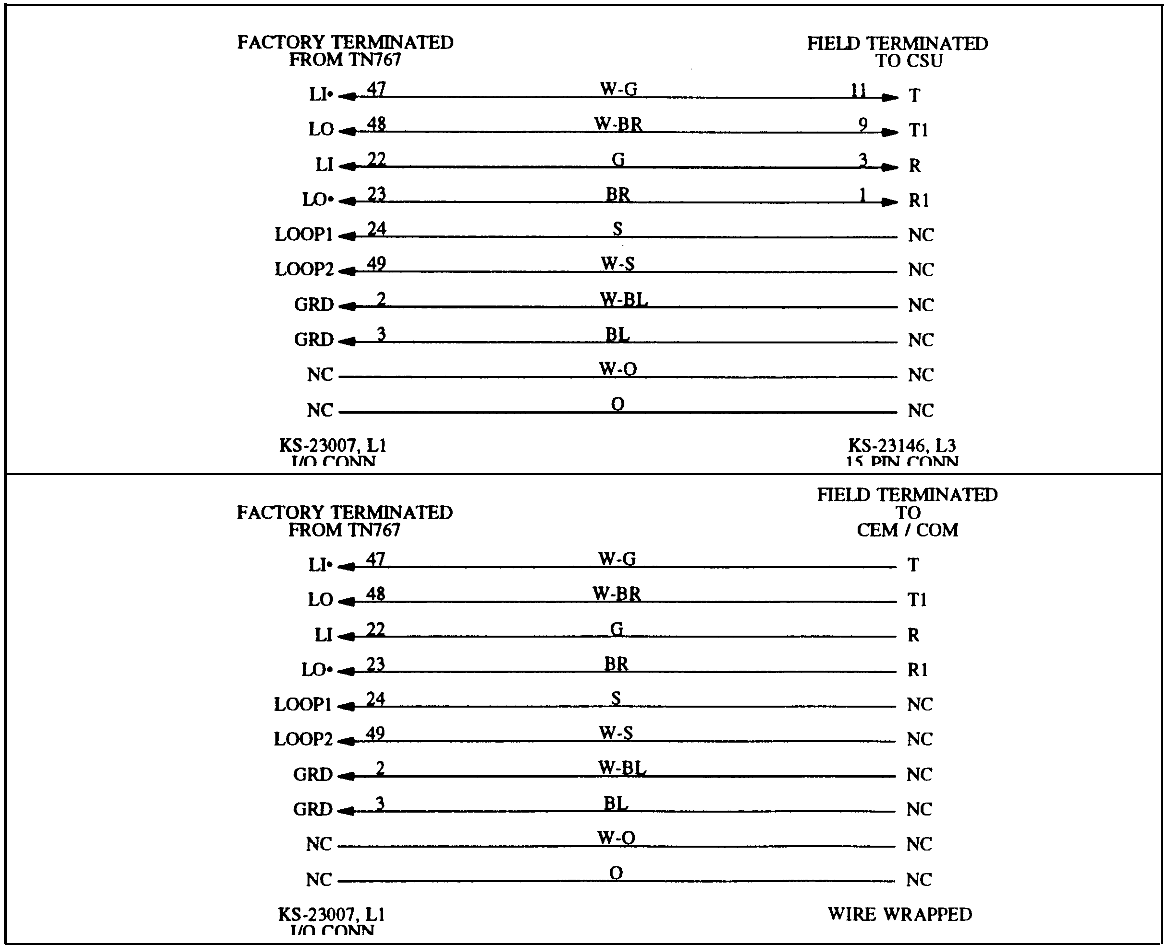


Figure 25-14. ISDN/PRI and DS1 Cable Terminations

TABLE 25-26. ISDN BRI Administration Set Up

LEAD COLOR	CONNECTING BLOCK TERMINAL	110-TYPE CONN. BLOCK TERMINAL	BRI ADMIN NUMBER	TN556 (ISDN BRI)	LEAD COLOR	CONNECTING BLOCK TERMINAL	11O-TYPE CONN. BLOCK TERMINAL	BRI ADMIN NUMBER	TN556 (ISDN BRI]
W-BL	1			PXR0	Y-BL	31			TXT7
BL-W	2			PXT0	BL-Y	32		14	TXR7
W - O	3	1	0	TXT0	Y-O	33	6		PXR8
O - W	4			TXR0	O-Y	34			PXT8
W-GR	5			PXR1	Y-OR	35		16	TXT8
GR-W	6			PXT1	GR-Y	36			TXR8
W-BR	7		2	TXT1	Y-BR	37			PXR9
BR-W	8			TXR1	BR-Y	38			PXT9
W-SL	9	2		PXR2	Y-SL	39	7	18	TXT9
SL-W	10			PXT2	SL-Y	40			TXR9
R-BL	11		4	TXT2	V-BL	41			PXR10
BL-R	12			TXR2	BL-V	42			PXT10
R-O	13			PXR3	V-O	43		20	TXT10
O-R	14			PXT3	O-V	44			TXR10
R-GR	15	3	6	TXT3	V-GR	45	8		PXR11
GR-R	16			TXR3	GR-V	46			PXT11
R-BR	17			PXR4	V-BR	47		22	TXT11
BR-R	18			PXT4	BR-V	48			TXR11
R-SL	19		8	TXT4	V-SL	49			
SL-R	20			TXR4	SL-V	50			
BK-BL	21	4		PXR5					
BL-BK	22			PXT5					
B K - O	23		10	TXT5					
O-BK	24			TXR5					
BK-GR	25			PXR6					
GR-BK	26			PXT6					
BK-BR	27	5	12	TXT6					
BR-BK	28			TXR6					
BK-SL	29			PXR7					
SL-BK	30		14	PXT7					

26. REMOTE MODULES

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REMOTE MODULE INSTALLATION

ED-1E434, Group 501 Coaxial Cabling — Central Location

Connect the ED-1E434, Group 501 intercabinet coaxial cable(s) (figure 26-1) from the CC backplane(s) to the MC backplane(s). Figure 26-2 illustrates the connections for an all unduplicated system. Figure 26-3 shows the connections for an all duplicated system. Figure 26-4 shows the connections for a typical system with duplicated common control and unduplicated module control. Route the cable between the cabinets through the duct work (use the shielded intercabinet duct for flat cables). The B and D legs are not used in an all unduplicated system, or a duplicated common control and unduplicated module control. The B and D legs should be coiled and stored in the cable duct (if space permits). Use the Customer System Document (CSD) and tables 26-1, 26-2, and 26-3 to determine the backplane locations used at the common control and the leg(s) of the cable that is to be connected at each module control.

Use tables 26-1, 26-2, and 26-3 to determine this association by looking up the remote module number (to be paired with a central module) to find the appropriate common control backplane connector(s) and the leg that is used for the central module control.

The first column in tables 26-1, 26-2, and 26-3 is the remote module number. This is not the number the module is assigned within the total system, but is the number assigned the remote module. The first remote module may be the sixth module within the system. For example, if your remote module being installed is the fourth remote module in the system, then for an all unduplicated system, a Group 501 cable will run from E8 on the common control backplane to 4MHZ1 to 7 (CC0) on the module control backplane using leg C. However, for an all duplicated system, the Group 501 cable will run from E8 on both common control backplanes to 4MHZ-CC0 and 4MHZ-CC1 on both the module control backplanes using legs C and D.

For a duplicated common control and unduplicated module control system, the Group 501 cable will run from E8 on both common controls. Leg A from CC0 will connect to 4MHZ1 to 7 (CC0) while leg A of CC1 will connect to 4MHZ1 to 7 (CC1) of the same module control carrier. Leg B of each cable is connected in the same manner to the next module. Legs C and D are not used, and should be stored. Repeat this process for each central module control that is being linked to a remote module.

A Group 502 cable can be used to extend each leg of the Group 501 cable. The combined length of Groups 501 and 502 cable must be a maximum of 200 feet. The maximum length of the unused Group 501 cable must be 8 feet.

An existing Group 501 cable can be used if its unused legs are not dead-dressed or cut off. If the existing cable must be replaced, the original connections must be replaced.

NOTE	The module control end of a group 84 cable can be adapted for conversion to a universal module by the addition of a 510 cable.

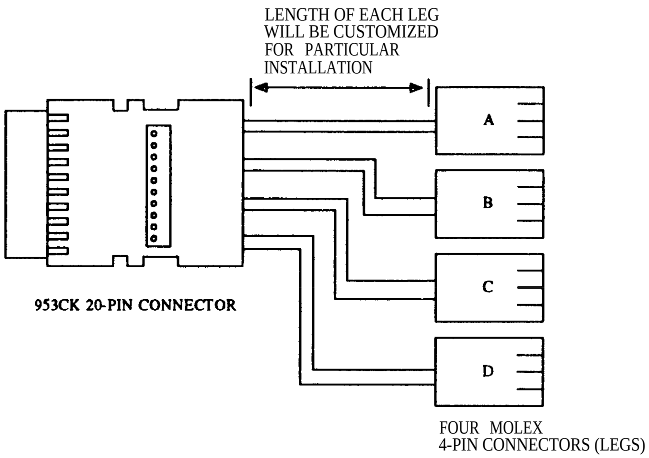


Figure 26-1. ED-1E434, Group 501 Coaxial Cable

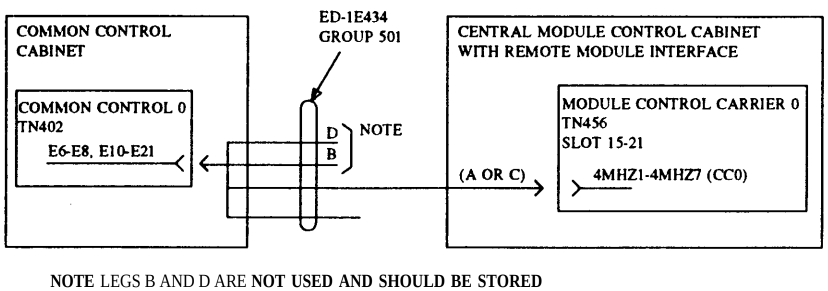


Figure 26-2. ED-1E434, Group 501 Connections for an All Unduplicated System (Phase 3)

TABLE 26-1. ED-1E434, Group 501 Connections for an All Unduplicated System (Phase 3)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	CONNECTOR
01 02	E7	A C	4MHZ1 , (CC0) 4MHZ2, (CC0)
03 04	E8	A C	4MHZ3, (CC0) 4MHZ4, (CC0)
05 06	E6	A C	4MHZ5, (CC0) 4MHZ6, (CC0)
07	E13	A	4MHZ7, (CC0)

This is the number of the module at the remote locale, not the actual module number within the system.

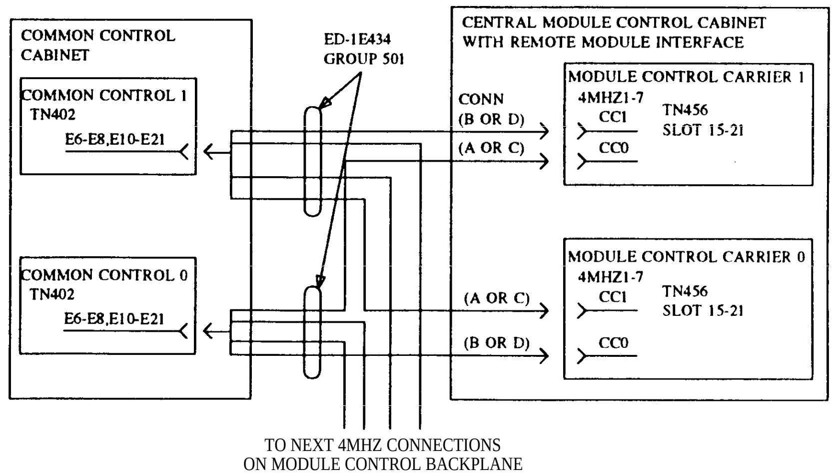


Figure 26-3. ED-1E434, Group 501 Connections for an All Duplicated System (Phase 3)

TABLE 26-2. ED-1E434, Group 501 Connections for an All Duplicated System (Phase 3)

REMOTE MODULE	COMMON CONTROL	CC CONN	CABLE LEGS	MODULE CONTROL	MODULE CONTROL CONNECTION
1	0	E7	A and C	1	4MHZ1 (CC0)
			B or D	0	4MHZ1 (CC0)
	1	E7	A or C	1	4MHZ1 (CCl)
			B or D	0	4MHZ1 (CCl)
2	0	E7	A and C	1	4MHZ2 (CCO)
			B or D	0	4MHZ2 (CCO)
	1	E7	A or C	1	4MHZ2 (CC1)
			B or D	0	4MHZ2 (CC1)
3	0	E8	A and C	1	4MHZ3 (CC0)
			B or D	0	4MHZ3 (CC0)
	1	E8	A or C	1	4MHZ3 (CCl)
			B or D	0	4MHZ3 (CCl)
4	0	E8	A and C	1	4MHZ4 (CC0)
			B or D	0	4MHZ4 (CC0)
	1	E8	A or C	1	4MHZ4 (CCl)
			B or D	0	4MHZ4 (CCl)
5	0	E6	A and C	1	4MHZ5 (CC0)
			B or D	0	4MHZ5 (CC0)
	1	E6	A or C	1	4MHZ5 (CCl)
			B or D	0	4MHZ5 (CCl)
6	0	E6	A and C	1	4MHZ6 (CC0)
			B or D	0	4MHZ6 (CC0)
	1	E6	A or C	1	4MHZ6 (CC1)
			B or D	0	4MHZ6 (CC1)
7	0	E13	A and C	1	4MHZ7 (CC0)
			B or D	0	4MHZ7 (CC0)
	1	E13	A or C	1	4MHZ7 (CC1)
			B or D	0	4MHZ7 (CCl)

This is the number of the module at the remote locale, not the actual module within the system.

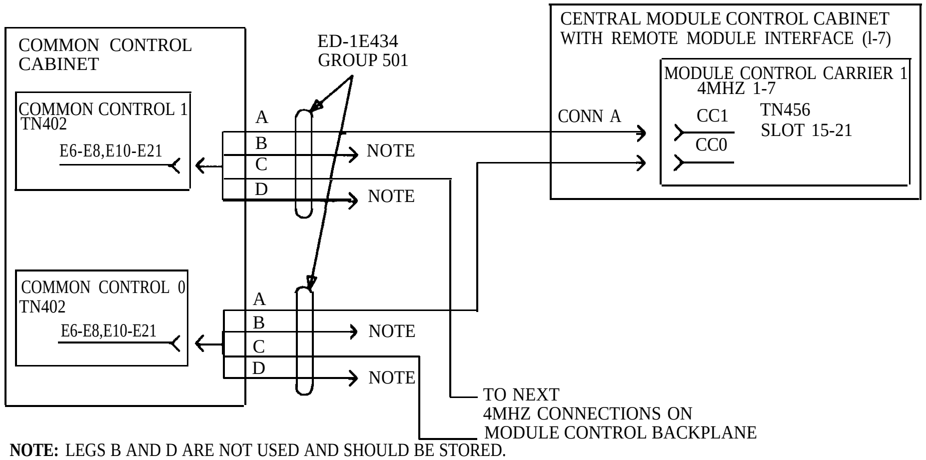


Figure 26-4. ED-1E434, Group 501 Connections for an all Duplicated CC and Unduplicated MC System (Phase 3)

TABLE 26-3. ED-1EM34, Group 501 Connections for an all Duplicated CC and Unduplicated MC System (Phase 3)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	CONNECTOR
01	E7(0)	A	4MHZ1 (CC0)
	E7(l)	A	4MHZ1 (CCl)
02	E7(0)	C	4MHZ2 (CC0)
	E7(l)	C	4MH'Z2 (CC1)
03	E8(0)	A	4MHZ3 (CC0)
	E8(1)	A	4MHZ3 (CCl)
04	E8(0)	C	4MHZ4 (CC0)
	E8(1)	C	4MHZ4 (CC1)
05	E6(0)	A	4MHZ5 (CC0)
	E6(l)	A	4MHZ5 (CCl)
06	E6(0)	C	4MHZ6 (CC0)
	E6(1)	C	4MHZ6 (CC0)
07	E13(0)	A	4MHZ7 (CC0)
	E13(1)	A	4MHZ7 (CCl)

Central Location ED-1E434, Group 504 or 505 TMS Fiber Link(s) (Phase 3)

Install the TMS fiber link(s) for the central location from the TMS carrier(s) to the central LCIT.

WARNING: The cable must be loosely supported to prevent damage. The Fiber-optic cable has a minimum bend radius of 1.5 inches.

Install the TMS fiber link as follows:

1. Connect transmitter (982NL) and receiver (982NK) paddleboards to the appropriate connectors on the backplane of the TMS carrier(s). The transmitter paddleboard must be mounted first.

NOTE: Use transceivers 982NN (TX) and 982NM (RX) (instead of 982NL and 982NK) if the TMS is more than 4900 feet from the LCIT.

2. Connect transmitter paddleboard 982NL to Fiber 1 and the receiver paddleboard 982NK to Fiber 2 of the ED-1E434, Group 504 or 505 lightguide cable.

NOTE: Use Group 504 for LCITs with 3B/ST fanouts. Use Group 505 for LCITs with 3B fanouts.

3. Route the cable out of the auxiliary cabinet to the central LCIT along the outside of the overhead ducts using locally provided hardware.
4. Connect the fiber-optic cables as shown in figures 26-5 and 26-6.

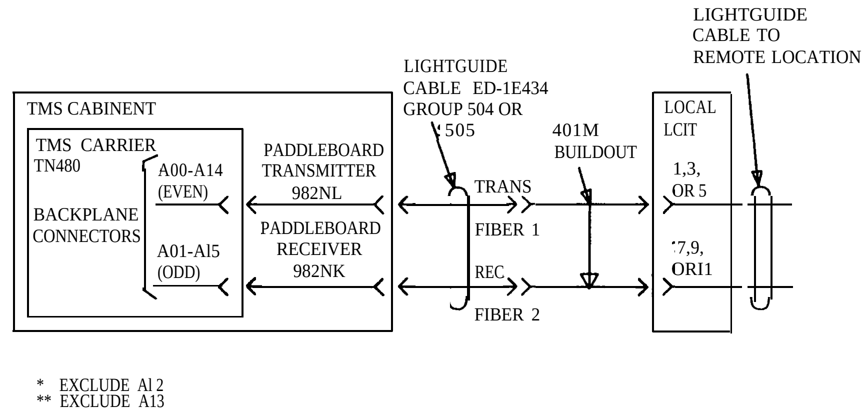


Figure 26-5. Central TMS Fiber-Link Connections for Unduplicated MC (Phase 3)

TABLE 26-4. Central TMS Fiber-Link Connections for Unduplicated MC (Phase 3)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00	17	Al0(TX) All(RX)
02	00	16	A08(TX) A09(RX)
03	00	02	A00(TX) A01(RX)
04	00	03	A02(TX) A03(RX)
05	00	04	A04(TX) A05(RX)
06	00	05	A06(TX) A07(RX)
07	01	19	A14(TX) A15(RX)

(TX) designates transmitter paddleboard 982NL or 982NN
(RX) designatcs receiver paddleboard 982NK or 982NM

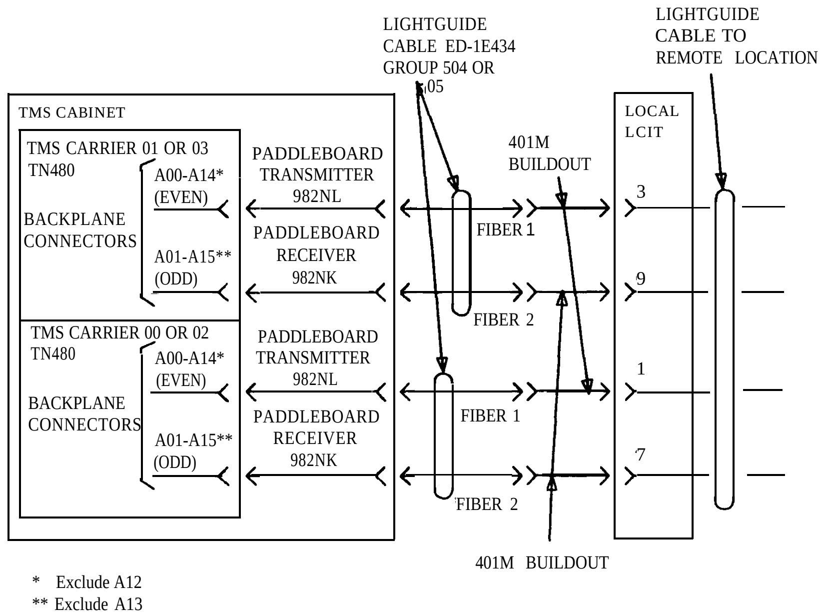


Figure 26-6. Central TMS Fiber-Link Connections for Duplicated MC (Phase 3)

TABLE 26-5. Central TMS Fiber-Link Connections for a 1 Through 7 Module System (Phase 3 Duplicated MC)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00 and 02	17	A10(TX) All(RX)
02	00 and 02	16	A08(TX) A09(RX)
03	00 and 02	02	A00(TX) A01(RX)
04	00 and 02	03	A02(TX) A03(RX)
05	00 and 02	04	A04(TX) A05(RX)
06	00 and 02	05	A06(TX) A07(RX)
07	01 and 03	19	A14(TX) A15(RX)

(TX) designates transmitter paddleboard 982NL or 982NN
(RX) designates receiver paddleboard 982NK or 982NM

Central Location ED-1E434, Group 504 or 505 RMI Fiber Link(s) (Phase 3)

Install the RMI fiber link(s) for the central location from the module control(s) to the central LCIT.

WARNING

The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 26-7 and 26-8 show the RMI fiber link for an unduplicated and duplicated system at the central location. Install the RMI fiber link(s) as follows:

1. Connect the transceiver 9823A to RMI1-7 on the backplane of the module control carriers.

NOTE

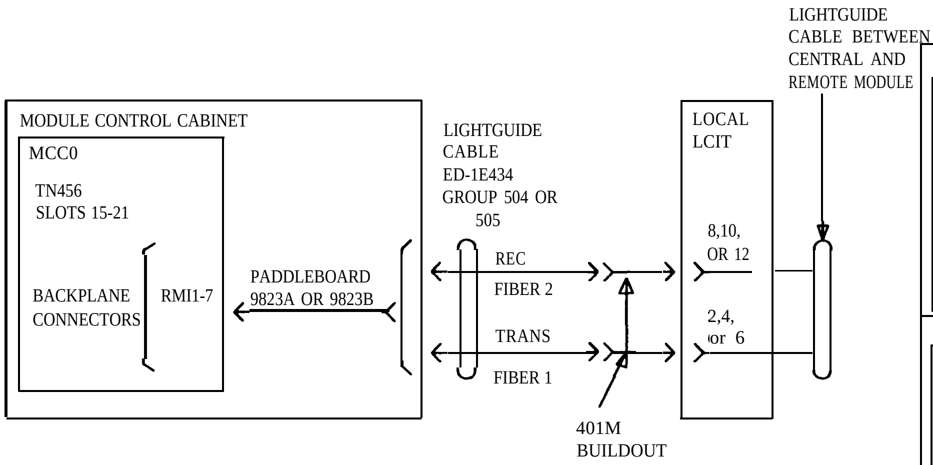
Use transceiver 9823B if the remote module is more than 4900 feet away.

2. Connect the transmit side of the transceiver to Fiber 1 and the receiver side to Fiber 2 of the ED-1E434, Group 504 or 505 lightguide cable.

NOTE

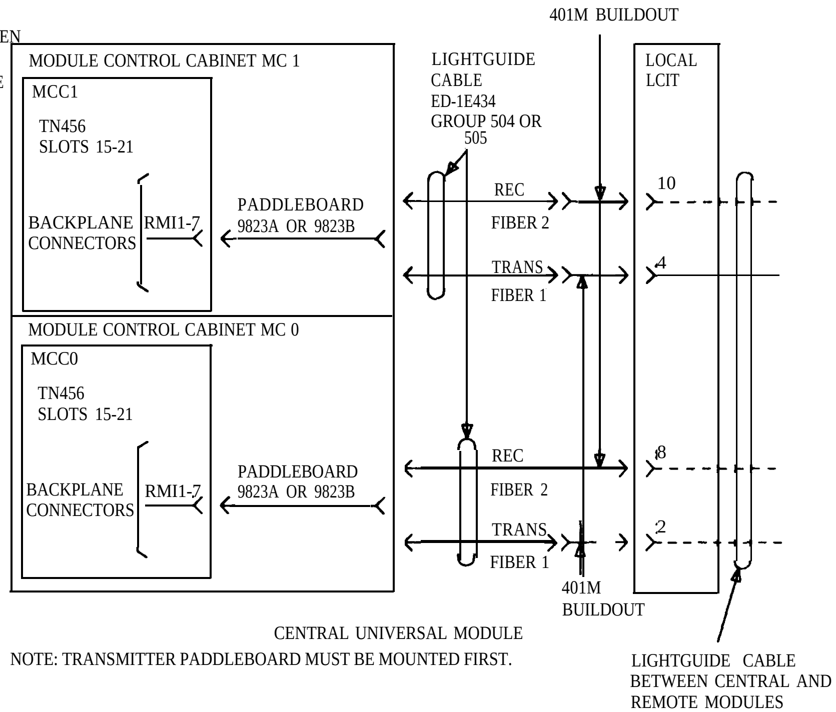
Use Group 504 for LCITs with 3B/ST fanouts. Use Group 505 for LCITs with 3B fanouts.

3. Route the cable out of the universal cabinet to the central LCIT outside the overhead ducts using the locally provided hardware. This cable should enter the right side of the LCIT.
4. Connect the fiber-optic cables as shown in figures 26-7 and 26-8.



NOTE: TRANSMITTER PADDLEBOARD MUST BE MOUNTED FIRST.

Figure 26-7. Central RMI Fiber-Link Connections for Unduplicated MC (Phase 3)



NOTE: TRANSMITTER PADDLEBOARD MUST BE MOUNTED FIRST.

Figure 26-8. Central RMI Fiber-Link Connections for Duplicated MC (Phase 3)

Remote Location ED-1E434, Group 504 or 505 RMI Fiber Link(s) (Phase 3)

Install the RMI fiber link for the remote location. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 26-9 and 26-10 show the RMI fiber link for the remote location for an unduplicated and duplicated system. Install the RMI fiber link as follows:

1. Connect transceiver 9823A to the RMI-1 plug on the connector panel of the module control carriers.
2. Connect the transmitter end of the transceiver to Fiber 2 of an ED-1E434 Group 504 or 505 cable. Connect Fiber 1 to the receiver end.
3. Route the cable out of the module control cabinet to the remote LCIT along the outside of the overhead ducts using locally provided hardware.
4. Connect the fiber-optic cables as shown in figures 26-9 and 26-10.

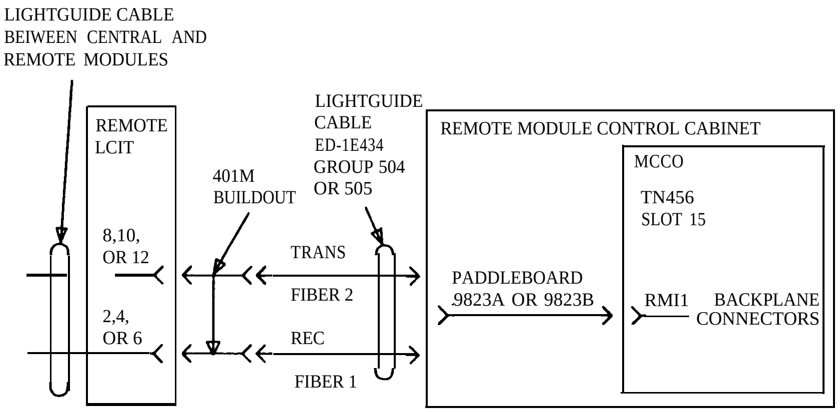


Figure 26-9. Remote RMI Fiber-Link Connections for Unduplicated MC (Phase 3)

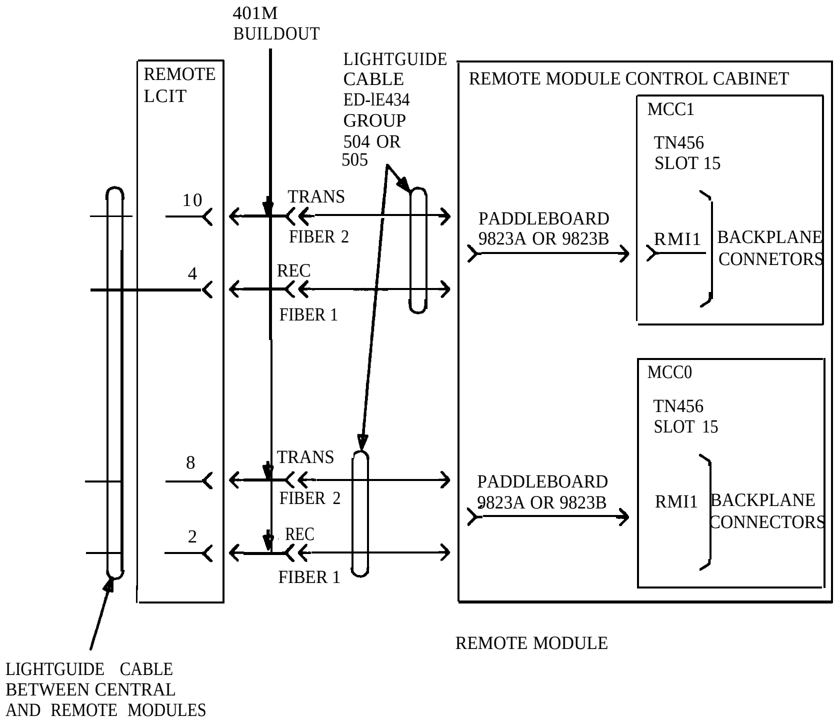


Figure 26-10. Remote RMI Fiber-Link Connections for Duplicated MC (Phase 3)

Remote Location ED-1E434, Group 504 or 505 TMS Fiber Link(s) (Phase 3)

Install the TMS fiber link(s) for the remote location from the remote LCIT to the remote module for an unduplicated and duplicated system as shown below.

WARNING

The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Install the TMS fiber link as follows:

1. Connect transceiver 9823A to the LGI connector on the module control carrier(s).

NOTE

Use transceiver 9823B if the central location is more than 4900 feet away.

2. Connect the Fiber 2 of a ED-1E434 Group 504 of 505 cable to the transmitter end of the transceiver. Connect to Fiber 1 to the receiver end.
3. Route the cable to the remote LCIT along the outside of the overhead ducts using locally provided hardware.
4. Connect the fiber-optic cables as shown in figures 26-11 and 26-12.

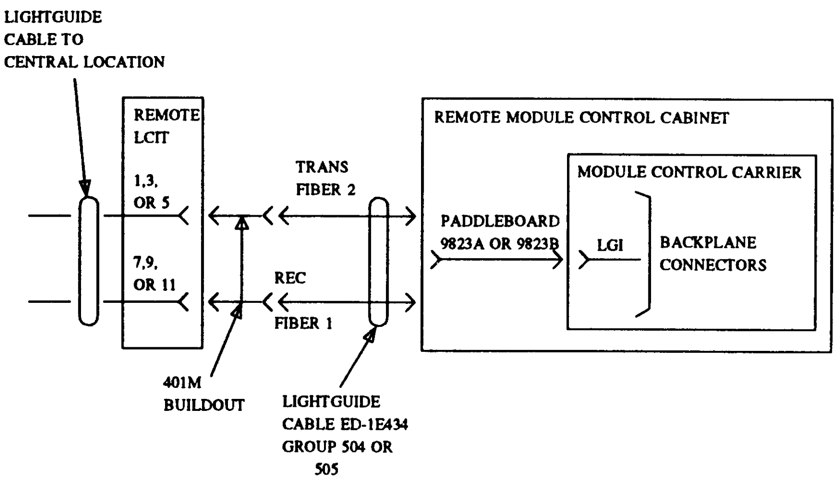


Figure 26-11. Remote TMS Fiber-Link Connections for Unduplicated MC (Phase 3)

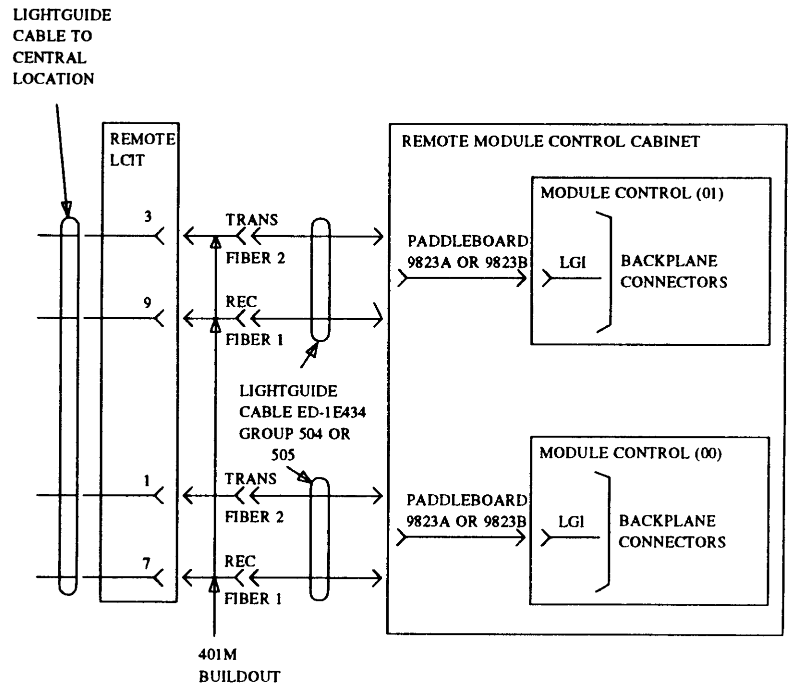


Figure 26-12. Remote TMS Fiber-Link Connections for Duplicated MC (Phase 3)

Remote Location H-600-211, G1 Jumper Cable

On every module control connector panel, only connect the remote module H-600-211, G1, jumper cable as shown below. This also applies to duplicate module control connector panels.

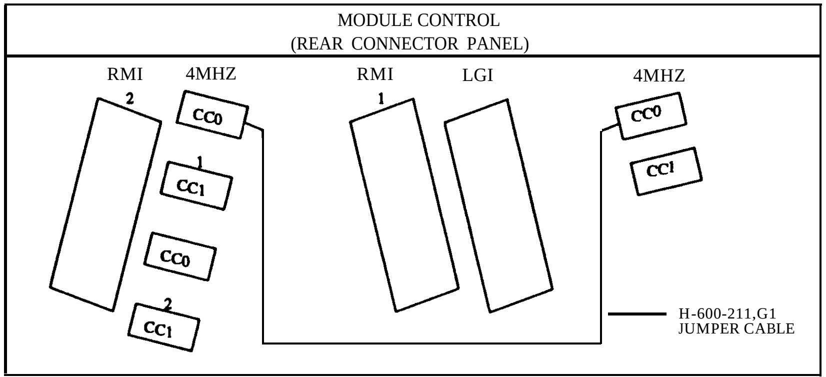
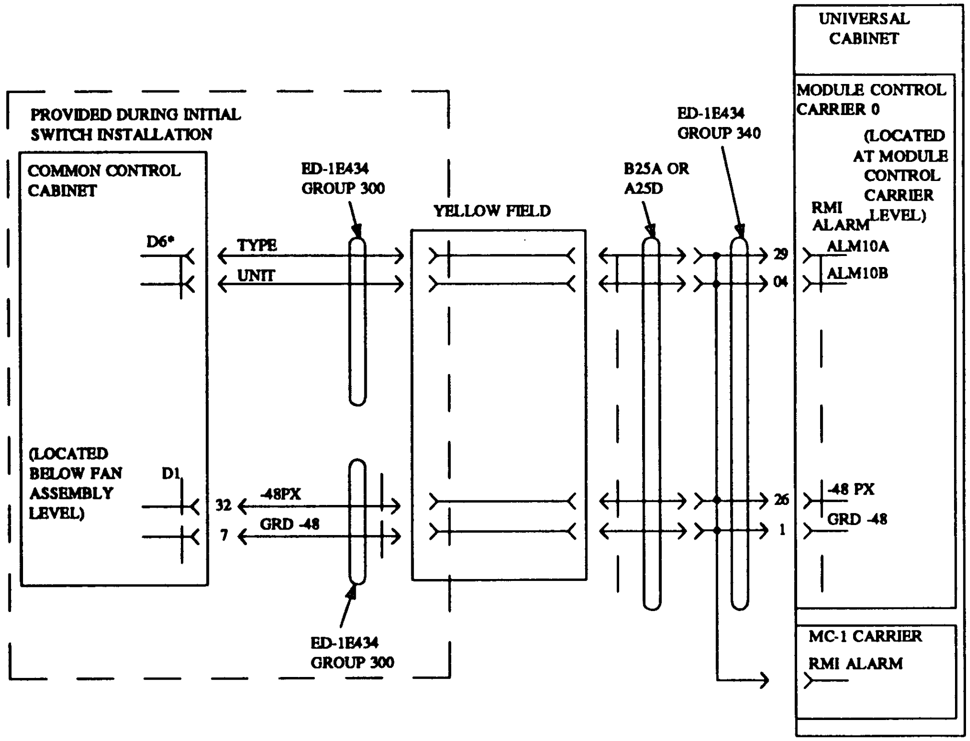


Figure 26-13. Remote Module Connector Panel Cable Connections

Emergency Transfer and Alarm Connections

Central Location (Phase 3)

Connect the ED-1E434, Group 300 cables from **RMI ALARM** connector on the universal module control connector panel. Make standard cross-connect field connections from the common control cabinet to the module control cabinet(s) as shown in figure 26-14. These cross-connections should be made in the yellow wall field.



NOTE:
FOR DUPLICATED SYSTEMS, AN ED-1E434 GROUP 340 CABLE IS USED TO "Y" MCO AND MC1 "RMI ALARM" CONNECTORS TOGETHER, AND THEN CONNECTS TO THE GROUP CABLE.

Figure 26-14. Central Alarm Connections (Phase 3) for Remote Modules for Duplicated System

Remote Location (Phase 3)

If the Remote Emergency Transfer feature is provided, connect A25D or B25A from the RMI ALARM and AUX/CNSL1 connectors on the module control connector panel to the yellow wall field. Standard cross-connections for remote emergency transfer and alarm leads are required as shown in figure 26-15.

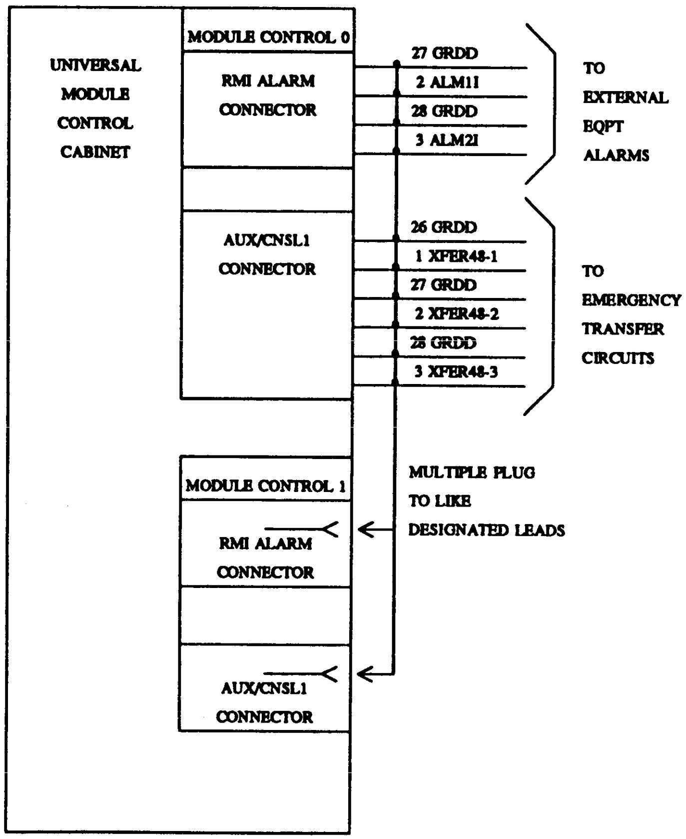


Figure 26-15. Remote Location Cross-Connections (Phase 3)

FIBER-OPTIC LINKS

Figure 26-16 shows duplex cables (lightguide) with the paddleboard transmitters and receivers. Figure 26-17 illustrates the proper mounting position for the paddleboard transmitter and receiver.

Six types of duplex cable may be used for the lightguide connections. Group 504 and 505 are used both for RMI and TMS connections for DEFINITY Generic 2. These cables are fragile and should be routed from the appropriate carrier to the LCIT (figure 26-18) outside the overhead duct work. Figure 26-19 illustrates how the fiber cables should be routed. There is no adjustment necessary for DEFINITY Generic 2 since only the 401M buildout is used.

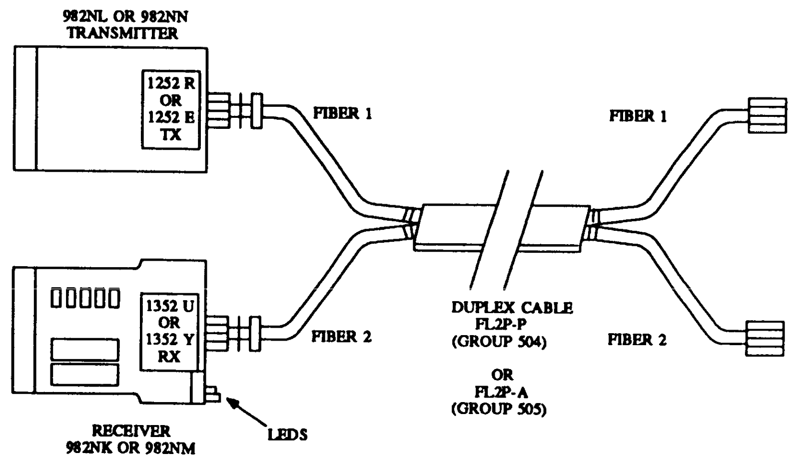


Figure 26-16. Lightguide Cables and Paddleboards

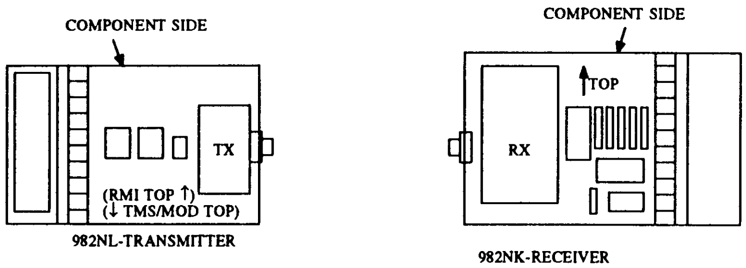


Figure 26-17. Paddleboards and Mounting Locations

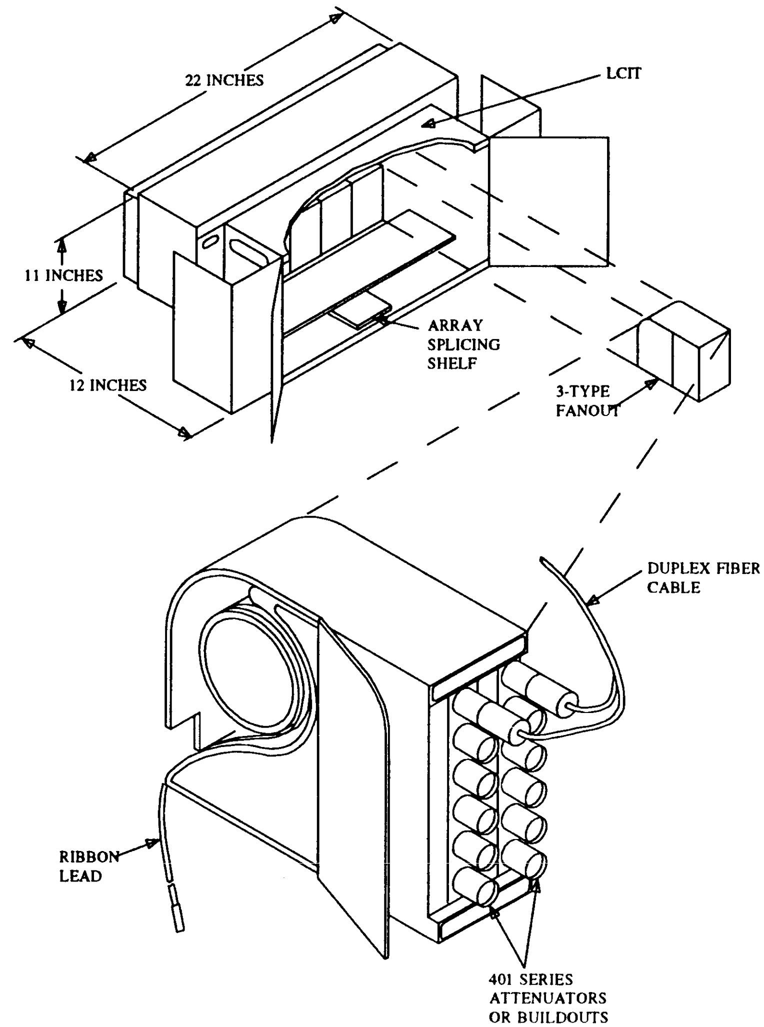


Figure 26-18. LCIT With 3-Type Fanout

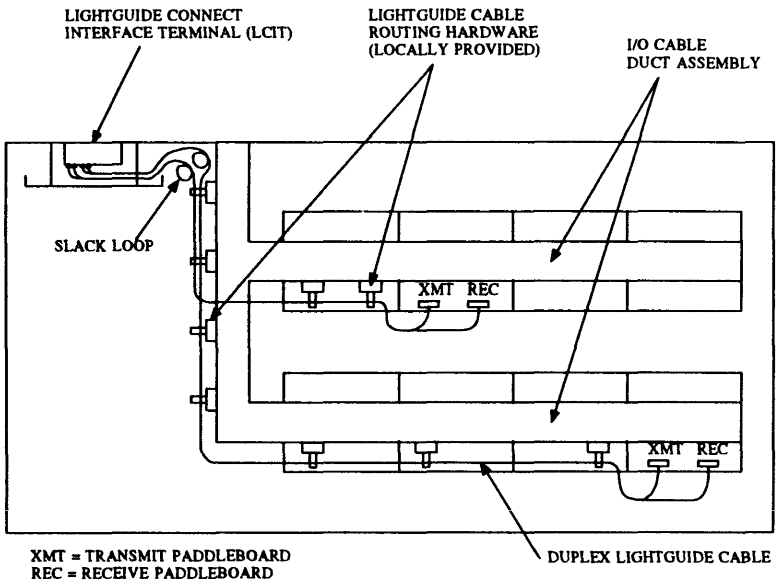


Figure 26-19. Routing of Lightguide Cables to LCIT

Central Location ED-1E434, Group 504 or 505 RMI Fiber Link(s) (Phase 1)

Install the RMI fiber link(s) for the central location from the module control(s) to the central LCIT.

The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 26-20 and 26-21 show the RMI fiber link for an unduplicated and duplicated system at the central location. Install the RMI fiber link(s) as follows:

1. Connect transmitter and receiver paddleboards to **A05** and **A04** on the backplane of the module control carriers. The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 504 or 505 lightguide cable.
3. Route the cable out of the module control cabinet to the central LCIT outside the overhead ducts using the locally provided hardware. This cable should enter the right side of the LCIT. Figure 26-19 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 26-18) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 26-20 and 26-21.

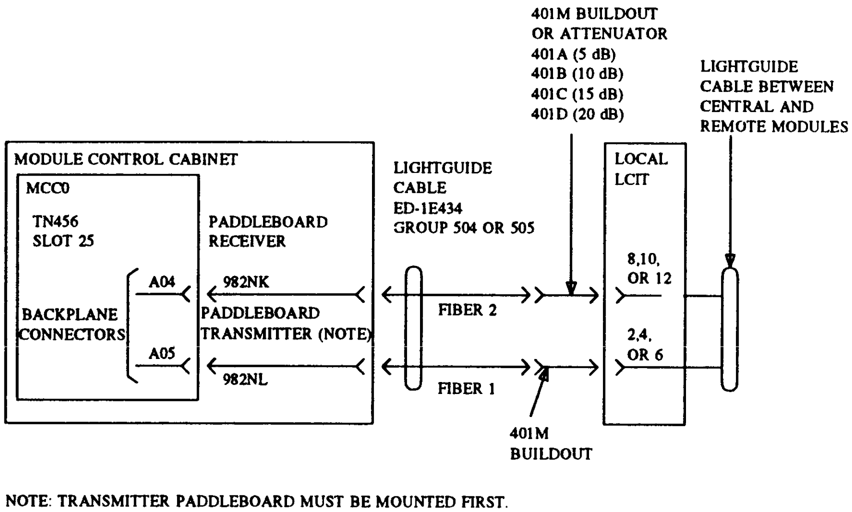


Figure 26-20. Central RMI Fiber-Link Connections for Unduplicated MC (Phase 1)

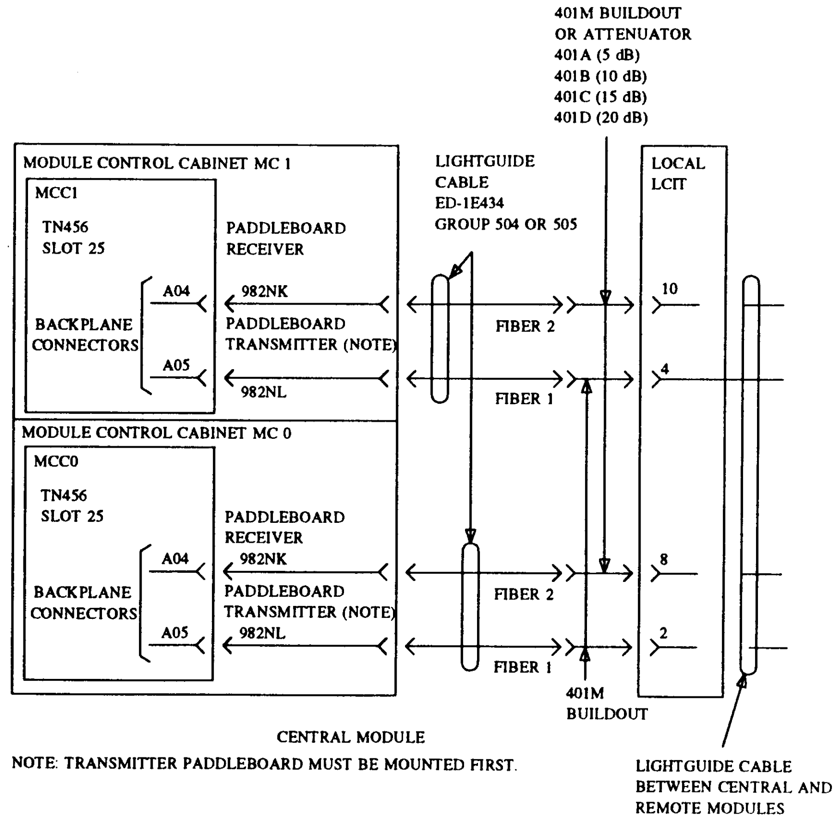


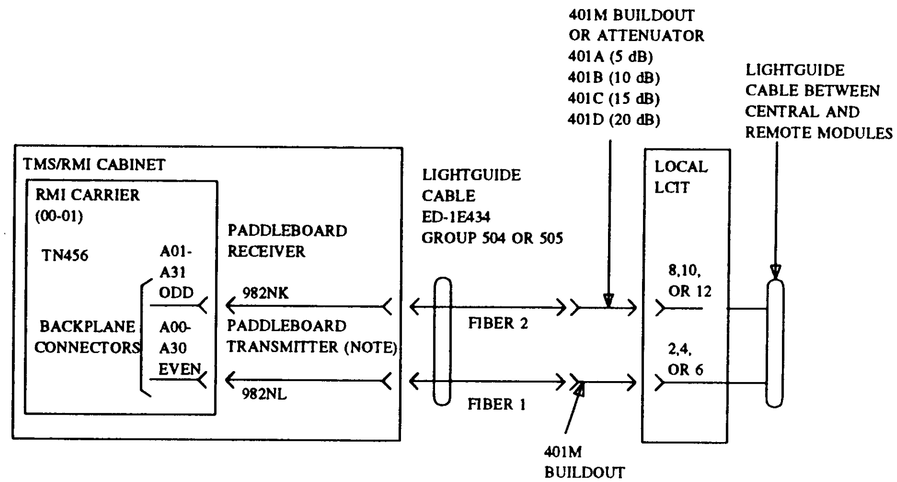
Figure 26-21. Central RMI Fiber-Link Connections for Duplicated MC (Phase 1)

Central Location ED-1E434, Group 504 or 505 RMI Fiber Link(s) (Phase 2)

Install the RMI fiber link(s) for the central location from the RMI carriers to the central LCIT. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 26-22 and 26-23 show the RMI fiber link, and tables 26-6 and 26-7 show the appropriate backplane connectors used for an unduplicated and duplicated system at the central location. Install the RMI fiber link(s) as follows:

1. Connect transmitter and receiver paddleboards to **A00-A30** even and **A01-A31** odd on the backplane of the RMI carriers. The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 504 or 505 lightguide cable.
3. Route the cable out of the TMS/RMI cabinet to the central LCIT outside the overhead ducts using the locally provided hardware. This cable should enter the right side of the LCIT. Figure 26-19 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 26-18) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 26-22 and 26-23.



NOTE: TRANSMITTER PADDLEBOARD MUST BE MOUNTED FIRST.

Figure 26-22. Central RMI Fiber-Link Connections for Unduplicated MC (Phase 2)

TABLE 26-6. RMI Carrier Backplane Connections for Unduplicated MC (Phase 2)

REMOTE MODULE (NOTE)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR TRANSMITTER	RECEIVER
01	00	00	A00	A01
02	00	13	A16	A17
03	00	01	A02	A03
04	00	14	A18	A19
05	00	02	A04	A05
06	00	15	A20	A21
07	00	03	A06	A07
08	00	16	A22	A23
09	00	05	A08	A09
10	00	18	A24	A25
11	00	06	A10	Al 1
12	00	19	A26	A27
13	00	07	A12	A13
14	00	20	A28	A29
15	00	08	A14	A15
16	00	21	A30	A31
17	01	00	A00	A01
18	01	13	A16	A17
19	01	01	A02	A03
20	01	14	A18	A19
21	01	02	A04	A05
22	01	15	A20	A21
23	01	03	A06	A07
24	01	16	A22	A23
25	01	05	A08	A09
26	01	18	A24	A25
27	01	06	A10	Al 1
28	01	19	A26	A27
29	01	07	A12	A13
30	01	20	A28	A29

This is the number of the module at the remote locale, not the actual module number within the system.

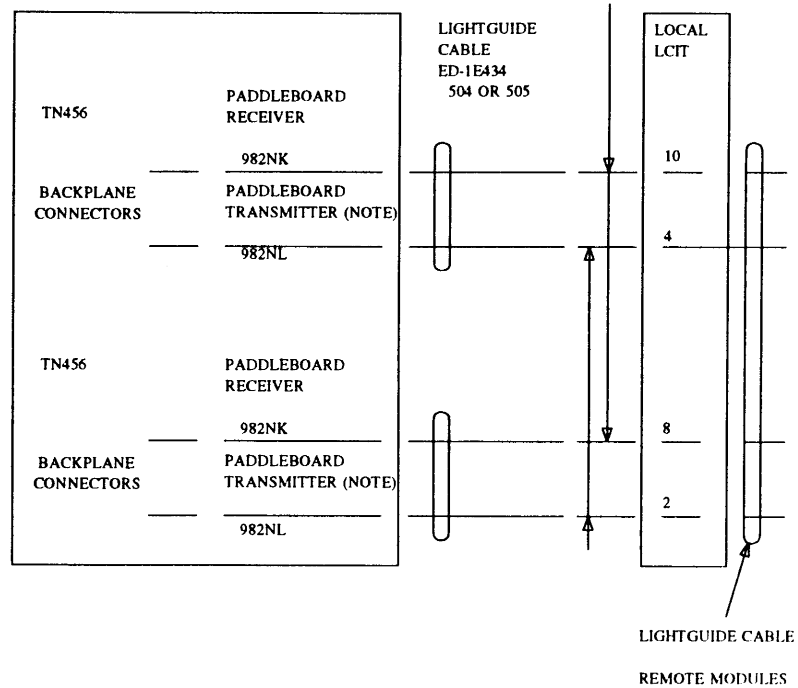


Figure 26-23. Central RMI Fiber-Link Connections for Duplicated MC (Phase 2)

TABLE 26-7. RMI Carrier Backplane Connections for Duplicated MC (Phase 2)

REMOTE MODULE (NOTE)	RMI CARRIER SLOT	RMI CARRIER NUMBER	RMI CARRIER BACKPLANE CONNECTOR TRANSMITTER	RMI CARRIER BACKPLANE CONNECTOR RECEIVER	REMOTE MODULE (NOTE)	RMI CARRIER SLOT	RMI CARRIER NUMBER	RMI CARRIER BACKPLANE CONNECTOR TRANSMITTER	RMI CARRIER BACKPLANE CONNECTOR RECEIVER
01	00 00	00 13	A00 A16	A01 A17	17	02 02	00 13	A00 A16	A01 A17
02	00 00	01 14	A02 A18	A03 A19	18	02 02	01 14	A02 A18	A03 A19
03	00 00	02 15	A04 A20	A05 A21	19	02 02	02 15	A04 A20	A05 A21
04	00 00	03 16	A06 A22	A07 A23	20	02 02	03 16	A06 A22	A07 A23
05	00 00	05 18	A08 A24	A09 A25	21	02 02	05 18	A08 A24	A09 A25
06	00 00	06 19	A10 A26	A11 A27	22	02 02	06 19	A10 A26	A11 A27
07	00 00	07 20	A12 A28	A13 A29	23	02 02	07 20	A12 A28	A13 A29
08	00 00	08 21	A14 A30	A15 A31	24	02 02	08 21	A14 A30	A15 A31
09	01 01	00 13	A00 A16	A01 A17	25	03 03	00 13	A00 A16	A01 A17
10	01 01	01 14	A02 A18	A03 A19	26	03 03	01 14	A02 A18	A03 A19
11	01 01	02 15	A04 A20	A05 A21	27	03 03	02 15	A04 A20	A05 A21
12	01 01	03 16	A06 A22	A07 A23	28	03 03	03 16	A06 A22	A07 A23
13	01 01	05 18	A08 A24	A09 A25	29	03 03	05 18	A08 A24	A09 A25
14	01 01	06 19	A10 A26	A11 A27	30	03 03	06 19	A10 A26	A11 A27
15	01 01	07 20	A12 A28	A13 A29					
16	01 01	08 21	A14 A30	A15 A31					

This is the number of the module at the remote locale, not the actual module number within he system.

Central Location ED-1E434, Group 504 or 505 TMS Fiber Link(s) (Phases 1 and 2)

Install the TMS fiber link(s) for the central location from the TMS carrier(s) to the central LCIT. Figures 26-24 and 26-25 show the connections for an unduplicated and duplicated system. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Use the CSD to determine the connector pins that are used on TMS carrier(s) for the TMS fiber link to each remote module. If CSDs are unavailable, table 26-8 can be used to determine this information for an unduplicated system. Tables 26-9 and 26-10 can be used to determine this information for a duplicated system. Look up the module number of each remote module in the appropriate table, and use the corresponding TMS carrier and pin numbers to connect from the TMS backplane to the LCIT as shown in figures 26-24 and 26-25. The number of a remote module is determined by the module that is in the system.

Install the TMS fiber link as follows:

1. Connect transmitter and receiver paddleboards to the appropriate connectors on the backplane of the TMS carrier(s). The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 1 and the receiver paddleboard to Fiber 2 of the ED-1E434, Group 504 or 505 lightguide cable.
3. Route the cable out of the auxiliary cabinet to the central LCIT along the outside of the overhead ducts using locally provided hardware. Figure 26-19 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 26-18) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 26-24 and 26-25.

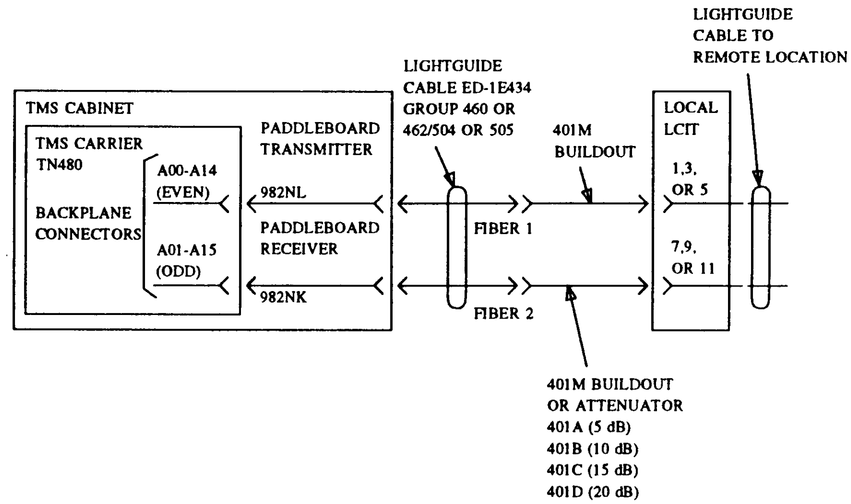


Figure 26-24. Central TMS Fiber-Link Connections for Unduplicated MC (Phases 1 and 2)

TABLE 26-8. Central TMS Fiber-Link Connections for Unduplicated MC (Phases 1 and 2)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR	REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECT0R
01	00	17	A10(T) All(R)	16	02	18	Al2(T) A13(R)
02	00	16	A08(T) A09(R)	17	02	17	A10(T) A11(R)
03	00	02	A00(T) A01(R)	18	02	16	A08(T) A09(R)
04	00	03	A02(T) A03(R)	19	02	02	A00(T) A01(R)
05	00	04	A04(T) A05(R)	20	02	03	A02(T) A03(R)
06	00	05	A06(T) A07(R)	21	02	04	A04(T) A05(R)
07	01	19	A14(T) A15(R)	22	02	05	A06(T) A07(R)
08	01	18	A12(T) A13(R)	23	03	19	A14(T) A15(R)
09	01	17	A10(T) All(R)	24	03	18	Al 2(T) A13(R)
10	01	16	A08(T) A09(R)	25	03	17	Al0(T) Al 1 (R)
11	01	02	A00(T) A01(R)	26	03	16	A08(T) A09(R)
12	01	03	A02(T) A03(R)	27	03	02	A00(T) A01(R)
13	01	04	A04(T) A05(R)	28	03	03	A02(T) A03(R)
14	01	05	A06(T) A07(R)	29	03	04	A04(T) A05(R)
15	02	19	A14(T) A15(R)	30	03	05	A06(T) A07(R)

(T) designates transmitter paddleboard 982NK
(R) designates receiver paddleboard 982NL

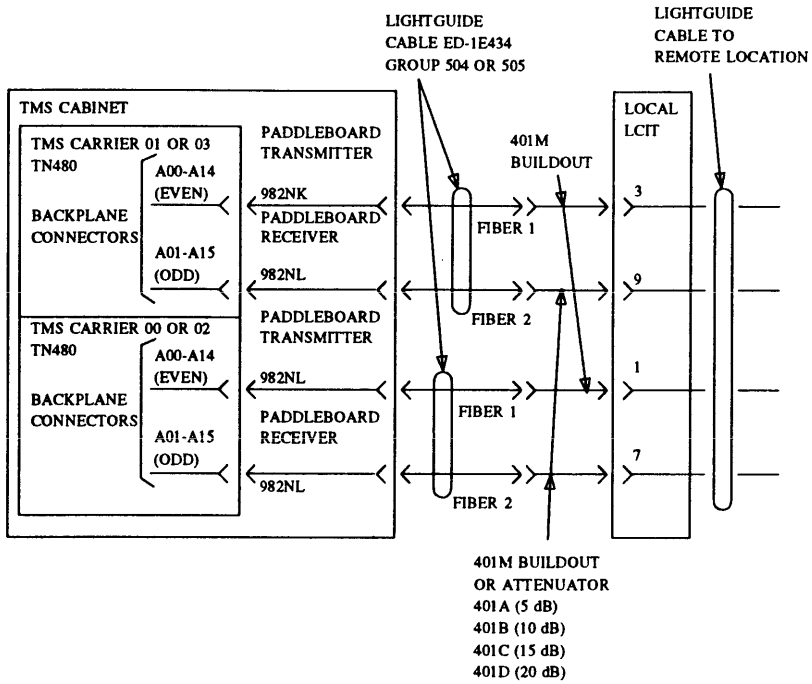


Figure 26-25. Central TMS Fiber-Link Connections for Duplicated MC (Phases 1 and 2)

TABLE 26-9. Central TMS Fiber-Link Connections for a 1 Through 15 Module System (Phases 1 and 2 Duplicated MC)

REMOTE MODULE	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00 and 02	17	A10(T) A11(R)
02	00 and 02	16	A08(T) A09(R)
03	00 and 02	02	A00(T) A01(R)
04	00 and 02	03	A02(T) A03(R)
05	00 and 02	04	A04(T) A05(R)
06	00 and 02	05	A06(T) A07(R)
07	01 and 03	19	A14(T) A15(R)
08	01 and 03	18	A12(T) A13(R)
09	01 and 03	17	A10(T) A11(R)
10	01 and 03	16	A08(T) A09(R)
11	01 and 03	02	A00(T) A01(R)
12	01 and 03	03	A02(T) A03(R)
13	01 and 03	04	A04(T) A05(R)
14	01 and 03	05	A06(T) A07(R)

(T) designates transmittal paddleboard 982NL
(R) designates receiver paddleboard 982NL

TABLE 26-10. Central TMS Fiber-Link Connections for a 1 Through 31 Module System (Phases 1 and 2 Duplicated MC)

REMOTE MODULE	TMS CABINET	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTION	REMOTE MODULE	TMS CABINET	TMS CARRIER	SLOT NUMBER	TMS BACKPLANE CONNECTOR
01	00 and 01	00	17	A10(T) All(R)	16	00 and 01	02	18	A12(T) A13(R)
02	00 and 01	00	16	A08(T) A09(R)	17	00 and 01	02	17	AI0(T) All(R)
03	00 and 01	00	02	A00(T) A01(R)	18	00 and 01	02	16	A08(T) A09(R)
04	00 and 01	00	03	A02(T) A03(R)	19	00 and 01	02	02	A00(T) A01(R)
05	00 and 01	00	04	A04(T) A05(R)	20	00 and 01	02	03	A02(T) A03(R)
06	00 and 01	00	05	A06(T) A07(R)	21	00 and 01	02	04	A04(T) A05(R)
07	00 and 01	01	19	A14(T) Al5(R)	22	00 and 01	02	05	A06(T) A07(R)
08	00 and 01	01	18	A12(T) A13(R)	23	00 and 01	03	19	A14(T) Al5(R)
09	00 and 01	01	17	Al O(T) Al I(R)	24	00 and 01	03	18	A12(T) A13(R)
10	00 and 01	01	16	A08(T) A09(R)	25	00 and 01	03	17	A10(T) Al 1 (R)
11	00 and 01	01	02	A00(T) A01(R)	26	00 and 01	03	16	A08(T') A09(R)
12	00 and 01	01	03	A02(T) A03(R)	27	00 and 01	03	02	A00(T) A01(R)
13	00 and 01	01	04	A04(T) A05(R)	28	00 and 01	03	03	A02(T) A03(R)
14	00 and 01	01	05	A06(T) A07(R)	29	00 and 01	03	04	A04(T) A05(R)
15	00 and 01	02	19	A14(T) Al5(R)	30	00 and 01	03	05	A06(T) A07(R)

(T) designates transmitter paddleboard 982NK
(R) designates receiver paddleboard 982NL

Remote Location ED-1E434, Group 504 or 505 RMI Fiber Link(s) (Phases 1 and 3)

Traditional Module of Remote Site Install the RMI fiber link for the remote location from the module control to the central LCIT. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Figures 26-26 and 26-27 show the RMI fiber link for the remote location for an unduplicated and duplicated system. Install the RMI fiber link as follows:

1. Connect transmitter and receiver paddleboards to **A05** and **A04** on the backplane of the module control carriers. The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 2 and the receiver paddleboard to Fiber 1 of the ED-1E434 lightguide cable.
3. Route the cable out of the module control cabinet to the remote LCIT along the outside of the overhead ducts using locally provided hardware. Figure 26-19 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 26-18) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 26-26 and 26-27.

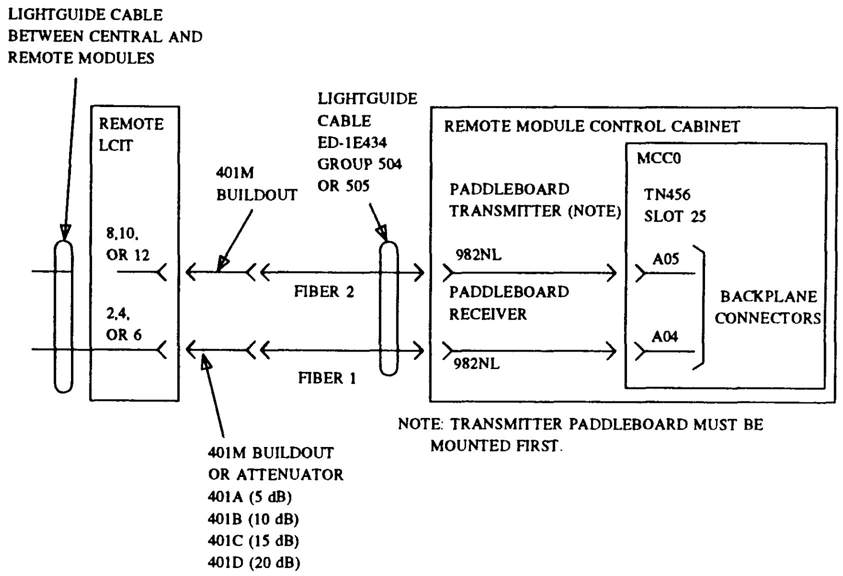


Figure 26-26. Remote RMI Fiber-Link Connections for Unduplicated MC (Phases 1 and 3 — Traditional Module at Remote Site)

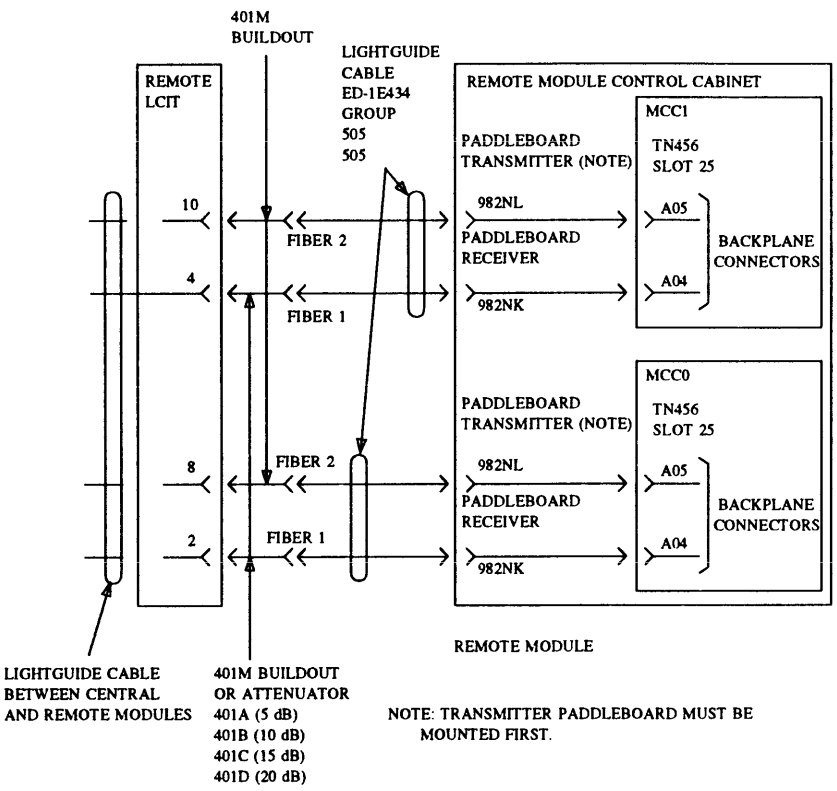


Figure 26-27. Remote RMI Fiber-Link Connections for Duplicated MC (Phase 1 and 3 — Traditional Module at Remote Site)

Remote Location ED-1E434, Group 504 or 505 TMS Fiber Link(s) (Phases 1 2, and 3 — Traditional Module at Remote Site)

Install all the TMS fiber link(s) for the remote location from the TMS carrier(s) to the remote LCIT as shown in figures 26-28 and 26-29 for an unduplicated and duplicated system. The cable must be loosely supported to prevent damage. The fiber-optic cable has a minimum bend radius of 1.5 inches.

Install the TMS fiber link as follows:

1. Connect transmitter and receiver paddleboards to the appropriate connectors on the backplane of the module control carrier(s). The transmitter paddleboard must be mounted first.
2. Connect transmitter paddleboard to Fiber 2 and the receiver paddleboard to Fiber 1 of the ED-1E434 lightguide cable.
3. Route the cable out of the auxiliary cabinet to the remote LCIT along the outside of the overhead ducts using locally provided hardware. Figure 26-19 illustrates the routing of lightguide cables.
4. Connect the appropriate attenuator to the central LCIT (figure 26-18) in the correct position as determined by your CSD.
5. Connect the fiber-optic cables to the appropriate attenuator as shown in figures 26-28 and 26-29.

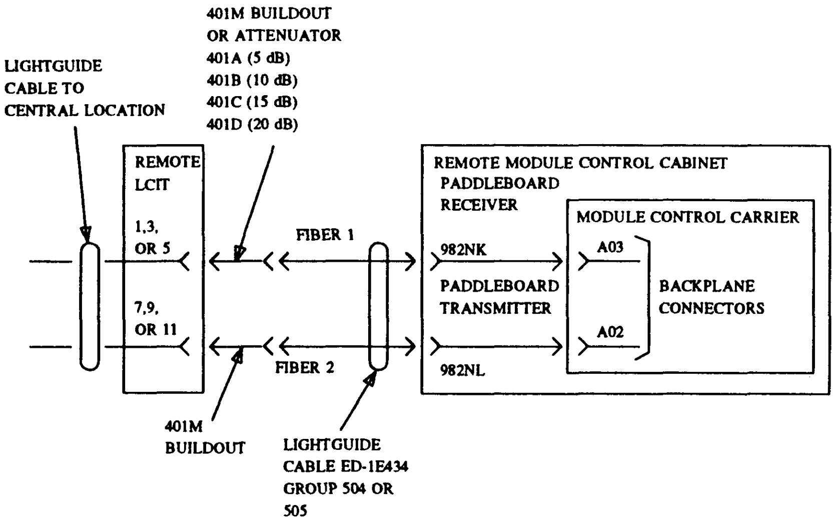


Figure 26-28. Remote TMS Fiber-Link Connections for Unduplicated MC Phases 1, 2, and 3 — Traditional Module at Remote Site)

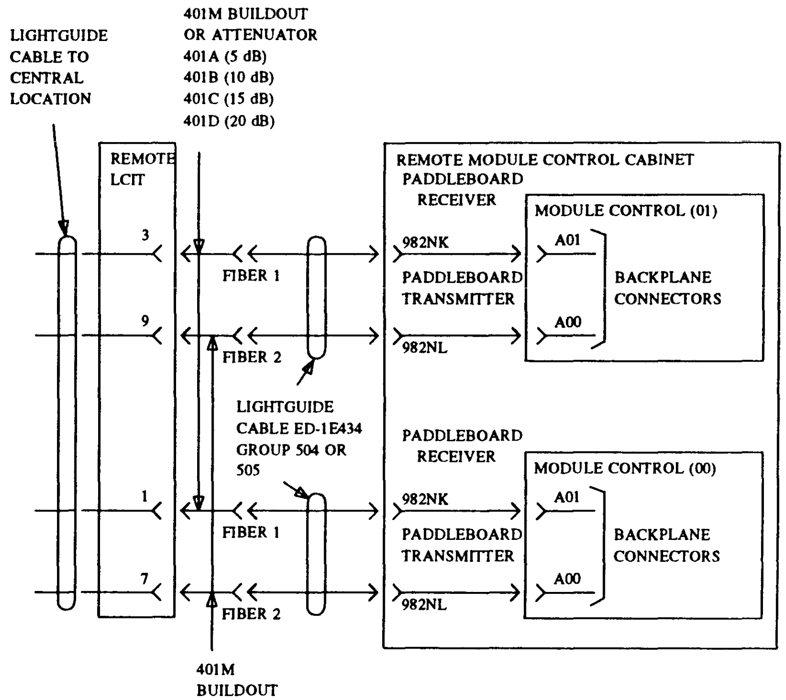


Figure 26-29. Remote TMS Fiber-Link Connections for Duplicated MC (Phases 1, 2, and 3 — Traditional Module at Remote Site)

ED-1E434, Group 501 Coaxial Cabling (Phase 1)

Connect the ED-1E434, Group 501 intercabinet coaxial cable(s) (figure 26-30) from the common control backplane(s) to the traditional module control backplane(s). Figure 26-31 illustrates the connections for an all unduplicated system. Figure 26-32 illustrates the typical connections for an all duplicated system; while figure 26-33 shows the connections for a typical system with duplicated common control and unduplicated module control. Route the cable between the cabinets through the duct work (use the shielded intercabinet duct for flat cables). The B and D legs are not used in an all unduplicated system, or a duplicated common control and unduplicated module control. The B and D legs should be coiled and stored in the cable duct (if space permits). Use the Customer System Document (CSD) and tables 26-11, 26-12, and 26-13 to determine the backplane pin locations used at the common control and the leg(s) of the cable that is to be connected at each module control.

Use tables 26-11, 26-12, and 26-13 to determine this association by looking up the remote module number (to be paired with a central module) to find the appropriate common control backplane connector(s) and the leg that is used for the central module control.

The first column in tables 26-11, 26-12, and 26-13 is the remote module number. This is not the number the module is assigned within the total system, but is the number assigned the remote module. The first remote module may be the sixth module within the system. For example, if your remote module being installed is the fourth remote module in the system, then for an all unduplicated system, a cable will run **E8** on the common control backplane to **B04** on the module control backplane using leg C. However, for an all duplicated system, the cable will run from **E8** on both common control backplanes to **B03** and **B04** on both the module control backplanes using legs C and D.

For a duplicated common control and unduplicated module control system, the cable will run from **E8** on both common controls. Leg A from CC0 will connect to **B04,** while leg A of CC1 will connect to **B03** of the same module control carrier. Leg C of each cable is connected in the same manner to the next module. Legs B and D are not used, and should be stored. Repeat this process for each central module control that is being linked to a remote module.

A Group 89 cable can be used to extend each leg of the Group 84 cable. The combined length of Groups 84 and 89 cables must be a maximum of 200 feet. The maximum length of the unused Group 84 cable must be no more than 8 feet. In addition, to connect a Group 501 cable to a traditional module control carrier, a Group 502 adapter is required. The combined maximum length of Group 501 and 502 cables must be no more than 200 feet.

An existing Group 84 or 501 cable can be used if its unused legs are not dead-dressed or cut off.

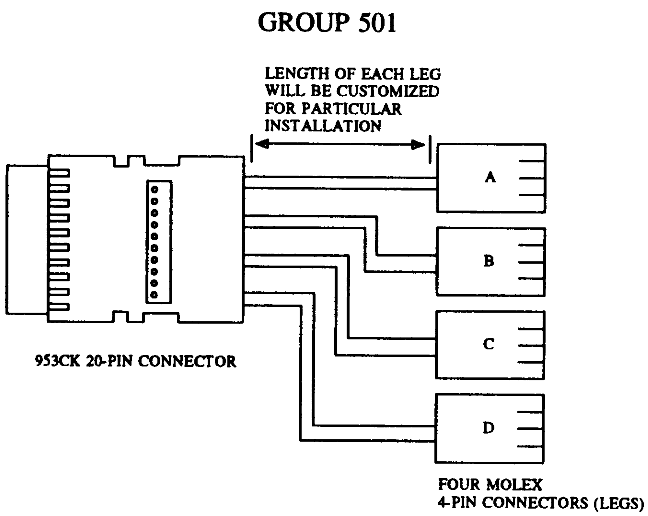


Figure 26-30. ED-1E434, Coaxial Cables

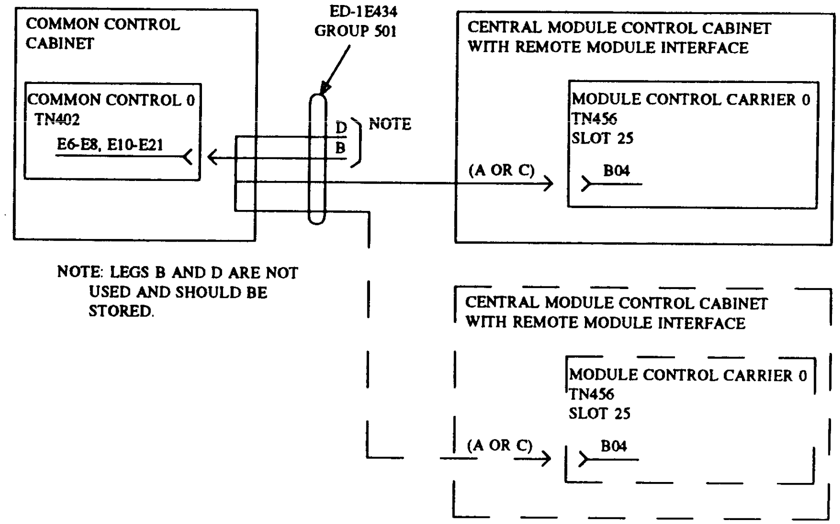


Figure 26-31. ED-1E434, Group 501 Connections for an All Unduplicated System (Phase 1)

TABLE 26-11. ED-1E434, Group 501 Connections for an All Unduplicated System (Phase 1)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	CONNECTOR
01 02	E7	A C	B04 B04
03 04	E8	A C	B04 B04
05 06	E6	A C	B04 B04
07 08	E13	A C	B04 B04
09 10	El1	A C	B04 B04
11 12	E12	A C	B04 B04
13 14	E10	A C	B04 B04
15 16	E17	A C	B04 B04
17 18	E15	A C	B04 B04
19 20	E16	A C	B04 B04
21 22	E14	A C	B04 B04
23 24	E21	A C	B04 B04
25 26	E19	A C	B04 B04
27 28	E20	A C	B04 B04
29 30	E18	A C	B04 B04

This is the number of the module at the remote locale, not the actual module number within the system

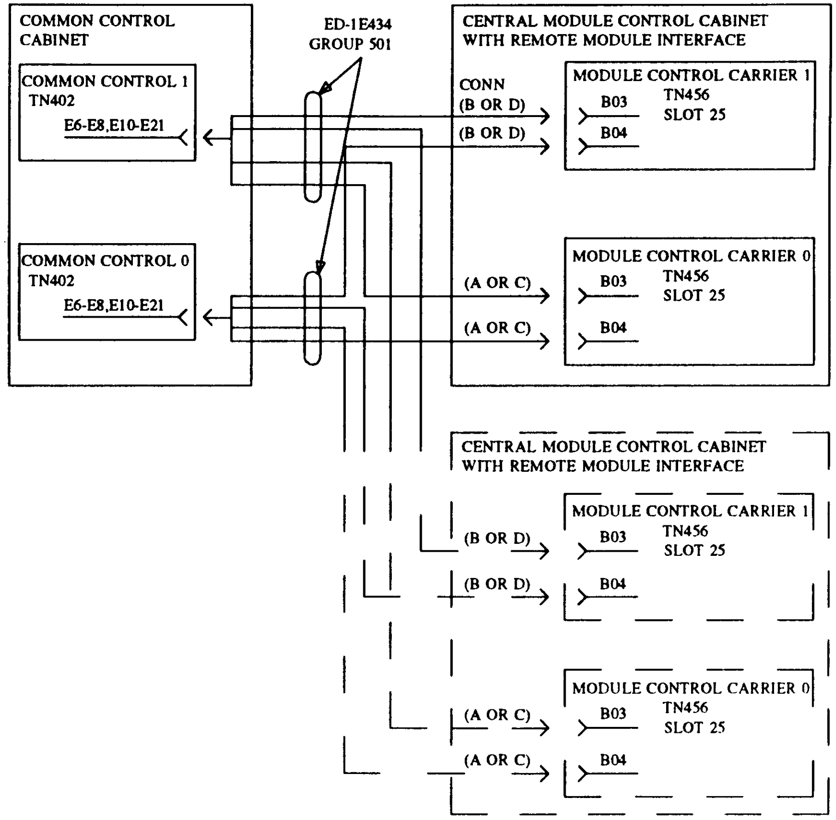


Figure 26-32. ED-1E434, Group 501 Connections for an All Duplicated System (Phase 1)

TABLE 26-12. ED-1E434, Group 501 Connections for an All Duplicated System (Phase 1)

REMOTE MODULE (NOTE)	COMMON CONTROL(00) AND (01) BACKPLANE CONNECTOR	MODULE CONTROL LEGS (GROUP 501)	CONNECTOR
01 02	E7	A and B C and D	B04 B03
03 04	E8	A and B C and D	B04 B03
05 06	E6	A and B C and D	B04 B03
07 08	E13	A and B C and D	B04 B03
09 10	E11	A and B C and D	B04 B03
11 12	E12	A and B C and D	B04 B03
13 14	E10	A and B C and D	B04 B03
15 16	E17	A and B C and D	B04 B03
17 18	E15	A and B C and D	B04 B03
19 20	E16	A and B C and D	B04 B03
21 22	E14	A and B C and D	B04 B03
23 24	E21	A and B C and D	B04 B03
25 26	E19	A and B C and D	B04 B03
27 28	E20	A and B C and D	B04 B03
29 30	E18	A and B C and D	B04 B03

This is the number of the module at the remote locale, not the actual module within the system.

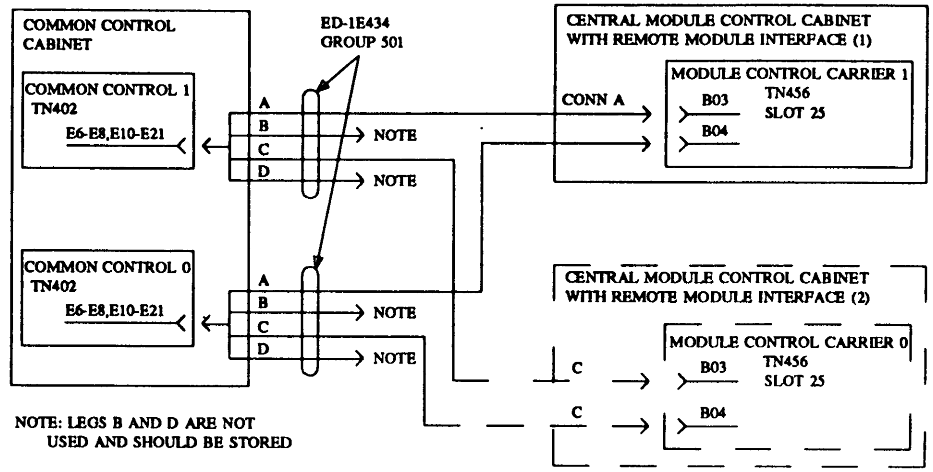


Figure 26-33. ED-1E434, Group 501 Connections for an all Duplicated CC and Unduplicated MC System (Phase 1)

TABLE 26-13. ED-1E434, Group 501 Connections for an all Duplicated CC and Unduplicated MC System (Phase 1)

REMOTE M0DULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	CONNECTOR	REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	CONNECTOR
01	E7(0) E7(1)	A A	B04 B03	16	E17(0) E17(1)	C C	B04 B03
02	E7(0) E7(1)	C C	B04 B03	17	E15(0) E15(1)	A A	B04 B03
03	E8(0) E8(1)	A A	B04 B03	18	E15(0) E15(1)	C C	B04 B03
04	E8(0) E8(1)	C C	B04 B03	19	E16(0) E16(1)	A A	B04 B03
05	E6(0) E6(1)	A A	B04 B03	20	E16(0) E16(1)	C C	B04 B03
06	E6(0) E6(1)	C C	B04 B03	21	E14(0) E14(1)	A A	B04 B03
07	El 3(0) E13(1)	A A	B04 B03	22	E14(0) E14(1)	C C	B04 B03
08	E13(0) E13(1)	C C	B04 B03	23	E21(0) E21(I)	A A	B04 B03
09	E1l(0) E11(l)	A A	B04 B03	24	E21(0) E21(1)	C C	B04 B03
10	El1(0) E11(l)	C C	B04 B03	25	E19(0) E19(1)	A A	B04 B03
11	El 2(0) E12(1)	A A	B04 B03	26	E19(0) E19(1)	C C	B04 B03
12	El 2(0) E12(1)	C C	B04 B03	27	E20(0) E20(1)	A A	B04 B03
13	E10(0) E10(1)	A A	B04 B03	28	E20(0) E20(1)	C C	B04 B03
14	E10(0) E10(1)	C C	B04 B03	29	E18(0) E18(1)	A A	B04 B03
15	E17(0) E17(1)	A A	B04 B03	30	E18(0) E18(I)	C C	B04 B03

This is the number of the module at the remote locale, not the actual module number within the system.

ED-1E434, Group 501 Coaxial Cabling

Connect the ED-1E434, Group 501 intercabinet coaxial cable(s) (figure 26-34) from the common control backplane(s) to the RMI carrier backplane(s). Figure 26-35 illustrates the connections for an all unduplicated system. Figure 26-36 illustrates the connections for a typical all duplicated system, while figure 26-37 shows the connections for a typical system with duplicated common control and unduplicated module control. Route the cable between the cabinets through the duct work (use the shielded intercabinet duct for flat cables). The B and D legs are not used in an all unduplicated or a duplicated common control and unduplicated module control system and should be coiled and stored in the cable duct (if space permits).

Use the Customer System Document (CSD) and tables 26-14, 26-15, and 26-16 to determine the backplane pin locations used at the common control and the backplane pin locations used at the RMI carrier. These tables should also be used to determine the legs that are used at the RMI carrier. This association can be determined by looking up the remote module number to find the appropriate common control backplane connector(s) and the leg that is used for the RMI carrier.

The first column in tables 26-14, 26-15, and 26-16 is the remote module number. This is not the number the module is assigned within the total system, but the number assigned to the remote module. The first remote module may be the sixth module within the system. For example, if your remote module being installed is the fourth in the system, then for an all unduplicated system a cable will run from **E8** on the common control backplane to **B18** on the RMI carrier backplane using leg C. However, for an all duplicated system, the cable will run from **E8** on both common control backplanes to **B06, B07, B22,** and **B23** on the RMI carrier (00) backplane using legs C and D off of each cable. For a duplicated common control and unduplicated module control system, the Group 501 cable will run from **E08** on both common controls. Leg C will connect to **B06** of the RMI carrier with leg C of the other common control running to **B22** on the same RMI carrier. Leg A of both cables will have been used previously on the third remote module. Repeat this process for each central module control that is being linked to a remote module.

A cable Group 89 can be used to extend each leg of the Group 501 cable. The combined length of Groups 501 and 89 must be a maximum of 200 feet. There may be unused legs for a Group 501 cable if connections are not needed for a succeeding module to the RMI carrier. In addition to connect a Group 501 cable leg to a RMI carrier in a MOLEX H-600-217, G1, adapter is requested.

An existing Group 501 cable can be used if its unused legs are not dead-dressed or cut off.

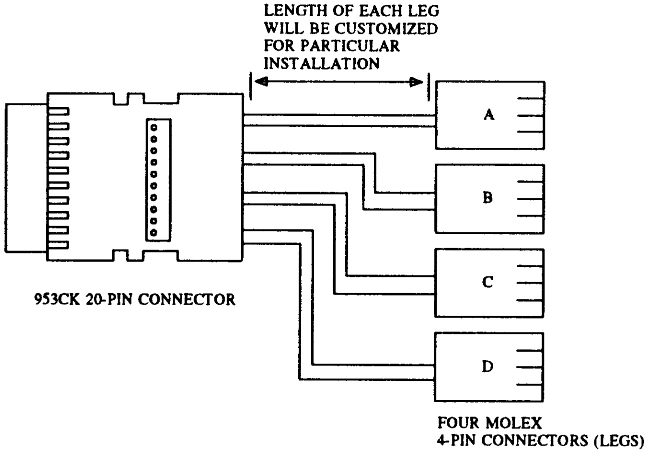


Figure 26-34. ED-1E434, Group 501 Coaxial Cable

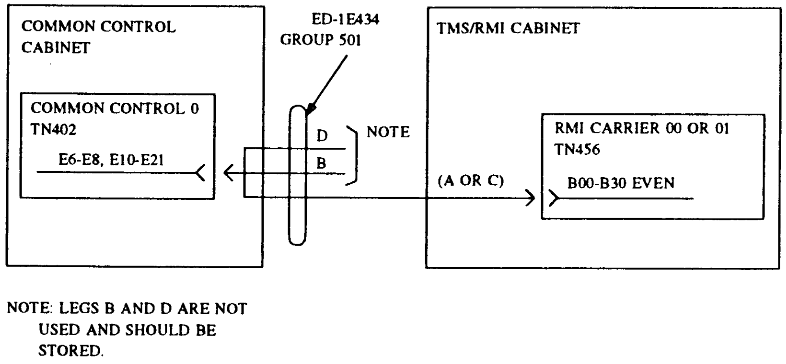


Figure 26-35. ED-1E434, Group 501 Connections for an Unduplicated System (Phase 2)

TABLE 26-14. ED-1E434, Group 501 Connections for an Unduplicated System (Phase 2)

REMOTE MODULE (NOTE)	COMMON CONTROL BACKPLANE CONNECTOR	MODULE CONTROL LEG (GROUP 501)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTOR
01 02	E7	A C	00 00	00 13	BOO B16
03 04	E8	A C	00 00	01 14	B02 B18
05 06	E6	A C	00 00	02 15	B04 B20
07 08	E13	A C	00 00	03 16	B06 B22
09 10	E11	A C	00 00	05 18	B08 B24
11 12	E12	A C	00 00	06 19	B10 B26
13 14	E10	A C	00 00	07 20	B12 B28
15 16	E17	A C	00 00	08 21	B14 B30
17 18	E15	A C	01 01	00 13	BOO B16
19 20	E16	A C	01 01	01 14	B02 B18
21 22	E14	A C	01 01	02 15	B04 B20
23 24	E21	A C	01 01	03 16	B06 B22
25 26	E19	A C	01 01	05 18	B08 B24
27 28	E20	A C	01 01	06 19	B10 B26
29 30	E18	A C	01 01	07 20	B12 B28

This is the number of the module at the remote locale, not the actual module number within the system.

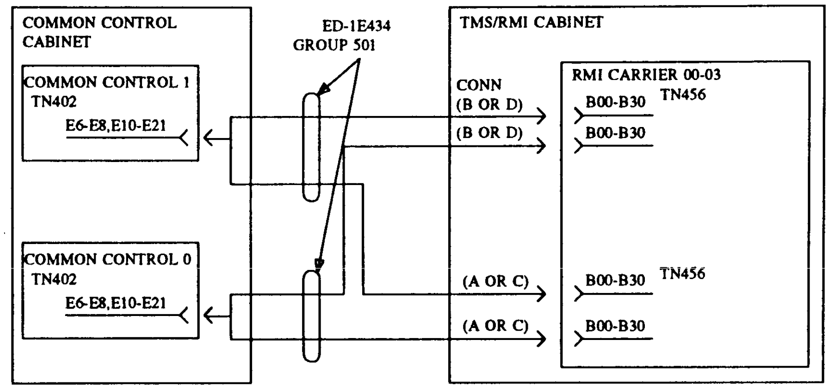


Figure 26-36. ED-1E434, Group 501 Connections for a Duplicated System (Phase 2)

TABLE 26-15. ED-1E434, Group 501 Connections for a Duplicated System (Phase 2)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEGS (GROUP 501)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS
01	00	E7	A and B	00	00	B00 and B01
	01		A and B	00	13	B16 and B17
02	00		C and D	00	01	B02 and B03
	01		Canal D	00	14	B18 and B19
03	00	E8	A and B	00	02	B04 and B05
	01		A and B	00	15	B20 and B21
04	00		C and D	00	03	B06 and B07
	01		C and D	00	16	B22 and B23
05	00	E6	A and B	00	05	B08 and B09
	01		A and B	00	18	B24 and B25
06	00		Canal D	00	06	B10 and B11
	01		C and D	00	19	B26 and B27
07	00	E13	A and B	00	07	B12 and B13
	01		A and B	00	20	B28 and B29
08	00		C and D	00	08	B14 and B15
	01		C and D	00	21	B30 and B31
09	00	El1	A and B	01	00	B00 and B01
	01		A and B	01	13	B16 and B17
10	00		C and D	01	01	B02 and B03
	01		C and D	01	14	B18 and B19
11	00	E12	A and B	01	02	B04 and B05
	01		A and B	01	15	B20 and B21
12	00		C and D	01	03	B06 and B07
	01		C and D	01	16	B22 and B23
13	00	E10	A and B	01	05	B08 and B09
	01		A and B	01	13	B24 and B25
14	00		C and D	01	06	B10 and B11
	01		Canal D	01	19	B26 and B27
15	00	E17	A and B	01	07	B12 and B13
	01		A and B	01	20	B28 and B29
16	00		C and D	01	08	B14 and B15
	01		Canal D	01	21	B30 and B31

This is the number of the module at the remote locale, not the actual module number within the system.

TABLE 26-15. ED-1E434, Group 501 Connections for a Duplicated System (Phase 2) (Contd)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEGS (GROUP 501)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS
17	00	E15	A and B	02	00	B00 and B01
	01		A and B	02	13	B16 and B17
18	00		C and D	02	01	B02 and B03
	01		C and D	02	14	B18 and B19
19	00	El 6	A and B	02	02	B04 and B05
	01		A and B	02	15	B20 and B21
20	00		C and D	02	03	B06 and B07
	01		C and D	02	16	B22 and B23
21	00	E14	A and B	02	05	B08 and B09
	01		A and B	02	18	B24 and B25
22	00		C and D	02	06	B10 and B11
	01		C and D	02	19	B26 and B27
23	00	E21	A and B	02	07	B12 and B13
	01		A and B	2	20	B28 and B29
24	00		C and D	02	08	B14 and B15
	01		C and D	02	21	B30 and B31
25	00	E19	A and B	03	00	B00 and B01
	01		A and B	03	13	B16 and B17
26	00		C and D	03	01	B02 and B03
	01		C and D	03	14	B18 and B19
27	00	E20	A and B	03	02	B04 and B05
	01		A and B	03	15	B20 and B21
28	00		C and D	03	03	B06 and B07
	01		C and D	03	16	B22 and B23
29	00	El 8	A and B	03	05	B08 and B09
	01		A and B	03	18	B24 and B25
30	00		C and D	03	06	B10 and B11
	01		C and D	03	19	B26 and B27

This is the number of the module at the remote locale, not the actual module number within the system.

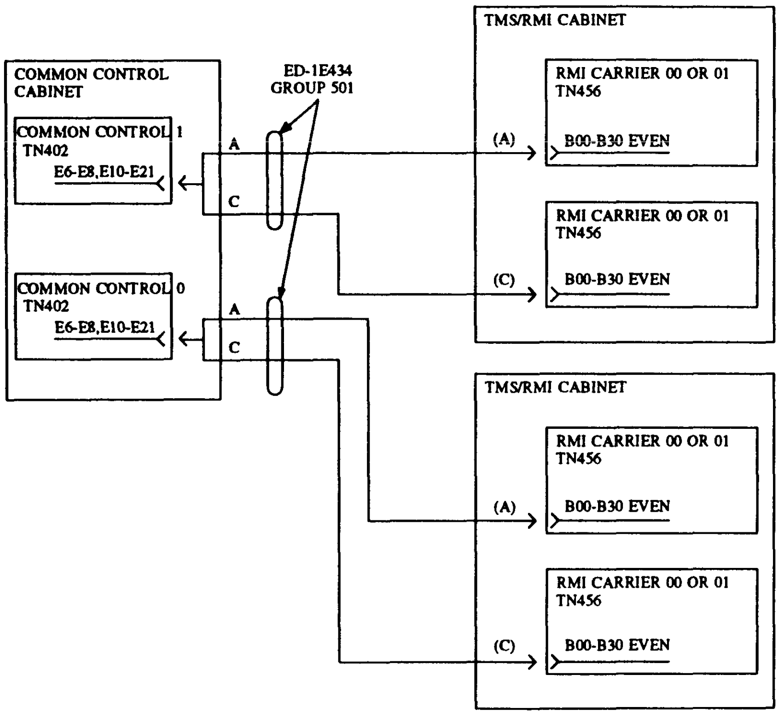


Figure 26-37. ED-1E434, Group 501 Connections for a Duplicated CC and Unduplicated MC System (Phase 2)

TABLE 26-16. ED-1E434, Group 501 Connections for a Duplicated CC and Unduplicated MC System (Phase 2)

REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEG (GROUP 501)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS	REMOTE MODULE (NOTE)	COMMON CONTROL	COMMON CONTROL CONNECTOR	MODULE CONTROL LEG (GROUP 501)	RMI CARRIER	RMI CARRIER SLOT NUMBER	RMI CARRIER BACKPLANE CONNECTORS
01	00	E7	A	00	00	BOO	17	00	E15	A	02	00	B00
	01		A	00	13	B16		01		A	02	13	B16
02	00		C	00	01	B02	18	00		C	02	01	B02
	01		C	00	14	B18		01		C	02	14	B18
03	00	E8	A	00	02	B04	19	00	E16	A	02	02	B04
	01		A	00	15	B20		01		A	02	15	B20
04	00		C	00	03	B06	20	00		C	02	03	B06
	01		C	00	16	B22		01		C	02	16	B22
05	00	E6	A	00	05	B08	21	00	E14	A	02	05	B08
	01		A	00	18	B24		01		A	02	18	B24
06	00		C	00	06	B 10	22	00		C	02	06	B10
	01		C	00	19	B26		01		C	02	19	B26
07	00	E13	A	00	07	B12	23	00	E21	A	02	07	B12
	01		A	00	20	B28		01		A	2	20	B28
08	00		C	00	08	B14	24	00		C	02	08	B14
	01		C	00	21	B30		01		C	02	21	B30
09	00	El1	A	01	00	BOO	25	00	E19	A	03	00	B00
	01		A	01	13	B16		01		A	03	13	B16
10	00		C	01	01	B02	26	00		C	03	01	B02
	01		C	01	14	B18		01		C	03	14	B18
11	00	E12	A	01	02	B04	27	00	E20	A	03	02	B04
	01		A	01	15	B20		01		A	03	15	B20
12	00		C	01	03	B06	28	00		C	03	03	B06
	01		C	01	16	B22		01		C	03	16	B22
13	00	E10	A	01	05	B08	29	00	E18	A	03	05	B08
	01		A	01	13	B24		01		A	03	18	B24
14	00		C	01	06	B10	30	00		C	03	06	B10
	01		C	01	19	B26		01		C	03	19	B26
15	00	E17	A	01	07	B12							
	01		A	01	20	B28							
16	00		C	01	08	B14							
	01		C	01	21	B30							

This is the number of the module at the remote locale, not the actual module number within the system.

INSTALLING THE SINGLE CARRIER CABINET

The following sections describe the DEFINITY® Generic 2 single carrier cabinet and provide detailed installation specifics for incorporating the cabinet into a Generic 2 system.

The Single Carrier Cabinet Stack: An Overview

The DEFINITY® Generic 2 Single Carrier Cabinet (SCC) serves as a remote module for Generic 2 systems and includes the following features:

- Duplicated module control in a single carrier
- Cabinet design based on common hardware and equipment including cabinet frame, doors, and carrier complex. Up to four cabinets can be stacked to house a Generic 2 module
- Single cabinet module control cabinet equipped with existing module control packs
- Single carrier port cabinet supports the entire port complex; this cabinet is equipped with System 75-based port and tone circuit packs. The single carrier cabinet module control can support from one to three port cabinets
- Single carrier module control cabinet uses ODL-50 fiber optic technology

The single carrier module stack (module control and port cabinets) is designed as a remote module only and cannot itself support remote modules. Figure 26-38 shows a rear view of a typical single carrier cabinet stack.

PEC Requirements

The single carrier module corresponds to PEC 6555-SCM.

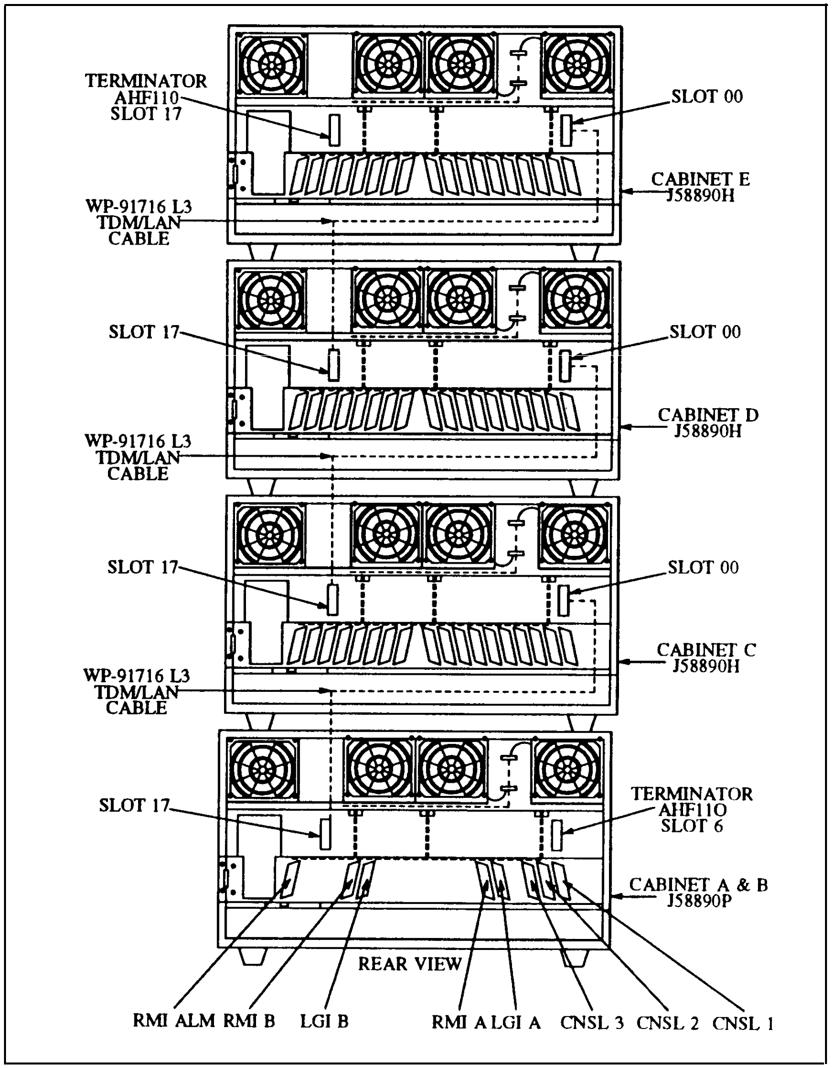


Figure 26-38. Single Carrier Cabinet Stack

The Single Carrier Module Control

The single carrier module control cabinet (J58890P) houses both module processors. The cabinet is functionally divided into halves, identified as A and B. Both halves are populated if a duplicated module control is required; the left half (A) is populated if an unduplicated module control is required. Module control 0 slots (left half of cabinet) are numbered consecutively as A1 through A11 from left to right. Module control 1 slots (right half of cabinet) are numbered consecutively as B1 through B11 from left to right.

Figure 26-39 shows the single carrier module control cabinet in detail.

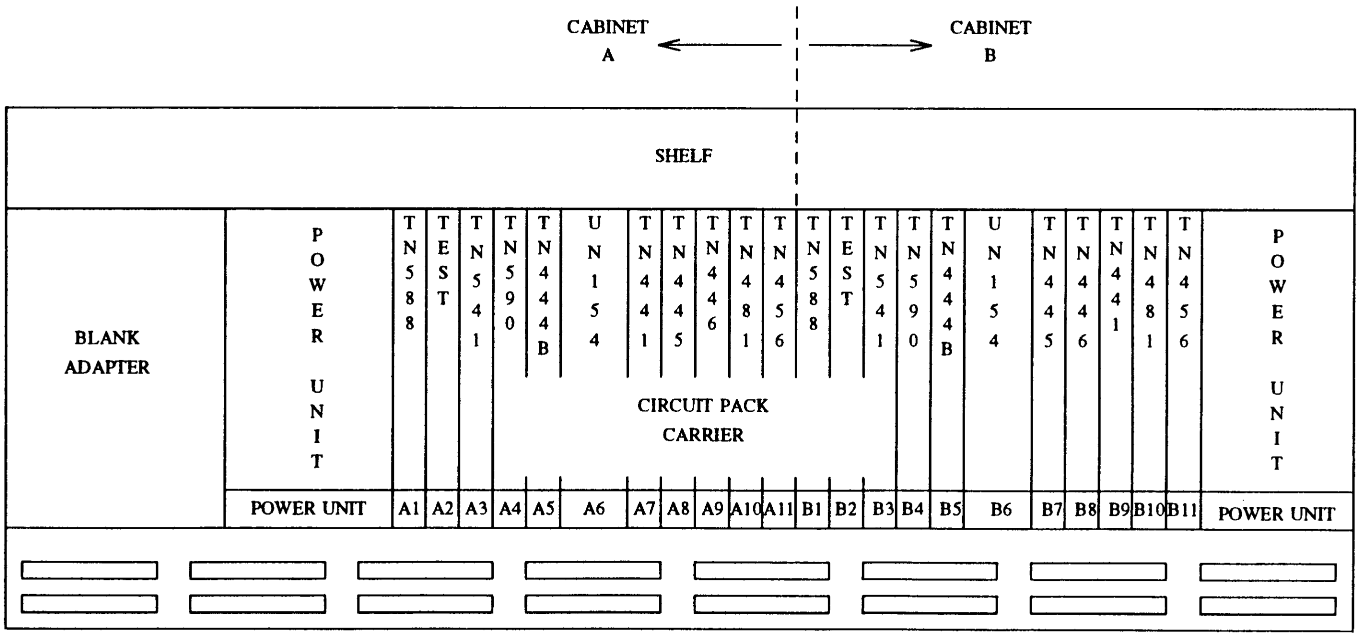


Figure 26-39. Single Carrier Module Control Cabinet J58890P (Front View)

The single carrier module control cabinet does not house port circuit packs. If the system is configured for module control duplication, at least two port cabinets are required to accommodate both tone clock circuit packs. Port cabinets are located in carrier positions C, D, and E.

For AC systems, AC power unit ACX535 is included in the single carrier cabinet. For DC systems, DC power unit 647A is used.

The module control cabinet cooling fans are rated at 48V; port cabinet fans use 12V fan units. The two fan types cannot be used interchangeably.

Connections to Generic 2 systems are identical to those of the remote universal module. These connections are identified in a subsequent chapter of this book.

Cabinet Hardware Specifics

The universal module control is housed in a single XE-type cabinet. The cabinet contains all the necessary hardware and equipment required to support one unduplicated or one duplicated module control complex. The cabinet is equipped as follows:

- Universal module control (J58890P-1)—Can be equipped with one to two universal module controls for standard, high, or critical reliability. This cabinet holds the circuit packs that interface Generic 2 and System 75 components: at least one single carrier module control cabinet is always required.
- Single carrier port cabinet (J58890H-1)—Contains port and tone circuit packs. Each cabinet provides 18 universal slots for port packs, and a dedicated power supply.

The single carrier module stack accommodates one to three single carrier common port cabinets. However, at least one cabinet in stack position C is always required.

The single carrier module control cabinet is also equipped with the following hardware:

- Power and ground wiring
- One TDWLAN bus terminator pack (AHF10)
- One current limiter pack (CFY1 or CFY1B)
- Cabinet front doors and rear panels
- Earthquake bracing (installed in the field)

Figure 26-40 shows the single carrier module control cabinet and associated equipment. Figure 26-41 shows the single carrier port cabinet and associated equipment.

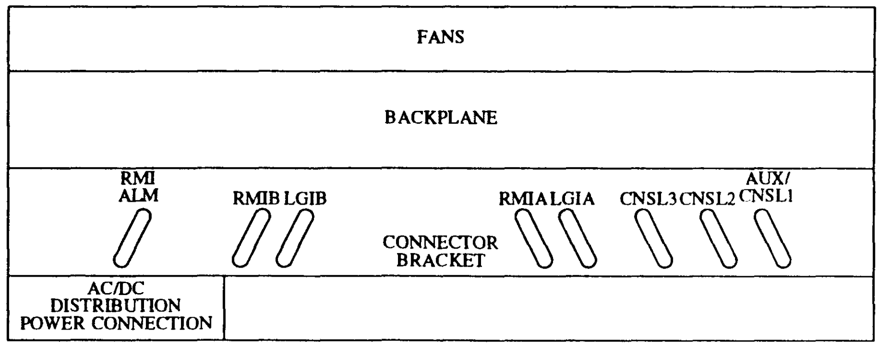


Figure 26-40. Single Carrier Module Control Cabinet J58890P (Rear View)

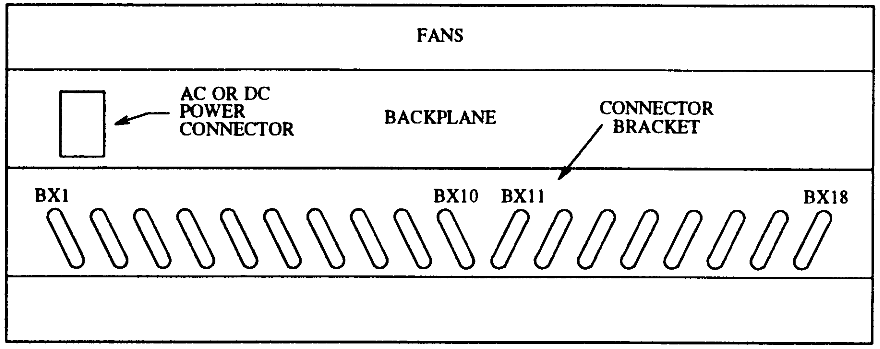


Figure 26-41. Single Carrier Port Cabinet J58890H (Rear View)

Circuit Pack Locations and Requirements

The following table shows single carrier module control circuit pack locations and requirements.

TABLE 26-17. Single Carrier Module Control Circuit Pack Placement

Slot	Circuit Pack	Remarks
PWR	ACX535	Always required for AC powered modules
PWR	647A1	Always required for DC powered modules
1	TN588	Always required
2	TN512B	Test board, not shipped with System (See Note 2)
3	TN541	Required only when duplicated modules are equipped
4	TN590	Always required
5	TN444B	Always required
6	UN154B	Always required
7	TN445	Always required
8	TN446	Always required
9	TN441	Always required
10	TN481	Always required
11	TN456	Always required
12	TN588	Always required for duplicated module control
13	TN512B	Test board, not shipped with System (See Note 2)
14	TN541	Required only when duplicated modules are equipped

TABLE 26-17. Single Carrier Module Control Circuit Pack Placement (continued)

Slot	Circuit Pack	Remarks
15	TN590	Always required for duplicated module control
16	TN444B	Always required for duplicated module control
17	UNl54B	Always required for duplicated module control
18	TN445	Always required for duplicated module control
19	TN446	Always required for duplicated module control
20	TN441	Always required for duplicated module control
21	TN481	Always required for duplicated module control
22	TN456	Always required for duplicated module control
PWR	ACX535	Always required for AC powered duplicated modules
PWR	647A1	Always required for DC powered duplicated modules

NOTES:

1. All unused circuit pack slots shall be equipped with a blank faceplate cover (158B).
2. Slots 2 and 13 shall be quipped with a 0.50 inch blank faceplate cover (1589A).

Cabinet Interconnectivity

One RMI circuit pack must be equipped in slot A11 of the universal module control carrier 0, which is on the left side of the carrier when viewed from the front. In duplicated universal modules requiring duplicated 4MHz channel RMI links, the second RMI circuit pack is equipped in slot B11 of universal module control carrier 1, which is on the right side of the carrier when viewed from the front.

No internal cabling is required.

Optic fiber cables are terminated onto 9823-type lightwave transceivers (short or long wavelength). Each remote universal module requires one fiber termination per LGI and RMI circuit pack (two terminations for duplicated modules). The 9823-type lightwave transceivers mount on the

I/O connector plate located at the rear of the carrier. Using the group 504 cable ASSY requires 3B/ST fanouts in the LCIT unit.

The TDM/LAN bus must run continuously through all the cabinets within the module stack. This is achieved with the extension cable. The bus also requires two bus terminator packs; one at each end of the bus. The number of carriers equipped in a module stack dictate the location of the bus terminator packs. One bus terminator is always equipped on the module control cabinet backplane. The second is always equipped on the last port cabinet backplane. The extension bus cables (WP91716 L3) are equipped as part of the port cabinet; these are simply terminated to the cabinet below in the stack. Figure 26-42 shows this daisy chain approach.

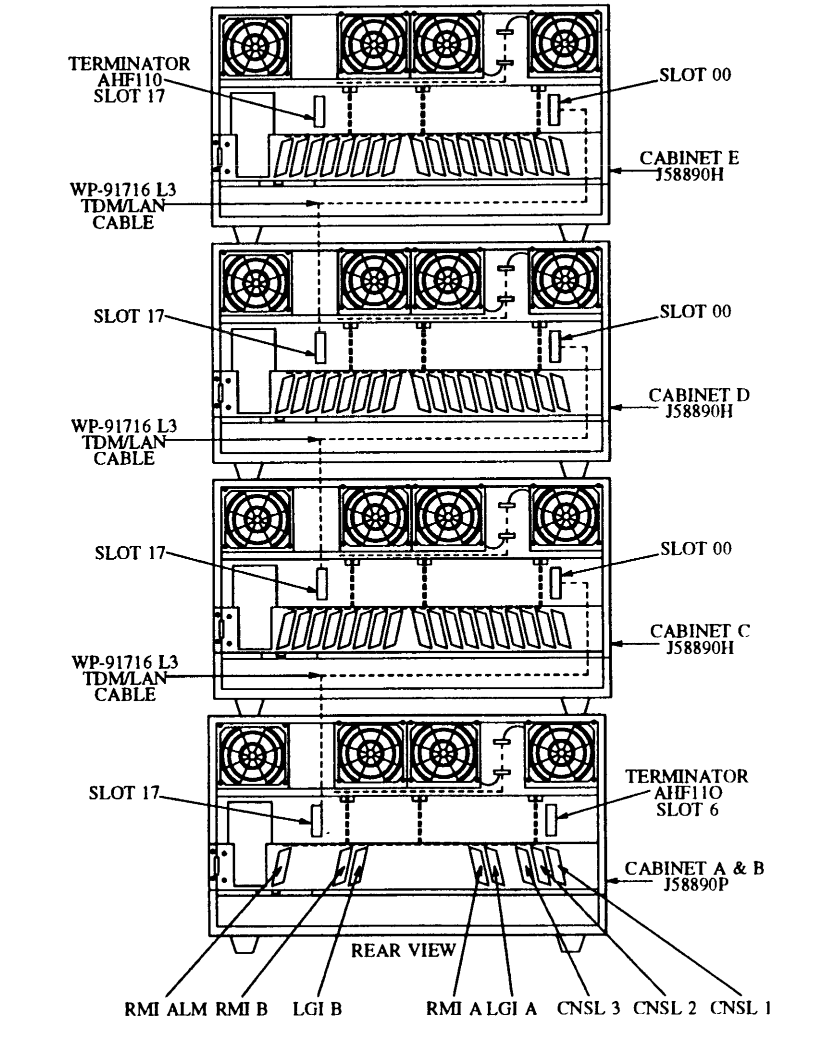


Figure 26-42. TDM/LAN Cable Placement

Single Carrier Module Control Stack Wallfield Connectivity

- Aux/CSL1 connector:
  - — Provides power source to one attendant console or one ORPI unit for central and remote modules
  - — Provides leads to three emergency transfer panels
  - — This external connection to the cross-connect field is always required in remote modules. For centrally located modules, is required only when attendant consoles or ORPIs are associated with the module

  A new 25-pair cable is required to support this connection. This cable is described in the Port I/O section that follows.

- CSL2 and CSL3 connectors
  - — Each connector provides a power source to one attendant console or one ORPI unit for central and remote modules
  - — These external connections to the cross-connect field are required only when the module supports more than one attendant console or one ORPI unit

  A 25-pair cable (B25A) is required to support each connection.

- RMI/ALM connector
  - — Provides leads to the alarm panel in the CC cabinet. Also provides up to 14 external alarm signals from remote modules to the remote interface (TN492C) circuit pack in the CC cabinet. These interfaces are routed via the cross-connect field and apply to remote modules only
  - — Provides leads to sense external alarms: applies only to remote modules
  - — This external connection to the cross-connect field is always required in central modules. This connection is required in remote modules when external alarms need to be modified

  A 25-pair cable (B25A) is required to support this connection.

- Port I/O connectivity
  - — Each single carrier port cabinet is equipped with eighteen 25-pair connectors. Each connector corresponds to one universal port slot. Each equipped circuit pack slot must be connected to the cross-connect field via a 25-pair cable. Up to 54 port I/O cables can be required per module. The tone/clock generator, tone detector, and maintenance test circuit packs located in universal port slots do not require I/O cabling to the cross-connect field.
  - — A new unshielded 25-pair cable (B25A) is required to support this connection. This cable group cannot be used in traditional modules.
  - — A new cable group (1E-434, group 506) is required to interconnect TN555 to TN767B when these circuit packs are used in pairs to provide ISDN/PRI. One cable is required for each TN555/TN767B pair.
  - — A new H600-307 cable is required for use with the TN767B DS1 circuit pack. The cable is a single ended cable with several connectors shipped loose for field termination to CSUs and other interface units.

Single Carrier Cabinet Power and Grounding

The single carrier module stack is designed so that each cabinet is powered separately with either 110V AC or -48V DC. The type of power distribution selected for a stack dictates the power supplies that must be used at the cabinet level. Power unit requirements for both power distribution options are as follows:

110V AC Power Distribution One ACX535 power supply is required for each cabinet with an unduplicated module control. This supply resides in the left power slot, as viewed from the front of the cabinet.

Two ACX535 power supplies are required for each cabinet with duplicated module controls. These supplies reside in the right and left power slots, as viewed from the front of the cabinet.

One W-91153 L2 power supply is required for each port cabinet. This supply resides in the right power slot, as viewed from the front of the cabinet.

Figure 26-43 illustrates the AC power distribution scheme.

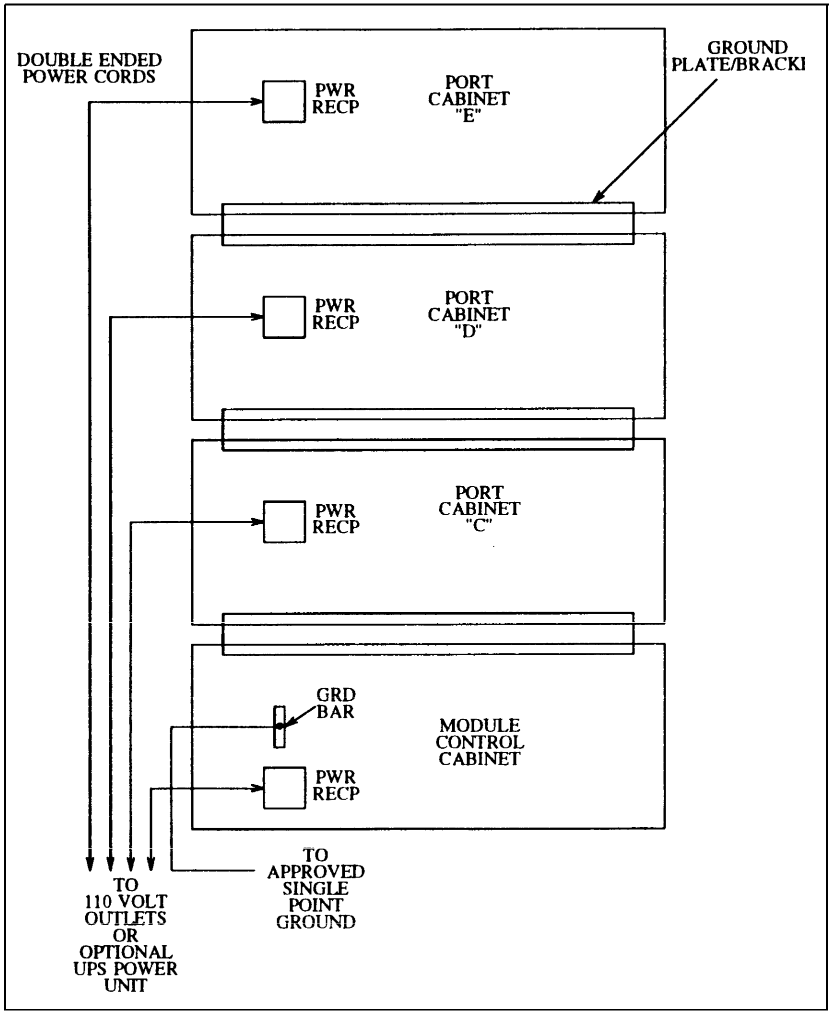


Figure 26-43. AC Power Scheme

-48V DC Power Distribution One 647A power supply is required for the unduplicated module control cabinet. This supply resides in the left power slot, as viewed from the front of the cabinet.

Two 647A power supplies are required for each cabinet with duplicated module controls. These supplies reside in the left and right power slots, as viewed from the front of the cabinet.

One 676B power supply is required for each port cabinet. This supply resides in the right power slot, as viewed from the front of the cabinet.

One J58890CG DC power distribution strip must be wall-mounted. The main power cables from the battery plant terminate on this unit. The DC power cords from each single carrier cabinet connect to DC outlets provided. Figure 26-44 shows power level distribution for DC systems.

Auxiliary Console Grounding For DC systems, AUXCNSL ground connections must be identical to those of the Generic 2 system. Generic 2 grounding is described fully in chapters 23 and 24.

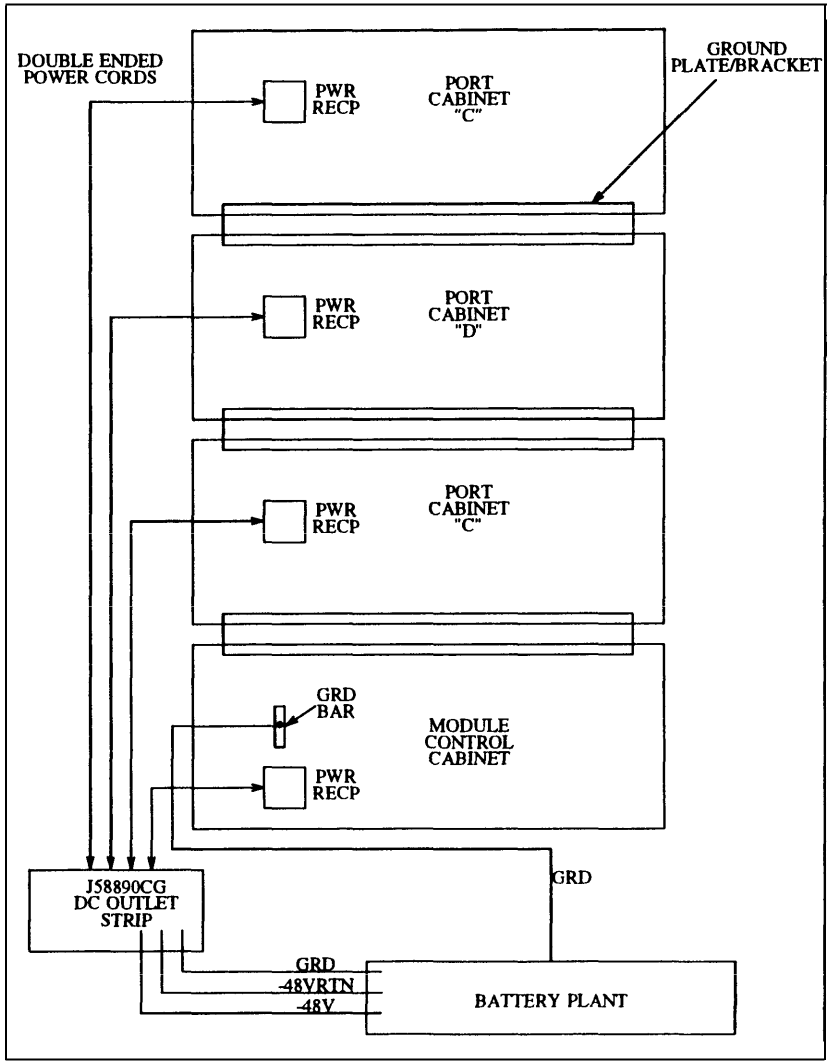


Figure 26-44. DC Power Scheme

27. ATTENDANT CONSOLE

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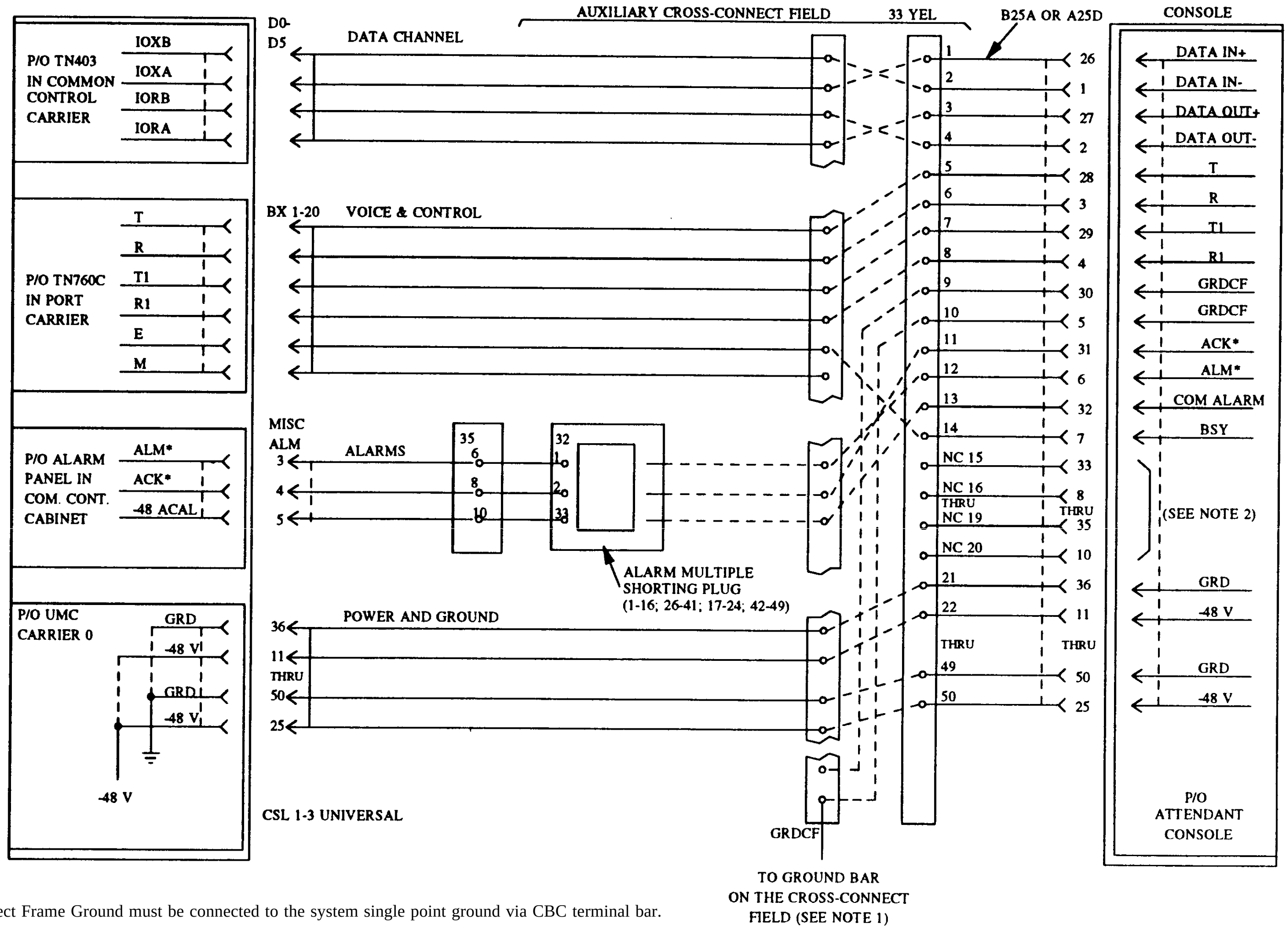
CONSOLE CONNECTIONS

Figure 27-1 shows attendant console connections between a UMC cabinet the wall field, and the attendant console.



NOTES:

1. The Cross-connect Frame Ground must be connected to the system single point ground via CBC terminal bar.
2. The NC by numbers 15 through 20 represents a "No Connect" at the cross-connect field.

Figure 27-1. Console Connections

INSTALLING THE ORPI

ORPI to LCIT Connections — Central Locations

Use table 27-1 to determine the proper cable group. Make the connections between the LCIT and ORPI using the selected cable and figure 27-2. Cables with 50 micron diameter are coded blue (1) or white (2); 62.5 micron cables are gray and stamped with "1" or "2." DEFINITY Generic 2 installations use the 3B/ST fanouts. Previously installed systems use 3B biconic fanouts, but they do not have to be replaced. For LCITs with biconic connectors, GRP465 must be used with GRP509.

TABLE 27-1. Cable Group

CABLE GROUP ED1E434-11	CABLE TYPE	MICRON	LENGTH (FT)
509	FLP-B	62.5	2

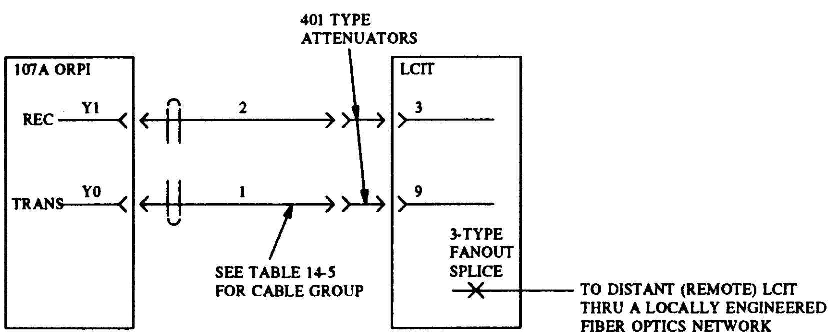


Figure 27-2. ORPI to Central LCIT Connections

ORPI to LCIT — Remote Location Connections

The remote console is connected to several sources through the remote cross-connect field and receives its data from the remotely located ORPI. The alarm leads also come from the ORPI but must be fanned out if more than one remote console is provided. The remote console receives its voice from an SN233 or TN760 located in a remote port carrier. The remote console receives its power from a remote module control or port cabinet with a DC fan power supply.

ORPI to LCIT Connections

Use table 27-2 to determine the proper cable group. Make the connections between the LCIT and ORPI using the selected cable and figure 27-3. Cables with 50 micron diameter are coded blue(1) or white(2); 62.5 micron cables are gray and stamped with “1” or “2.” DEFINITY Generic 2 installations will use the 3B/ST fanouts. Previously installed systems use 3B biconic fanouts, but they do not have to be replaced. For LCITs with biconic connectors, GRP465 must be used with GRP509.

TABLE 27-2. Cable Group

CABLE GROUP ED1E434-11	CABLE TYPE	MICRON	LENGTH (FT)
509	FLP-B	62.5	2

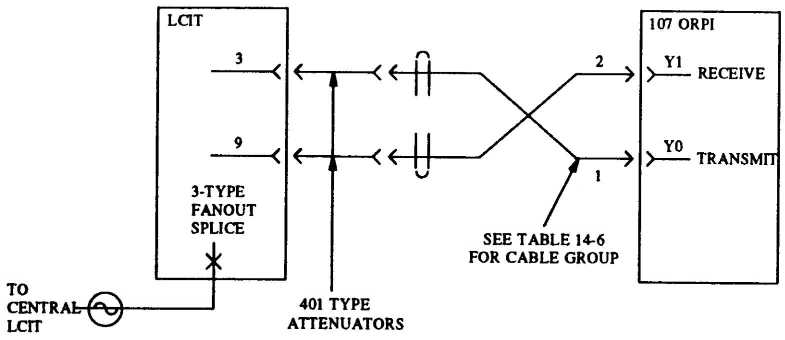


Figure 27-3. ORPI to Remote LCIT Connections

ORPI Connections

Make the connections shown in table 27-3 and figure 27-4 at the ORPI and the remote cross-connect field.

TABLE 27-3. D1 Connector Lead Designation

LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECITNG BLOCK TERMINAL	LEAD DESIGNATION	D1 ON ORPI	LEAD COLOR	CONNECTING BLOCK TERMINAL
IOXBO	26	W-VL	1	COMALARM	13	GR-BK	26
IOXAO	1	B-W	2	GRD	39	BK-BR	27
IORBO	27	W-O	3	-48V	14	BR-BK	28
IORAO	2	O-W	4	GRD	40	BK-SL	29
IOXB1	28	W-GR	5	-48V	15	SLBK	30
IOXA1	3	GR-W	6	GRD	41	Y-BL	31
IORB1	29	W-BR	7	-48V	16	BL-Y	32
IORA1	4	BR-W	8	GRD	42	Y-O	33
IOXB2	30	W-SL	9	-48V	17	O-Y	34
10XA2	5	SL-W	10	GRD	43	Y-GR	35
IORB2	31	R-BL	11	-48V	18	GR-Y	36
IORA2	6	BL-R	12	GRD	44	Y-BR	37
IOXB3	32	R-O	13	-48V	19	BR-Y	38
IOXA3	7	O-R	14	GRD	45	Y-SL	39
IORB3	33	R-GR	15	-48V	20	SL-Y	40
IORA3	8	GR-R	16	GRD	46	V-BL	41
IOXB4	34	R-BR	17	-48V	21	BL-V	42
IOXA4	9	BR-R	18	GRD	47	V-O	43
IORB4	35	R-SL	19	-48V	22	O-V	44
IORA4	10	SL-R	20	GRD	48	V-GR	45
OUTALM*	36	BK-BL	21	-48V	23	GR-V	46
OUTACK*	11	BL-BK	22	GRD	49	V-BR	47
	37	BK-O	23	-48V	24	BR-V	48
	12	O-BK	24		50	V-SL	49
	38	BK-GR	25		25	SL-V	50

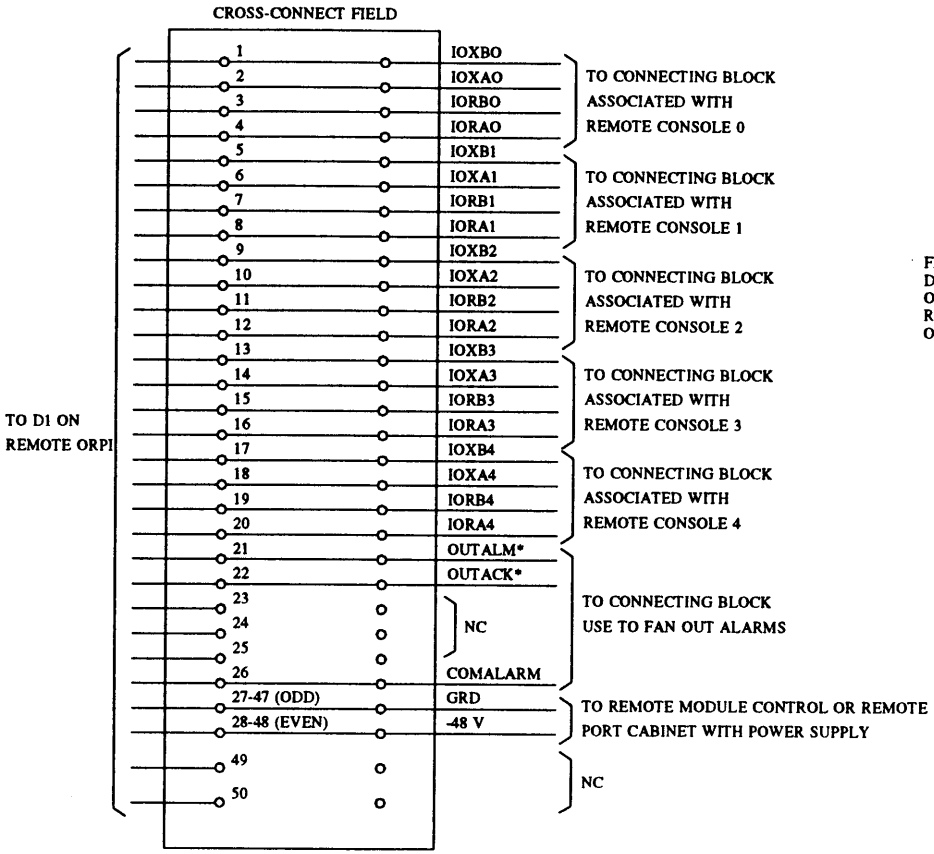


Figure 27-4. D1 Cross-Connect Connections

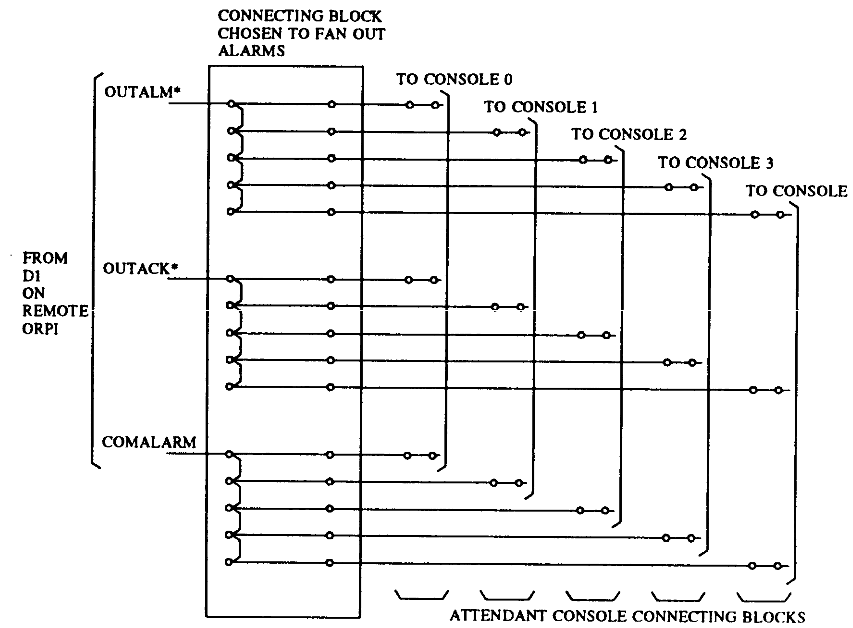


Figure 27-5. Fanning Out Alarm Leads

Fanning Out Alarm Leads

The ORPI provides only one set of alarm leads. If you have more than one console at the remote location, the alarm leads must be fanned out. Use the information in figure 27-5 to fan the leads out.

Console Connections

Make the connections from the console to the cross-connect field as shown in figure 27-6.

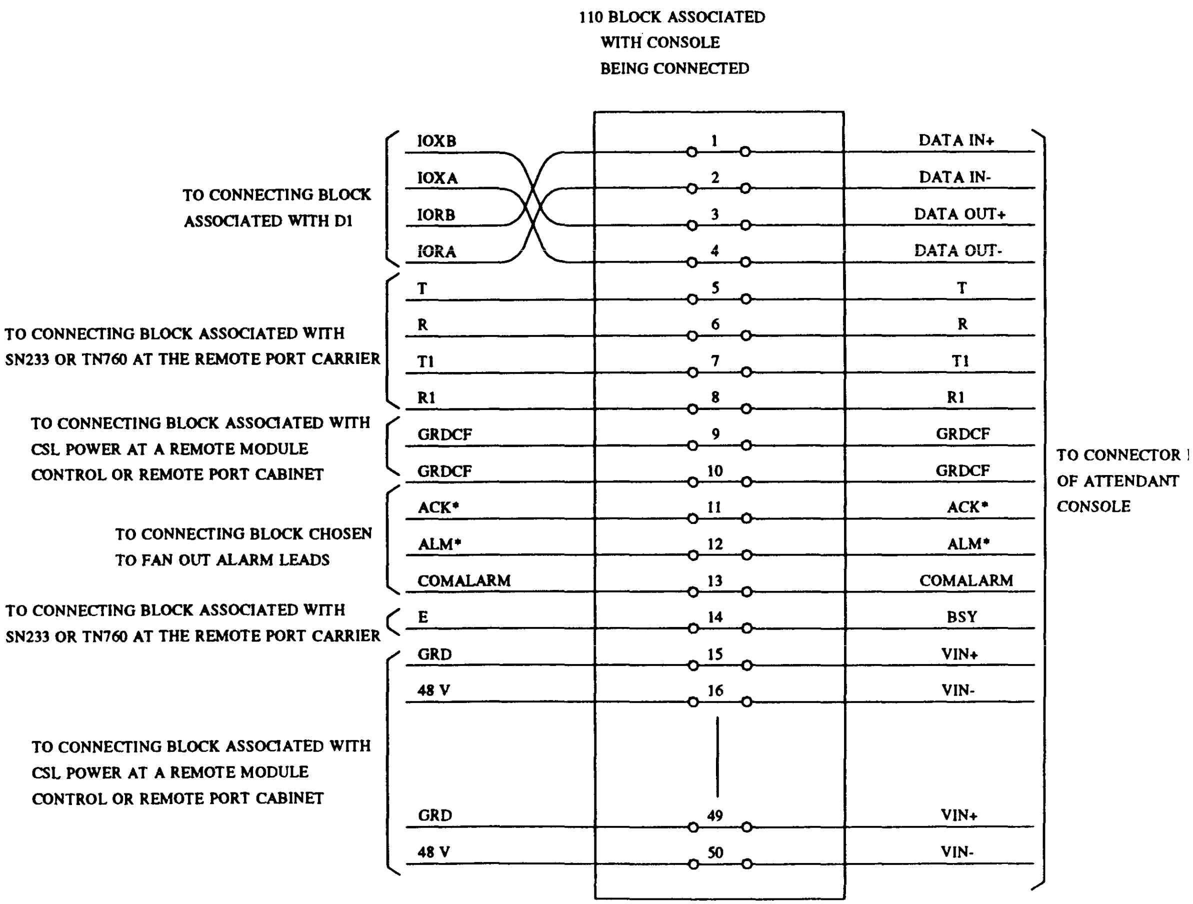
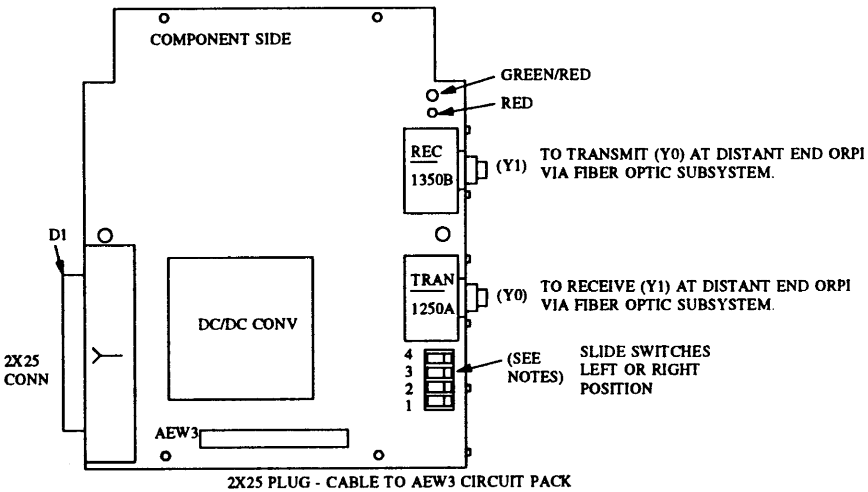


Figure 27-6. Console Connector Terminating Information

Customizing Fiber-Optic Links

The fiber-optic network between the ORPI and the LCIT must be customized to achieve the required power levels. Each fiber link must be tested individually.

Figure 27-7 shows the location of switches that are used in customizing the fiber network; figure 27-8 shows the attenuator locations.



NOTES:

1. Switch 1 is used in balancing the lightguide. Settings arc TST or NORMAL.
2. Switch 2 is used to select power level for the transmitter. Settings are HALF or FULL.
3. Switch 3 is used for factory test only. Ensure that S3 is in the NORMAL position (as shipped from the factory) when performing the balancing tests.
4. Switch 4 is not used.

Figure 27-7. Circuit Pack AEW3 Switch Locations

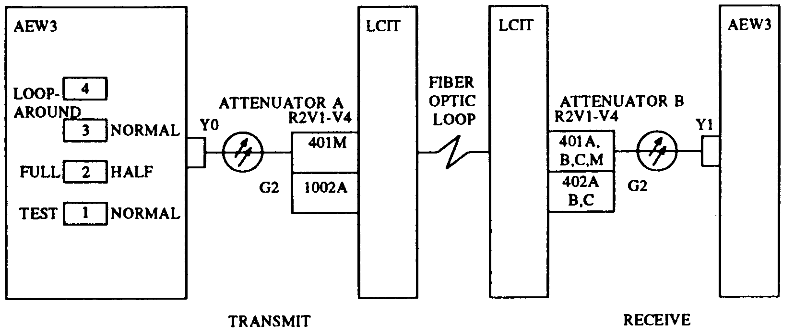


Figure 27-8. Attenuator Locations

Adjust the fiber-optic link as follows:

1. On the AEW3, in the transmit LCIT, set switch 1 to TEST. (See figure 27-7.)
2. Insert 1002A as attenuator A. (See figure 27-8.)
3. Set Switch 2 (FULL or HALF), and insert Attenuator B according to table 27-4.
4. Determine the condition of the fiber-optic link by observing the LEDs on the receiver and AEW3.
   a. If one green LED lights, the link is within the required power range.
   b. If both LEDs are red, the link is in an overdriven condition.
   c. If a single LED is red, the link is in an underdriven condition.
5. If the fiber-optic link is overdriven or underdriven, adjust it by changing the power level settings on the Transmit AEW3 and/or replacing the 401 or 402 series attenuators at the Receive LCIT with different values (see table 27-4). If the link still doesn’t fall into adjustment, use the information in flowchart figure 27-9. Adjust until the link is brought in range.

6. Return Switch 1 to the Normal Mode. Disregard LED indications when operating in the Normal Mode.

TABLE 27-4. Fiber-Optic Link Power Options

LCIT to LCIT DISTANCE	FIBER GRADE	SWITCH 2 FULL/HALF	ATTEN-UATOR B	INITIAL ACTION IF UNDER-DRIVEN 1 RED LED	INITIAL ACTION IF OVER-DRIVEN 2 RED LED
0-1000 ft 0-0.19 mi 0-0.30 km	L	FULL	12 dB 402B	Switch 2 to half power, ATTEN B to D 5 dB	Switch 2 to half power
0-1000 ft 0-0.19 mi 0-0.30 km	L	FULL	15 dB 402C	Switch 2 to half power, ATEN B to D 5 dB	Switch 2 to half power
1000 2800 ft 019-0.53 mi 0.30-0.85 km	L	HALF	5 dB 402A	Switch 2 to full power ATTEN B	Switch 2 to half power, to 10 dB
2800- 4900 ft 0.53-0.98 mi 0.85-1.49 km	L	FULL	5 dB 402A	Switch 2 to half power, ATTEN B to 0 dB	Switch 2 to half power
4900- 7200 ft 0.93-1.36 mi 1.49-2.20 km	L	HALF	0 dB 1002A	Switch 2 to full power	Switch 2 to half power, ATTEN B to 5 dB
7200- 9800 ft 1.36-1.86 mi 2.20-2.99 km	N	HALF	0 dB 1002A	Switch 2 to full power	Switch 2 to half power, ATTEN B to 5 dB
9800- 13000 ft 1.86-2.46 mi 2.99-4.00 km	N	FULL	0 dB 1002A		Switch 2 to half power

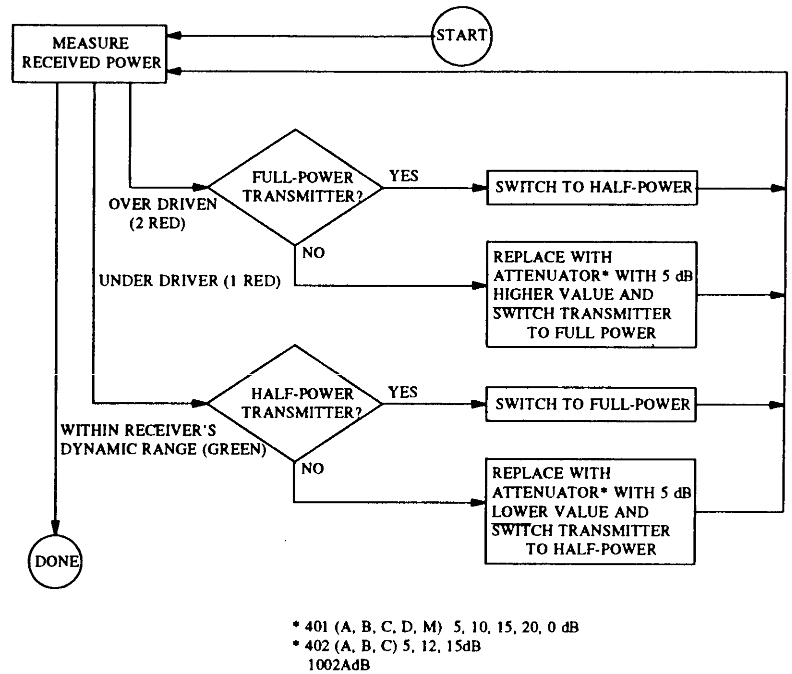


Figure 27-9. Flowchart for Adjusting the ORPI Fiber-Optic Link

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INTRODUCTION

Chapter 28 describes the various circuit packs associated with the system and the carrier and slot position each circuit pack occupies. Some circuit packs have option switches that require setting. This section includes a list of those circuit packs and how to set their option switches.

WARNING

Some circuit packs use the new slide switches. They are either open or closed. Refer to figure 28-1 for rocker switch settings and 28-2 for slide switch settings. Tables in this chapter have been changed from D (down) to C (closed) and U (up) to O (open).

Option settings for rocker-type switches use the following convention:

D - Down (switch contacts are closed). C in tables.

U - Up (switch contacts are open). O in tables.

X - Not used (switch contacts are not used and may be set in either position)

Switch sections are set down (closed) when the rocker end adjacent to the number is depressed and up (open) when the rocker end away from the number is depressed.

NOTE

In figure 28-1, switch sections 2 and 5 are down (closed) and switch sections 1, 3, 4, and 6 are up (open).

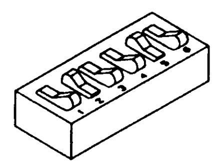
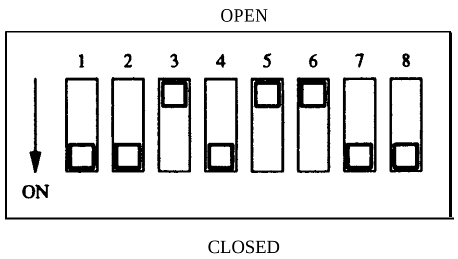


Figure 28-1. Rocker Switch



NOTE:
On red option switches, the "ON" position closes the switch.

Figure 28-2. Slide Switch

WARNING

Electrostatic discharge can damage circuit packs containing integrated circuits (ICs). Installation personnel must always attach wrist grounding straps before handling circuit packs.

Tables 28-1 through 28-5 show the various carriers and their associated circuit packs.

CC CARRIER CIRCUIT PACKS

TABLE 28-1. CC Carrier and Associated Circuit Packs

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
00	TN370C	Sequencer	Contains the microspore and its logic	one required per carrier
04	TN379	Cache memory (optional)	Contains frequently accessed instruction and data	
07 08 09 10	TN394	4-megaword memory	provides 4-megaword (16-bit words of memory 4 required)	
11 12 13 14		Not equipped for G2		
20	TN563	SCSI Host adapter	Controls the DTS and provides two serial ADU interfaces (PPG ports) for Manager II	One required per CC Carrier
24 25 26	TN4030 or TN474B (NOTE 1)	Peripheral interface (optional)	Provides interface between the processor and peripherals direct output connectivity	One required per control carrier when 3B CDRU or PCC is required

NOTE 1: These slots can accept TN403 or TN474 processor communication circuit (PCC). These packs are optional.

UMC CARRIER CIRCUIT PACKS

TABLE 28-2. UMC Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
Power (Left side of Carrier)	631DA1 or 644A1	AC Single Output Power supply DC single output power Supply	Provides +5 VDC. Provides +5 VDC.	Always required for AC powered modules. Always required for DC powered module. See table 28-3.
1	TN401B	MC channel	Provides TN401 operations with an increased number of alarm interfaces.	Always required.
2	TN512B	Test board	Equipped for high-level maintenance testing.	Test board not shipped with system. Used by craftsperson. Not required for system operation.
3	—	Blank faceplate cover required		
4	TN541	Duplication/update channel	Provides TN530 functionality with expanded double write address space.	Required only when duplicated modules are equipped.
5	TN580 or	Universal module processor	Providcs TN380D functionality with expanded RAM/EPROM size and upgraded firmware.	Always required. When used in a duplicated system, the TN580 must reside in both UMC 0 and UMC 1.
	TN590	DownloadabIc module processor	Provides TN580 functionality.	Always required. When used in a duplicated system, a TN590 must reside in both UMC 0 and UMC1.
6	TN444B	Maintenance interface	Interfaces the scanner to all the circuits in the MC for most maintenance purposes.	Always required.
7	UN154	Universal bus	Provides intelligent interface between the System 85 module processor and the universal modules port complex.	Always required.
8	—			
9	—	Blank faceplate required (Z100A)		
10	—	Blank faceplate required (Z100A)		
11	TN445	TSI p-store	Stores switching instructions for the TSI arithmetic logic unit to execute. Provides error detection and control functions.	Always required.

TABLE 28-2. UMC Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
12	TN446	TSI ALU	Provides execution logic for the switching instructions stored in the time slot interchange p-store.	Always required.
Any available	TN771B	Maintenance test	Provides facility testing for both analog and digital circuit packs. Replaces SN261C in Generic 2 systems.	Always required.
13	TN460C or TN441	Module clock TMS intermodule data store	Timing source in MC control. Connects to the module busses and provides many functions for the intermodule calls.	Required only in single module system. Required only in multimodule system.
14	TN463 or TN481 or	System clock synchronizer TMS lightguide interface	Provides synchronization of clock signals with an external clock. TMS interface in multimodule system.	Required only in single module system with DS1 or ISDN trunks. Must be used if TN441 is used in slot 13. The TN2131 converts composite clock
	TN2131	External clock interface	Provides synchronization of clock signals with an external clock.	signal from synchronization clock to 8 KHz transistor transistor logic (TTL) signal for system For multi-module systems, TN2131 and TN463 reside in TMS or CC/TMS, slot 20. See chapter 30 for complete synchronization clock information.
15	TN456	RMI	Provides lightguide communication interface for a module at a a remote location.	Provides RMI link. Required only in remote application. One required at each end of a fiber link.
15-21	TN456	RMI	Provides lightguide communication interface for a module at a remote location.	One per remote module for phase 3 remote module equipment configurations. (One RMI pack in slot 15 of the control carrier in remote modules, maximum of seven RMI packs per control carrier in central modules).
Power (right side (of carrier)	631DBI or 645 BI	AC dual output power supply DC dual output power suppl y	Provides -5/-48 VDC. Provides -5/-48 VDC.	Always required for AC powered modules. Always required for DC powered modules.

NOTE 1: All unused circuit pack slots will be equipped with a blank faceplate cover (Z100A).

NOTE 2: Slot 1 will also be equipped with a .50 inch blank faceplate cover (Z100C This cover is required in addition to TN401B to completely cover slot 1.

NOTE 3: In the case of duplicated MC carriers, the same packs will appear in both carriers.

TABLE 28-3. Multicarrier Cabinet Power Supply Application Options

System	Power Supply	Application
Generic 1	631DA 63lDB	Use in any carrier.
	631AR 631BR 631WA 631WB	Do not use in port carriers with caution labels. If port carriers are not labeled, you can use any of the supplies listed in this table.
Generic 2	63lDA 631DB	The only power supplies supported for G2 universal modules: use in any carrier.
	63lAR 63lBR 63lWA 63lWB	*DO NOT USE IN* **ANY** *G 2 CARRIER.*

What About DC System?

DC systems are not affected; no changes to current DC power supply guidelines have occured. A reminder, however, that AC POWER SUPPLIES SHOULD NEVER BE USED IN DC SYSTEMS. Approved and supported DC power supplies include only the 644A and 645B.

MISCELLANEOUS HARDWARE AND EQUIPMENT

This section presents information on miscellaneous hardware and equipment associated with the universal module control (UMC) carrier. Applicable configuration rules are also presented. The following hardware and equipment is configured at the cabinet level unless otherwise specified.

- Current Limiter Pack (CFY1)

  One current limiter pack is always required per UMC cabinet. This pack resides on the backplane behind the left power slot of the first UMC carrier (equipment level A). The current limiter pack is never equipped in the second UMC carrier (equipment level "B").

- Lightwave Transceivers (4B, 4C)

  One LT transceiver short wavelength (9823A) or one LT long wavelength (9823B) is required per each TN481 and TN456 equipped in the carrier. The LT mounts on the I/O connector plate located on the rear of the carrier. The short wavelength LT is required whenever the module is a central module or a remote module located within 4900 ft. from the main equipment room. The long wavelength LT is required in remote modules located 4900 to 25,000 ft. from the main equipment room.

COMMON PORT CARRIER CIRCUIT PACKS

This section identifies the circuit packs applicable to common port carriers.

TABLE 28-4. Common Port Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
Power (left side of carrier)	631 DA1	AC single output power supply	Provide +5 VDC.	Always required for AC powered modules.
	644 Al	DC single output power supply	Provide +5 VDC.	Always required for DC powered supplies. See table 28-3.
Power/service or common port slot 1-20	TN748C	Tone detector	Provides four touch-tone receivers and two general purpose receivers.	When the number TN748Cs exceed the number of service slots, remaining packs are equipped in universal port slots.
2-20	TN555	DS1 packet adjunct (ISDN/PRI)	Provides 24 channels on a DS1 link.	Always paired with a TN767.
1-20	TN556	ISDN BRI line	Provides twelve ports for ISDN/BRI.	In G2, the maximum number of terminals per port is one.
1-20	TN726	Data line circuit (DLC)	Provide eight ports for asynchronous equipment with RS232 interface.	
1-20	TN735	MET line circuit pack	Provide four ports for multibutton electronic telephone sets.	
1-20	TN742	Analog line (OPS, ONS OPX, test)	Providcs eight lines, analog contact interfaces, moderns, or data ports per pack.	
1-20	TN746	TN746 analog line (ONS only)	Provides sixteen lines or sixteen contact interfaces per pack.	Used for loops less than 3100 feet long.
1-20	TN746B	Analog line	Provides sixteen analog ports or twelve trunk ports or eight contact interfaces for ACD applications.	
1-20	TN747B	CO trunk	Provides eight trunks per pack.	
Any Available	TN771B	Maintenance test	Providcs facility testing for both analog and digital circuit packs. Replaces SN261 C in Generic 2 systems.	Always required

TABLE 28-4. Common Port Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
1-20	TN753	DID trunk	Provides eight trunks per pack.	
1-20	TN754	Digital line (MFDT)	Provides eight lines or eight host access trunk packs per pack.	
1-20	TN760C	Tie trunk	Provides four trunks per pack.	Contains option switches for E&M or simplex signaling.
1-20	TN762B	Hybrid line (MFAT)	Provides eight lines per pack for multi-appearance voice terminals.	
1-20	TN763B	Auxiliary trunk	Provides four ports for auxiliary features.	
1-19	TN767	DS1 interface	Provides 24 ports for DS1 line or trunk applications.	When used for DS1 trunks, two common port carrier slots must be allocated per pack Paired with TN555 for ISDN PRI trunks. Cannot be used in slot 20.
1	TN768	Tone generator circuit pack	Supplies call progress tones, answer-back tones, and trunk transmission test tones, plus fault detection for the ring generator.	Minimum one pack per module (two for tone duplication) with a maximum of one pack per port carrier
1-20	TN784 or TN754B	Digital line	Provides eight ports with lightening protection, for connection to digital terminals or data moduals.	
Power (right side of carrier)	631DB1 or 645B1	AC dual output power supply DC dual output power supply	Provides -5/-48 VDC. Provides -5/-48 VDC.	Always required for AC powered modules. Always required for DC powered modules. See table 28-3.

TMS CARRIER CIRCUIT PACKS

TABLE 28-5. TMS Carrier and Associated Circuit Packs (Part 1 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
00 01	4940A	Power unit	DC-DC converter	
02 03 04 05	TN480	Module interface	Receives data from and transmits data to the modules	One required per module.
06	TN473	Fanout	Distributes data from module interface to the multiplexer	
07	UN150	Fanin	Distributes data from module interface to the multiplexer	
08 09	TN470	MPX	Provides the half-connections which allow voice and data communications between modules	One TN470 required for first module and one TN470 for every two modules thereafter.
10	TN452C	Port control interface	Provides I/O bus signal control	
11	TN462	Local clock termination	Receives clock oscillator signals and distributes them from the TMS carrier	
12 13	TN470	MPX	Provides the half connections which allow voice and data communications between modules	Same as position 08.
14	UN150	Fanin	Distributes data from module interface to the multiplexer	
15	TN473	Fanout	Distributes data from module interface to the multiplexer	
16 17 18 19	TN480	Module interface	Receives data from and transmits data to the modules	Same as position 02. A TN480 may be installed in position 19 in the growth TMS carrier only.
20	TN463 or TN2131	System clock synchronizer External clock interface	Provides synchronization of clock signals with an external clock	TN2131 location varies depending on system configuration. For single module systerm, TN2131 resides in UMC, slot 14. See chapter 30 for complete synchronization clock information.

TABLE 28-5. TMS Carrier and Associated Circuit Packs (Part 2 of 2)

CARRIER SLOT POSITION	CIRCUIT PACK CODE	CIRCUIT PACK NAME	FUNCTION	NOTES
21	TN461	Clock oscillator	Generates reference clock signals for multimodule system and serves as an interface between the system clock synchronizer and secondary clock signals.	Only in basic TMS carrier.
22	TN482	TMS maintenance interface	Provides test and maintenance access to TMS network	Only in basic TMS carrier.
23	TN530	Duplicate/update channel	Links two MC carriers of duplicated MC system.	Only in basic TMS carrier.
24	TN512B	Test support	Used in field maintenance to provide extra memory for code testing.	Only in basic TMS carrier.
25	TN381	TMS processor	Provides control interface between the TMS and the CC.	Only in basic TMS carrier.
26	TN400B	I/O bus interface	Interfaces the module processor with the port control interface.	
27	TN401	MC channel	Interfaces between the CC and digital network.	
28	495FA	Power unit	DC-to-DC converter.	

CIRCUIT PACK SWITCH SETTINGS

ANN11E Circuit Pack

Figure 28-3 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

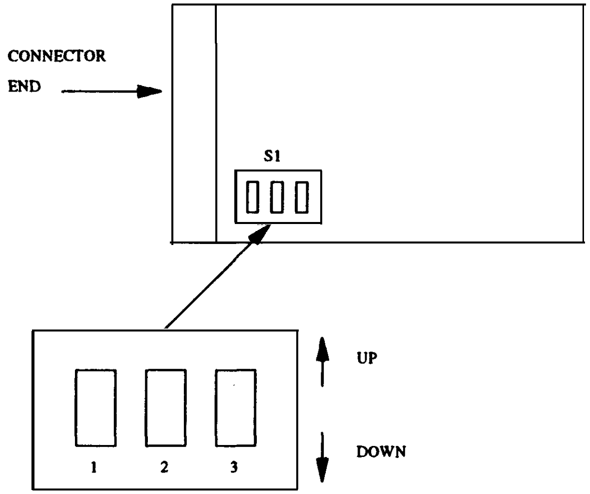


Figure 28-3. ANN11E S1 Switch

Use table 28-6 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from an System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the cable length distance. The options at both systems should be set for the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 28-6. ANN11E S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	D	D	U
133-266 feet	D	U	D
266-399 feet	D	U	U
399-533 feet	U	D	D
533-655 feet	U	D	U

ANN15B and ANN16B Circuit Packs

Figure 28-4 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

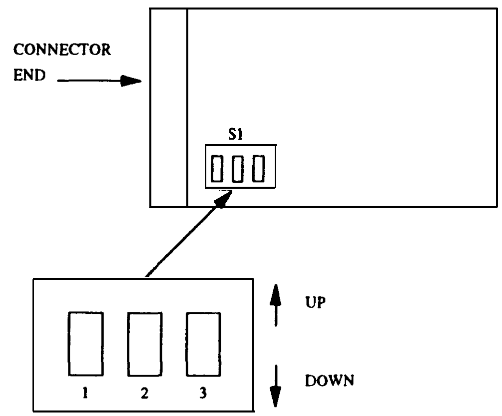


Figure 28-4. ANN15B and ANN16B S1 Switch

Use table 28-7 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from an System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the distance. The options at both systems should be set at the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 28-7. ANN15B and ANN16B S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	D	D	U
133-266 feet	D	U	U
266-399 feet	D	U	U
399-533 feet	U	D	D
533-655 feet	U	D	U

ANN35 Circuit Pack

Figure 28-5 shows a three-rocker switch package (S1) positioned on the circuit pack. The switch is set to the cable length distance of the DS-1 cable.

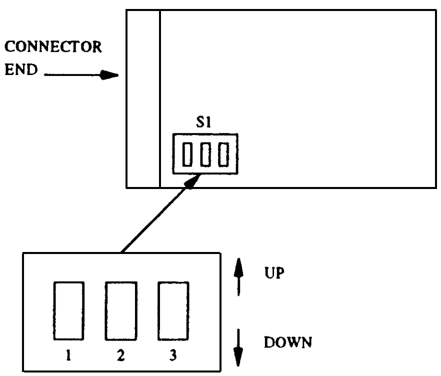


Figure 28-5. ANN35 S1 Switch

Use table 28-7 to set the option switches based on the length of the DS-1 cable between the cabinet and the DSX-1 cross-connect point. If a DS-1 trunk port from a System 85 is connected to another system or device that has similar equalization options, a phantom point midway between the two systems should be chosen as the distance. The options at both systems should be set at the distance to the phantom point. If the unit being connected to the DS-1 trunk port does not have equalization options, the distance should be set to the input of the device.

TABLE 28-8. ANN35 S1 Switch Settings

CABLE LENGTH	SW1	SW2	SW3
0-133 feet	D	D	U
133-266 feet	D	U	D
266-399 feet	U	U	D
399-533 feet	U	D	D
533-655 feet	U	D	U

SN221B Circuit Pack

Figure 28-6 shows four, two-rocker switch packages, S1-S4 positioned on the circuit pack. Each switch package serves two of the eight port circuits provided on the pack.

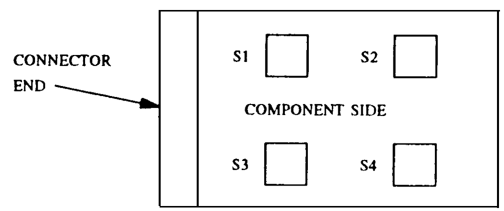


Figure 28-6. SN221B Switch Locations

Figure 28-7 identifies the two switch sections (1/2) in the single switch package.

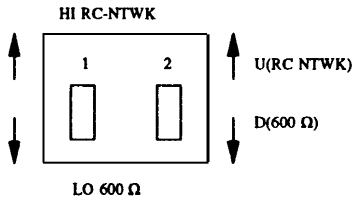


Figure 28-7. SN221B S1-S4 Switch

Refer to table 28-9 to select the required option for a port circuit. First, identify the switch package (S1-S4) associated with the port circuit (locate the package as shown in figure 28-6). Next, set the single switch section for that port as shown in table 28-9; (U) indicates the switch section is fully depressed at the upper end and (D) indicates the switch section is fully depressed at the lower end.

TABLE 28-9. SN22lB Switch Settings

PORT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION POSITION*	
			OPTION 600 Ω	OPTION (RC-NTWK)
0	1	1	D	U
1	1	2	D	U
2	2	1	D	U
3	2	2	D	U
4	3	1	D	U
5	3	2	D	U
6	4	1	D	U
7	4	2	D	U

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK and option for loop length greater than 3500 feet.

SN224B Circuit Pack

A single shorting plug is provided to adapt the port circuits to interface with either multifunction electronic telephone (MFET) or multibutton electronic telephone (MET) sets. All four ports are altered by the single plug. Both MFET and MET sets can be used with the shorting plug in place (POSITION 1); however, the distance from station set to port is limited to 1,000 feet. For MFET set distances to 3,000 feet, the plug must be set to POSITION 2. (See figure 28-8 for Position 1 or 2 arrangements.) This makes the circuit pack incompatible with MET sets. Position 2 does nothing electrically to the circuit pack, it is just a method of storing the strap.

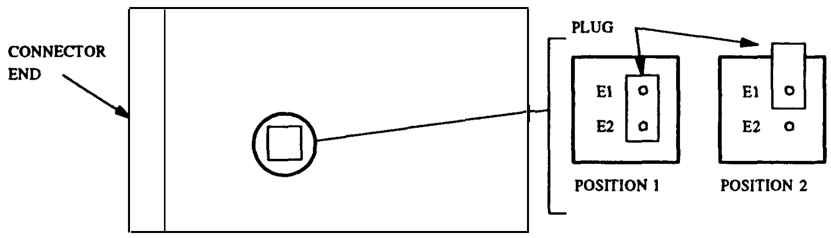


Figure 28-8. SN224B Shorting Plug Positions

When installing 106B Display Units, the shorting plug must be placed in position 1. This position dedicates all the port circuits to MET set or display unit operation and it makes the circuit pack incompatible with MFET sets.

SN228B Circuit Pack

Figure 28-9 shows eight, two-rocker switch packages S1-S8 positioned on the circuit pack. Each switch package serves one of the eight port circuits provided on the pack.

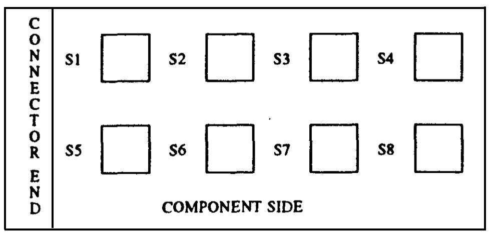


Figure 28-9. SN228B Switch Locations

Figure 28-10 shows a single switch package that identifies the two switch sections (1, 2) in the package.

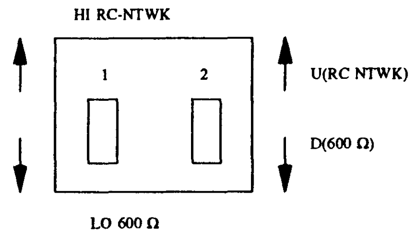


Figure 28-10. SN228B S1-S8 Switch

Use table 28-10 to select the required option for a port circuit. First, identify the switch package (S1-S8) associated with the port circuit (locate the package as shown on figure 28-9). Next, use table 28-10 to set the single switch section for that port. (U) indicates the switch section is fully depressed at the upper end and (D) indicates the switch section is fully depressed at the lower end.

TABLE 28-10. SN228B Switch Settings

PORT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION POSITION*	
			OPTION 600 Ω AND LO	OPTION (RC-NTWK) AND HI
0	1	1 and 2	D	U
1	2	1 and 2	D	U
2	3	1 and 2	D	U
3	4	1 and 2	D	U
4	5	1 and 2	D	U
5	6	1 and 2	D	U
6	7	1 and 2	D	U
7	8	1 and 2	D	U

* Use 600 Ω and LO options for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK and HI options for loop length greater than 3500 feet.

SN230B Circuit Pack

Figure 28-11 shows four, two-rocker switch packages positioned on the circuit pack. Each switch package is assigned to a single port circuit as identified in the diagram.

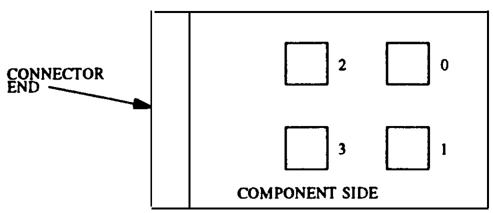


Figure 28-11. SN230B Switch Package Locations

Figure 28-12 shows a single switch package that identifies the two switch sections (1, 2) in the package.

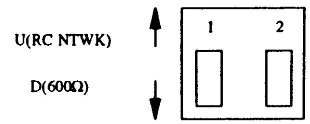


Figure 28-12. SN230B Switch Package

Refer to figure 28-11 to select the required option for a port circuit and identify the associated switch package. Then set the switch sections for that port as shown in table 28-11.

TABLE 28-11. SN230B Switch Settings

OPTION	TERMINATION	SWITCH SECTION 1	2
W	RC BALANCE NETWORK	U	X
X	600 OHM	D	X

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC BALANCE NETWORK option for loop length greater than 3500 feet.

In the table, (U) indicates the switch is fully depressed at the upper end and (D) indicates the switch is fully depressed at the lower end. “X” denotes that switch section (2) is not used. The position of this switch section has no effect on circuit operation.

SN231 Circuit Pack

Four switch packages, each containing four (three for vintage 5) rocker switch sections, are positioned on the circuit pack. Each switch package is assigned to a single port circuit as identified in figures 28-13 or 28-14.

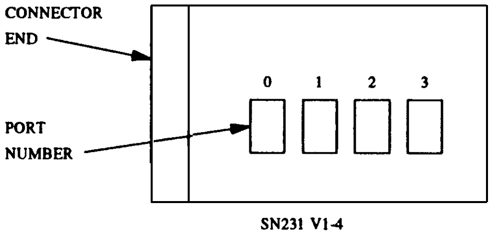


Figure 28-13. SN231 (V1-V4) Switch Locations

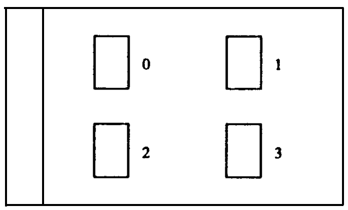


Figure 28-14. SN231 (V5) Switch Location

Single switch packages are shown in figure 28-15 to identify the four rocker switch sections in vintage 1-4 circuit packs and the three rocker switch sections in vintage 5 circuit packs.

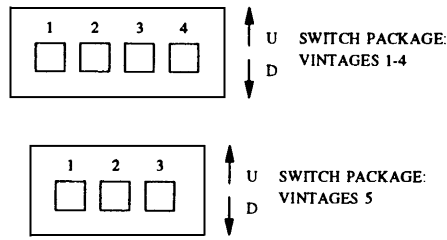


Figure 28-15. S14231 Switch Sections

To select the required transmission option for a port circuit, identify the associated switch package from the pack diagram. Then set switch sections for that port as shown in table 28-11. Use switch section columns 1, 2, and 3 for vintage 5 circuit packs.

TABLE 28-12. SN231 Switch Settings

OPTION	TRANSMISSION	SERVICE TYPE	SWITCH SECTION 1	2	3	4
S	One way incoming	Recorded announcement	U	D	U	X
S	One way incoming	Music on hold	D	D	U	X
R	One way outgoing	Paging without talkback	U	U	D	X
Q	Two way	Paging with talkback	U	D	D	X
Q	Two way	Dictation trunks	U	D	D	X
ZA	Two wire signaling	Not applicable	D	X	X	X
ZB	Four wire signaling	Not applicable	U	X	X	X

In table 28-12, “U” indicates the switch is fully depressed at the upper end and “D” indicates the switch is fully depressed at the lower end. An “X” indicates that a switch section is not used in the option and may remain in either position.

SN232B Circuit Pack

Figure 28-16 shows two, two-rocker switch packages S1 and S2 positioned on the circuit pack. Each package serves two port circuits.

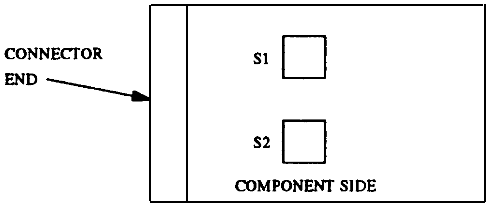


Figure 28-16. SN232B Switch Locations

Figure 28-17 shows a single switch package that identifies the two switch sections in the package.

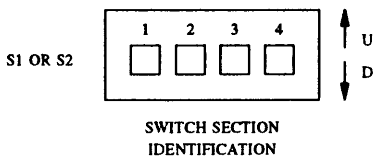


Figure 28-17. SN232B Switch

Use table 28-13 to select the required option for a port circuit. The symbol “U” indicates that the switch section is fully depressed at the upper end and “D” indicates that the switch section is fully depressed at the lower end.

TABLE 28-13. SN232B Switch Settings

PORT CIRCUIT	SWITCH PACKAGE	SWITCH SECTION	SWITCHES SECTION SETTING*	
			RC-NTWK	600Ω
0	S1	1	U	D
		2	D	U
1	S2	1	U	D
		2	D	U
2	S1	3	U	D
		4	D	U
3	S2	3	U	D
		4	D	U

* Use 600:Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK option for loop length greater than 3500 feet.

SN233B Circuit Pack

Access to both transmit and receive transmission channels and to the E & M signaling leads for each port is provided by jacks on the front of the pack. The jack assignment is shown in figure 28-18. Plug insertion into the transmit or receive channel jack accesses the local end, opening the channel toward the distant end. Plug insertion into the signaling jack opens the signaling leads toward the distant ends unless on-board switches are set as described below.

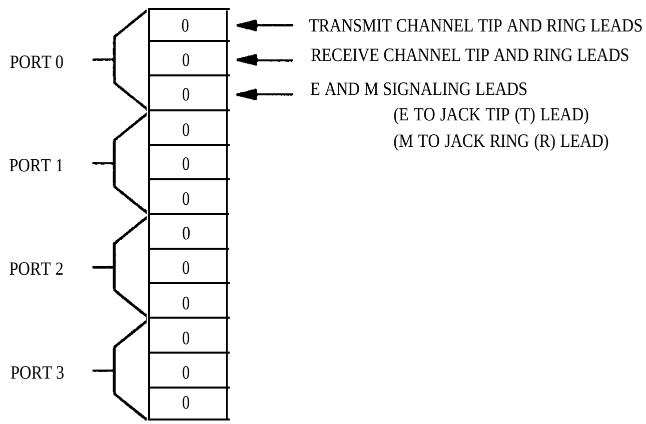


Figure 28-18. SN233B Jack Assignments

Figure 28-19 shows two, four-rocker switch packages S1 and S2. Switch settings determine the type access from the E & M lead jack. With a switch section fully depressed at the upper end "U", access is to the pack circuitry only (open from distant end) when plug is inserted. If the switch section is fully depressed at the lower end "D", access bridges the signaling lead. Table 28-14 shows the switch settings.

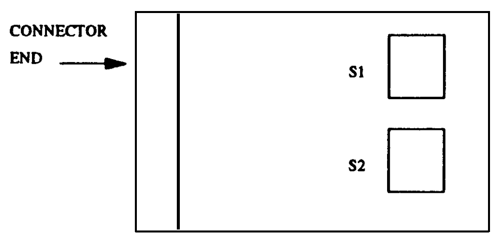


Figure 28-19. SN233B Switch Location

Figure 28-20 shows a single switch package.

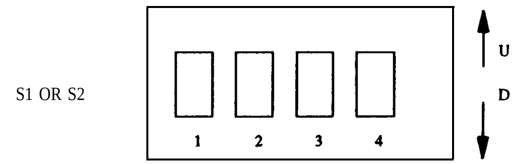


Figure 28-20. SN233B Switch Location

TABLE 28-14. SN233B Switch Settings

PORT	LEAD	SWITCH	SECTION
0	M	1	1
	E		2
1	M	1	3
	E		4
2	M	2	1
	E		2
3	M	2	3
	E		4

SN233C Circuit Packs

Switch Assignment

Table 28-15 describes the type of signaling used on the port is set by option switches. Four switch packages, S1 though S4, are located as shown in figure 28-21. S1 contains four rocker switch sections that are shared between Port 0 and Port 1. S3 also contains four rocker switch sections that are shared between Port 2 and Port 3. S2 contains 10 rocker switch sections that are shared between Port 0 and Port 1. S4 contains 10 rocker switch sections that are shared between Port 2 and Port 3. The switch settings determine the type and method of signaling used for the port and the codec conversion mode. Table 28-15 below shows the switch settings for various signaling types for any port.

TABLE 28-15. SN233C Switch Settings

SWITCH SECTION	A a	B b	C c	D d	E e	F f
Standard E&M Type IA	D	D	D	D	U	U
IB	U	U	D	U	U	U
V	U	U	D	D	U	U
Protected Type IA	D	D	U	D	U	U
(NOTE 1) IB	U	U	U	U	U	U
V	U	U	U	D	U	U
Simplex Type IA	D	D	U	D	D	D
IB	U	U	U	U	D	D
V	U	U	U	D	D	D

Capital letters A through F = Port 0 and Port 2
Small letters A through F = Port 1 and Port 3
Set switch M for appropriate conversion mode (NOTE 2):
ulaw (Domestic) = U
alaw (International) = D
NOTE 1: The M lead when protected has series resistance added to provide for lightning protection.
NOTE 2: Some international countries use ulaw.

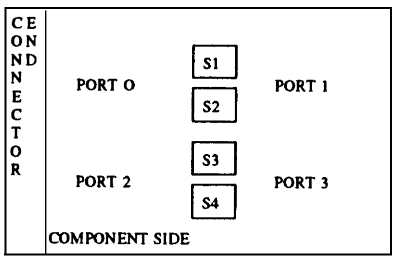


Figure 28-21. SN233C Switch Locations

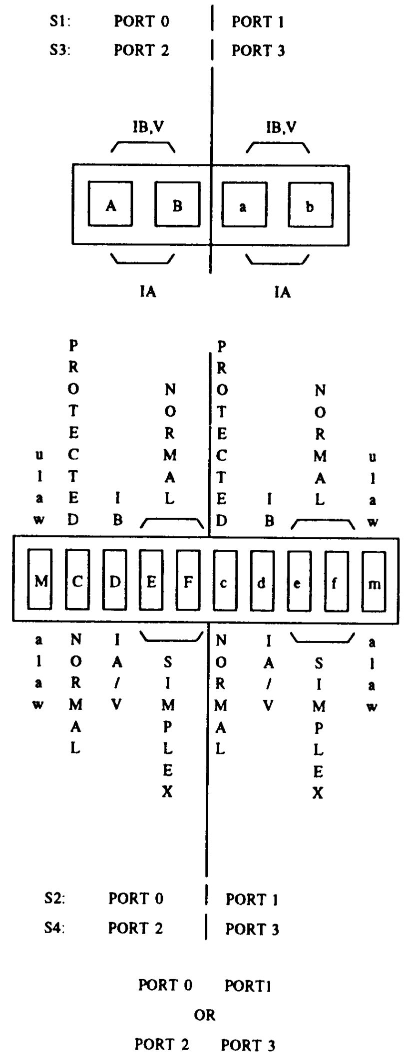


Figure 28-22. SN233C Port Settings

SN238 Circuit Pack

There are two switch packages each containing eight switch sections. Switch S1 is used to select odd or even parity, enable or disable parity, and to select a baud (data) rate. Switch S2 is used to enable or disable auto baud and auto parity for ports 0-3. S2 is also used to enable or disable keyboard dialing for Ports 0-3. See figure 28-23 for switch locations.

Figures 28-24 and 28-25 show single switch packages.

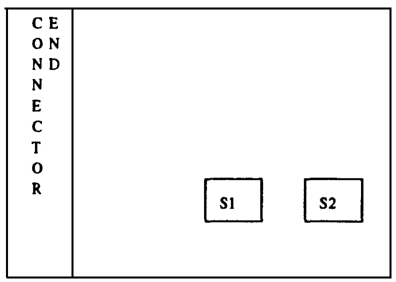


Figure 28-23. SN238 Switch Locations

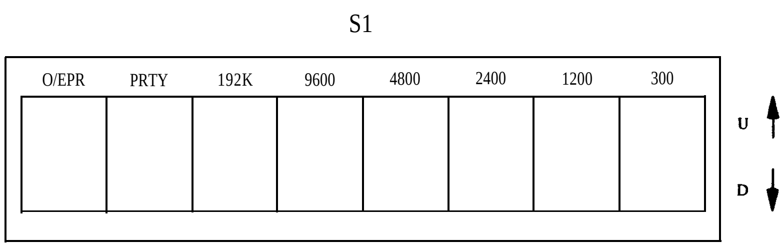


Figure 28-24. SN238 S1 Switch

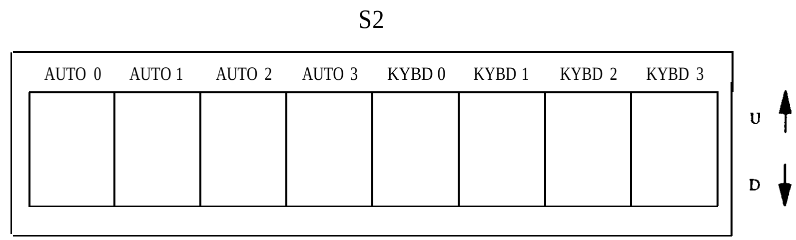


Figure 28-25. SN238 S2 Switch

S1 Option Setting

NOTE	If more than one baud rate is selected, the port board will determine the highest common baud rate with the distant end. When a call is disconnected or not initiated, the port board follows the highest baud rate selected on S1. See table 28-16 for S1 parity and baud settings.

TABLE 28-16. SN238 S1 Switch Settings

SWITCH	SETTING	FUNCTION
O/EPR	D	Odd parity
	U	Even parity
PRTY	D	Parity enabled
	U	Parity disabled
19.2k	D	19.2K baud
	U	Switch disabled
9600	D	9600 baud
	U	Switch disabled
4800	D	4800 baud
	U	Switch disabled
2400	D	2400 baud
	U	Switch disabled
1200	D	1200 baud
	U	Switch disabled
300	D	300 baud
	U	Switch disabled

TABLE 28-17. SN238 S2 Switch Settings

SWITCH	SETTING	FUNCTION
AUTO 0	D	Enables auto-baud and auto-parity for Port 0
	U	Disablcs auto-baud and auto-parity for Port 0
AUTO 1	D	Enables auto-baud and auto-parity for Port 1
	U	Disables auto-baud and auto-parity for Port 1
AUTO 2	D	Enables auto-baud and auto-parity for Port 2
	U	Disables auto-baud and auto-parity for Port 2
AUTO 3	D	Enables auto-baud and auto-parity for Port 3
	U	Disables auto-baud and auto-parity for Port 3
KYBD 0	D	Enables keyboard dialing for Port 0
	U	Disables keyboard dialing for Port 0
KYBD 1	D	Enables keyboard dialing for Port 1
	U	Disables keyboard dialing for Port 1
KYBD 2	D	Enables keyboard dialing for Port 2
	U	Disables keyboard dialing for Port 2
KYBD 3	D	Enables keybaord dialing for Port 3
	U	Disables keyboard dialing for Port 3

S2 Settings

NOTE

If auto-baud and auto-parity are enabled with S2, the option settings on S1 are ignored. If auto baud and auto parity are enabled for a port, keyboard dialing for the same port must be enabled. See table 28-17 for S2 parity and baud settings.

SN243B Circuit Pack

SN243B with a Single Switch

A switch package containing four rocker switch sections is located on the circuit pack as shown in figure 28-26.

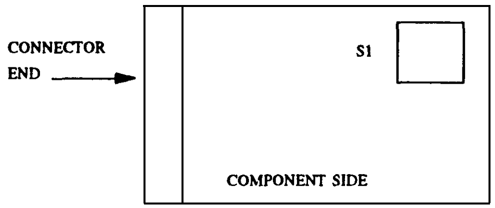


Figure 28-26. SN243B Switch Location

The switch package shown in figure 28-27 identifies the four switch sections and their settings.

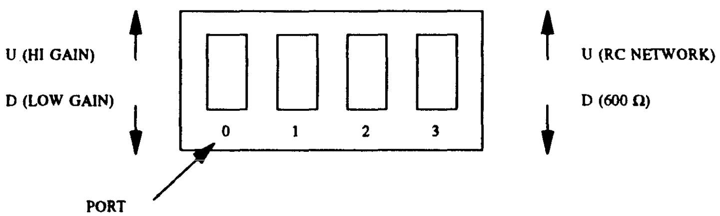


Figure 28-27. SN243B Switch

Use the 600Ω option for loop length less than 3500 feet (about 600 Ω without set). Use the RC NETWORK option for loop length greater than 3500 feet.

SN243B with Two Switches

Figure 28-28 shows two, two-rocker switch packages S1 and S2 positioned on the circuit pack. Each switch package serves two port circuits.

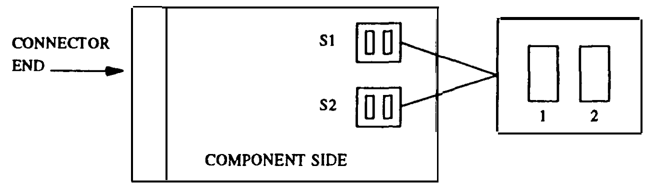


Figure 28-28. SN243 Switch and Location

Use table 28-18 to select the desired option for a port circuit. "U" indicates the switch section is fully depressed at the upper end and "D" indicates the switch section is fully depressed at the lower end.

TABLE 28-18. SN243B Switch Settings

PORT CIRCUIT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION SETTING*	
			600 Ω	RC NTWK
0	S1	1	U	D
1	S1	2	U	D
2	S2	1	U	D
3	S2	2	U	D

* Use 600 Ω option for loop length less than 3500 feet (about 600 Ω without set). Use RC-NTWK option for loop length greater than 3500 feet.

SN250 Circuit Pack

A switch package containing three rocker switch sections is located on the circuit pack as shown in figure 28-29.

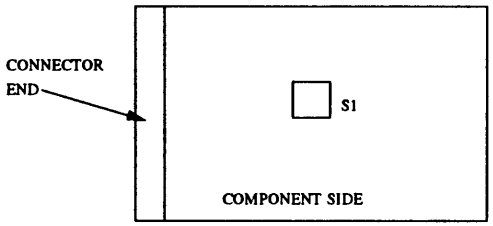


Figure 28-29. SN250 Switch Package Location

The switch package shown in figure 28-30 identifies the three switch sections. All of the switch sections should be depressed toward the numbers for use with this system.

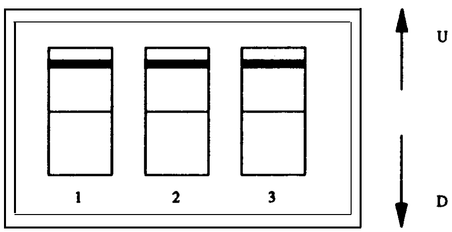


Figure 28-30. SN250 Switch Package

SN250 circuit packs identified as vintage 6 or later do not have this switch package and do not require option settings.

SN253C Circuit Pack

A switch package containing two rocker switch sections is located on the circuit pack as shown in figure 28-31.

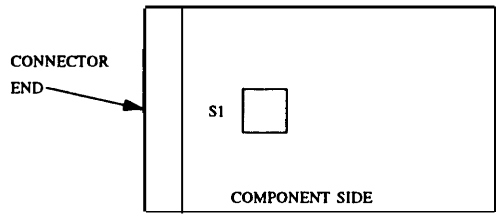


Figure 28-31. SN253C Switch Location

The switch package shown in figure 28-32 identifies thet two switch sections.

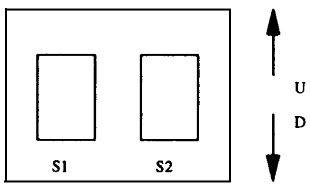


Figure 28-32. SN253C Switch Package

Table 28-19 indicates the switch section positions required for each option provided. “U” indicates the rocker switch is depressed at the upper end and “D” indicates the switch is depressed at the lower end.

TABLE 28-19. SN253C Switch Settings

FUNCTION		OPTION	SWITCH S1	SWITCH S2
Internal system chime only (0.5 sec.)		K	U	U
External chime period (sec.)	0.50	J	D	U
	1.00	G	U	D
	2.00	F	D	D

* Internal chime will operate also, at same rate chosen for external chime.

TN403 (Dual Speed Data Channels) Circuit Pack

Switch S1 (shown in figure 28-33) controls the data transmission rate for circuit pack channels 14 and 15. Figure 28-34 identifies the switch sections that control channels 14 and 15. Table 28-20 shows switch setting options.

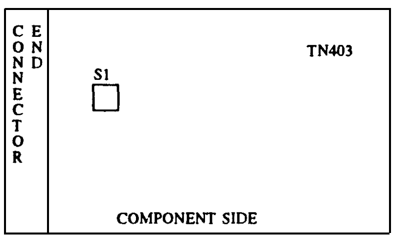


Figure 28-33. TN403 Switch Location

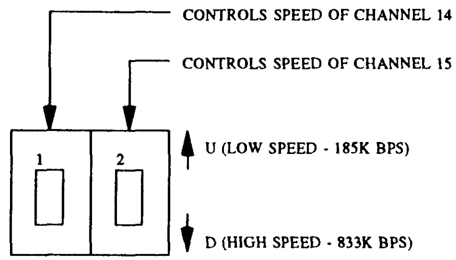


Figure 28-34. TN403 Switch

TABLE 28-20. TN403 Switch Settings

CARRIER SLOT NO.	CHANNEL NUMBERS	TN403 CHANNEL NUMBER	SWITCH SECTION	SWITCH POSITION
23	00-15	15	2	D
		14	1	D
24	16-31	15	2	U
		14	1	U
25	32-47	15	2	U
		14	1	U
26	46-63	15	2	U
		14	1	U
CHANNELS 0-13 ARE NOT SPEED OPTIONABLE, THEY WILL ONLY OPERATE AT LOW SPEED (185K BPS).				

TN456 Circuit Pack

For Phase 1 systems, a TN456 circuit pack must be installed in slot 25 of each central and remote MC carrier that is associated with RMI. For Phase 2 systems, one TN456 (two if duplicated) circuit pack must be installed in the RMI carrier(s) for each remote MC carrier, and one TN456 must be installed in slot 25 of each remote MC carrier. The option switches must be set before the circuit pack is installed. Proceed as follows:

1. Locate the wrist strap (ground) and cable assembly in the bottom of the MC cabinet next to the AC distribution unit.
2. Attach the wrist strap to either wrist.
3. Connect the alligator clip to the screw that fastens the door latch to the frame.
4. Set option switches 1 and 2 (slide-type) on each TN456 circuit pack to **CENTRAL** or **REMOTE** for the location of the MC carrier where the circuit pack will be placed. Figure 28-35 shows the TN456 circuit pack and switch locations.
5. Install one TN456 circuit pack in the appropriate location as shown in the Customer System Document (CSD) for each remote MC carrier (J58888M).
6. Remove wrist strap and cable assembly. Replace them in the bottom of the MC cabinet for future use.

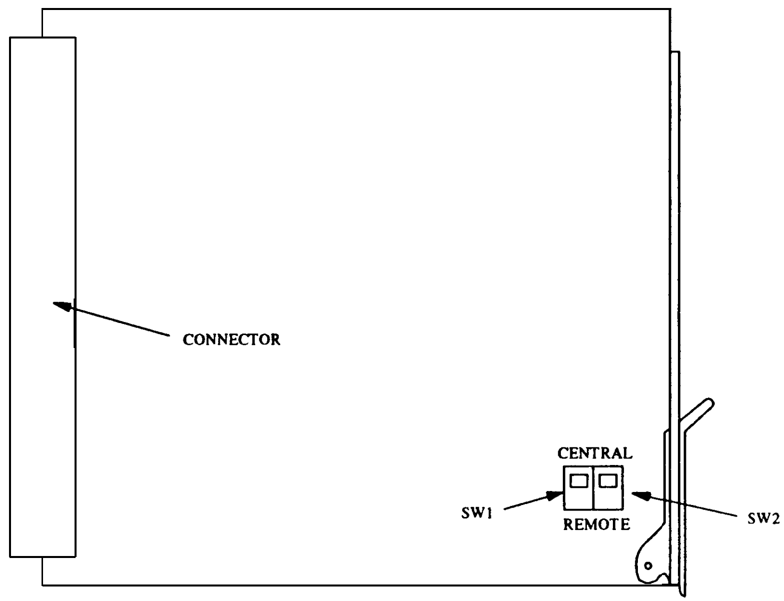


Figure 28-35. Option Switch Locations for TN456 Circuit Pack

TN492C Circuit Pack

Plug PL1 is located on the board as shown in figure 28-36. The plug must have the 4 terminals inserted in it (terminals keyed) at the time of battery installation. An amber LED in faceplate 17 will turn on if this connection is incorrect. Determine if battery connection is correct, if not, correct the connections.

The backup battery B1 must be replaced 5 years after the date of installation. See Note.

The backup battety has a date label. Mark the battery replacement date on the label. Then, affix the label to the faceplate of circuit pack 492C.

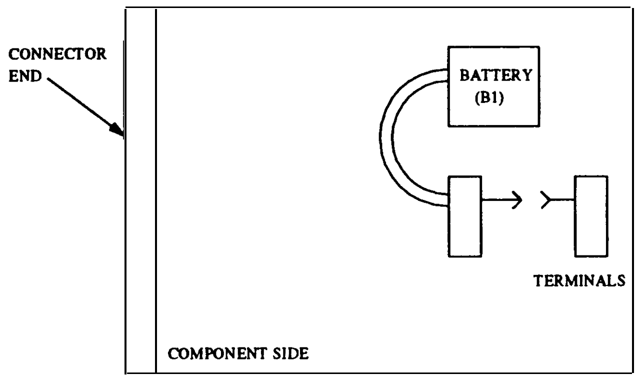


Figure 28-36. TN492C Circuit Pack Configuration

NOTE

Do not order the battery by KS number. It must be ordered as comcode 844665836, which consists of the battery (comcode 41561485) and a connector (comcode 86427-7).

TN513 Circuit Pack

Figure 28-37 shows two switch packages with seven switch sections allow configuration of the serial port hardware. Switch S1 is used to configure channel 0 USART and switch S2 is used to configure channel 1 USART.

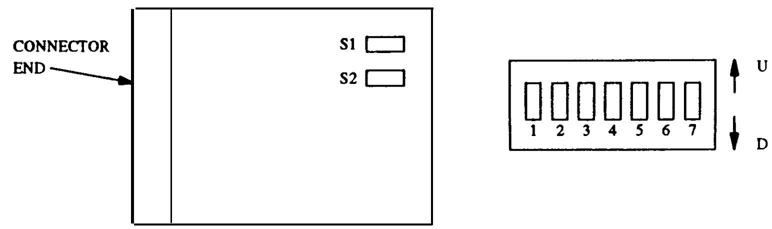


Figure 28-37. TN513 Switch Packages and Locations

Table 28-21 shows the S1 and S2 switch section positions required for each option provided. "U" indicates the rocker switch is depressed at the upper end and "D" indicates the switch is depressed at the lower end.

TABLE 28-21. TN513 Switch Settings

FUNCTION	SWITCH	SWITCH SECTION	POSITION
RX/TX DIRECT MODE	1 0R 2	1,4	D
		2,3	U
RX/TX NULL MODE	1 0R 2	2,3	D
		1,4	U
SHORT CTS/RTS	1 0R 2	5	D
SHORT DTR/DSR	1 0R 2	6	D
LOGICALLY(AND)CHO	1	7	D
AND CHI USART INTERRUPTS	2	7	U
INDEPENDENT CH0 AND	1	7	U
CH1 USART INTERRUPTS	2	7	D
DISABLE CH1 USART	1	7	U
INTERRUPTS	2	7	U

AEH4 Alarm Board

AEH4 is located behind the DC fan assembly in the rear of each cabinet. See figure 28-38 for location of switches S1-S4 and table 28-22 for their settings.

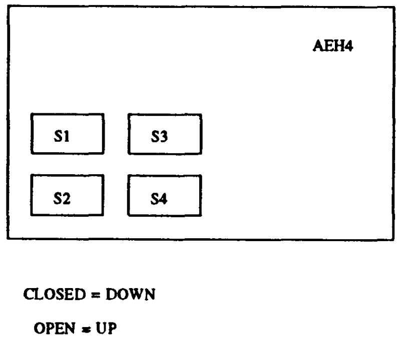


Figure 28-38. AEH4 Switch Locations

TABLE 28-22. AEH4 Switch Settings

AEH4 LOCATED IN THIS TYPE OF CABINET	SWITCH S1						SWITCH S2						SWITCH S3						SWITCH S4					
	SECTION						SECTION						SECTION						SECTION					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
UNDUPLICATED CC (501CC) (MAY CONTAIN PORT CIRCUITS)	U	D	D	U	U	D	D	U	U	U	U	U	U	U	U	U	U	U	D	D	U	U	U	D
DUPLICATED CC(501CC)	U	D	D	U	U	D	D	U	U	U	U	D	U	U	U	D	D	U	U	U	U	D	U	D
MC WITH 309A/310A UNDUPLICATED 501CC SYSTEM	D	U	U	D	D	U	U	D	D	D	D	U	U	U	U	U	U	U	U	U	U	U	D	U
MC WITH 309A/310A DUPLICATED 501CC SYSTEM	D	U	U	D	D	U	U	D	D	D	D	U	U	U	D	U	U	D	D	D	U	U	D	U
PORT CABINET WITH 309A/310A	D	U	U	D	D	U	U	D	D	D	D	U	U	U	D	U	U	D	D	D	U	U	D	U
PORT CABINET WITHOUT 309A/310A	D	U	U	D	D	U	U	D	U	U	U	U	U	U	U	U	U	U	U	U	U	U	D	U
UNDUPLICATED TMS FOR UP TO 31 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U
DUPLICATED TMS - ONE CABINET FOR UP TO 15 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U
DUPLICATED TMS - TWO CABINETS FOR 16-31 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U
AUXILIARY CABINET WITH DC FAN ASSEMBLY	U	D	D	U	U	D	D	U	U	U	U	U	U	U	U	U	U	U	U	U	D	U	D	D
DUPLICATED MC CABINET WITH 2 BULK OLS POWER SUPPLIES	D	U	U	D	D	U	U	D	D	D	D	D	U	U	U	U	U	D	U	D	U	D	D	D

NOTE

All option settings and cable connections that have been made by the factory before shipping should be checked and verified since the cabling differs for different cabinet configurations.

CAL1B Circuit Pack

Figure 28-39 shows CAL1B dip switch location on the circuit board. Figure 28-40 shows various switch positions, and table 28-23 shows switch settings.

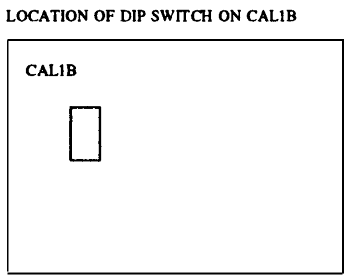
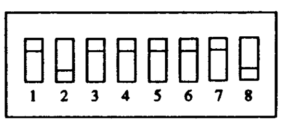


Figure 28-39. CAL1B Switch Location



NOTE:
A SWITCH IS CLOSEDWHEN THE ROCKER ARM IS DEPRESSED TOWARD THE SWITCH POLE NUMBER. AS SHOWN, POLES 2 AND 8 ARE CLOSED.

Figure 28-40. CAL1B Switch

TABLE 28-23. CAL1B Switch Settings

POWER UNIT	SWITCH							
	1	2	3	4	5	6	7	8
OLS OR OBS	0	1	0	0	0	0	0	1
DC CONVERTER	0	1	0	0	0	1	1	0

1 = OPTION DIP SWITCH CLOSED
0 = OPTION DIP SWITCH OPEN

PROCEDURES FOR REMOVING CIRCUIT PACKS FROM CC CARRIER

Unduplicated CC — Check to see if system is in emergency transfer mode at the alarm panel. If it is, set the emergency transfer switch to ACT. If the system is not in emergency transfer, set emergency switch to **INHIB.** Notify the customer that no new calls will be processed. Set the **GO/HALT** switch to **HALT.** At this point, circuit packs can be removed from the CC carrier. After replacing the circuit packs that were removed from the CC carrier, the system can be reactivated. If the emergency transfer switch is in the **ACT** position at the alarm panel, set the **GO/HALT** switch to **GO.** If the system appears to be functioning properly, set the emergency transfer switch to **NORMAL.** Notify the customer that emergency transfer service will be interrupted. Depress **RESET.** If the emergency transfer switch is in **INHIB** position, at the alarm panel, depress **RESET** and set **GO/HALT** switch to **GO** within 5 seconds after depressing **RESET.** Set emergency transfer switch to **NORMAL.**

Duplicated CC — Determine if the circuit pack being replaced is in the on-line or off-line carrier of the duplicated CC. If the circuit pack being replaced is in the on-line carrier of the duplicated CC, use PROC 613 Test 3 to soft switch the on-line CC to the off-line carrier. If the soft switch cannot be performed, replace circuit pack(s) in the on-line carrier using the steps for unduplicated CC carrier circuit pack replacement above. Set the **LOCK ON LINE** switch to active (on-line) CC position; i.e., **CC0** or **CC1.** At the off-line CC, remove the circuit pack being replaced. Verify option settings on replacement circuit pack are correct (if applicable). At the off-line CC, replace the circuit pack, and set the **GO/HALT** switch to **GO.** Set the **LOCK ON LINE** switch to **OFF.**

29. POWER-UP SEQUENCE AND MICRODIAGNOSTICS

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GENERAL

This chapter details the power-up sequence for both AC and DC systems, including certain precautionary steps to ensure proper power and ground connections. It also references the correct document for microdiagnostics, as well as the installation and cleaning of carrier covers.

WARNING

Failure to follow the specific sequence in the design order may result in damage to the system.

Do not use past experience with System 85 as the basis for powering up the DEFINITY Generic 2 system. The procedures are different. At the front of each cabinet, remove any shipping bars from the carriers.

Install the plastic covers on each carrier. These covers must be in place to provide the air flow to cool the carrier components.

A liquid anti-static coating has been applied to the plastic covers to prevent Electric Static Discharge (ESD) damage to circuit components. If fingerprints and/or smudges appear on these covers, use only a soft, clean, dry cloth or tissue to clean the cover.

AC SYSTEMS

If you find problems or errors in connections, contact the local electrical contractor for their work, or your field support representative for equipment that is supplied by AT&T and connected by AT&T employees.

Verify system grounding using the *DEFINITY Communications System Generic 2 and System 85 Electrical Protection Grounding, and Exposure Checklist, 555-104-120,* before beginning this procedure.

AC Power-Up Procedure

These steps are for powering up a new system. Begin with step 1 only if this is a new installation. Begin with step 9 if you are adding a UMC cabinet to an existing lineup.

If site power is 240 VAC, ensure that the 208 VAC stepdown transformer has been installed. Verify with the local electrical contractor that the transformer wiring is correct and in accordance with national and local codes.

1. Verify the amperage rating and type of circuit breakers for cabinets, feeder wires, and utility receptacles at the AC load center.
2. Verify the internal wiring connections within the AC protector cabinet with the local contractor. Typical AC protector cabinet wiring connections for DEFINITY Generic 2 are shown in *Chapter 23.*

The controls in steps 3-5 are on the Alarm Panel in the CC/TMS cabinet.

3. Set the EMERGENCY TRANSFER SWITCH to **OFF.**
4. Set the COMMON CONTROL SWITCH to **OFF.**
5. Set the GO/HALT SWITCH to **GO.** If this is a duplicated common control, set both switches to **GO.**
6. Set all cabinet OLS POWER SWITCHES/CIRCUIT BREAKERS to **OFF.**
7. Set the AC NONFUSIBLE DISCONNECT SWITCH to **ON.**
8. Identify the SYSTEM CIRCUIT BREAKERS at the AC load center for the individual cabinet power receptacles if this was not done by the electrical contractor.
9. Set all SYSTEM CIRCUIT BREAKERS at the AC load center to ON if this is a new installation. If this is a system addition, set the new MODULE CIRCUIT BREAKER at the AC load center to ON.
10. Verify that the correct receptacle (voltage and amperage rating) is in place for all cabinet and utility receptacles.
11. Verify the voltage level for all utility receptacles. The voltage should be 120 VAC, (±6 volts).
12. Verify the voltage levels for all cabinet power receptacles. The voltage levels are detailed in table 29-1.

TABLE 29-1. AC Voltage Input Levels

CABINET TYPE	INPUT VOLTAGE
UMC	187 to 229 VAC
CC/TMS	187 to 299 VAC
TMS	187 to 299 VAC
AP, AUX, SMDR	108 to 132 VAC

13. Connect the cabinet power cords to the individual cabinet power receptacles. For system additions only, proceed to step 20. For new installations, continue with this procedure.

Reference figure 29-1 for steps 14-17.

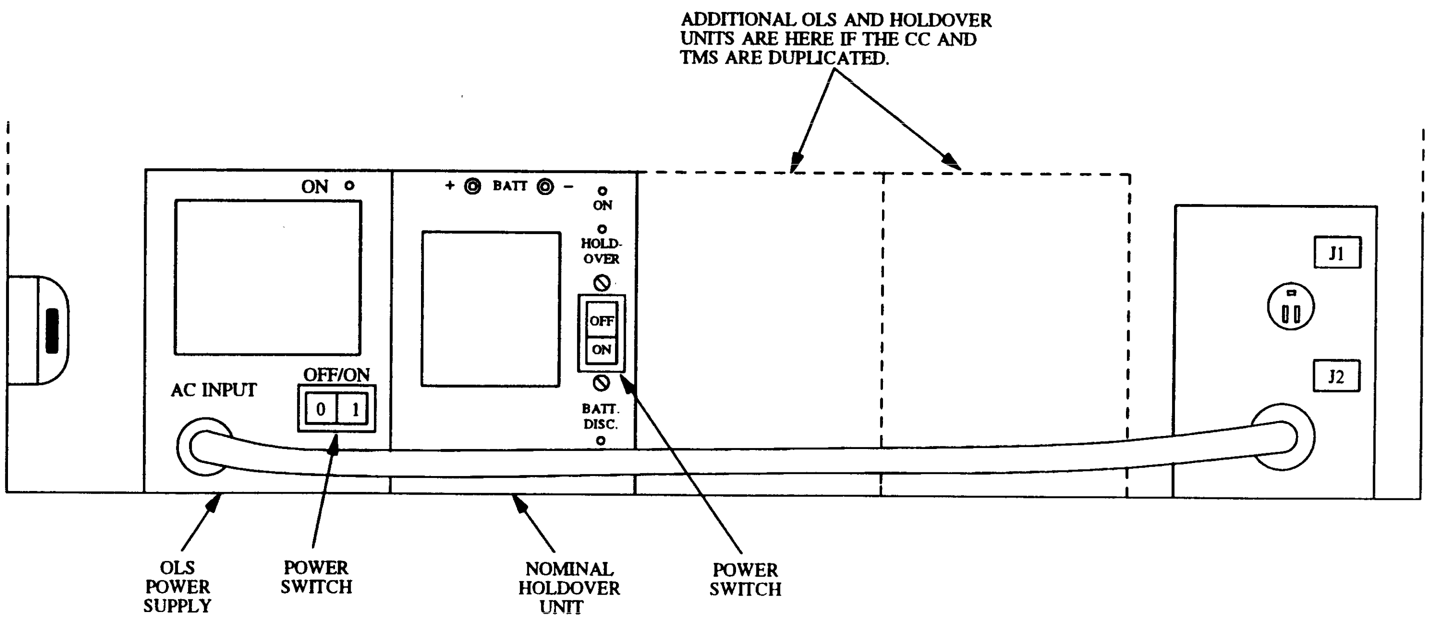


Figure 29-1. CC/TMS Cabinet Power Units (front view)

14. Set the NOMINAL HOLDOVER UNIT POWER SWITCH in the CC/TMS cabinet to **OFF.** If the CC/TMS is duplicated, set both NOMINAL HOLDOVER POWER SWITCHES to **OFF** at this time.

15. Set the individual CARRIER CIRCUIT BREAKERS in the CC/TMS cabinet to **ON.**

16. Set the CC/TMS OLS POWER SUPPLY SWITCH to **ON.** If the CC/TMS is duplicated set both OLS POWER SUPPLY SWITCHES to **ON** at this time. The green POWER INDICATOR LED should light.

WARNING

Do not power-up any other cabinets at this time.

17. Set the CC/TMS NOMINAL HOLDOVER POWER SWITCH to **ON.** The green POWER INDICATOR LED should light. If the CC/TMS is duplicated, set both NOMINAL HOLDOVER POWER SWITCHES to **ON.**

NOTE

When the CC/TMS SYSTEM CIRCUIT BREAKER is set to **ON,** the CC/TMS cabinet fans go into high speed operation. After approximately five seconds, the fans slow to normal operating speed.

18. Measure the CC/TMS rectifier voltage at the end of the power supply leads where they connect to the bus bar. See table 29-2 for acceptable voltage levels.

TABLE 29-2. OLS Output Voltages — AC Systems

CABINET TYPE	VOLTAGE	MAX	MIN
CC/TMS	-48 VDC	-50.5 VDC	-45.5 VDC
TMS	-48 VDC	-50.5 VDC	-45.5 VDC

Measure both OLS power supply levels if the cabinet is duplicated.

19. Repeat steps 14-18 of this procedure if the system has an additional TMS/RMI cabinet due to system size or configuration. If the system has only the CC/TMS cabinet, or if this step has been completed for any additional TMS/RMI cabinets, proceed with the next step in this procedure.

The next step begins the power-up sequence for the UMC cabinet(s).

WARNING

Do not Power-up the UMC battery charger until after first connecting the battery leads and then powering up the UMC AC power distribution unit. Doing this out of sequence may damage the battery charger.

Reference figure 29-2 for steps 20-25 of this procedure.

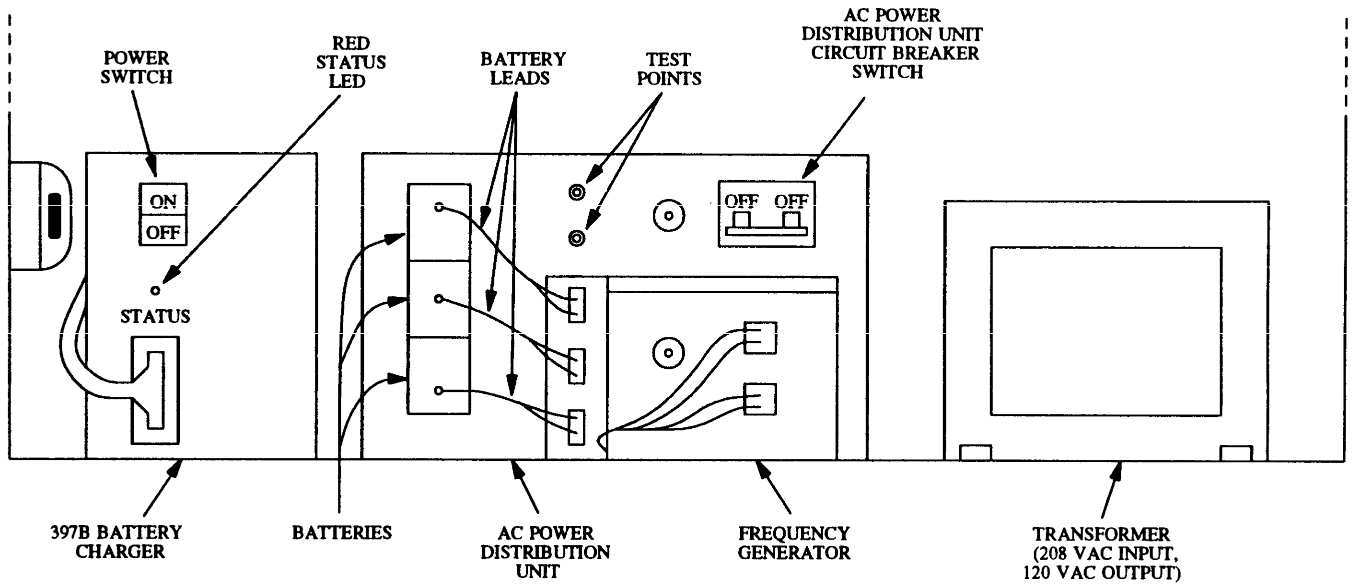


Figure 29-2. UMC Cabinet Power Units (front view)

20. Ensure the AC POWER DISTRIBUTION UNIT CIRCUIT BREAKER is set to **OFF.**
21. Set the 397B battery charger POWER SWITCH to **OFF.**
22. Plug in all three sets of BATTERY LEADS observing polarity (red to red, black to black). The connection sequence for the battery leads is not important. Do not force the plugs; they should insert easily.
23. Connect the AC power cord for the UMC cabinet.
24. Set the AC POWER DISTRIBUTION UNIT CIRCUIT BREAKER to **ON.** Verify that no red LEDs light on the carrier power units and that a yellow LED does light on each power unit. If a red LED lights, or a yellow LED does not light, or no LEDs light, contact your field support representative.

NOTE	When the AC POWER DISTRIBUTION UNIT CIRCUIT BREAKER is set to **ON,** the UMC cabinet fans go into high speed operation. After approximately five seconds, the fans slow to normal operating speed.

25. Set the 397B battery charger POWER SWITCH to **ON.** The STATUS LED may light at this time. If it does, it should go off in a few seconds. If it lights and does not go off, contact your field support representative.
26. Repeat steps 20-25 for each UMC Cabinet in the system.
27. If a traditional module is included as part of the system, use the power-up sequence in *Chapter 16* to power-up the traditional module at this time. If there are no traditional modules in the new installation, continue with the next step in this procedure.
28. If there are no AP, SMDR, or auxiliary cabinets, this procedure is complete. If there are AP, SMDR, and auxiliary cabinets in the system, set the SYSTEM CIRCUIT BREAKERS for all AP, SMDR, and auxiliary cabinets to **ON.**
29. Set all of these cabinet's POWER SWITCHES to **ON.** The sequence of applying power to these cabinets does not matter.
30. Ensure that all of the cabinets are functioning properly. This completes this procedure.

Proceed to the final section of this chapter, *Microdiagnostics.*

STANDBY POWER SYSTEMS

Standby Power Systems were formerly known as Extended Power Reserve systems. There are two types of Standby Power systems:

- Uninterruptible Power System (UPS)
- Direct Current Standby Power System (DCSPS)

If you are installing a DCSPS system, proceed to the next section of this chapter.

UPS Systems

The UPS system normally operates from a commercial AC input supply and provides AC power, rather than DC power, to the system.

The AC input supply is normally supplemented by some type of power backup, usually an AC generator or battery cabinet.

If the system has a generator, it automatically goes into operation if the commercial AC input supply is lost, providing backup AC power to the system.

If the system has a battery cabinet for backup, it provides backup DC power to a set of AC inverters that converts the DC input to AC output.

Since the UPS systems provide AC power to the system, use the power-up sequence for AC systems in this chapter to verify system power and ground connections and to provide initial power to the system. To verify the installation of the UPS and its power backup system (either the battery cabinet or generator), refer to the accompanying documentation for the UPS system.

The documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-432-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

A point-to-point wiring connection check for power and ground cables, as well as for the connections to the generator or battery cabinet, is mandatory.

If you are installing a UPS system, return to the *AC Power-Up Procedure* at this time.

DCSPS Systems

The DCSPS system normally operates from a commercial AC input supply. The batteries are in parallel with rectifiers that convert the AC into DC. The DC output of the rectifiers is supplied to the DC control cabinet and then to individual cabinets.

AC inverters may be connected to the battery supply through suitable circuit breakers for powering any cabinet that requires AC power.

As long as the AC input supply is available, the system operates off the AC powered rectifiers with a DC output. If the AC input supply is not available for any reason, the system immediately begins to draw power directly from the batteries. The powered system continues to operate until the AC input supply is restored or the battery voltage falls below 43.00 VDC.

The documents are available from the AT&T Customer Information Center in Indianapolis, Indiana if they were not shipped with the system you are installing. Phone 1-800-432-6600 in the United States and 1-800-255-1242 in Canada for ordering information.

If you are installing a DCSPS Standby Power system, begin the *DC Power-Up Procedure.*

DC Power-Up Procedure

This power-up procedure is general in nature and can be used with any of the DC Standby Power systems.

Except for the UMC cabinet, there are no individual cabinet power switches for DC cabinets. The ON/OFF function is provided by the system circuit breakers at the DC control cabinet. The UMC cabinet has a cabinet circuit breaker on the DC distribution unit that functions as a power switch.

The AC cabinets that are part of a DC system (AP, auxiliary, and SMDR) do have power switches.

Verify system grounding using the *DEFINITY Communications System Generic 2 and System 85 Electrical Protection, Grounding, and Exposure Checklist, 555-104-120,* before beginning this procedure.

Reference figure 29-3 for steps 1-10 of the DC Power-Up Procedure.

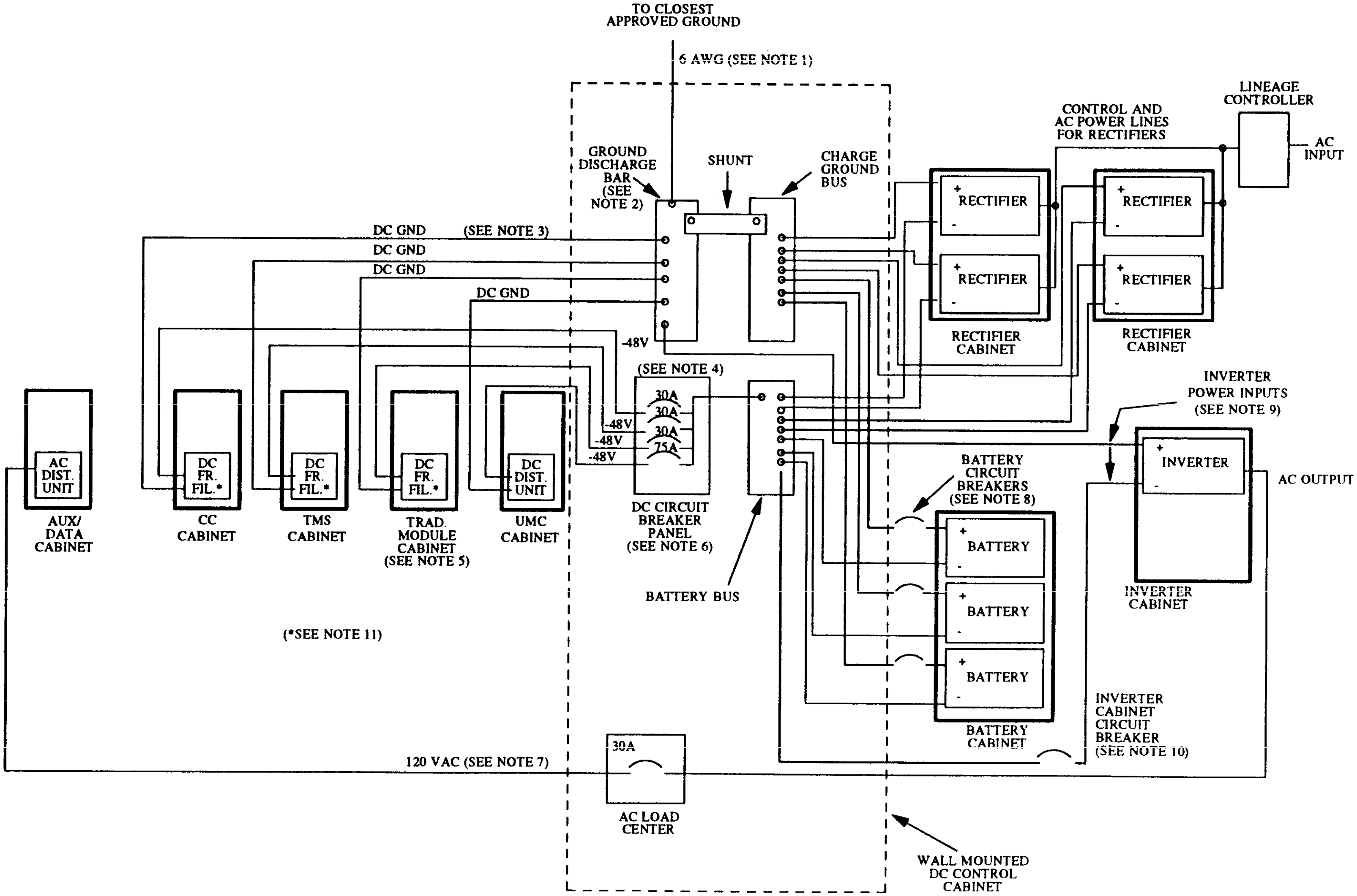


Figure 29-3. Typical Battery Plant for DC Systems

NOTES FOR FIGURE 29-3:

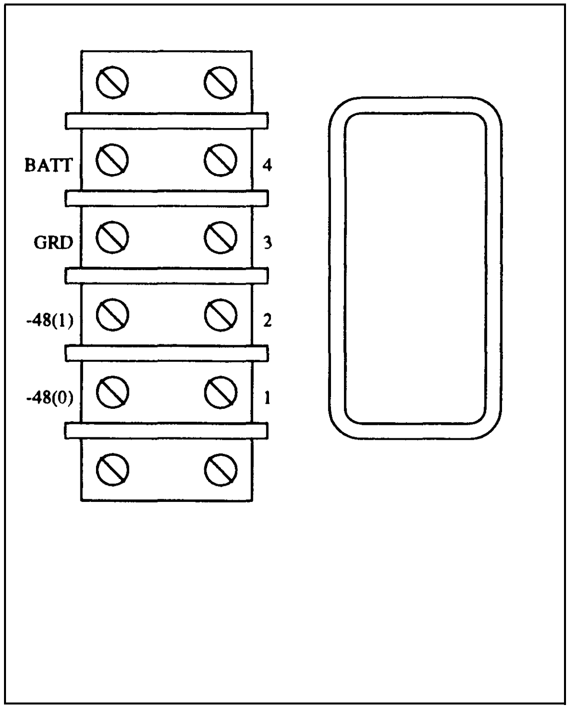
1. The size of the ground wire must be the same size as the largest conductor in the system, but no smaller than 6 AWG. For example, if the -48V power wire is a 2 AWG and that is the largest conductor in the system, then the ground wire from the ground discharge bar to the closest approved ground would be changed from 6 AWG to 2 AWG.
2. The ground discharge bar serves as the system single point ground for DC systems.
3. There is a DC GRD wire connected to the DC frame filter in all cabinets that connects back to the ground discharge bar except for the UMC cabinet. The UMC cabinet contains a DC distribution unit instead of a DC frame filter. There is only one DC GRD wire for UMC cabinets, but there are two DC GRD wires if the cabinet has a duplicated DC frame filter. The gauge of the DC GRD wire is 1 AWG for the UMC and CC/TMS cabinets. The gauge of the DC GRD wire is 2 AWG for the traditional module cabinets and the separate CC and TMS cabinets.
4. There is a -48V power wire connected to the DC frame filter or DC distribution unit in each cabinet that connects to the DC circuit breaker panel. There is an additional -48V power wire if the cabinet has a duplicated DC frame filter. There is only one -48V power wire for duplicated UMC cabinets. The gauge of the -48V power wire is 1 AWG for the UMC and CC/TMS cabinets. The gauge of the -48V power wire is 2 AWG for the traditional module cabinets and the separate CC and TMS cabinets.
5. Only one traditional module cabinet is shown in this figure due to space constraints.
6. The DC circuit breaker panel consists of 30 amp circuit breakers for traditional module cabinets and the CC and TMS cabinets. For traditional modules that contain more than 40 MFAT/DS 1 circuit packs, a 50 amp circuit breaker is required. There is an 75 amp circuit breaker for the UMC cabinet. There is one circuit breaker for each power wire suppled to a cabinet. There is an additional breaker for cabinets with duplicated power wires.
7. The 120 VAC power wire only connects to aux/data cabinets in DCSPS systems. The amperage of the AC circuit breaker is typically 30 amps, but varies depending on load requirements. The power wire connects to an AC distribution unit in the cabinet. If there are no aux/data cabinets in the system, the AC load center and the inverter are not included in the battery plant.
8. The battery circuit breakers are ganged together and their amperage varies depending on the load requirements.
9. The inverter is DC powered via the charge ground bus and the battery bus and has an AC output only for aux/data cabinets.
10. There is an inverter circuit breaker with an amperage rating that varies with load requirements.
11. DC FR. FIL. represents the DC frame filter. The DC frame filter provides the power and ground connection points in DC powered systems except for the UMC cabinet.

These steps are for powering up a new system. Begin with step 1 only if this is a new installation. Begin with step 11 if you are adding a UMC cabinet to an existing lineup.

1. Verify that the AC SYSTEM INPUT POWER SWITCH is **OFF.**
2. Verify that the system controller is connected to each of the rectifiers to provide AC power for conversion to DC power.
3. Verify that the negative terminals (-48 VDC) for each rectifier are properly connected to the battery bus in the DC control cabinet.
4. Verify that the positive terminals (DC GRD) for each rectifier are properly connected to the charge ground bus in the DC control cabinet.
5. Verify that the internal battery cabinet power and ground wires are properly connected with correct polarity.
6. Verify that the -48 VDC power wires from the battery cabinet are properly connected to the battery bus within the DC control cabinet.
7. Verify that the DC GRD return wires from the battery cabinet are properly connected to the battery circuit breakers and then to the charge ground bus within the DC control cabinet.
8. Verify that the AC inverter positive input terminal is properly connected to the inverter circuit breaker and then to the charge ground bus within the DC control cabinet.
9. Verify that the AC inverter negative input terminal is properly connected to the battery bus within the DC control cabinet.
10. Verify that the AC output of the AC inverter is connected to the AC load center circuit breakers.

Refer to figure 29-4 for connections for DC frame filters and figure 29-5 for connections for DC distribution units in steps 11 and 12.

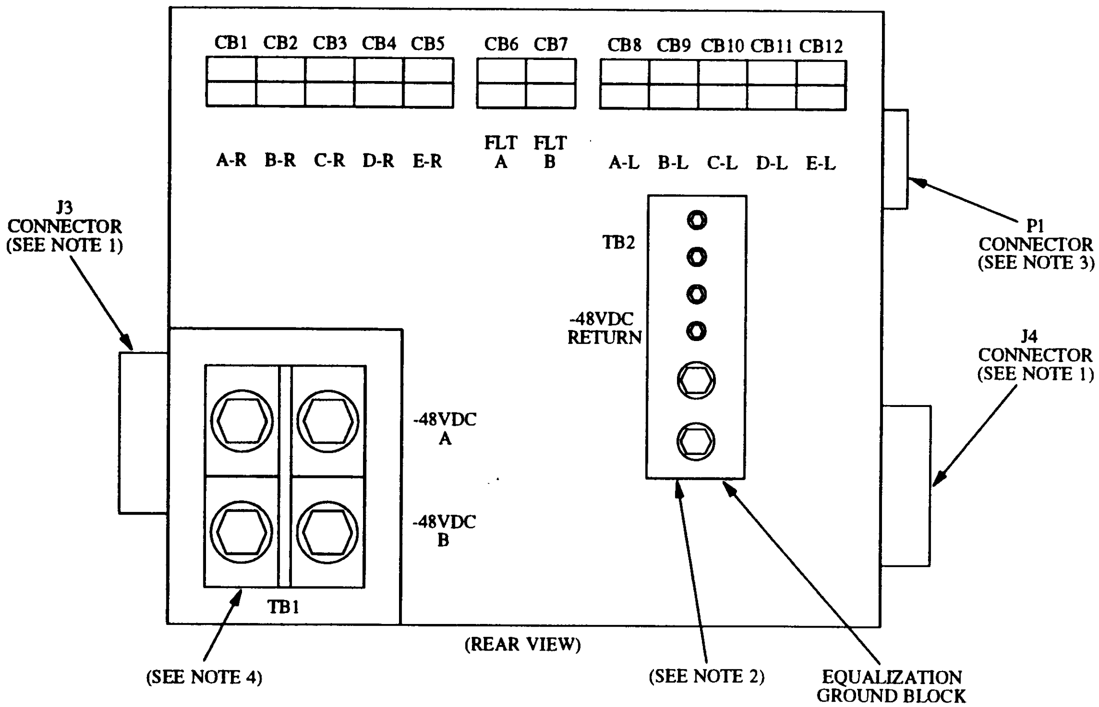
11. Verify that the -48 VDC wires from the circuit breaker panel in the DC control cabinet are connected to the -48 V terminals on the DC frame filter or DC distribution unit within each DC cabinet.
12. Verify that the DC GRD return wires from the ground discharge bar in the DC control cabinet are connected to the GRD terminals on the DC frame filter or DC distribution unit within each cabinet.



NOTES:

1. Connect both DC GRD return wires to terminal 3 on the right side of TBl if there are two DC GRD return wires. If there is only one DC GRD wire, it also connects to terminal 3.
2. If only one -48V power wire is used, connect it to terminal 1. Use terminal 2 if a second -48V power wire is used.

Figure 29-4. DC Frame Filter



NOTES:

1. These connect to the cabinet power harnesses.
2. The equalization ground block is insulated from the cabinet frame insidc the DC distribution unit.
3. This connects to the alarm cable harness.
4. Connect the -48V power wire to the left terminal of the -48VDC A connectors on TB1.
5. Connect the DC GRD return wire to either of the two large terminals on the equalization ground block (TB2).

Figure 29-5. DC Distribution Unit (rear view)

13. Verify that all CIRCUIT BREAKERS in all cabinets are set to **OFF.**

14. Refer to Lineage® 2000 Standby Power Systems Product Manual (167-790-110) and follow the procedures in that document to power-up the battery plant, charge the batteries, and verify voltage levels.

WARNING

Do not power on any other cabinets at this time.

15. Set the SYSTEM CIRCUIT BREAKER for the CC/TMS cabinet at the DC control cabinet to **ON** if this is a new installation.

NOTE

When the CC/TMS SYSTEM CIRCUIT BREAKER is set to **ON,** the CC/TMS cabinet fans go into high speed operation. After approximately five seconds, the fans slow to normal operating speed.

16. Set the individual CARRIER CIRCUIT BREAKERS in the CC/TMS cabinet to **ON.**

17. Measure the CC/TMS voltage at the end of the POWER SUPPLY leads where they connect to the bus bar. The acceptable voltage level should not be more than 1 VDC below the battery plant voltage level.

18. Repeat steps 15-17 of this procedure if the system has an additional TMS/RMI cabinet due to size or configuration. If the system has only the CC/TMS cabinet, or if this step has been completed for any additional TMS/RMI cabinets, proceed with the next step in this procedure.

NOTE

When the UMC DC SYSTEM CIRCUIT BREAKER is set to **ON,** the UMC cabinet fans go into high speed operation. After approximately five seconds, the fans slow to normal operating speed.

19. Set the UMC DC SYSTEM CIRCUIT BREAKER at the DC control cabinet for module 0 to **ON.**

Refer to figure 29-6 for step 20.

20. Set the UMC DC DISTRIBUTION UNIT MAIN CIRCUIT BREAKER in the UMC cabinet to **ON.**

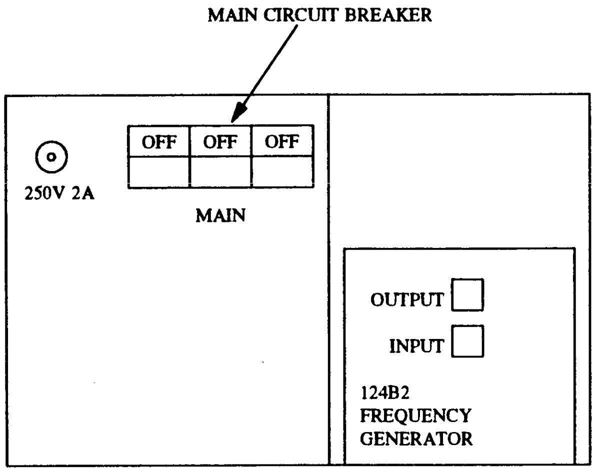


Figure 29-6. DC Distribution Unit (front view)

Refer to figure 29-5 for step 21.

21. Set the CARRIER and FILTER CIRCUIT BREAKERS (CB1 through CB12) on the rear of the DC distribution unit in the UMC cabinet to **ON.**
22. Set the 645B CARRIER POWER UNIT CIRCUIT BREAKERS to **ON.**
23. Verify that none of the circuit breakers have tripped.
24. Verify that the carrier power units have no red LEDs activated. All carrier power units should have yellow LEDs activated.
25. Repeat steps 23-28 for each UMC cabinet in the system.
26. If there are no traditional modules or auxiliary cabinets in the system, the procedure is complete. If a traditional module is included as part of the system, use the power-up sequence in *Chapter 16* to power it up. After completing the power-up sequence for any traditional modules, continue with the next step of this procedure.
27. If there are no AP, SMDR, or auxiliary cabinets, this procedure is complete. If there are AP, SMDR, and auxiliary cabinets in the system, set the SYSTEM CIRCUIT BREAKERS for all AP, SMDR, and auxiliary cabinets to **ON.**
28. Set all of these cabinet's POWER SWITCHES to **ON.** The sequence of applying power to these cabinets does not matter.
29. Ensure that all of the cabinets are functioning properly. This completes this procedure.

MICRODIAGNOSTICS

In past issues of this document, there was a separate chapter on system micrdiagnostics. However, there was no information on troubleshooting the system if it should fail a specific test. To adequately cover this subject would require a total reprint of large sections of the *DEFINITY Communications System Generic 2 Maintenance Repair Stategies* document (555-104-118). Refer to this document for microdiagnostics information and procedures.

This document is shipped with each system as part of the documentation package. Although the title indicates that it is only a DEFINITY document, it also applies to System 85.

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CONNECTING AUXILIARY AND PERIPHERAL EQUIPMENT

This chapter describes the connection of numerous peripheral and auxiliary pieces of equipment used with features provided by AT&T System 85. The equipment described in this chapter is normally mounted in the auxiliary cabinets provided with the System 85. In some cases, this is not possible so the equipment will be mounted elsewhere. Some of the equipment will be mounted in a convenient spot near the cross-connect field. In other cases, the equipment will be located at a convenient location for customer use.

Cabling Considerations

If the equipment is located in an auxiliary cabinet the equipment is cabled to the 110-type connecting blocks in the cabinet. These blocks are then connected to the 110-type connecting blocks in the auxiliary (yellow) portion of the TRUNK/AUX field of the main cross-connect field. If the equipment was installed elsewhere, it should be cabled directly to the yellow field.

110-Type Connecting Block

The 110-type connecting blocks on the cross-connect field and in the auxiliary cabinet contain two rows of 50 terminals. Each row of 50 terminals is divided into eight groups of six. The last two terminals are not used. Each group of six terminals is represented graphically by figure 30-1. Figure 30-2 shows a typical connection using 110-type blocks.

To conserve space in the connection drawings in this chapter:

- Unused terminals in a group are not shown.
- Connectors D0-D7 on the system cabinet and on the auxiliary cabinet are not shown.
- Connectors are not shown on the cross-connect field.

To determine connector numbers and cross-connect information, refer to the cable running lists and CSD furnished with each installation. Cross-connections can be made by either patch cords or cut-down wiring.

The connections and the terminations for the System 85 circuit packs are located in *chapter 10.*

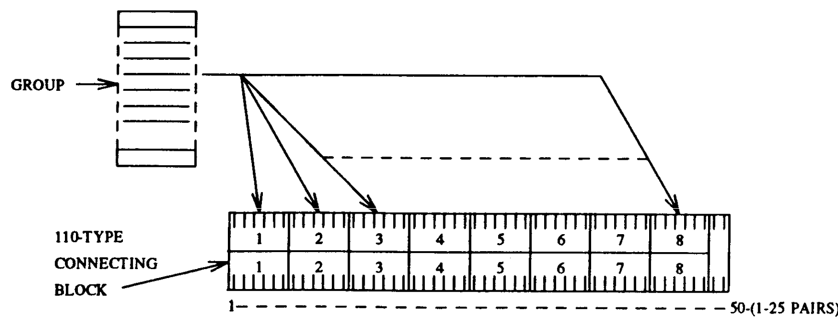


Figure 30-1. Diagram of a 110-Type Connecting Block

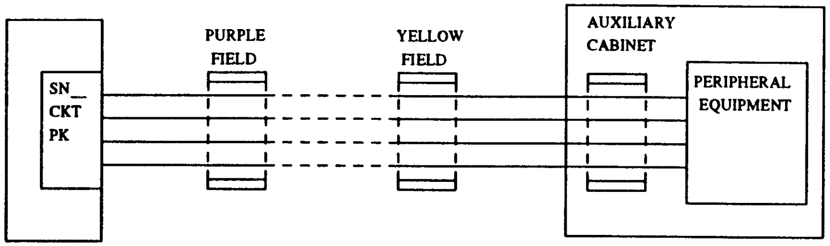
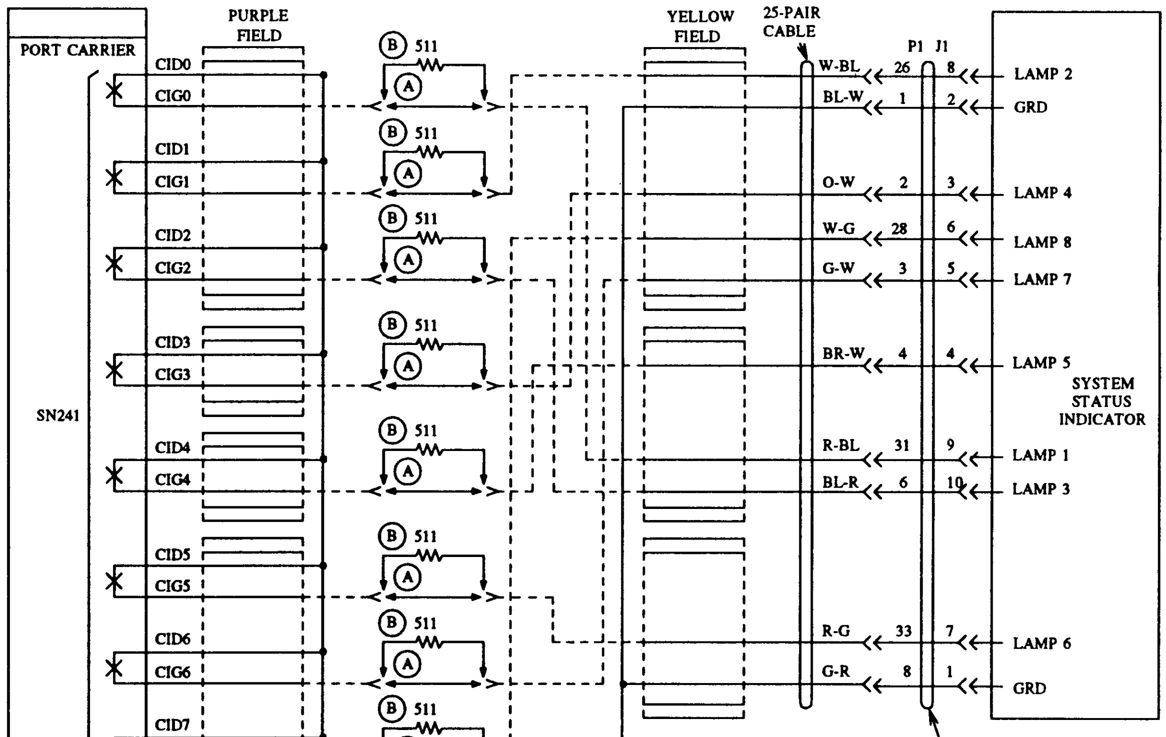


Figure 30-2. A Typical Cross-Connection Using 110-Type Blocks

30A8 SYSTEM STATUS INDICATOR

The system status indicator is used in conjunction with the Centralized Attendant Service (CAS) and Direct Department Calling (DDC)/Uniform Call Distribution (UCD) features to provide a status monitoring capability.

See *chapter 10* for circuit pack connections and terminations.



OPTIONS	
OPTION	CONDITION
A	NON-EXPOSED CABLING
B	EXPOSED CABLING

Figure 30-3. 30A8 System Status Indicator Connections

89A CONTROL UNIT

Paging Zones and the 89A Control Unit

The 89A control unit is used for the Loudspeaker Paging (Basic and Deluxe) and Chime Paging features. One control unit is required for each paging zone. Two 89A control units may be connected together if a single paging zone is to be accessed by both the Loudspeaker Paging and Chime Paging features.

Mounting the 89A Control Unit

Mount control units in auxiliary cabinet or on an 11-inch structural foam panel. One structural foam panel can accommodate two 89A control units. Remove cover. Separate the printed circuit board from the base pan by removing the six retaining screws. Attach the base pan to the mounting surface with two suitable screws. Position pan so that music and tone controls will be on top when circuit pack is reattached on base pan. Reattach printed circuit board to base pan with six screws (music and tone control at top). Do not plug the 2012D transformer(s) into its assigned outlet until all other connections are complete.

See *chapter 10* for circuit pack terminations and connections.

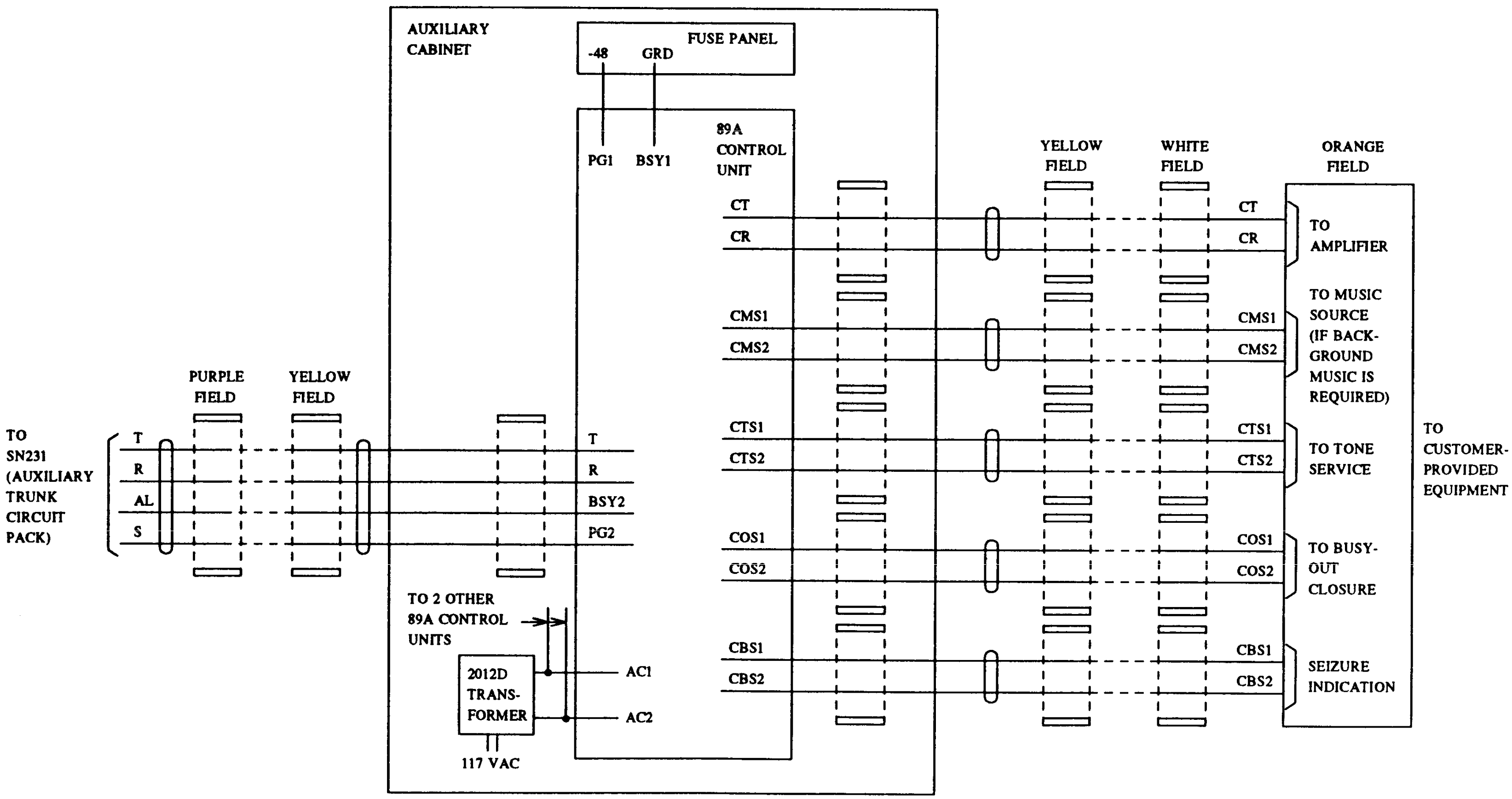


Figure 30-4. 89A Control Unit Connections — Loudspeaker Paging Feature

See *chapter 10* for circuit pack terminations and connections.

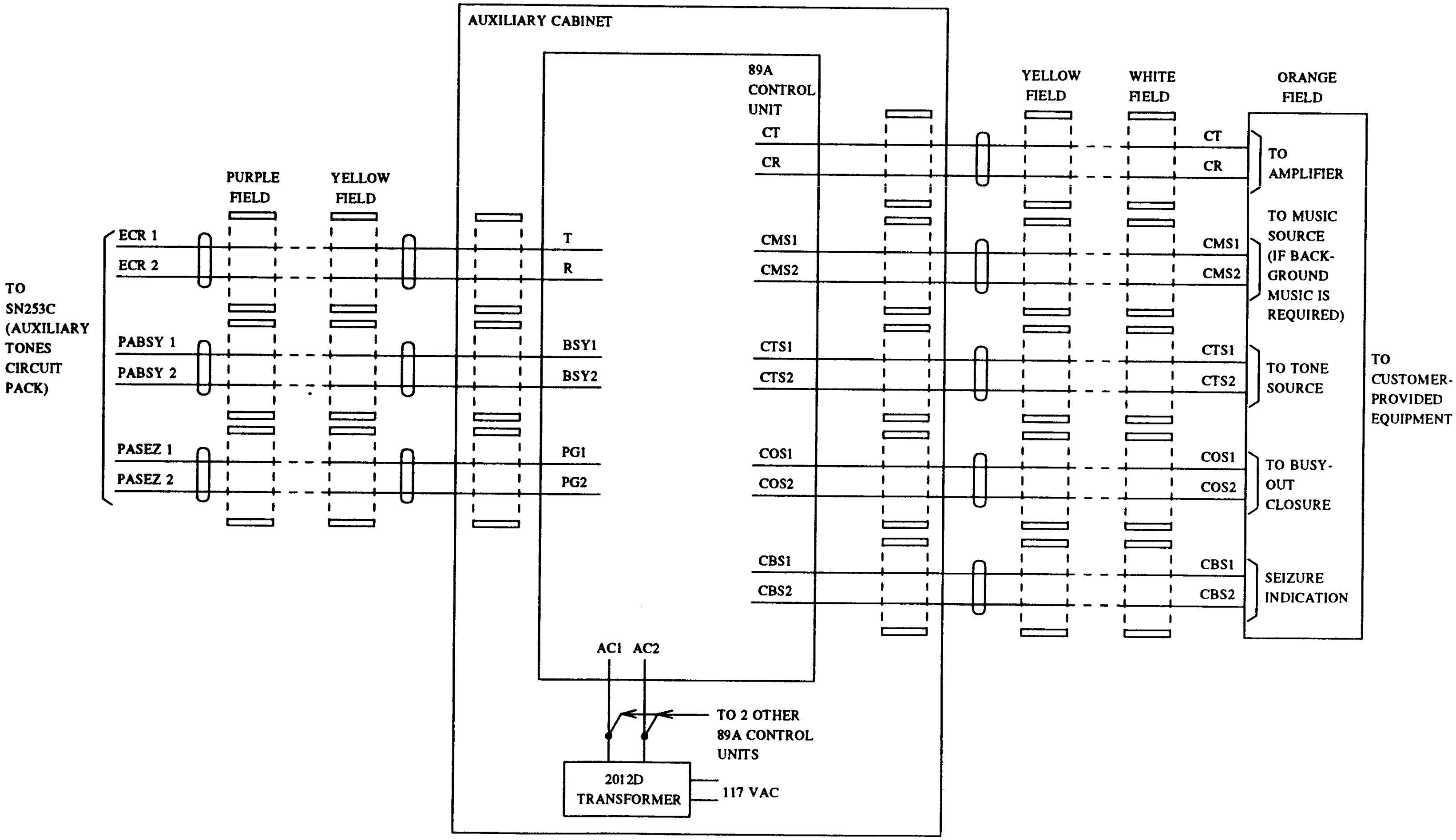


Figure 30-5. 89A Control Unit Connections — Chime Paging Feature

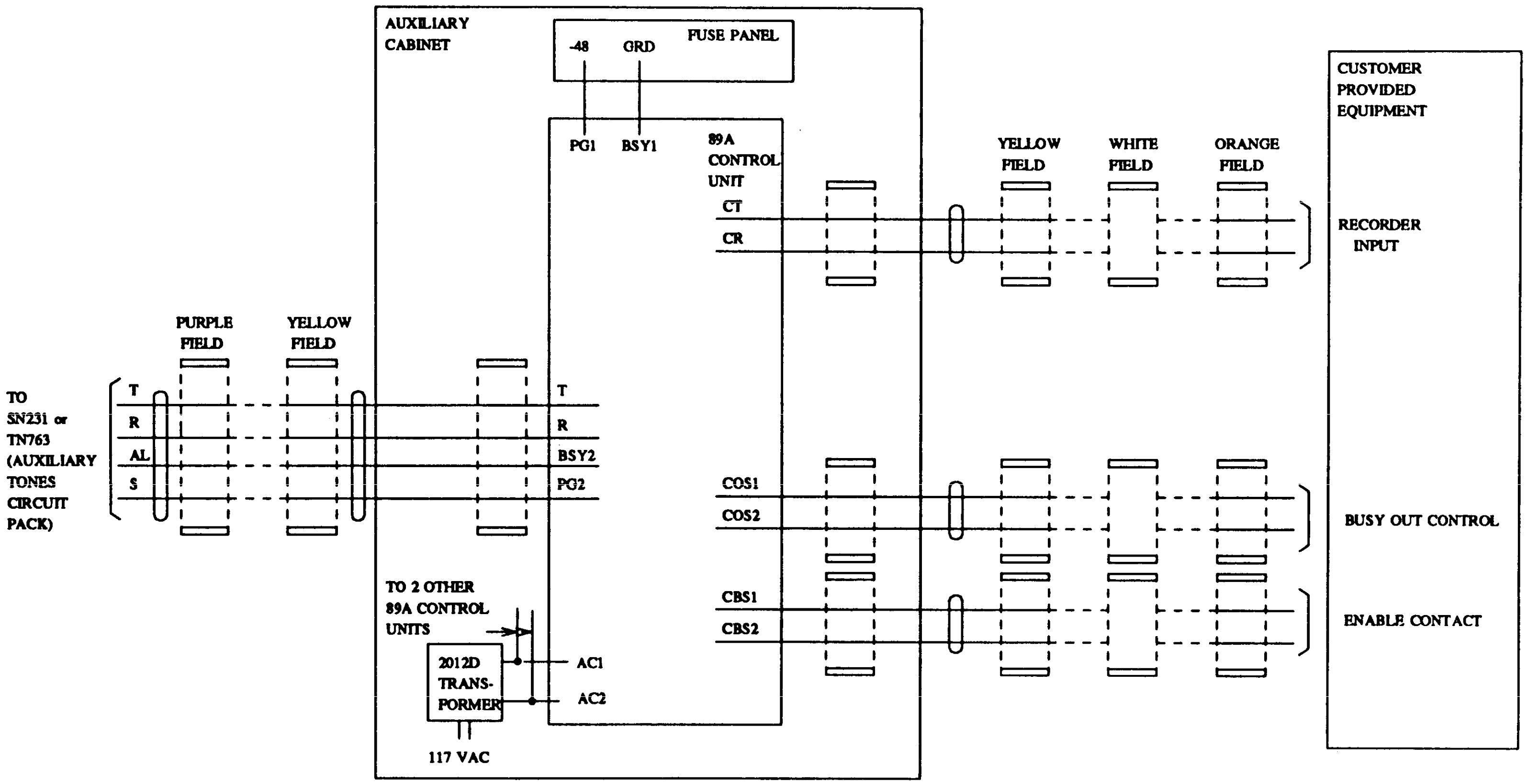


Figure 30-7. 89A Control Unit — Malicious Call Tracing

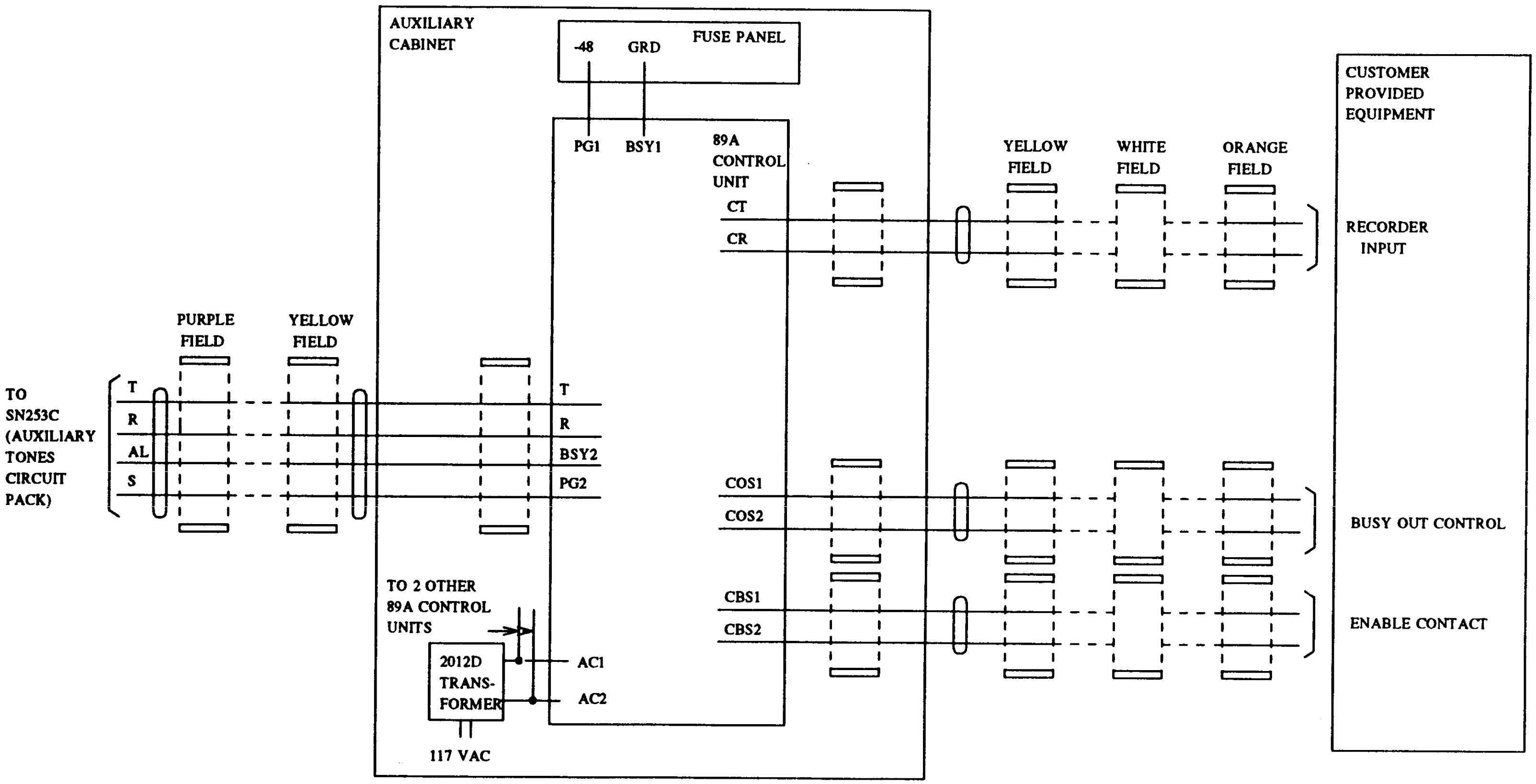


Figure 30-7. 89A Control Unit — Malicious Call Tracing

TABLE 30-1. 89A Control Unit —Options and Adjustments

CONTROL UNIT OPTIONS			
OPTION DESCRIPTION		**OPTION**	**ACTION**
INPUT IMPEDANCE	600Ω SINGLE 89A	Y	S1 CLOSED FULL CLOCKWISE
	15000Ω MULTIPLE 89A IN PARALLEL		S1 OPEN FULL COUNTER CLOCKWISE
CLICK SUPPRESSION	DEACTIVATED	X	S2 CLOSED FULL CLOCKWISE
	ACTIVE		S2 OPEN FULL COUNTER-CLOCKWISE
BUSY OUT SIGNAL	NOT INTERRUPT PAGE	Z	S3 CLOSED FULL CLOCKWISE
	INTERRUPT PAGE		S3 OPEN FULL COUNTER-CLOCKWISE

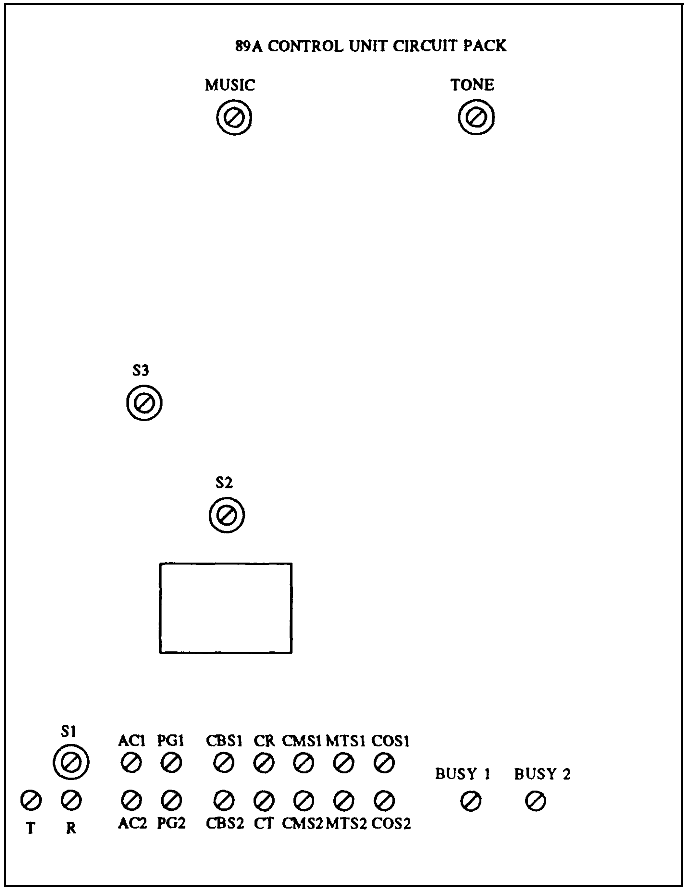
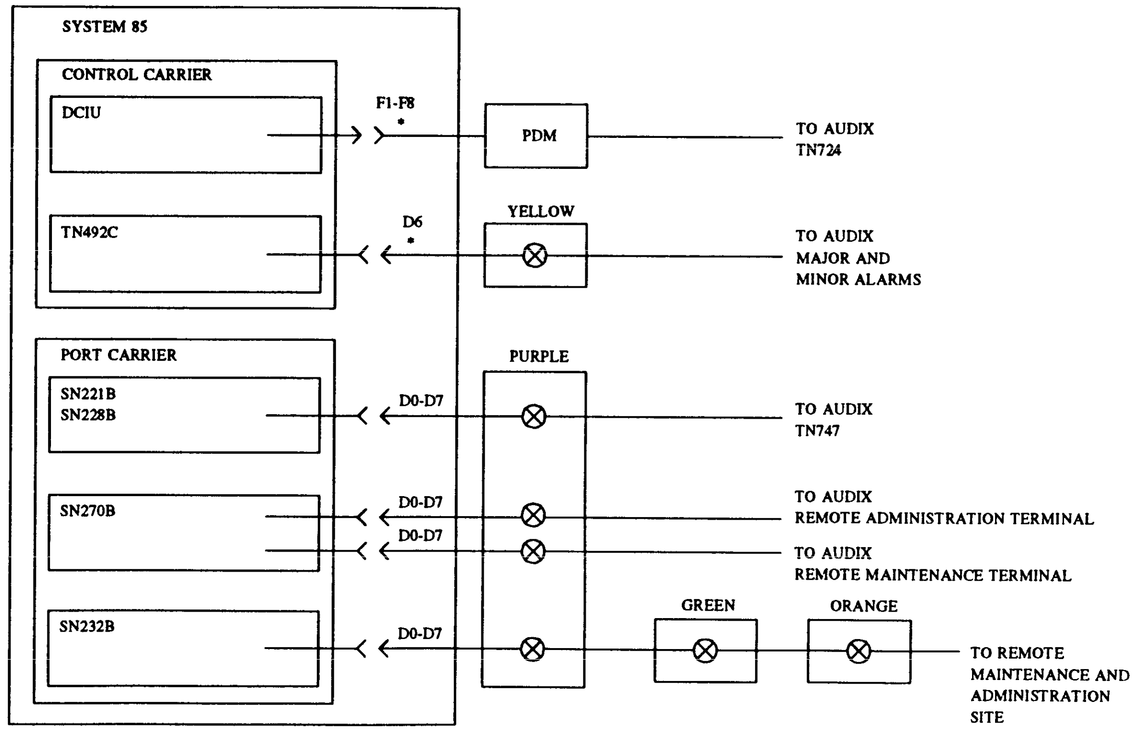


Figure 30-8. 89A Control Unit — Options and Adjustments Panel

AUDIX

Connection and terminations for System 85 circuit packs are located in *chapter 10.* Connections for the External Alarms are located in figure 30-21. Connections for the AUDIX system are located in *AUDIX Enhanced Large Installation Service Manual - R1V2* (585-300-101) and *AUDIX Enhanced Medium Installation Manual - R1V2* (585-300-103)



* IF SYSTEM 85 IS EQUIPPED WITH DUPLICATED COMMON CONTROL, USE WYE CABLES AND CONNECT TO THE SAME SLOT AND CIRCUIT IN THE SECOND COMMON CONTROL.

Figure 30-9. AUDIX Connections

COLOCATED TIE TRUNK CONNECTIONS

If colocated System 85s are each equipped with an SN233C circuit pack, an E&M converter must be used to make the E&M signaling between the switches compatible. The instructions for installing the J53050C1,L2 E&M converter are given in figure 30-10. The instructions for installing the ASTRO-ENDYNE 11625-1-1 E&M converter are given in figure 30-11. If colocated System 85s are equipped with SN233C tie trunk circuit packs, no E&M converter is required.

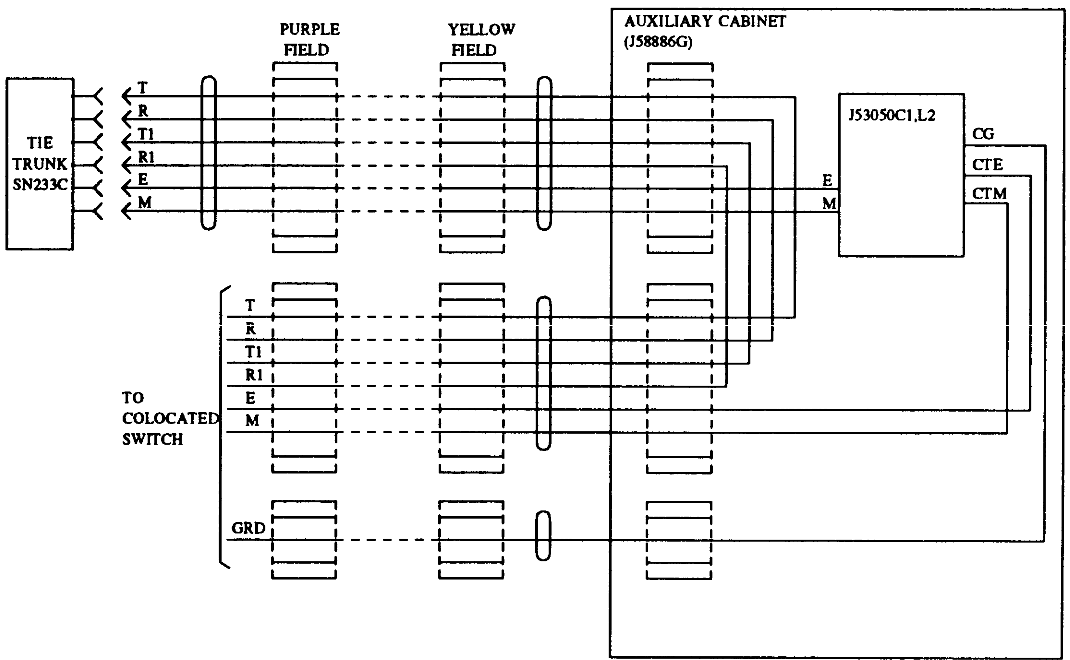


Figure 30-10. Colocated Tie Trunk Connections — J53050C1, L2

Colocated Tie Trunk Connections — ASTRO-ENDYNE 11625-1-1 E&M Converter

The ASTRO-ENDYNE 11625-1-1 E&M converter is designed for on-premises, colocated nonexposed applications. Each E&M converter circuit card contains four circuits. The E&M converter mounts in a Lorain 500-13 or equivalent carrier. Each carrier can hold 13 circuit cards for a maximum of 52 circuits per carrier. The carrier is located in the System 85 auxiliary cabinet.

See *chapter 10* for SN233C circuit pack connections and terminations.

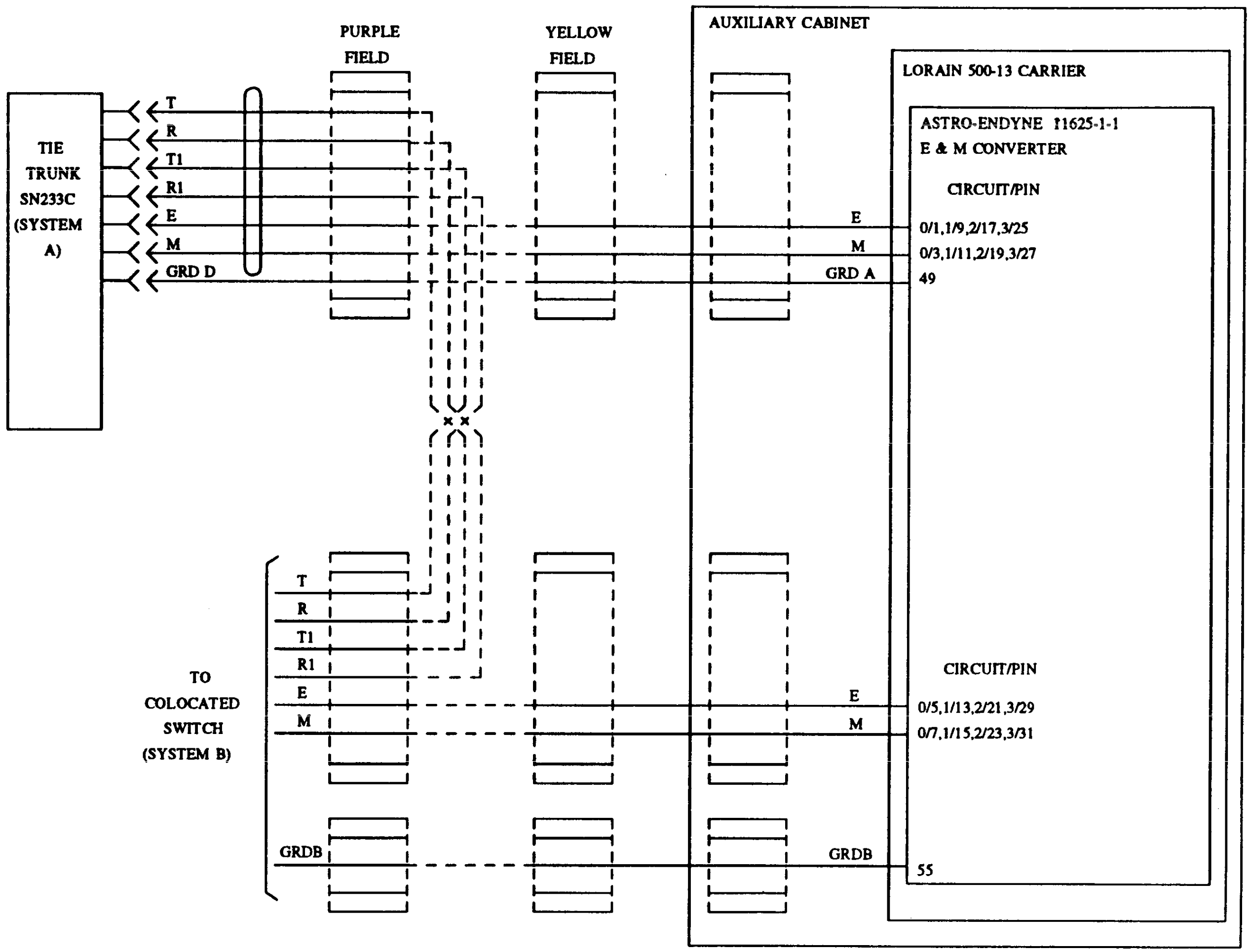


Figure 30-11. ASTRO-ENDYNE 11625-1-1 E&M Converter Connections — System A is System 85 Being Installed

DATA CHANNEL REPEATERS

The data channel repeaters provide range extension and/or lightning protection for low speed data channels. Up to four repeaters can be used to provide maximum data range extension of 11,000 feet. Only two repeaters are required for lightning protection (maximum range from terminal equipment must be 1000 feet or less). They can be arranged for single or dual channels and are mounted on a wall. A 28D1 power unit is needed on each repeater used for lightning protection and range extension. The 28D1 power unit, however, is not required for repeaters used only for lightning protection.

Distance and Power Requirements for Data Channels (24-Gauge Cable)

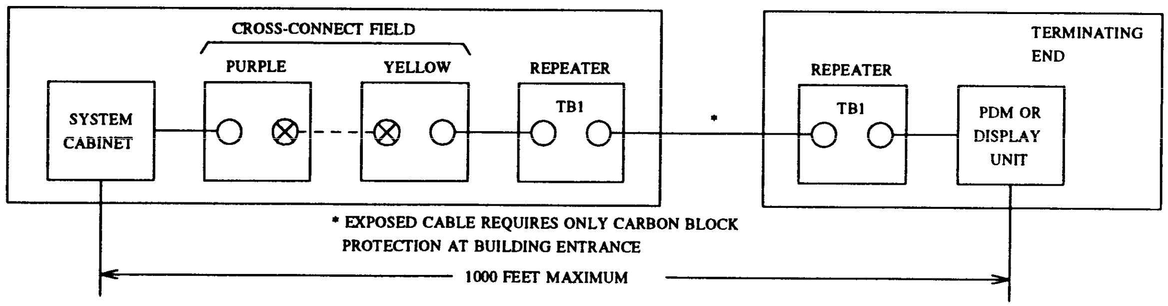


Figure 30-12. Requirements for Lightning Protection Only

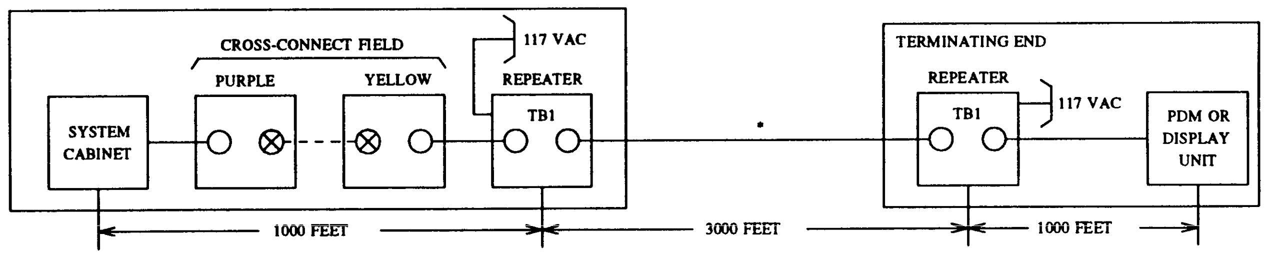


Figure 30-13. Requirements for Range Extension and Lightning Protection (5000 Feet)

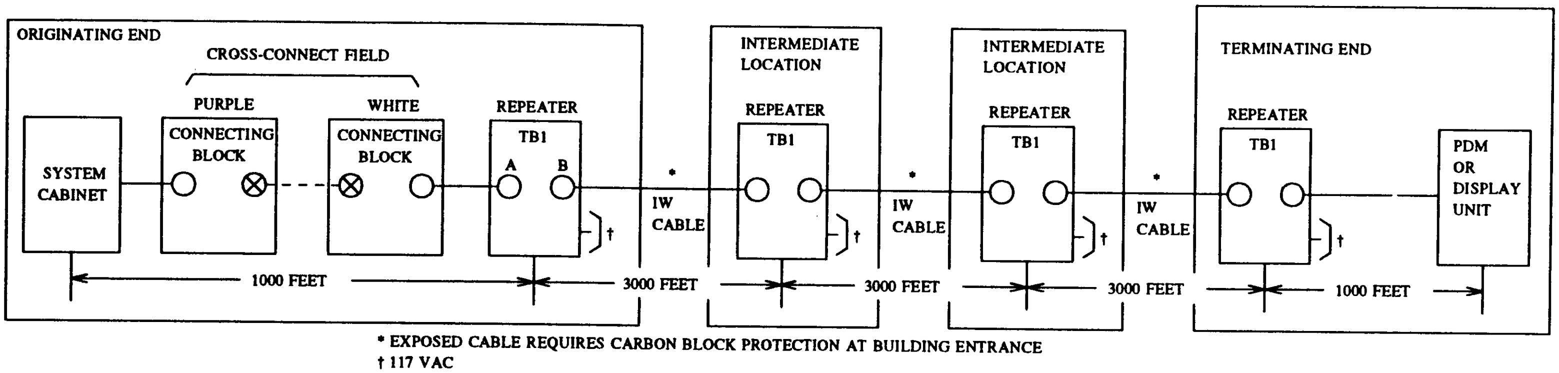


Figure 30-14. Requirements for Range Extension and Lightning Protection (11,000 Feet)

TABLE 30-2. Circuit Pack Requirements (Lightning Protection Only)

CHANNEL	CONNECTOR	CIRCUIT PACK REQUIRED
1	11	WJ3
	J2	WJ3
2	J3	WJ3
	J4	WJ3

TABLE 30-3. Circuit Pack Requirements (Range Extension and Lightning Protection)

CHANNEL	CONNECTOR	CIRCUIT PACK REQUIRED
1	J1	AE48
	J2	AE48
2	J3	AE48
	J4	AE48
1 and 2	J5	AE49 and 28D1 power unit

See *chapter 10* for TN403 circuit pack connections and terminations.

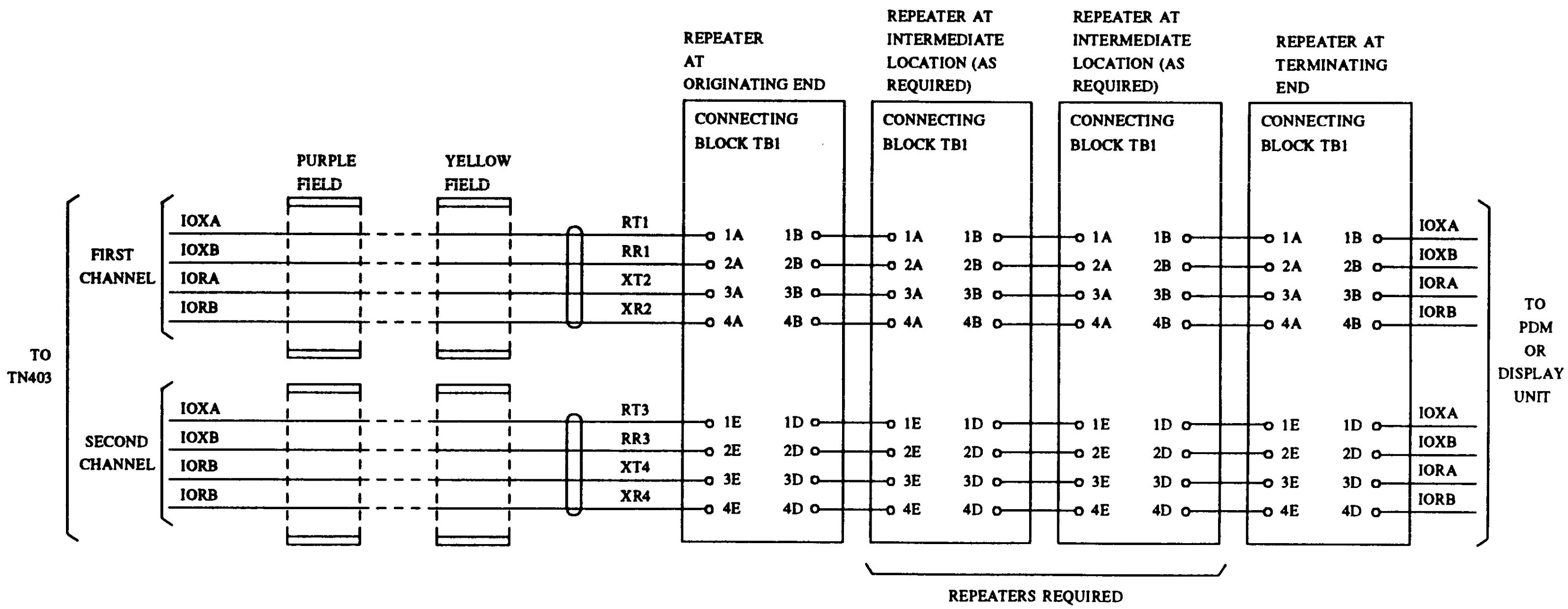


Figure 30-15. Data Channel Repeater Connections

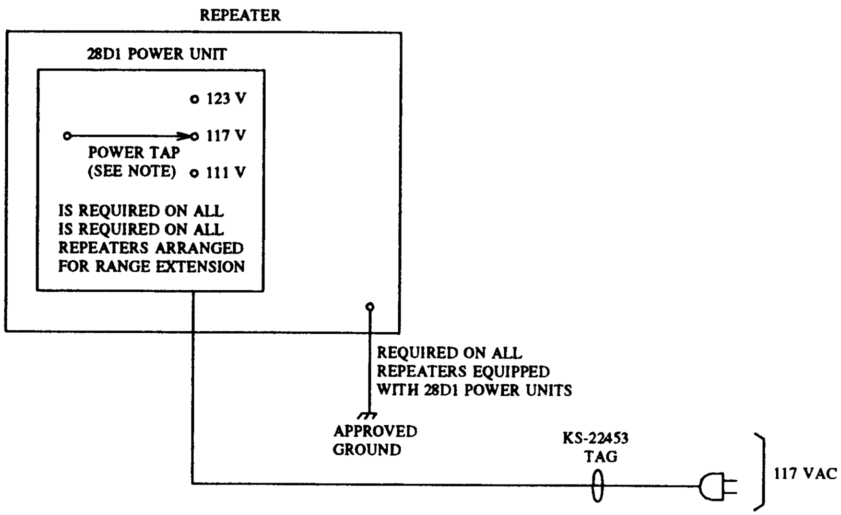


Figure 30-16. Repeater Grounding and Power Connections

Note: Power tap shown for connection to 117 VAC measured in range 117±3 VAC. Reconnect power tap if AC power measurement differs from required range.

DISPLAY UNITS

102-Type Display Unit

The 102-type display unit is used in conjunction with the KS-19252, L7 adapter and the 211A power unit.

To mount display unit on wall:

1. Mount 112A bracket on wall.
2. Remove faceplate from display unit.
3. Remove display unit cover and trim ring assembly from base by removing four attaching screws.
4. Rotate cover and trim ring assembly 180 degrees and reassemble to base.
5. Install faceplate.
6. Mount display unit to 112A bracket.

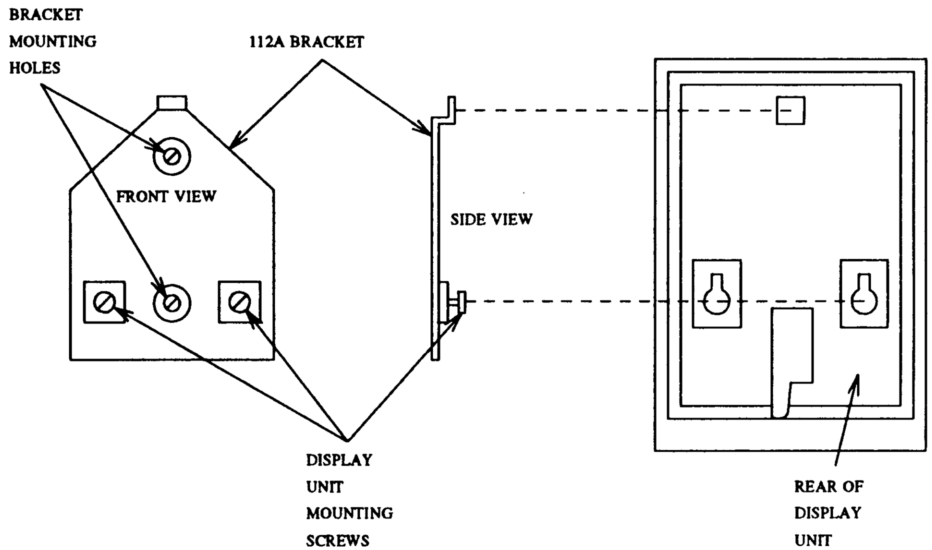


Figure 30-17. Mounting the 102-Type Display Unit

See *chapter 10* for TN403 circuit pack terminations and connections.

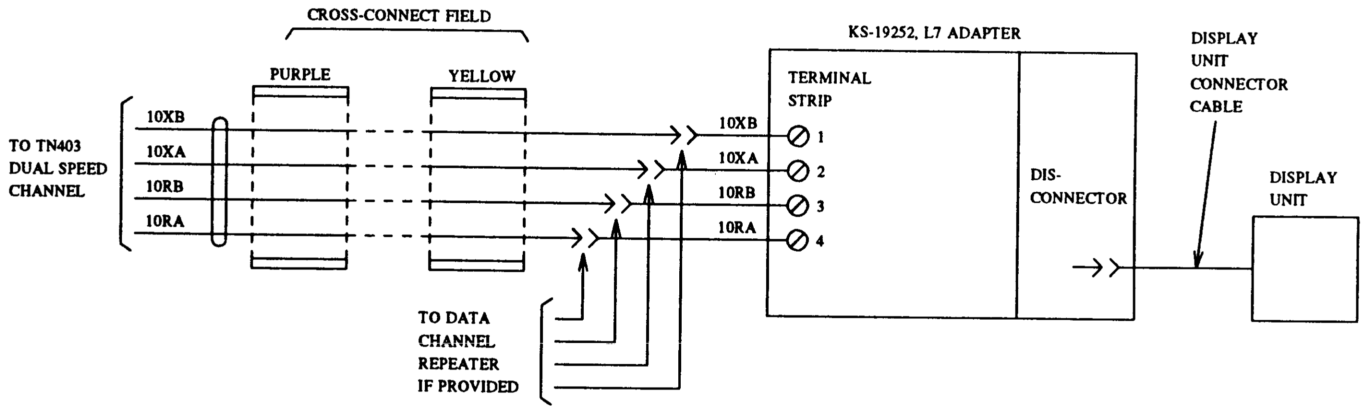


Figure 30-18. KS-19252, L7 Adapter Connections

CAUTION

Make no power connection until all other connections have been made.

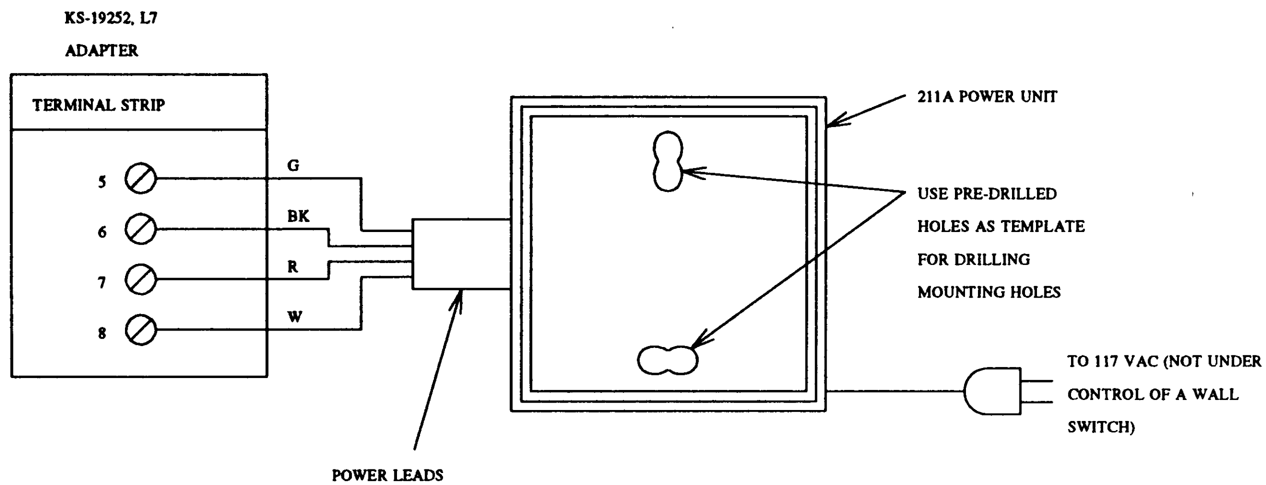
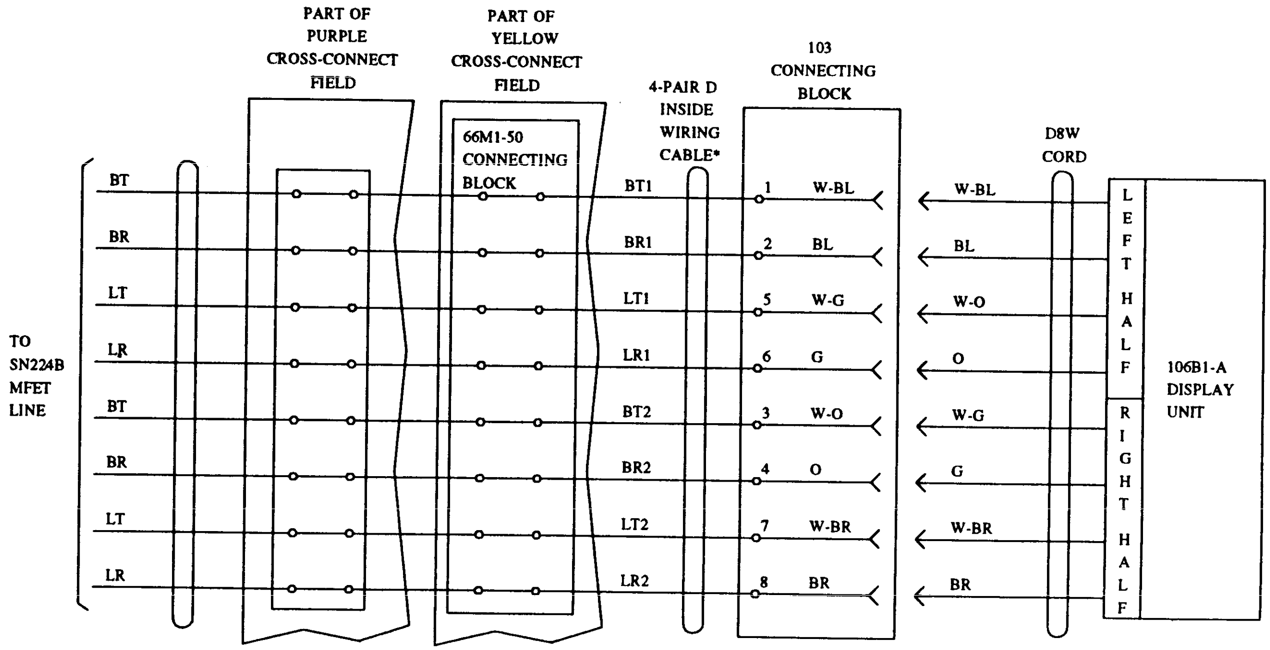


Figure 30-19. 211A Power Unit Installation and Connections

106-Type Display Unit

See *chapter 10* for SN224B circuit pack connections and terminations.



* TYPE 286A (0.51 MM OR 24-GUAGE) CABLE IS EQUIVALENT. TYPE 285A (0.64 MM OR 22-GUAGE) REQUIRED IF ONLY ONE PORT (DISPLAY UNIT HALF) IS CONNECTED AND RUN EXCEEDS 210 M (700 FEET).

Figure 30-20. 106BI-A Display Unit Connections

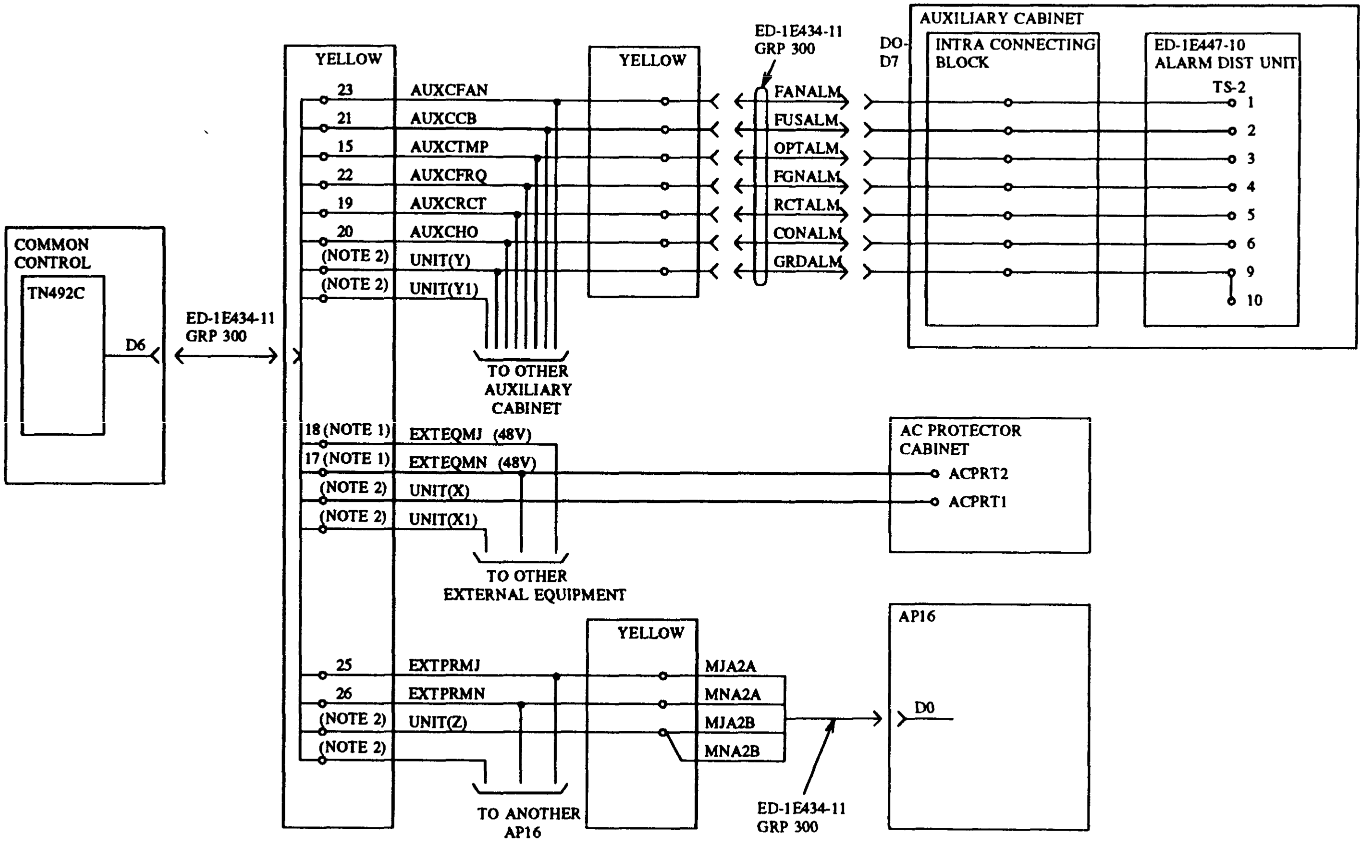
EXTERNAL ALARMS

External, or remote, alarms from auxiliary cabinets, Applications Processors, AC protector cabinet, and other external units may be input to the System 85 CC through the TN492C circuit pack. These alarms can then be automatically reported to a remote maintenance center equipped with INADS/RMATS II, Issue 3. The connection of external alarms must be coordinated with RMATS II center.

The TN492C Circuit Pack

The TN492C has 10 leads which serve as a common bus for 10 different alarm types plus 32 unit leads for identifying the equipment associated with the alarm. A unit number is assigned to each remote device that can uniquely initiate an alarm. A contact closure between the unit lead and an alarm type lead will be detected and registered.

See *chapter 10* for circuit pack connections and terminations.



NOTES:

1. These leads must go to another 110 block to be fanned out for us with other external equipment.
2. See table 30-4 for lead designations.

Figure 30-21. External Alarm Connections

TABLE 30-4. Unit Number Pin Numbers

CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL	CONNECTOR	LEAD DESIGNATION	LEAD COLOR	CONNECTING BLOCK TERMINAL
D6	UNIT20	W-BL	1	D6	EXTPRMN	G-BK	26
	UNIT19	BL-W	2		UNIT2	BK-BR	27
	UNIT22	W-O	3		UNIT1	BR-BK	28
	UNIT21	O-W	4		UNIT4	BK-S	29
	UNIT24	W-G	5		UNIT3	S-BK	30
	UNIT23	G-W	6		UNIT6	Y-BL	31
		W-BR	7		UNIT5	BL-Y	32
	UNIT25	BR-W	8		UNIT8	Y-O	33
	UNIT27	W-S	9		UNIT7	O-Y	34
	UNIT26	S-W	10		UNIT10	Y-G	35
	UNIT29	R-BL	11		UNIT9	G-Y	36
	UNIT28	BL-R	12			Y-BR	37
	UNIT31	R-O	13		UNIT11	BR-Y	38
	UNIT30	O-R	14		UNIT13	Y-S	39
	AUXCTMP	R-G	15		UNIT12	S-Y	40
	UNIT32	G-R	16		UNIT15	V-BL	41
	EXTEQMN	R-BR	17		UNIT14	BL-V	42
	EXTEQMJ	BR-R	18		UNIT17	V-O	43
	AUXCRCT	R-S	19		UNIT16	O-V	44
	AUXCHO	S-R	20			V-G	45
	AUXCCB	BK-BL	21		UNIT18	G-V	46
	AUXCFRQ	BL-BK	22		RING0	V-BR	47
	AUXCFAN	BK-O	23		TIP0	BR-V	48
		O-BK	24		RING1	V-S	49
	EXTPRMJ	BK-G	25		TIPl	S-V	50

ISN TO SYSTEM 85 CONNECTIONS

This figure shows the connections for one typical ISN port. For the pin assignments for cable group 351 and the RS-232 connector on the ISN concentrator, see figure 30-22 and its corresponding paragraph. See *chapter 10* for circuit pack terminations and connections.

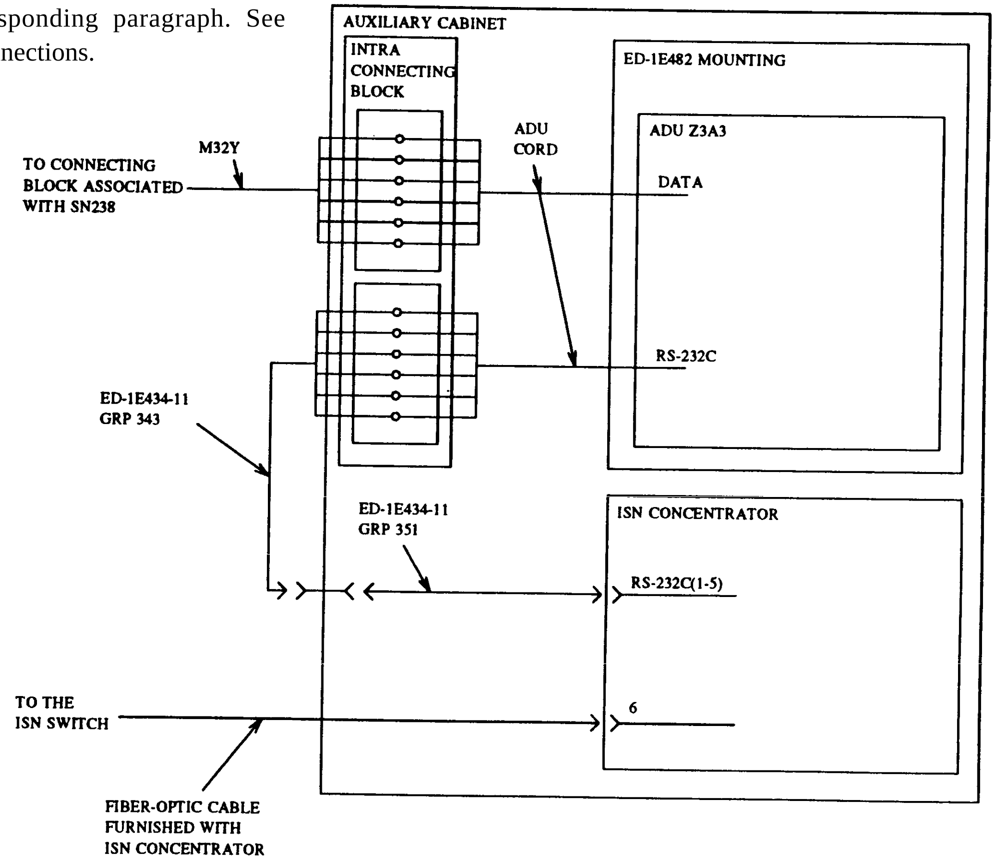


Figure 30-22. System 85 to ISN Using Z3A3 ADU

TABLE 30-5. Lead and Pin Assignments for ISN Concentrator

LEAD DESIGNATION	RS-232 CONNECTOR PIN NUMBER	CONDUCTOR COLOR	CONNECTOR 1 ISN PORT NUMBER	CONNECTOR 2	CONNECTOR 3	CONNECTOR 4	CONNECTOR 5
	1	BLW					
	26	W-BL					
R10	2	O-W	1	9	17	25	33
R20	27	W-O					
S10	3	G-W					
S20	28	W-G					
	4	BR-W					
	29	W-BR					
R12	5	S-W	2	10	18	26	34
R22	30	W-S					
S12	6	BL-R					
S22	31	R-BL					
	7	O-R					
	32	R-O					
R14	8	G-R	3	11	19	27	35
R24	33	R-G					
S14	9	BR-R					
S24	34	R-BR					
	10	S-R					
	35	R-S					
R16	11	BL-BK	4	12	20	28	36
R26	36	BK-BL					
S16	12	O-BK					
S26	37	BK-O					

LEAD DESIGNATION	RS-232 CONNECTOR PIN NUMBER	CONDUCTOR COLOR	CONNECTOR 1 ISN PORT NUMBER	CONNECTOR 2	CONNECTOR 3	CONNECTOR 4	CONNECTOR 5
	13	G-BK					
	38	BK-G					
R10	14	BR-BK	5	13	21	29	37
R20	39	BK-BR					
S10	15	S-BK					
S20	40	BK-S					
	16	BLY					
	41	Y-BL					
R12	17	O-Y	6	14	22	30	38
R22	42	Y-O					
S12	18	G-Y					
S22	43	Y-G					
	19	BR-Y					
	44	Y-BR					
R14	20	S-Y	7	15	23	31	39
R24	45	Y-S					
S14	21	BLV					
S24	46	V-BL					
	22	O-V					
	47	V-O					
R16	23	G-V	8	16	24	32	40
R26	48	V-G					
S16	24	BR-V					
S26	49	V-BR					
	25	S-V					
	50	V-S					

Figure 30-23 shows the connection of System 85 to ISN using Asynchronous Data Unit (ADU) circuit packs. The connecting information to the ISN is located in AT&T 555-300-111, AT&T Information System Network Service Manual, System Installation - R1V3. See *chapter 10* for SN238 circuit pack terminations and connections.

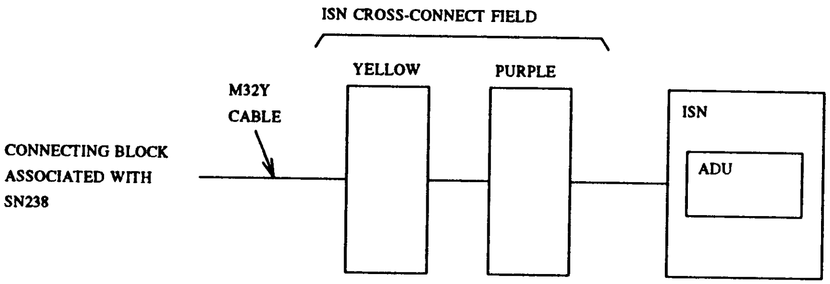


Figure 30-23. System 85 to ISN Using ADU Circuit Packs

(Lead designations and pin numbers for D6 connector can be found in table 30-4.)

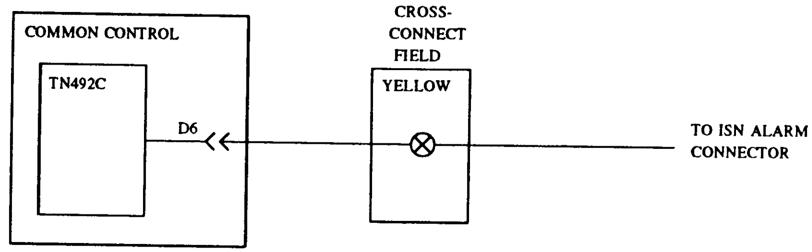


Figure 30-24. ISN Alarm Connection

MODEM POOLING

Modem pooling connections — see table 30-6 for the lead terminations for 40A4 P1 connections and 71A1 DCP LINE connections. See *chapter 10* for circuit pack terminations and connections.

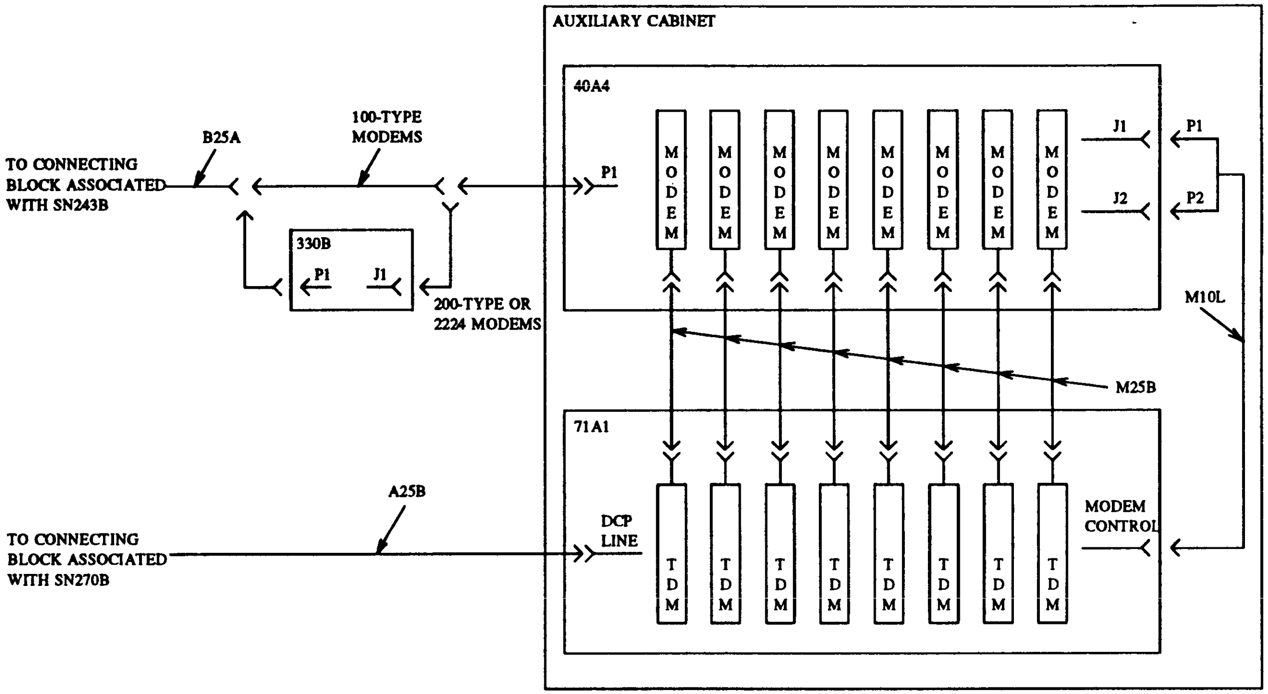


Figure 30-25. Modem Pooling Connections

TABLE 30-6. Modem Pooling — Lead Terminations

	40A4	71A1		40A4	71A1
	CONN P1	DCP LINE		CONN P1	DCP LINE
CONNECTOR PIN	LEAD DESIGNATION	LEAD DESIGNATION	CONNECTOR PIN	LEAD DESIGNATION	LEAD DESIGNATION
26	T(1)		13	MB1(4)	
1	R(1)		39	MB2(5)	0D1(5)
27	T(2)	0D1(l)	14	MB1(5)	0D2(5)
2	R(2)	0D2(1)	40	MB2(6)	1D1(5)
28	T(3)	lD1(l)	15	MB1(6)	1D2(5)
3	R(3)	1D2(1)	41	MB2(7)	
29	T(4)		16	MB1(7)	
4	R(4)		42	MB2(8)	0D1(6)
30	T(5)	0D1(2)	17	MB1(8)	0D2(6)
5	R(5)	0D2(2)	43	TSL0	1D1(6)
31	T(6)	1D1(2)	18	RSL0	1D2(6)
6	R(6)	1D2(2)	44		
32	T(7)		19		
7	R(7)		45		0D1(7)
33	T(8)	0D1(3)	20		0D2(7)
8	R(8)	0D2(3)	46	RD(5)	1D1(7)
34		1D1(3)	21	RD(l)	ID2(7)
9		1D2(3)	47	RD(6)	
35	MB2(1)		22	RD(2)	
10	MB1(l)		48	RD(7)	0D1(8)
36	MB2(2)	0D1(4)	23	RD(3)	0D2(8)
11	MBl(2)	0D2(4)	49	RD(8)	1D1(8)
37	MB2(3)	lD1(4)	24	RD(4)	1D2(8)
12	MBl(3)	1D2(4)	50	FG	
38	MB2(4)		25	GRD	

The screw switch S1 should be fully open so signal ground is not connected to frame ground. Plug in straps should be installed between terminals E2 and E4 and between terminals and E5. The pushbutton switches on the 212AR should never be operated unless the modem is in the test mode.

TABLE 30-7. 212AR Modem (Data Set) Options

212AR OPTIONS		
SWITCH	**ROCKER**	**COMMENT**
S1	O	C=CLOSE LOOP IN MB/AL MODE
	O	O=NO FUNCTION
	C	C=MODEM READY INDICATION IN AL MODE
S2	C	O=SPEED CONTROLLED BY PIN 23
	O	O=MB/AL CONTROLLED BY PIN 25
	O	O=HIGH SPEED INTERNAL TIMING
	O	
	O	O=HIGH SPEED ASYNCHRONOUS OPERATION
	C	C=10 BITS PER CHARACTER
	O	O=HIGH SPEED DL CONTROLLED REMOTELY
	C	C=RDL CONTROLLED BY PIN 21
	C	C=SPEED CONTROLLED BY PIN 23
S3	C	C=MODEM DISCONNECTS IF LOSS OF CARRIER
	C	C=MODEM DISCONNECTS IF SPACES RECEIVED
	C	C=NOT CLEAR TO SEND IF NO CARRIER
	C	C=SEND SPACES AT END OF CALL
	O	O=AUTOMATICALLY ANSWER INCOMING CALL
	O	O=NO ANSWER INDICATION ON PIN 22
	O	C=HIGH SPEED OPERATION ONLY
	C	C=SPEED INDICATION ON PIN 12
S5	O	O=HIGH SPEED ASYNCHRONOUS OPERATION
	O	
O=OPEN (ROCKER DOWN ON SIDE OPPOSITE TO NUMBERS) C=CLOSED (ROCKER DOWN ON SIDE ADJACENT TO NUMBERS)		

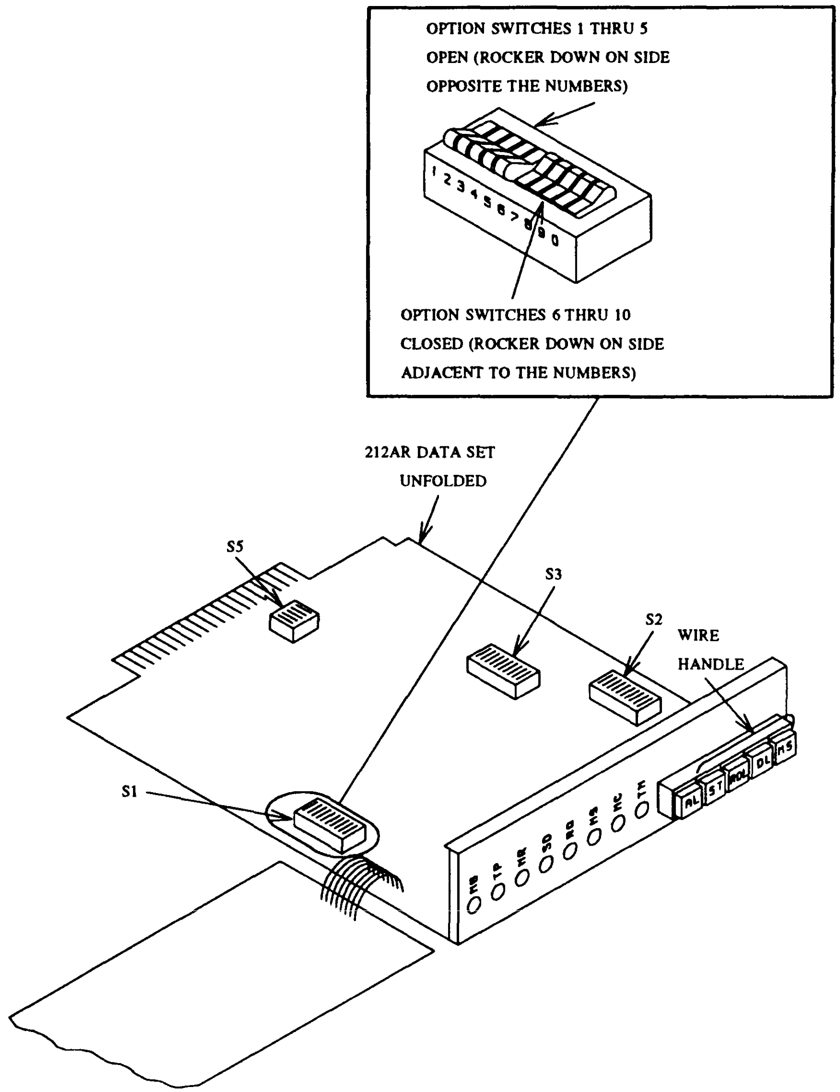


Figure 30-26. Diagram of Unfolded 212AR Modem (Data Set)

MUSIC-ON-HOLD AND DELUXE QUEUING — 36A VOICE COUPLER

NOTE

S1 switch should be set in the closed or down position.

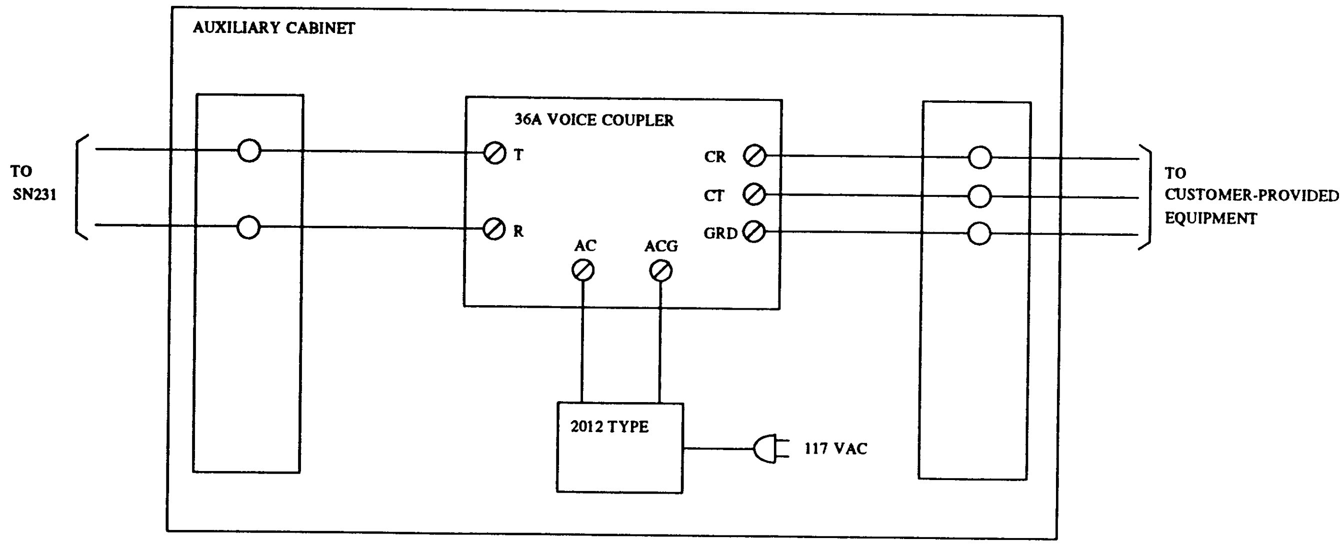


Figure 30-27. 36A Voice Coupler

POWER FAILURE TRANSFER

INSTALLING THE 808A EMERGENCY TRANSFER PANEL

The 808A Emergency Transfer Panel (ETP) provides emergency trunk bypass or power-fail transfer for up to five incoming Central Office (CO) trunk loops to five selected PBX station sets. When a power failure or other system problem interrupts service, the sets are automatically and directly connected to the CO trunk and are available for emergency use outside the PBX service environment.

During normal switch operation, -48V DC power from the alarm panel keeps the 808A's power failure detection relays open. During a power failure or major system failure the 808A operates as follows:

- Upon failure, the power failure detection relays close which enables the bypass circuits.
- Each bypass circuit directly connects a designated 7102 or 2500-type voice terminal to a central office (CO) trunk. The switch is completely bypassed.
- When a voice terminal connected to the 808A goes off-hook during bypass, circuitry inside the panel places signaling on the CO trunk causing the CO to return dial tone. Each 808A bypass circuit can be optioned for either loop-start or ground-start signaling.

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. (Unlike the older 609A transfer panel, the 808A panel doesn't require the voice terminal user to operate a signaling key.) Each 808A can handle up to five CO trunks.

(The model 574-5 panel, manufactured by Porta Systems Corporation, supported the power failure transfer feature before the AT&T model 808A became available. Operation for the 574-5 was essentially the same as 808A operation except that the 574-5 immediately dropped all calls in progress when power was restored.)

The 808A unit is shown in Figure 30-28.

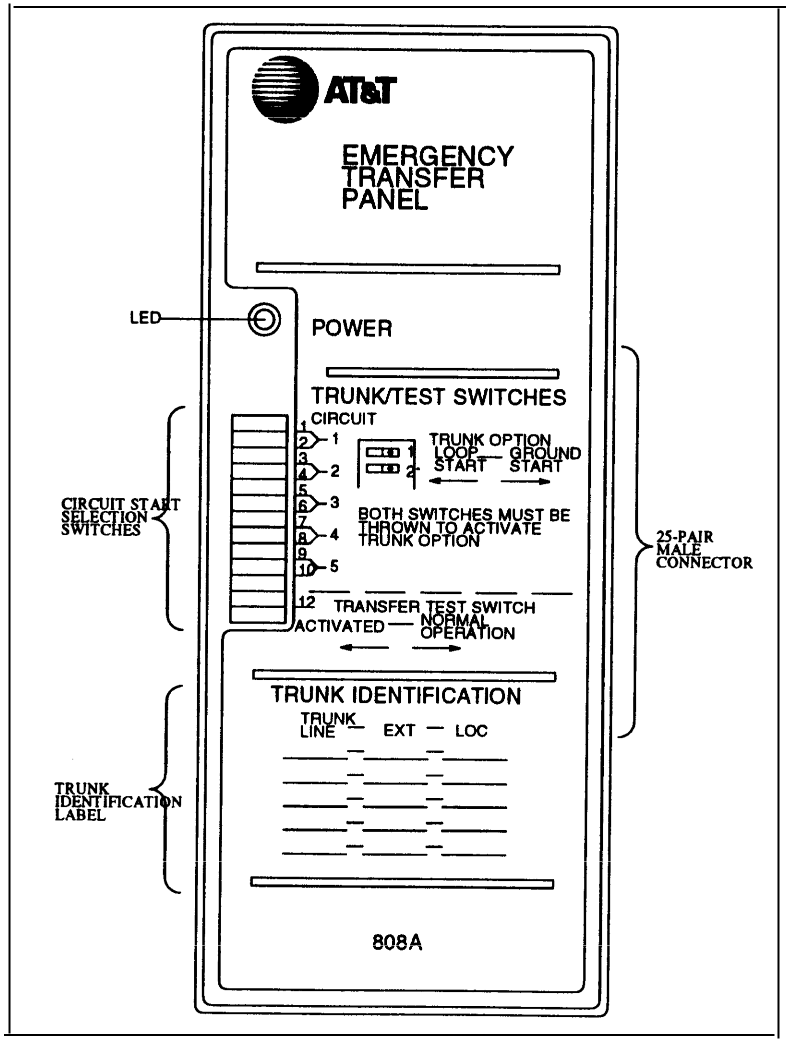


Figure 30-28. 808A Emergency Transfer Panel

The ETP 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 30-29).

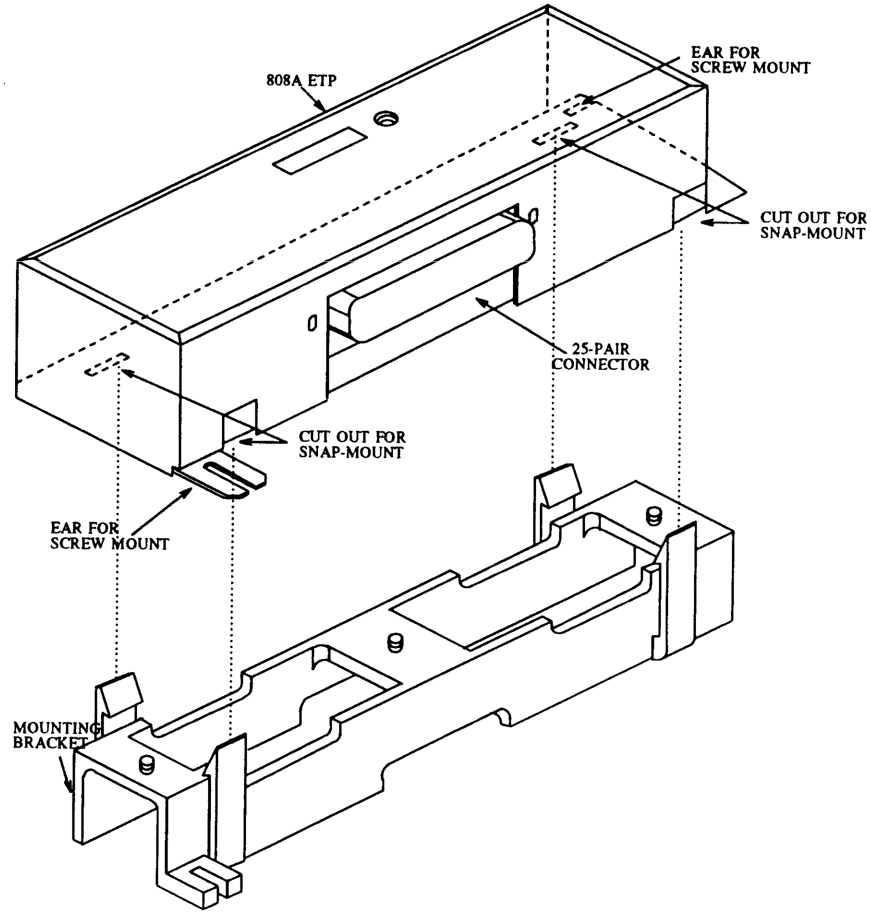


Figure 30-29. 808A EPT Mounting

NOTE

In addition to meeting standard environmental considerations such as temperature, humidity, etc., the 808A must be installed in a location that can be accessed only by authorized personnel.

To install the unit, follow the steps below:

Step 1: Locate the circuit start selection switches (see Figure 30-28). These are the first 10 two-position switches on the left side of the ETP. 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, etc. (see Table 30-8). Using Figure 30-28 as a reference, for loop start set the switches to the left. For ground start set the switches to the right.

TABLE 30-8. 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

Step 2: Connect a 25-pair cable between the male RJ21 25-pair connector on the ETP and the switch. Location of the connector is shown in Figure 30-28. Table 30-9 shows the pin assignments.

TABLE 30-9. Pin Assignments for 25-pair Connector

Pin	Color	Designation	Connector/Description
1	BL-W	RTC1	Ring-PBX Trunk Ckt 1
2	O-W	RTK1	Ring-CO Trunk Ckt 1
3	G-W	RLC1	Ring-PBX Line Port 1
4	BR-W	RST1	Ring-Emergency Terminal 1
5	S-W	RTC2	Ring-PBX Trunk Ckt 2
6	BL-R	RTK2	Ring-CO Trunk Ckt 2
7	O-R	RLC2	Ring-PBX Line Port 2
9	G-R	RST2	Ring-Emergency Terminal 2
10	S-R	RTK3	Ring-CO Trunk Ckt 3
11	BL-BK	RLC3	Ring-PBX Line Port 3
12	O-BK	RST3	Ring-Emergency Terminal 3
13	G-BK	RTC4	Ring-PBX Trunk Ckt 4
14	BR-BK	RTK4	Ring-CO Trunk Ckt 4
15	S-BK	RLC4	Ring-PBX Line Port 4
16	BL-Y	RST4	Ring-Emergency Terminal 4
17	O-Y	RTC5	Ring-PBX Trunk Ckt 5
18	G-Y	RTK5	Ring-CO Trunk Ckt 5
19	BR-Y	RLC5	Ring-PBX Line Port 5
20	S-Y	RST5	Ring-Emergency Terminal 5
21	BL-V	NO1	Normally Open 1 Contact
22	O-V	NC1	Normally Closed 1 Contact
23	G-V	NO2	Normally Open 2 Contact
24	BR-V		
25	S-V	-48PX	-48 Volts From Alm Panel

(continued below)

Table 30-9. Pin Assignments for 25-pair Connector (cont.)

Pin	Color	Designation	Connector/Description
26	W-BL	TTC1	Tip-PBX Trunk Ckt 1
27	W-O	TTK1	Tip-CO Trunk Ckt 1
28	W-G	TLC1	Tip-PBX Line Port 1
29	W-BR	TST1	Tip-Emergency Terminal 1
30	W-S	TTC2	Tip-PBX Trunk Ckt 2
31	R-BL	TTK2	Tip-CO Trunk Ckt 2
32	R-O	TLC2	Tip-PBX Line Port 2
33	R-G	TST2	Tip-Emergency Terminal 2
34	R-BR	TTC3	Tip-PBX Trunk Ckt 3
35	R-S	TTK3	Tip-CO Trunk Ckt 3
36	BK-BL	TLC3	Tip-PBX Line Port 3
37	BK-O	TST3	Tip-Emergency Terrninal 3
38	BK-G	TTC4	Tip-PBX Trunk Ckt 4
39	BK-BR	TTK4	Tip-CO Trunk Ckt 4
40	BK-S	TLC4	Tip-PBX Line Port 4
41	Y-BL	TST4	Tip-Emergency Terminal 4
42	Y-O	TTC5	Tip-PBX Trunk Ckt 5
43	Y-G	TTK5	Tip-CO Trunk Ckt 5
44	Y-BR	TLC5	Tip-PBX Line Port 5
45	Y-S	TST5	Tip-Emergency Terminal 5
46	V-BL	COM1	Common 1 Relay Contact
47	V-O	NC2	Normally Closed 2 Contact
48	V-G	COM2	Common 2 Relay Contact
49	V-BR		
50	V-S	GRD	Ground From PBX

Step 3: On the trunk identification label at the bottom of the ETP, record the trunk line, extension, and location for each circuit.

Step 4: To each voice terminal designated as an emergency terminal, attach a label identifying it as such. The labels are provided with the unit.

Step 5: Check the system for normal operation as follows:

— Place the test switch (switch 12) in the NORMAL OPERATION position (see Figure 30-28).

— Ensure that the power supply is providing -48 VDC at a maximum of 80ma.

— Check wiring connections (see Table 30-9).

— Verify power by observing the LED (see Figure 30-28). It should be ON.

— Verify that 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.

Step 6: Check the system for transfer operation as follows:

— Place the test switch (switch 12) in the ACTIVATED position (see Figure 30-28).

— Verify that power is not being supplied to the panel by observing the LED. It should be OFF.

— Verify that 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.

RADIO PAGING ACCESS

The Radio Paging Access feature provides attendant and station users dial access to customer-owned radio paging equipment to selectively tone alert or voice page individuals carrying pocket radio receivers.

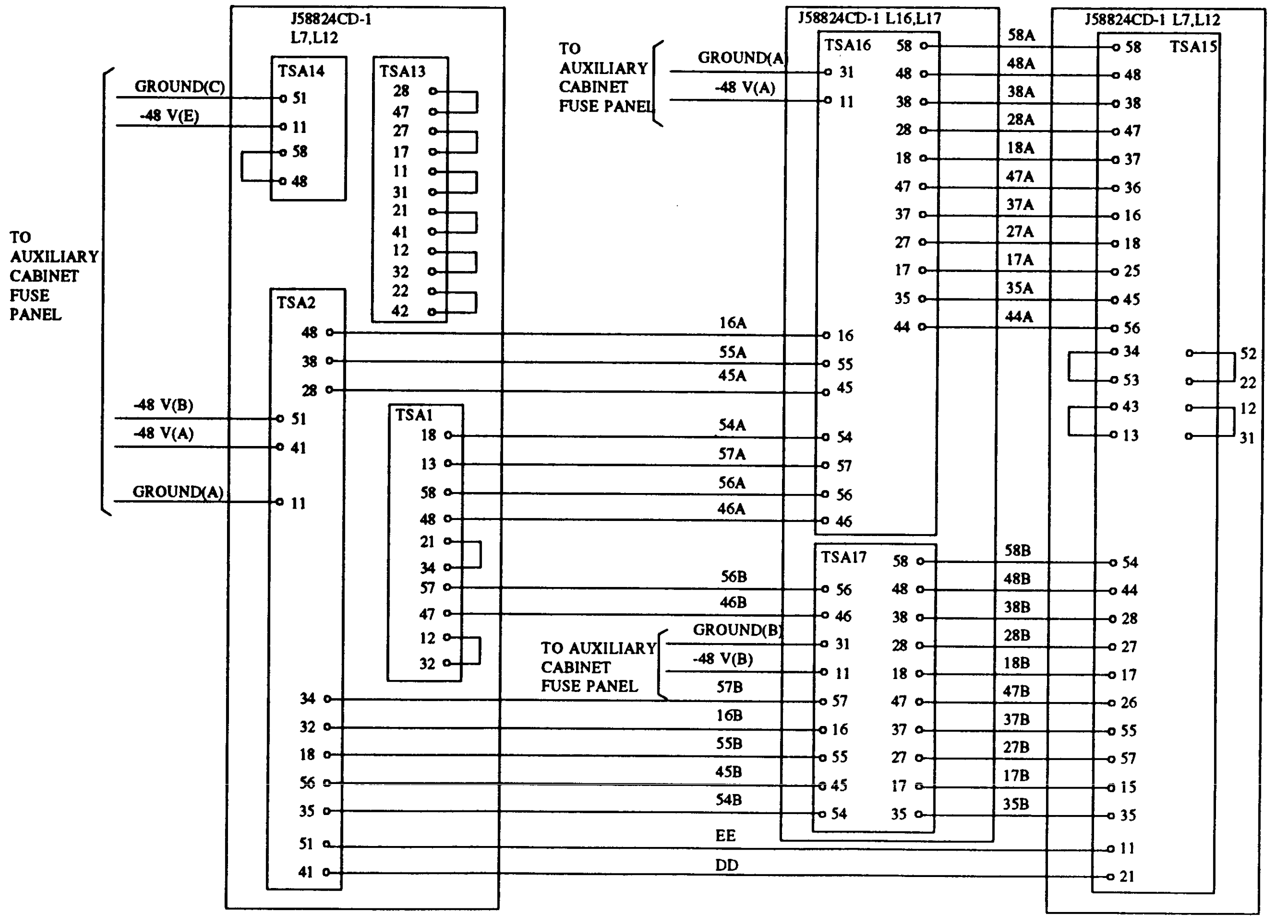


Figure 30-30. Radio Paging Access — Interface Unit Connections (Lists 7, 12, 16, 17)

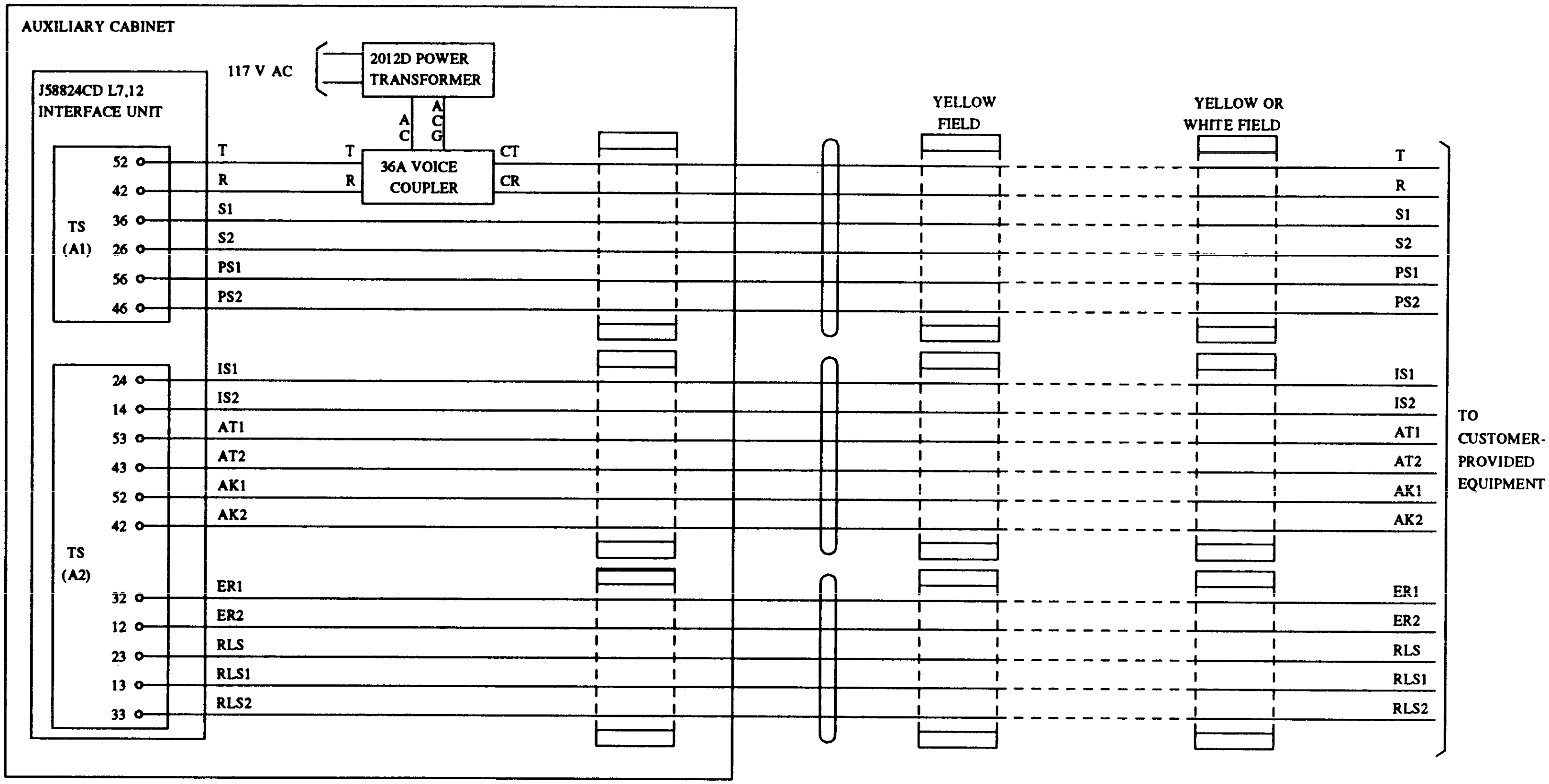


Figure 30-31. Radio Paging Access — Customer Equipment Connections

See *chapter 10* for circuit pack terminations and connections.

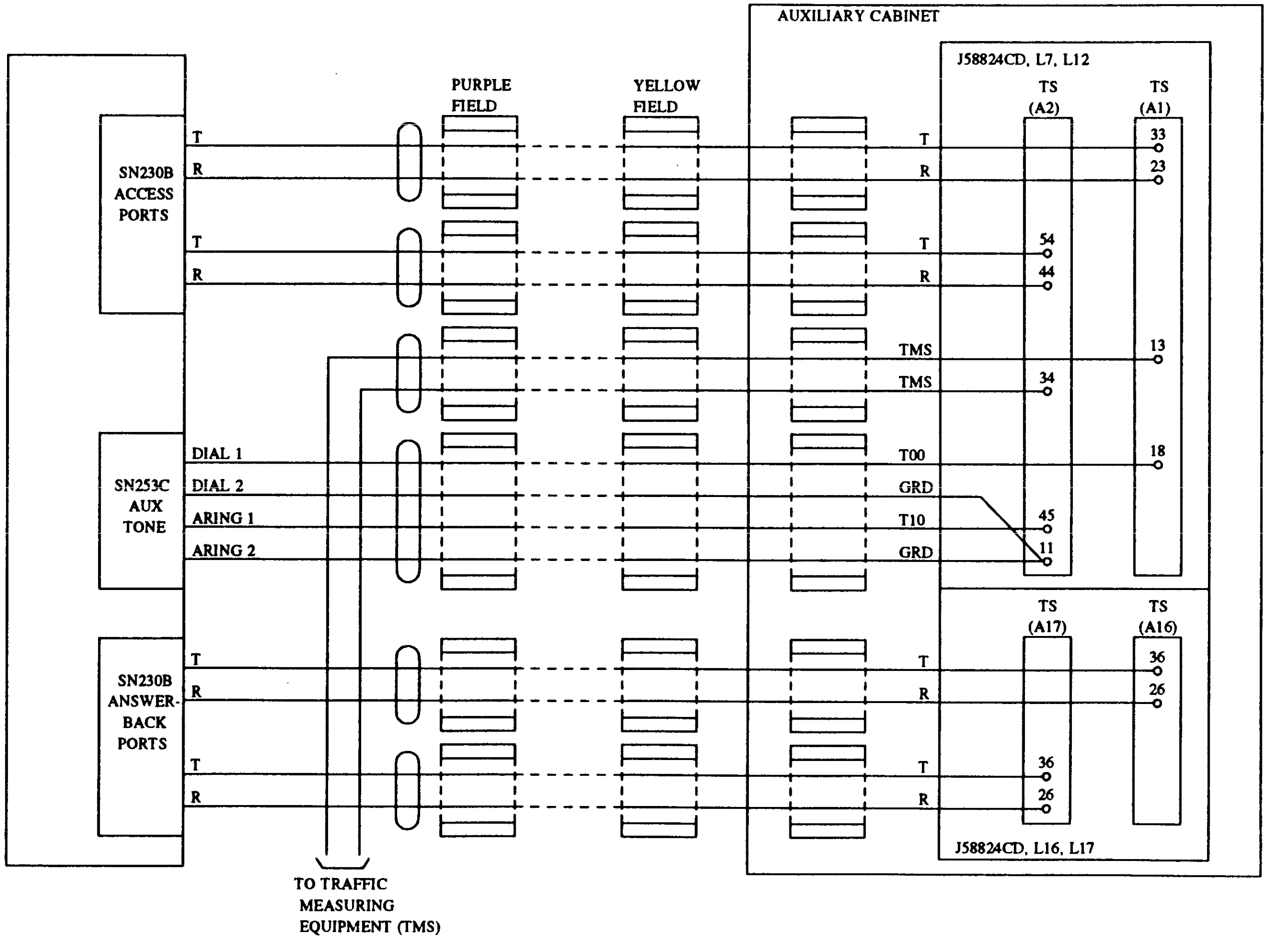


Figure 30-32. Radio Paging Access — Connections

RECORDED TELEPHONE DICTATION TRUNK AND 36A VOICE COUPLER

The Recorded Telephone Dictation Trunk feature allows access to and control of customer-owned dictating equipment by station users within the system. A 36A voice coupler must be provided when the dictation trunk connects to nonregistered customer equipment The voice coupler limits excess signal power and filters out above voice band components generated by the customer's equipment.

To install the dictation trunk unit in the auxiliary cabinet, install two 2-inch adapter mounting brackets to the right-hand cabinet upright in the space to be used. Secure the trunk unit to the adapter brackets and the left-side cabinet upright using the mounting screws provided. The mounting clips are used as spacers between the unit mounting plates. (See figure 30-33.)

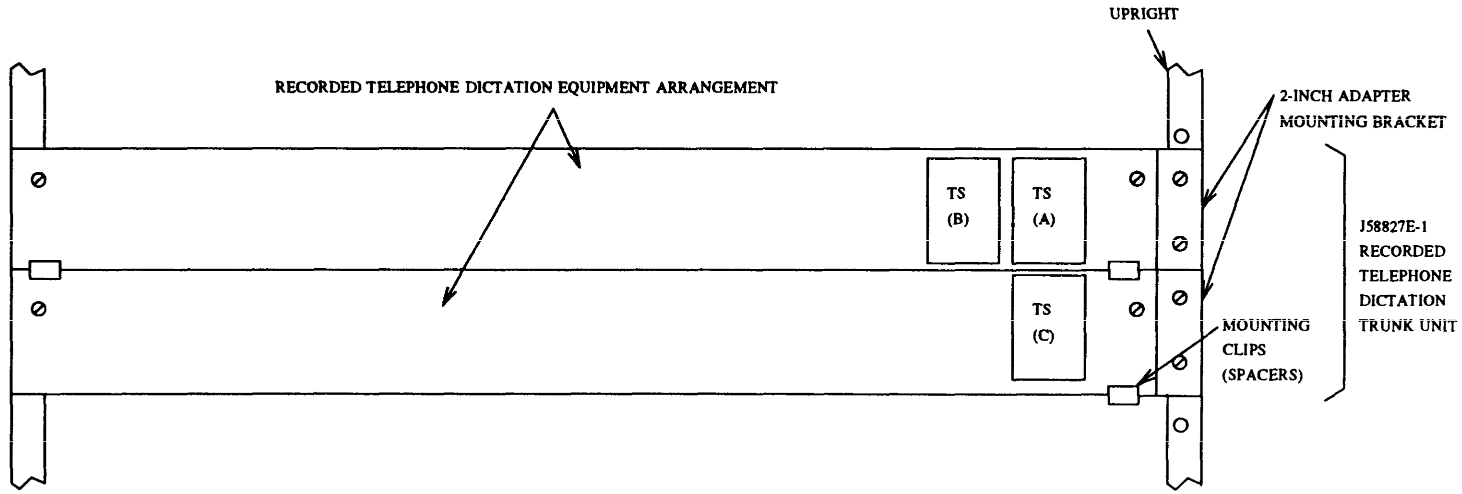


Figure 30-33. Dictation Trunk Unit Installation

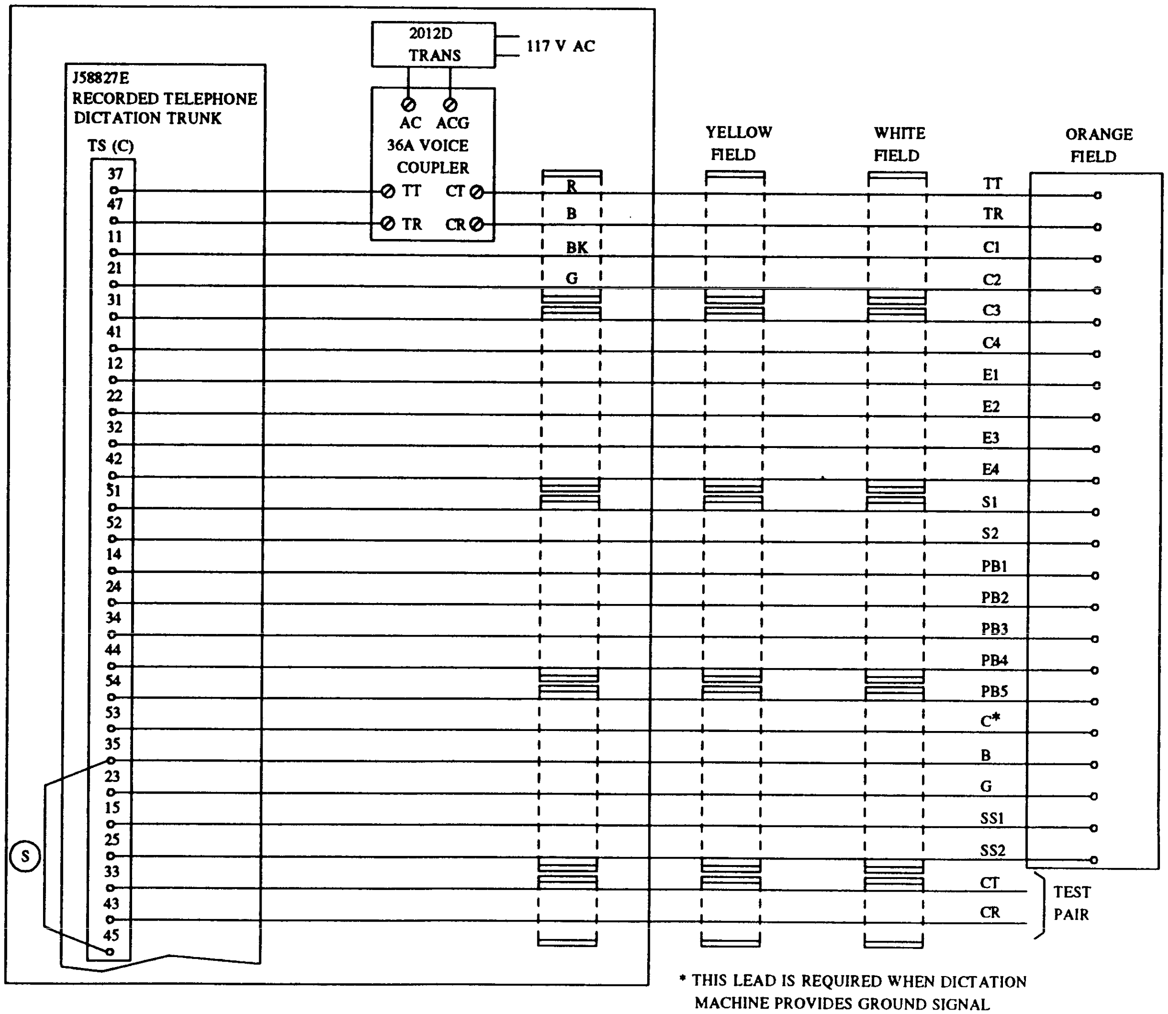


Figure 30-34. Dictation Trunk — Customer Equipment Connections

See *chapter 10* for the circuit pack terminations and connections.

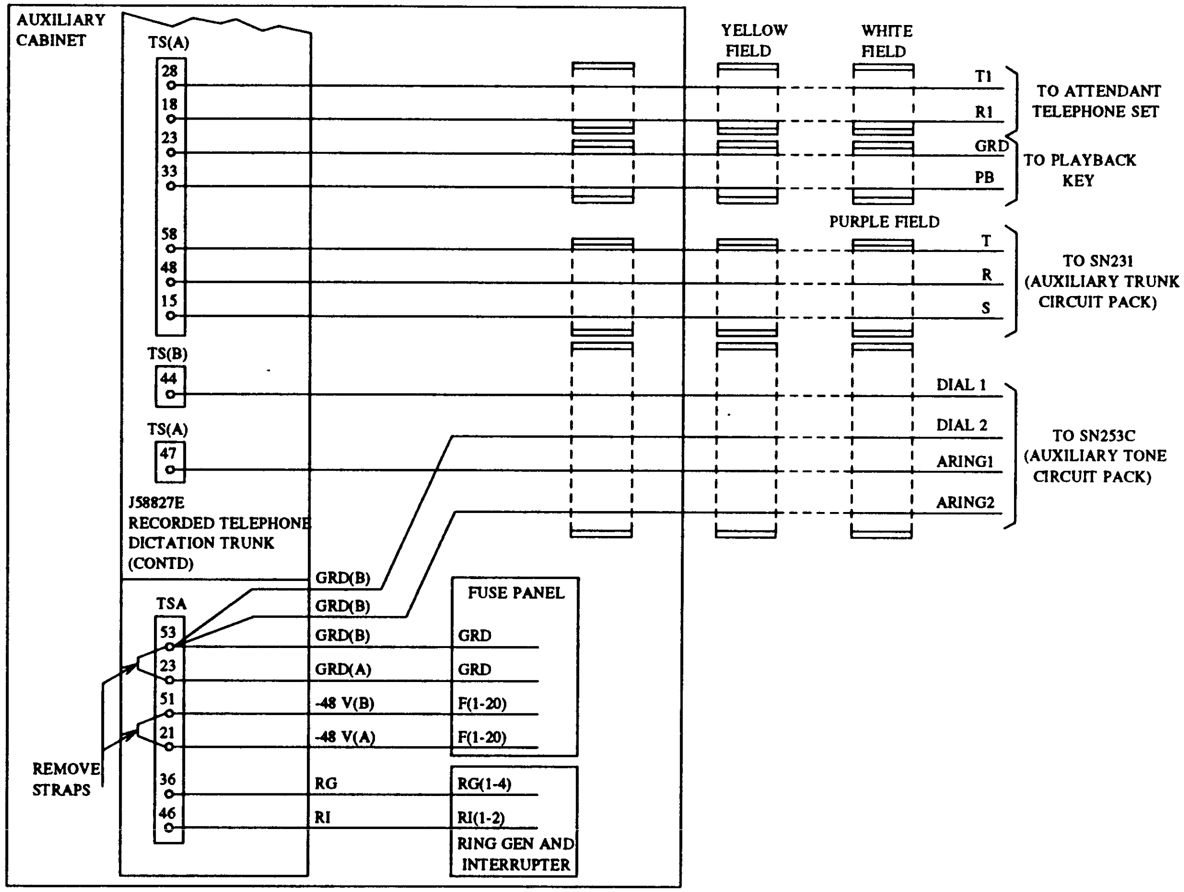


Figure 30-35. Dictation Truck — Telset, Playback Key, Ringing Generator, and Fuse Panel Connections

TABLE 30-10. Recorded Telephone Dictation Trunk Options (Part 1 of 2)

OPTION	FEATURE OR OPTION DESCRIPTION			STRAPS REQUIRED ON J58827E TS (A)	TS (B)	TS (C)
YC	To increase tone levels from dictation machine (ready to dictate tone, ringing tone, dial tone, etc.)			Install 0.55μ capacitor from contact 5 of key to connect 4M of B1 relay		
R	Additional machine playback features (specify one only)	Mach. provides playback signal Dial 3 extends playback Dial 1 ends playback	No No Yes		48-58	53-54
N		Mach. provides playback signal Dial 3 extends playback Dial 1 ends playback	Yes Yes No		28-38 46-56	13-14
Q		Mach. provides playback signal Dial 3 extends playback Dial 1 ends playback	Yes No Yes		48-58	
A		Mach. provides playback signal Dial 3 extends playback Dial 1 ends playback	Yes Yes Yes		46-56	13-14
S	Trunk located at switching system			35-45		
ZJ	Not ESS No. 1 Centrex			24-34		17-27
ZL	Loop resistance attendant telephone set	Less than 300 OHMS		Not required		
ZM		More than 300 OHMS		25-55 14-24		
ZC	Touch-tone operation	Required				18-28
ZB		Not required				48-58 28-38 18-57 47-57
B	Dictation machine unavailable to record	Makes trunk busy and signals attendant		13-23	26-36	
ZA		Makes trunk busy		13-23		

TABLE 30-10. Recorded Telephone Dictation Trunk Options (Part 2 of 2)

OPTION	FEATURE OR OPTION DESCRIPTION		STRAPS REQUIRED ON J58827E TS (A)	TS (B)	TS (C)
F	Playback reduced by dialing digit 2			42-52	
F with ZB or ZC				35-55	
E with ZB or ZC				45-55	
M	Dictation machine Start/stop by	DIAL 1 Touch-tone or rotary dial	46-56		
W			11-21	18-57 37-47 17-27 33-43 34-44	
ZG			47-57		
G		DIAL 1 Rotary dial only	46-56		
W			11-21	18-57 37-47 17-27 33-43 34-44	
M		Voice	46-56		
V				15-54 47-57 34-44 24-34 23-33	
YH	Key telephone operation	Required			27-56
YE,YG		Not required			17-27 46-56

RECORDED ANNOUNCEMENT UNIT

Recorded Announcement Unit KS-16765

The KS-16765 recorded announcement unit is used in association with the intercept feature. Incoming calls are intercepted and routed to a recorder which indicates to the caller the reason for the interception. Only one message can be given.

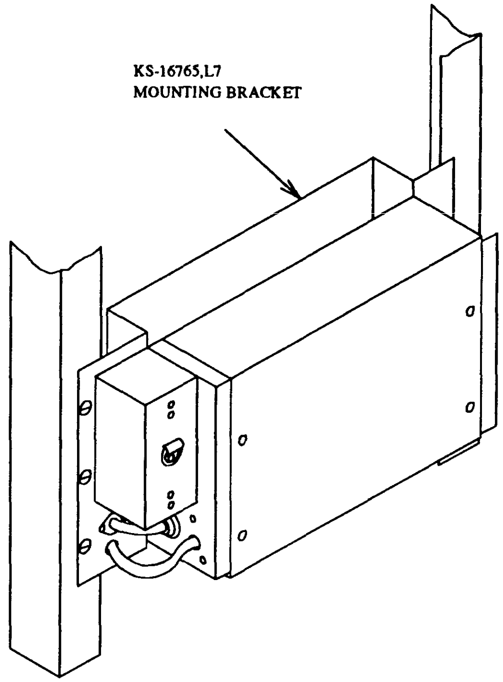


Figure 30-36. Recorded Announcement Unit KS-1 6765 Mounting Arrangement

See *chapter 10* for SN231 circuit pack connections and terminations.

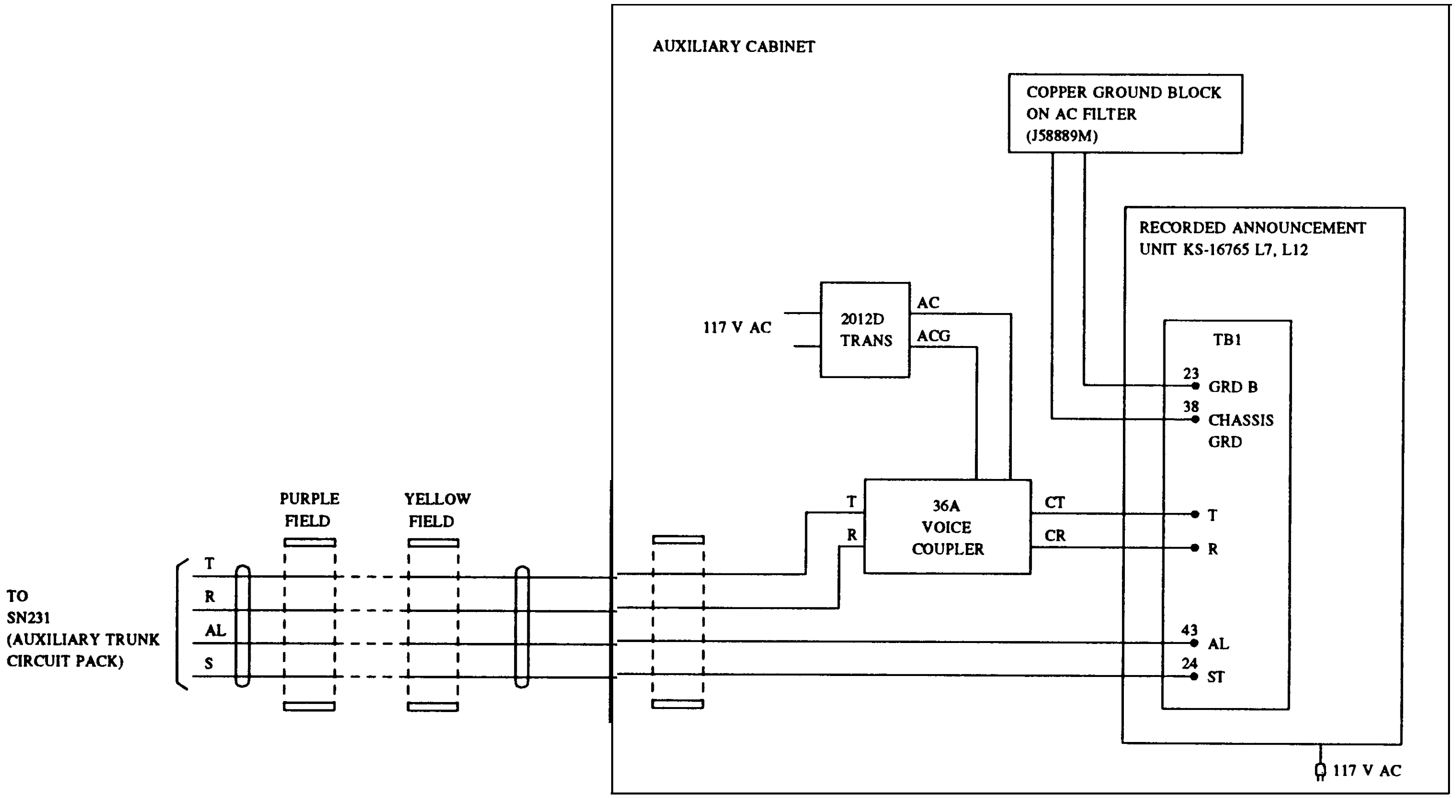


Figure 30-37. Recorded Announcement Unit KS-16765 Connections

13A Announcement System

The 13A announcement system mounts in the auxiliary cabinet. A minimum of two inches is required above and below the system. Check the equipment and see that correct circuit packs are in place. Up to eight announcement circuits may be provided.

See *chapter 10* for SN231 circuit pack terminations and connections.

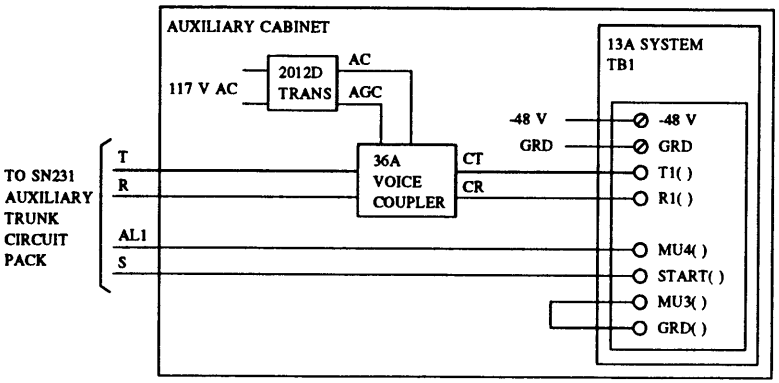


Figure 30-38. 13A Announcement System Connections

TABLE 30-11. 13A Announcement Circuit Terminations

TB1 TERMINATIONS					
CIRCUIT	DESIG	TERM	CIRCUIT	DESIG	TERM
	R1(0)	15		R1(4)	71
	T1(0)	16		T1(4)	72
0	GRD(0)	17	4	GRD(4)	73
	MU3(0)	25		MU3(4)	81
	MU4(0)	26		MU4(4)	82
	START(0)	28		START(4)	84
	R1(1)	29		R1(5)	85
	T1(1)	30		T1(5)	86
1	GRD(1)	31	5	GRD(5)	87
	MU3(1)	39		MU3(5)	95
	MU4(1)	40		MU4(5)	96
	START(1)	42		START(5)	98
	RI(2)	43		R1(6)	99
	T1(2)	44		T1(6)	100
2	GRD(2)	45	6	GRD(6)	101
	MU3(2)	53		MU3(6)	109
	MU4(2)	54		MU4(6)	110
	START(2)	56		START(6)	112
	R1(3)	57		R1(7)	113
	T1(3)	58		T1(7)	114
3	GRD(3)	59	7	GRD(7)	115
	MU3(3)	67		MU3(7)	123
	MU4(3)	68		MU4(7)	124
	START(3)	70		START(7)	126

Digital Announcer — DEFINITY Generic 2 and System 85

The external connections for the digital announcer use the same connector for both DEFINITY Generic 2 and System 85.

The single channel connector is the J2 type and is shown in figure 30-39.

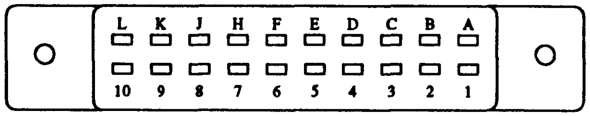


Figure 30-39. 65270 External Interface Connections — J2

The multichannel connector is the J2M type and is shown in figure 30-40.

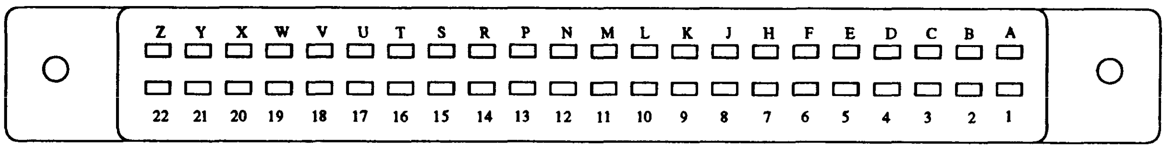
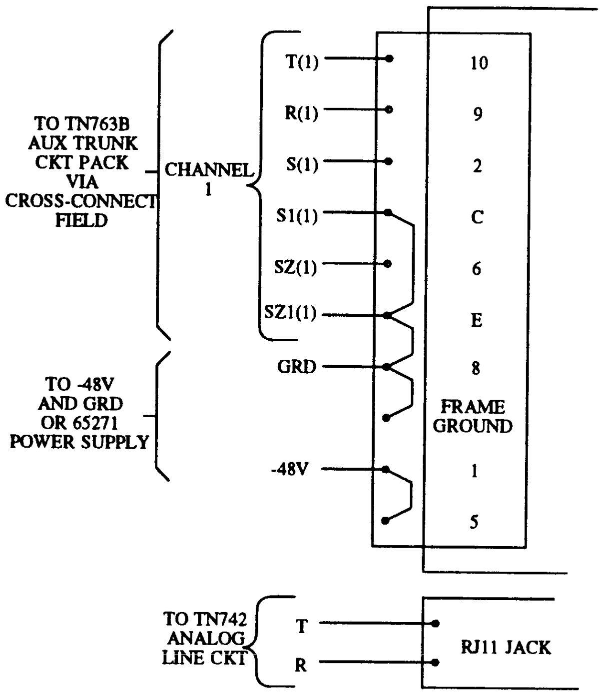


Figure 30-40. 65272 - 65276 External Interface Connections — J2M

DEFINITY Generic 2 Digital Announcer Connections

Figure 30-41 shows the connections for a single channel digital announcer.

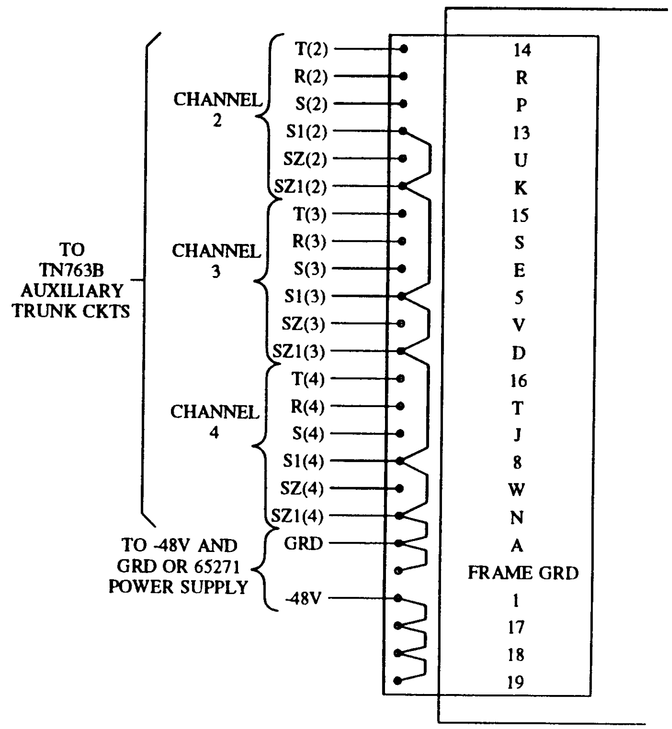


NOTES:

1. Strapping between pins C, E, 8, and frame ground provide ground connections. These should be factory installed, but must be verified, especially on older units.
2. Strapping between pins 1 and 5 provide -48 VDC connections. These should be factory installed, but must be verified, especially on older units.
3. Channel 1 connection (T, R, S, S1, SZ, and SZ1) are installer wiring. -48V and GRD are also installer wiring.
4. Do not interconnect the -48V source of the channel 1 unit to the channels 2-4 unit.

Figure 30-41. DEFINITY G2 Digital Announcer Connections — Channel 1

Figure 30-42 shows the connections for a multichannel digital announcer.



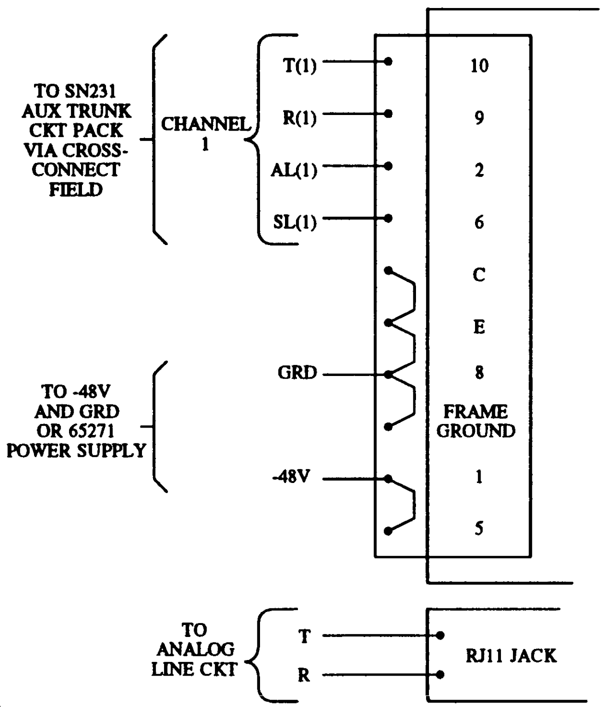
NOTES:

1. Strapping between pins 13, K, 5, D, 8, N, A, and frame ground provide ground connections. These should be factory installed, but must be verified, especially on older units.
2. Strapping between pins 1, 17, 18, and 19 provide -48 VDC connections. These should be factory installed, but must be verified, especially on older units.
3. Channels 2-4 connections (T, R, S, S1, SZ, and SZ1 for each channel) are installer wiring. -48V and GRD are also installer wiring.
4. Do not interconnect the -48V source of the channel 1 unit to the channels 2-4 unit

Figure 30-42. DEFINITY G2 Digital Announcer Connections — Channels 2-4

System 85 Digital Announcer Connections

Figure 30-43 shows the connections for a single channel digital announcer.

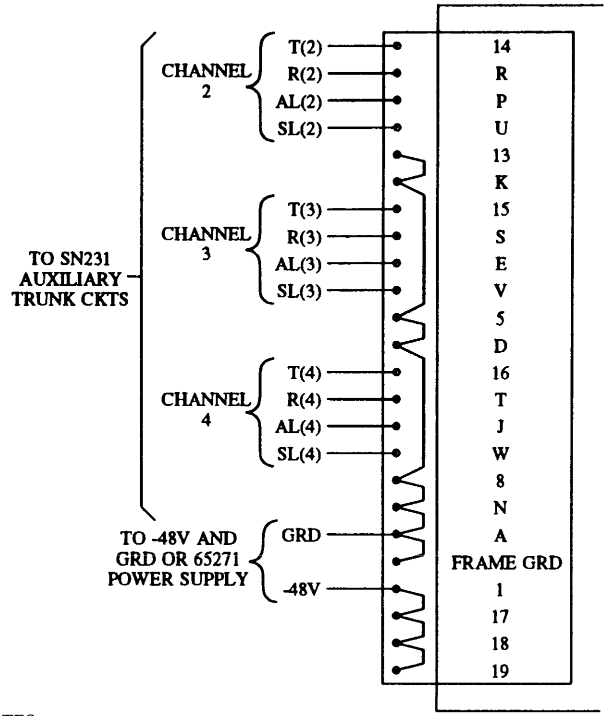


NOTES:

1. Strapping between pins C, E, 8, and frame ground provide ground connections. These should be factory installed, but must be verified, especially on older units.
2. Strapping between pins 1 and 5 provide -48 VDC connections. Thesc should be factory installed, but must be verified, especially on older units.
3. Channel 1 connections (T, R, AL, and SL) are installer wiring. -48V and GRD are also installer wiring.
4. Do not interconnect the -48V source of the channel 1 unit to the channels 2-4 unit.

Figure 30-43. System 85 Digital Announcer Connections — Channel 1

Figure 30-44 shows the connections for a multichannel digital announcer.



NOTES:

1. Strapping between pins 13, K, 5, D, 8, N, A, and frame ground provide ground connections. These should be factory installed, but must be verified, especially on older units.
2. Strapping between pins 1, 17, 18, and 19 provide -48 VDC connections. These should be factory installed, but must be verified, especially on older units.
3. Channels 2-4 connections (T, R, AL, and SL for each channel) are installer wiring. -48V and GRD arc also installer wiring.
4. Do not interconnect the -48V source of the channel 1 unit to the channels 2-4 unit.

Figure 30-44. System 85 Digital Announcer Connections — Channels 2-4

RMATS

See *chapter 10* for circuit pack terminations and connections.

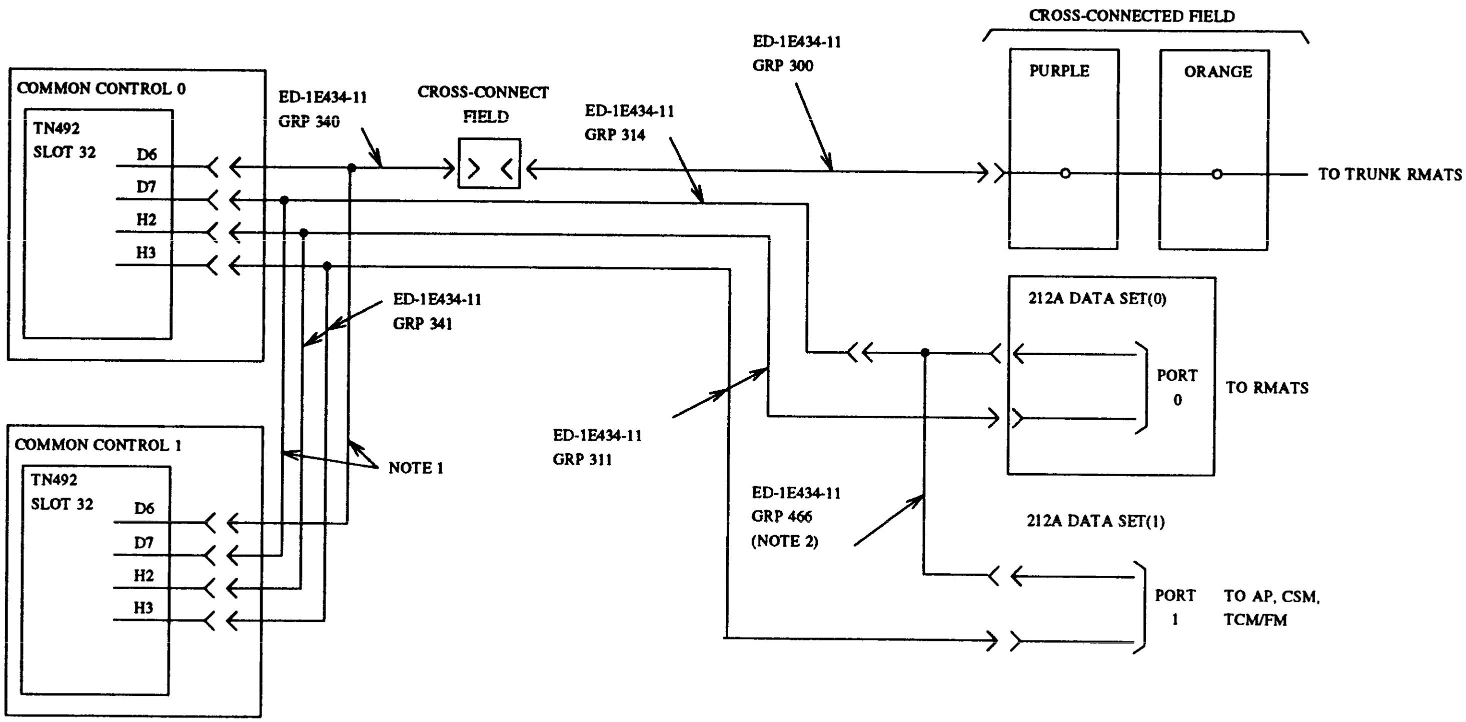


Figure 30-45. RMATS — Data Set Not in Auxiliary Cabinet

NOTES:

1. For duplicated CC only.
2. For single data set, use ED-1E434-11 GRP 109.

RMATS connections at the CC carrier. See *chapter 10* for circuit pack terminations and connections.

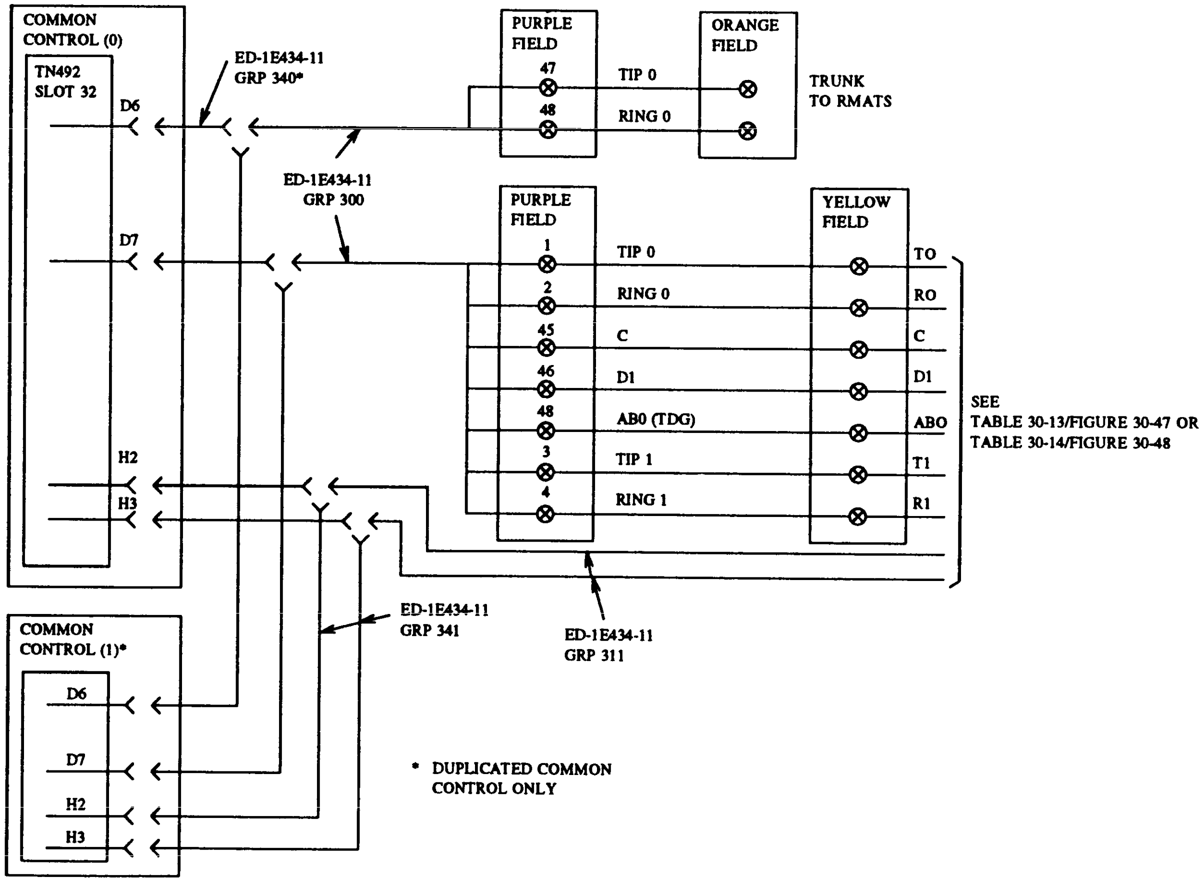


Figure 30-46. RMATS — Data Set in Auxiliary Cabinet

See table 30-14 for cross-connections.

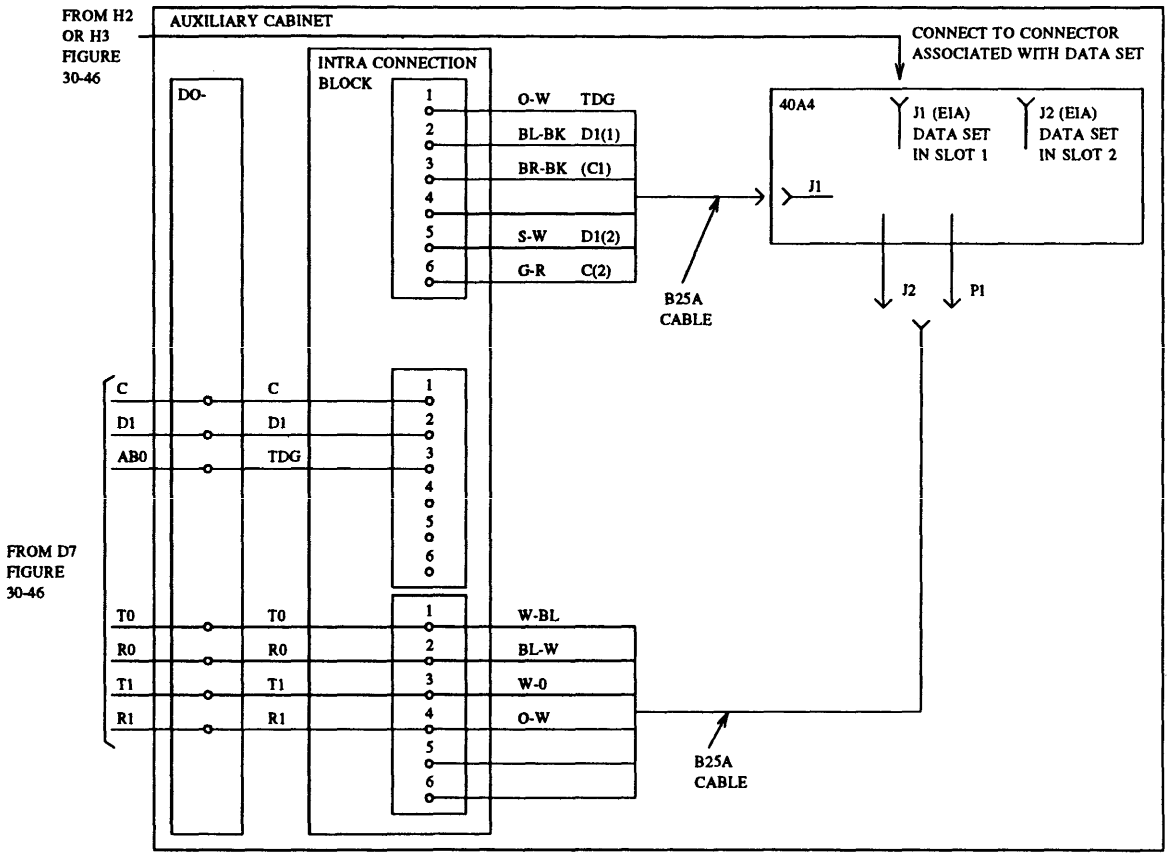


Figure 30-47. RMATS Connection With Data Set in Slot 1 or 2

TABLE 30-12. RMATS Connections — Data Set in Slot 1 or 2

DATA SET IN SLOT	FROM: 110 INTRACONNECT BLOCK ASSOCIATED WITH COMMON CONTROL D7 CONNECTIONS		TO: 110 INTRACONNECT BLOCK ASSOCIATED WITH 40A4 CONNECTOR J1			TO: 110 INTRACONNECT BLOCK ASSOCIATED WITH 40A4 CONNECTOR P1		
	TERMINAL	LEAD DESIGNATION	TERMINAL	LEAD COLOR	LEAD DESIGNATION	TERMINAL	LEAD COLOR	LEAD DESIGNATION
1	1	C	1	O-W	TDG	1	W-BL	T0
	2	D1	2	BL-BK	Dl(l)	2	BL-W	R0
	3	TDG	3	BR-BK	C(1)	3	W-O	T1
2	1	C	1	O-W	TDG	4	O-W	R1
	2	D1	5	S-W	D1(2)			
	3	TDG	6	G-R	C(2)			

See table 30-13 for connection of B25A cable to J2 of 40A4 and P2 of 57A1. See table 30-14 from cross-connections between 110 intraconnecting blocks.

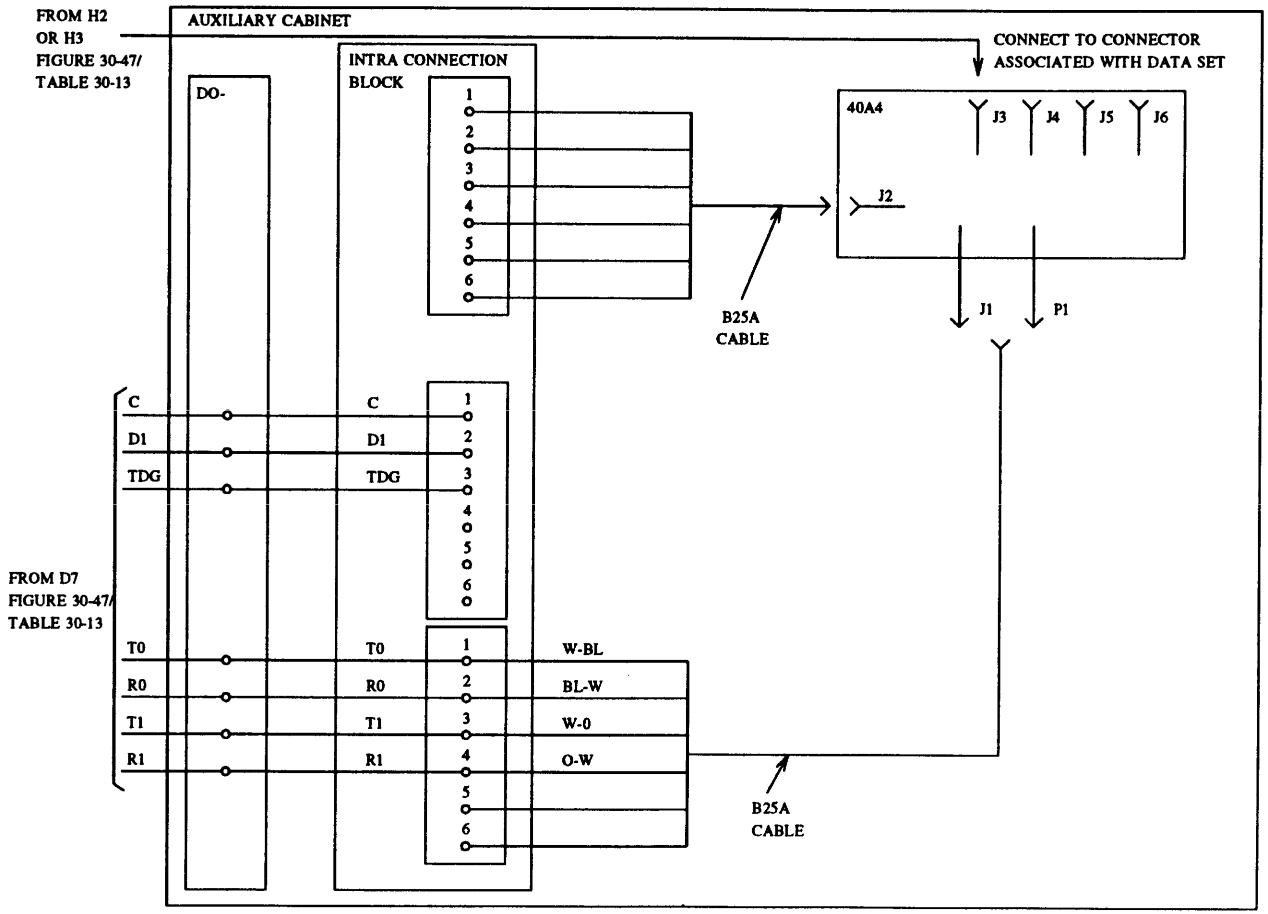


Figure 30-48. RMATS — Data Set in Slots 3-6

TABLE 30-13. RMATS Connections — Data Set in Slot 3-6

	CONNECTOR J2 ON 40A4		
DATA SET IN SLOT	LEAD DESIGNATION	B25A CABLE WIRE COLOR	110 INTRACONNECTING BLOCK PIN NUMBER
3	TDG	O-W	1
	C(3)	R-S	2
	D1(3)	S-R	3
4	TDG	O-W	1
	C(4)	V-BL	2
	D1(4)	BL-V	3
5	TDG	O-W	1
	C(5)	V-O	2
	D1(5)	O-V	3
6	TDG	O-W	1
	C(6)	BR-BK	2
	D1(6)	BL-BK	3

TABLE 30-14. RMATS 110 Cross-Connections — Data Set in Slot 3-6

	FROM		TO	
DATA SET IN SLOT	110 INTRACONNECT BLOCK ASSOCIATED WITH COMMON CONTROL D7 CONNECTIONS		110 INTRACONNECT BLOCK ASSOCIATED WITH 40A4 CONNECTOR J2	
	TERMINAL	LEAD DESIGNATION	TERMINAL	LEAD DESIGNATION
3	1	C(3)	2	C(3)
	2	D1(3)	3	D1(3)
	3	TDG	1	TDG
4	1	C(4)	2	C(4)
	2	D1(4)	3	D1(4)
	3	TDG	1	TDG
s	1	C(5)	2	C(5)
	2	D1(5)	3	D1(5)
	3	TDG	1	TDG
6	1	C(6)	2	C(6)
	2	D1(6)	3	D1(6)
	3	TDG	1	TDG

The 212AR data sets must be equipped with options E, ZF, XK, YF, YC, YG, YJ, YL, XM, S, Y, A, U, ZH, W, YO, YQ, XO and P. This results in the data set having the following settings.

TABLE 30-15. 212AR Data Set Switch Settings

SWITCH	SWITCH SECTION								
	1	2	3	4	5	6	7	8	9
S1	X	O	-	-	-	-	-	-	-
S2	X	O	O	O	O	X	X	O	O
S3	X	O	X	O	O	O	X	O	-
S5	O	O	-	-	-	-	-	-	-

X = Contact closed
DC = Don't care
O = Contact opened
- = Switch section doesn't exist

A strap must be placed between circuit points E3 and E4. A second strap must be placed between circuit points E1 and E2. If the 47D housing is used, connection S1 must be open (Option P) to disconnect signal ground from frame ground. If other housings are used, care must be taken to ensure that signal ground and frame ground are not connected to each other.

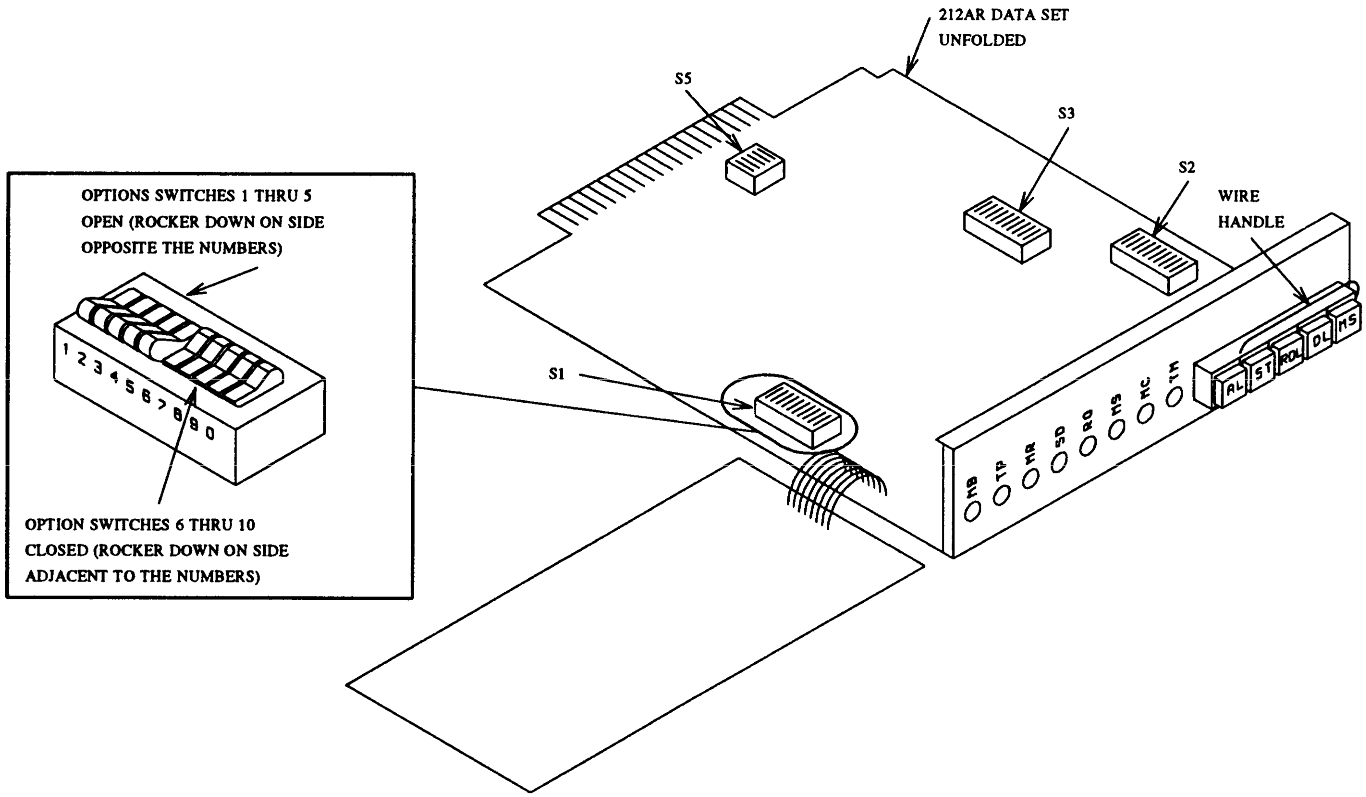


Figure 30-49. 212AR Data Set Unfolded

NOTE

Figure 30-47 gives the instructions for connecting a LSU to the System 85. It also gives a block diagram for connecting the LSU to its associated peripheral devices. For complete connections, see AT&T 190-402-000 (94A CPS Installation, Test, and Maintenance).

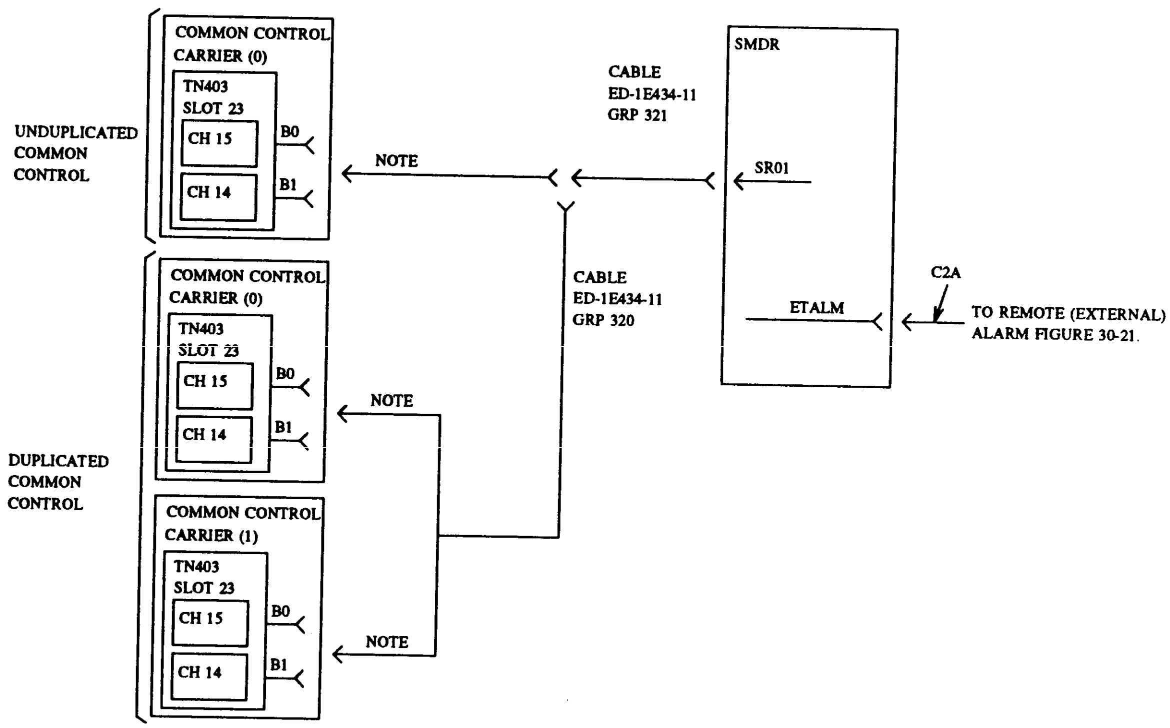


Figure 30-50. 9-Track SMDR

Connect to appropriate connector (B0 or B1). Appropriate connector can be determined from CSD.

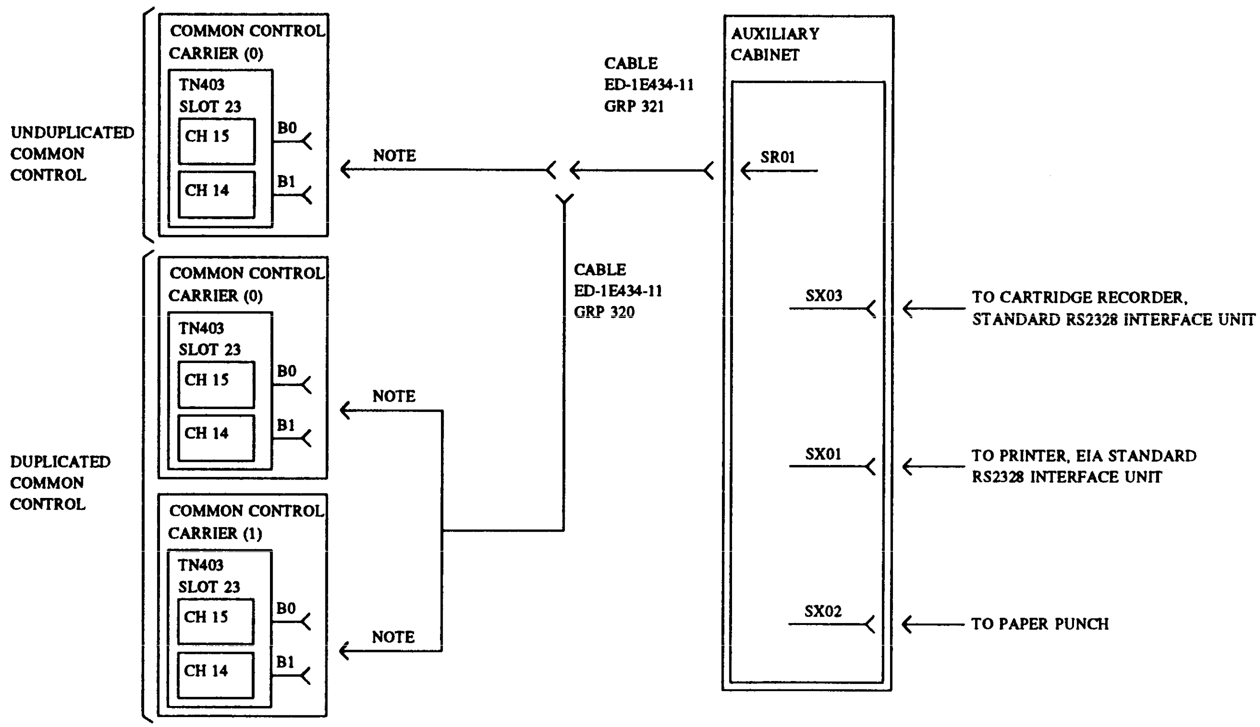


Figure 30-51. Direct Output SMDR

Connect to appropriate connector (B0 or B1). Appropriate connector can be determined from CSD.

Interface to NCOSS, CMDR, and CSMDR using LSUs

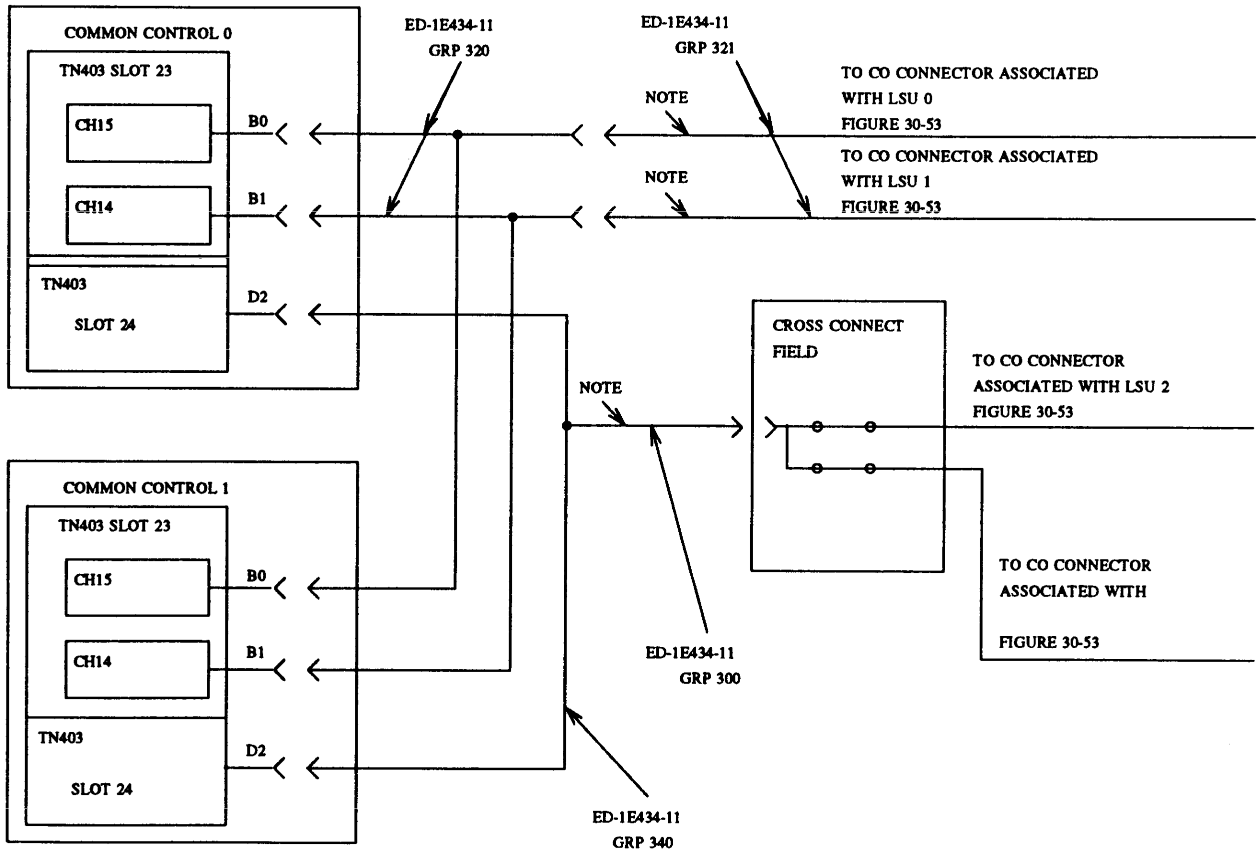


Figure 30-52. LSU to System 85 Connections (LSU 0-3)

Connect this cable directly to appropriate connector or System 85 control cabinet if the system is unduplicated CC.

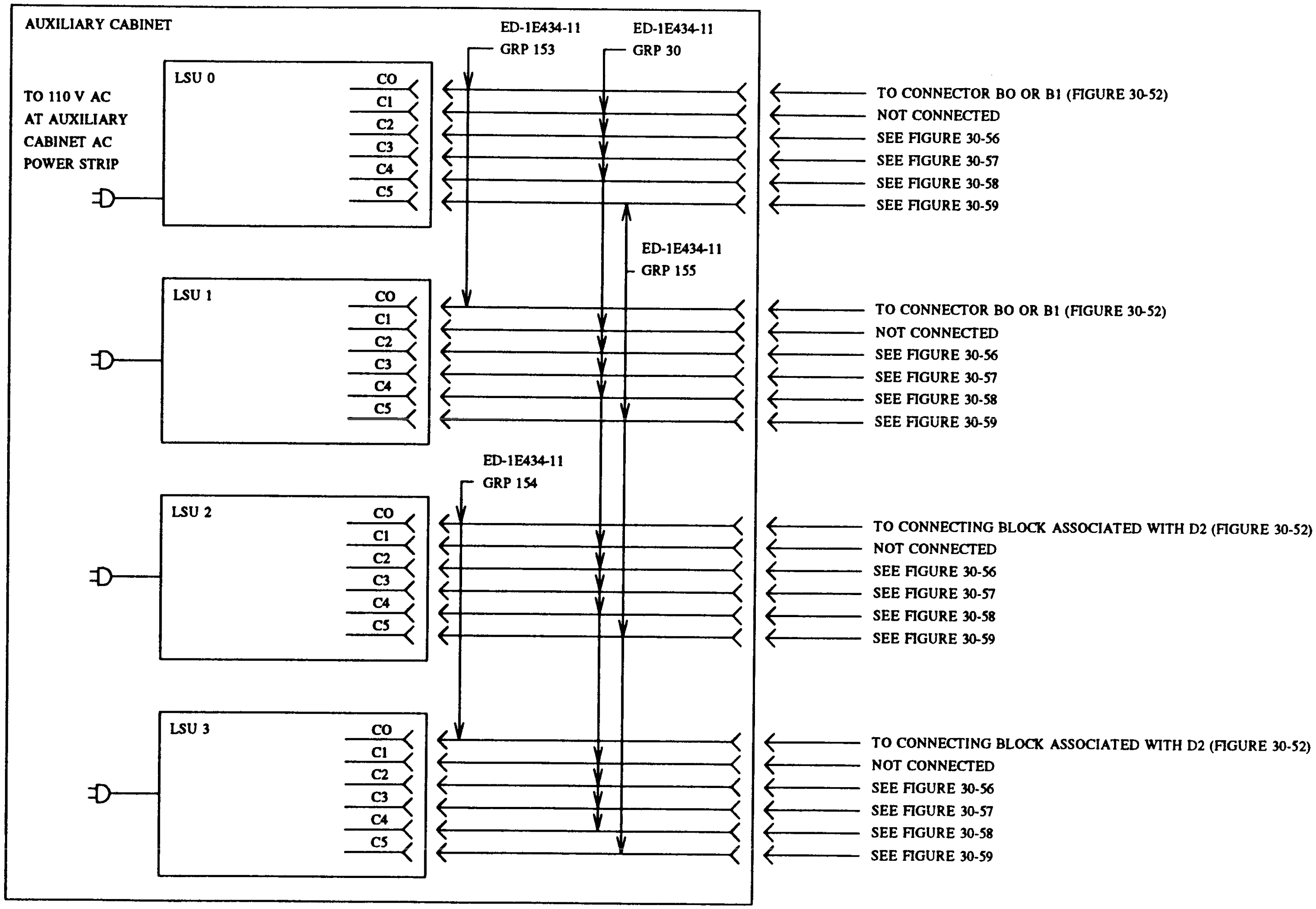


Figure 30-53. Connections at the LSU (LSU 0-3)

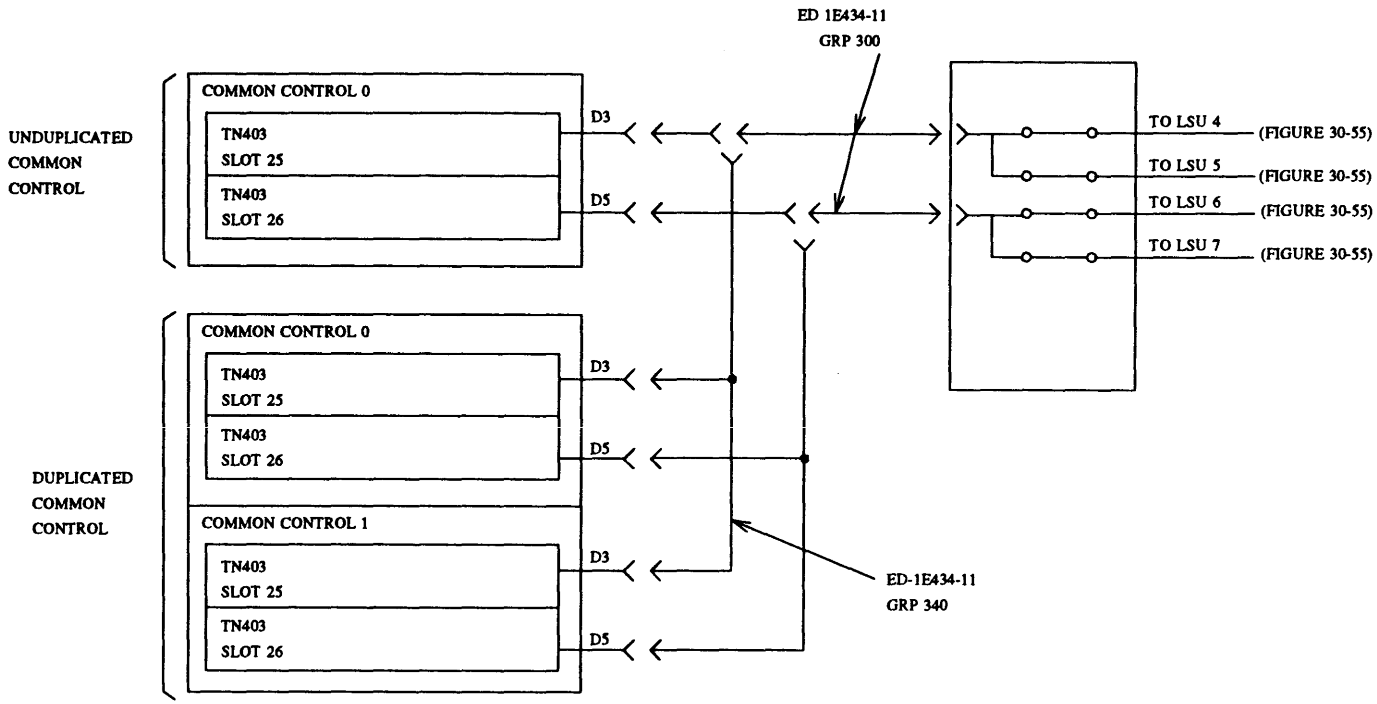


Figure 30-54. LSU to System 85 Connections (LSU 4-7)

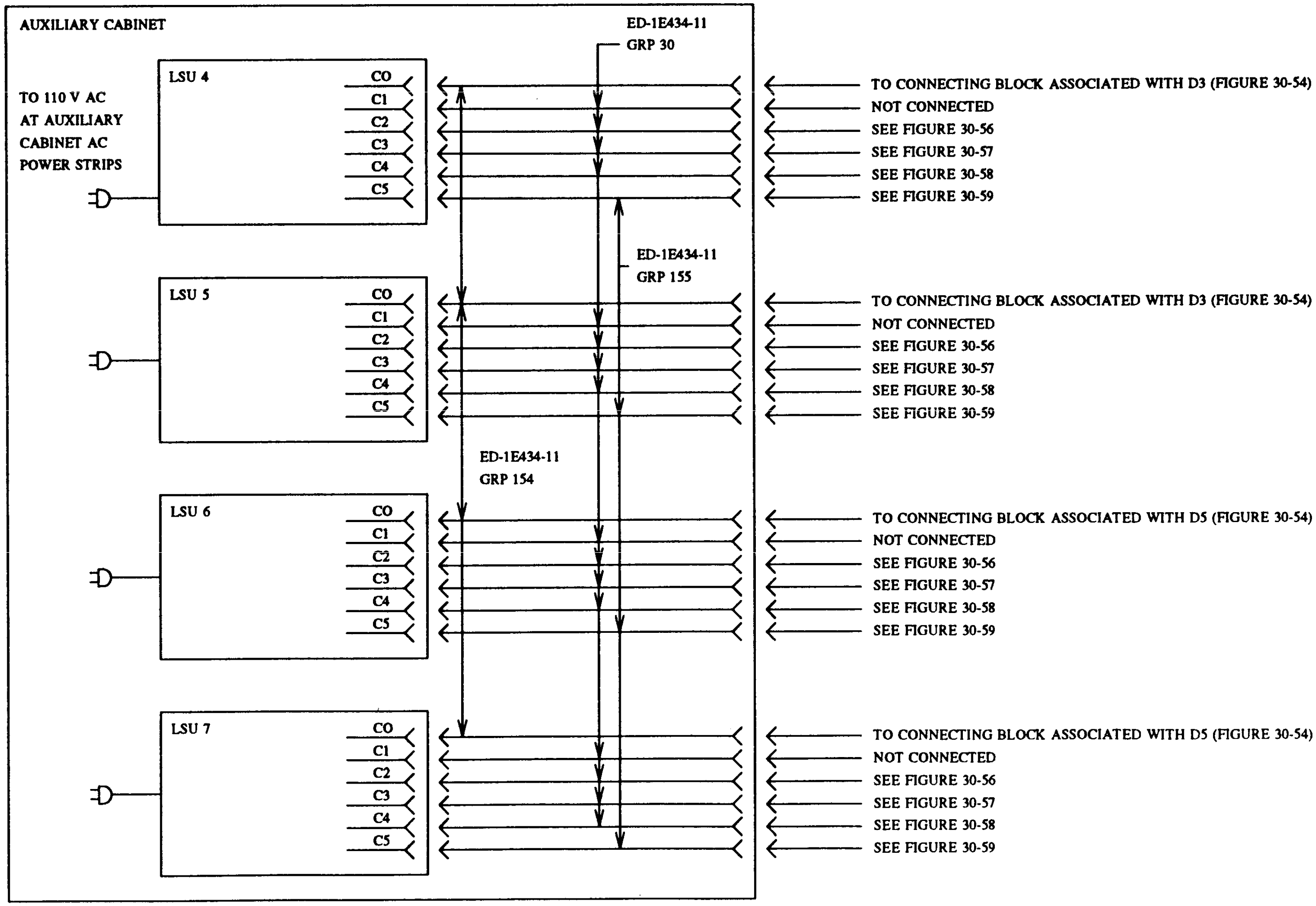


Figure 30-55. Connections at the LSU (LSU 4-7)

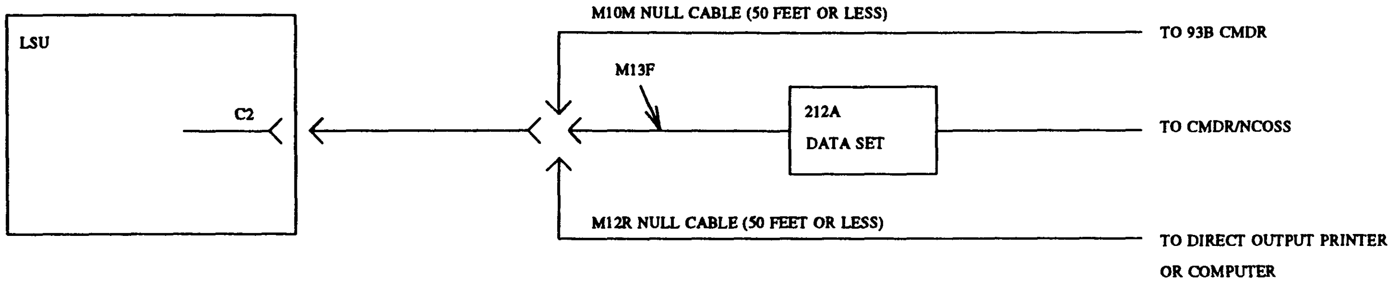


Figure 30-56. LSU Connector C2 Connections

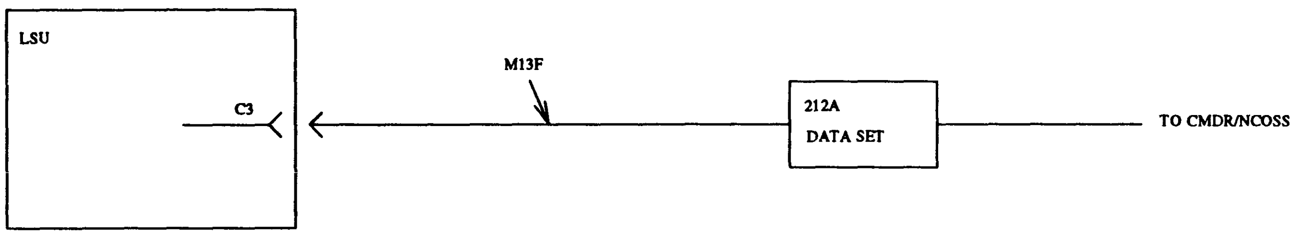


Figure 30-57. LSU Connector C3 Connections

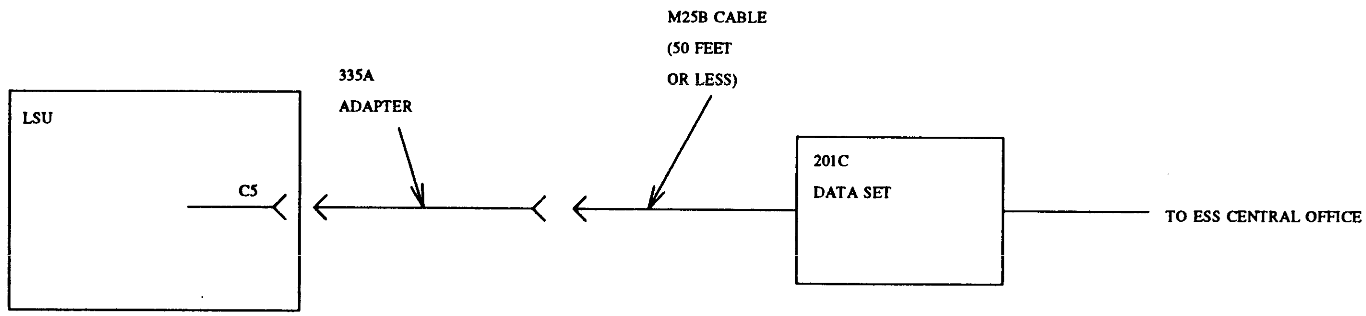


Figure 30-58. LSU Connector C4 Connections

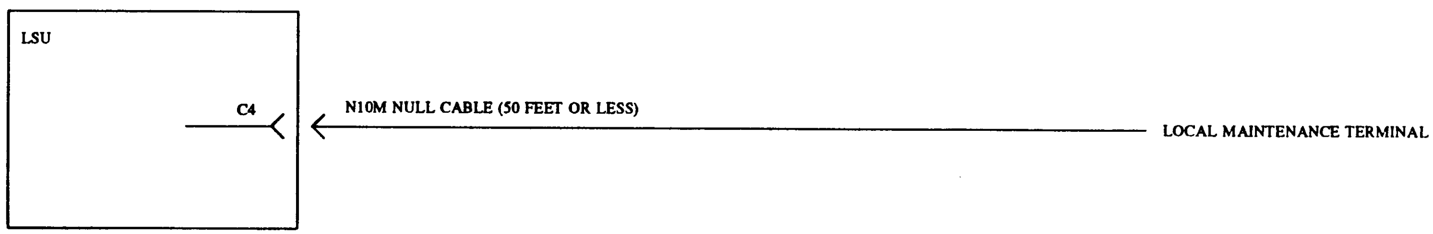


Figure 30-59. LSU Connector C5 Connections

See *chapter 10* for circuit pack terminations and connections.

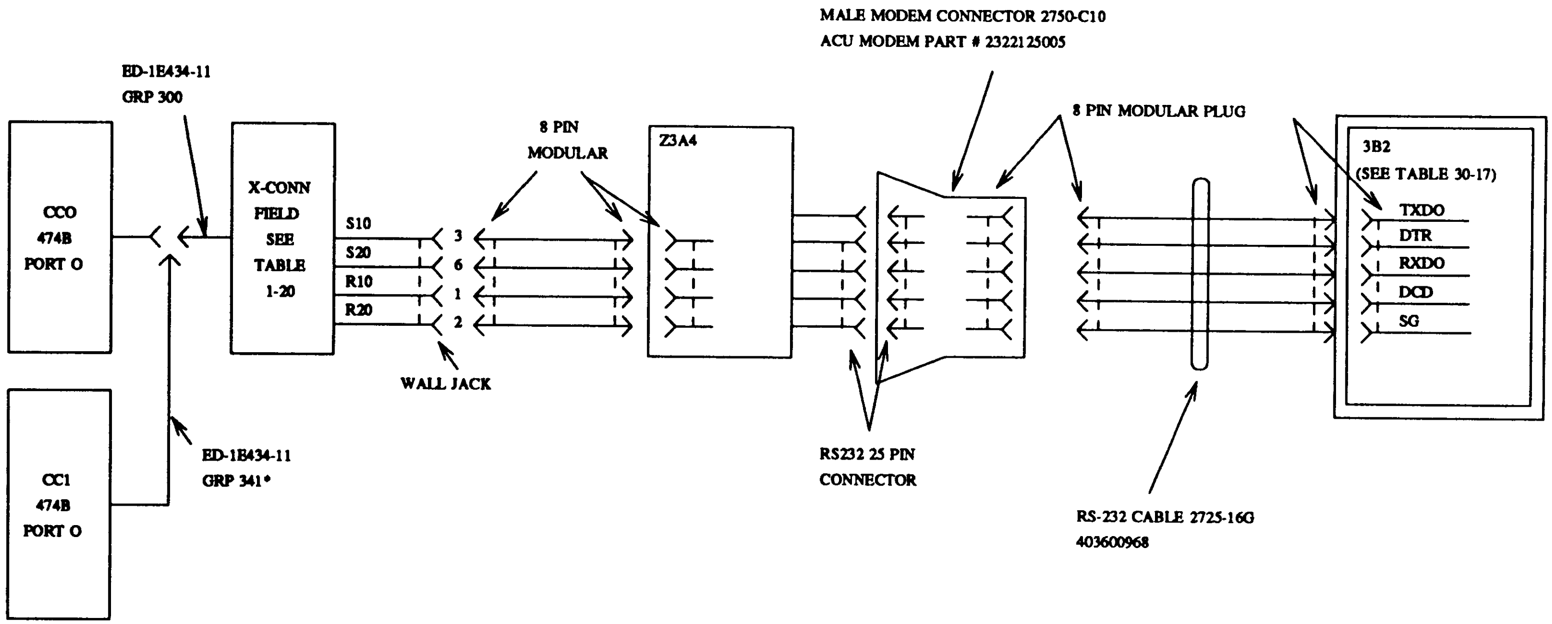


Figure 30-60. CDR Using 3B2

TABLE 30-16. Maximum TN474B to Cross-Connect Distances for CDR

MAXIMUM DISTANCE BETWEEN TN474B AND CROSS-CONNECT FIELD		
SPEED	WIRE SIZE	
	24 AWG	26 AWG
19.2 kb/s	2,000 FT	2,000 FT
9.6 kb/s	5,000 FT	4,500 FT
4.8 kb/s	7,000 FT	6,000 FT
2.4 kb/s	12,000 FT	10,000 FT
1.2 kb/s	20,000 FT	16,000 FT
300 b/s	40,000 FT	30,000 FT

***** Use “Y” Cable, GRP 341 for duplicated CC only.

Table 32-17. 3B2 Lead Designation — Pin Numbers for CDR

LEAD DESIGNATION	8 PIN MODULAR CONNECTOR PIN NUMBER	EIA-RS-232C PIN NUMBERS
TXDO	3	2
DTR	4	20
RXDO	5	3
DCD	6	8
SG	7	7

SMT

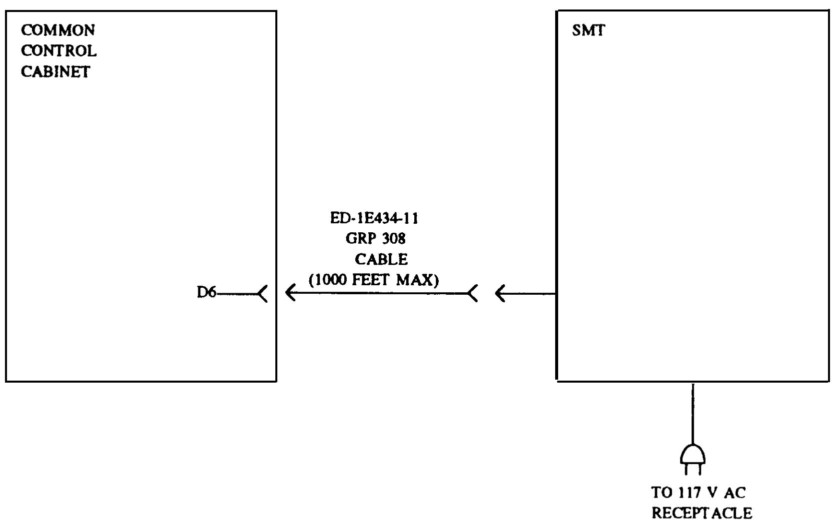


Figure 30-61. SMT Connections

TYPICAL VOICE TERMINAL CONNECTIONS TO SYSTEM CABINETS

See *chapter 10* for circuit pack connections and terminations.

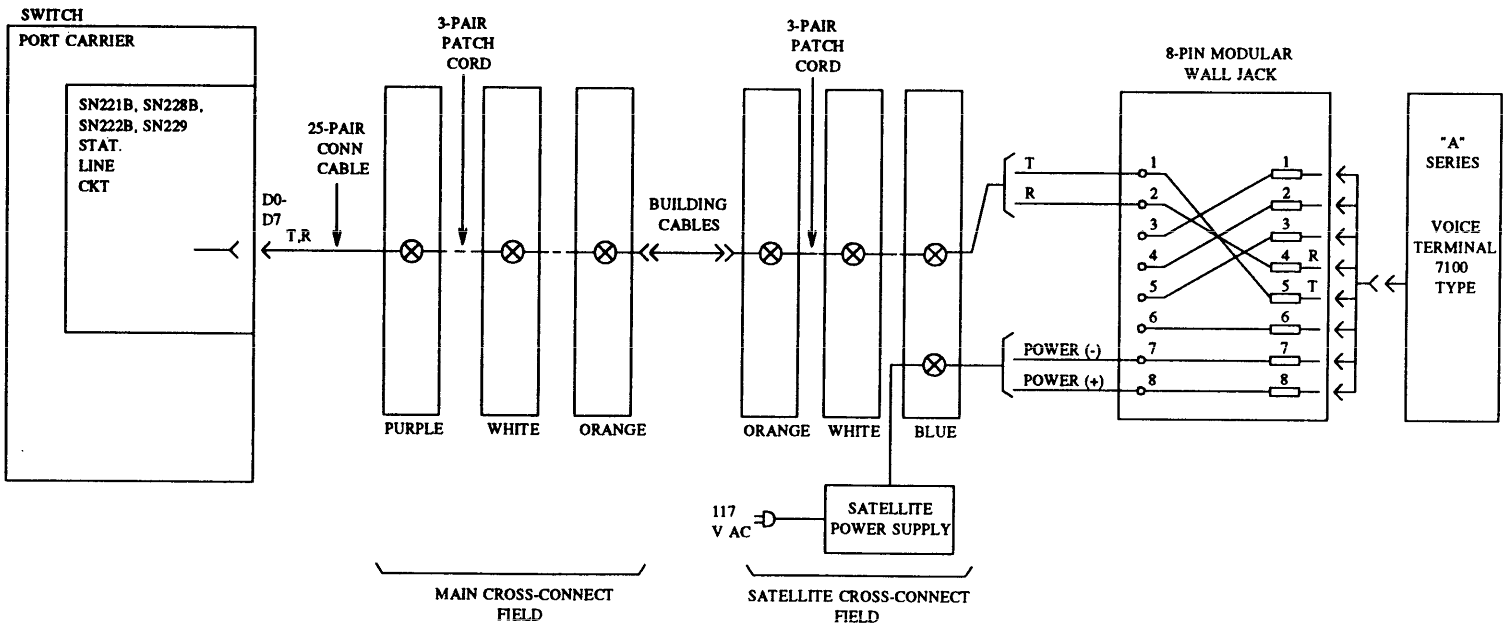


Figure 30-62. Typical A Series Voice Terminal Connections to Switch

See *chapter 10* for circuit pack connections and terminations.

WARNING

Connecting 2990-type MET set to wall jack having power applied to terminals 7 and 8 will damage the MET set.

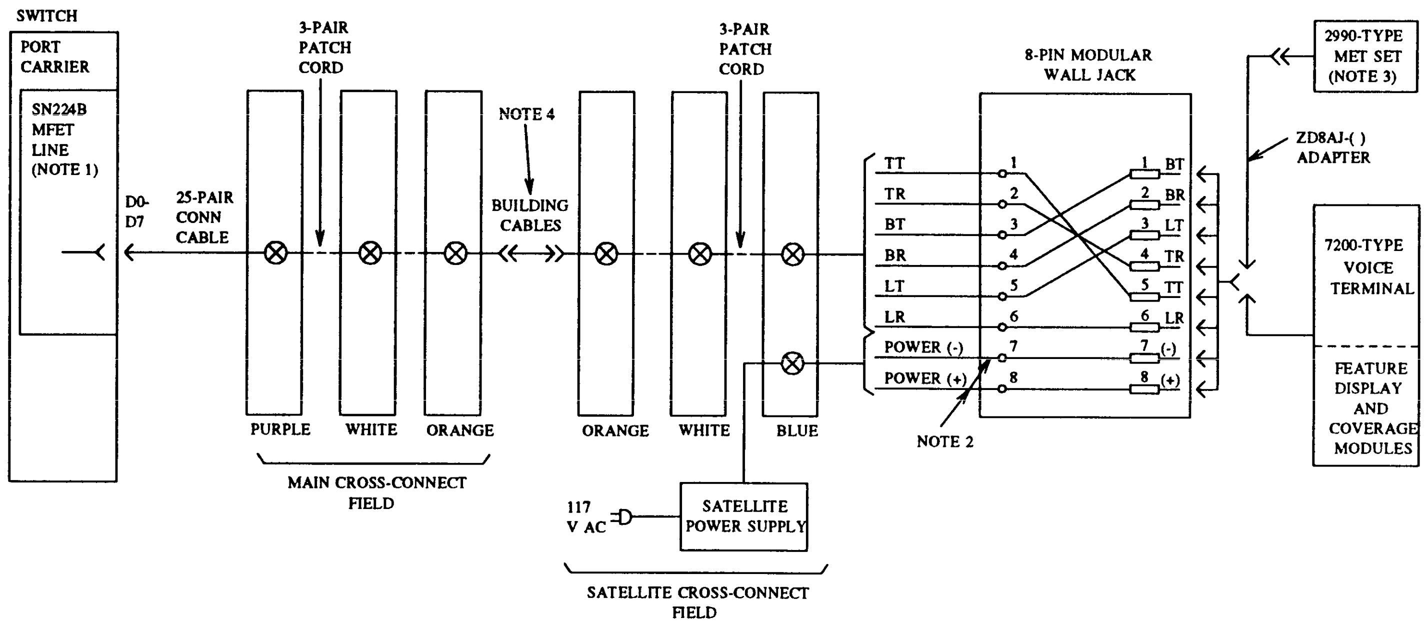


Figure 30-63. Typical Electronic Voice Terminal Connections to Switch

NOTES:

1. Option switch on line circuit pack must be set for MET set usage if pack serves one or more MET sets. See *Protection Devices for Hybrid or Digital* Voice *Terminals* section in this chapter.
2. Power leads must be removed at terminals 7 and 8 if MET set is connected to wall jack
3. MET set must be located within 1000 feet of switch cabinet.
4. If this is exposed cabling, see *Protection Devices for Hybrid or Digital Voice Terminals* section in the chapter for the proper protection device.

See *chapter 10* for circuit pack connections and terminations.

WARNING

Connecting 730X-H series voice terminal to wall jack having power applied to terminals 7 and 8 will damage the voice terminal.

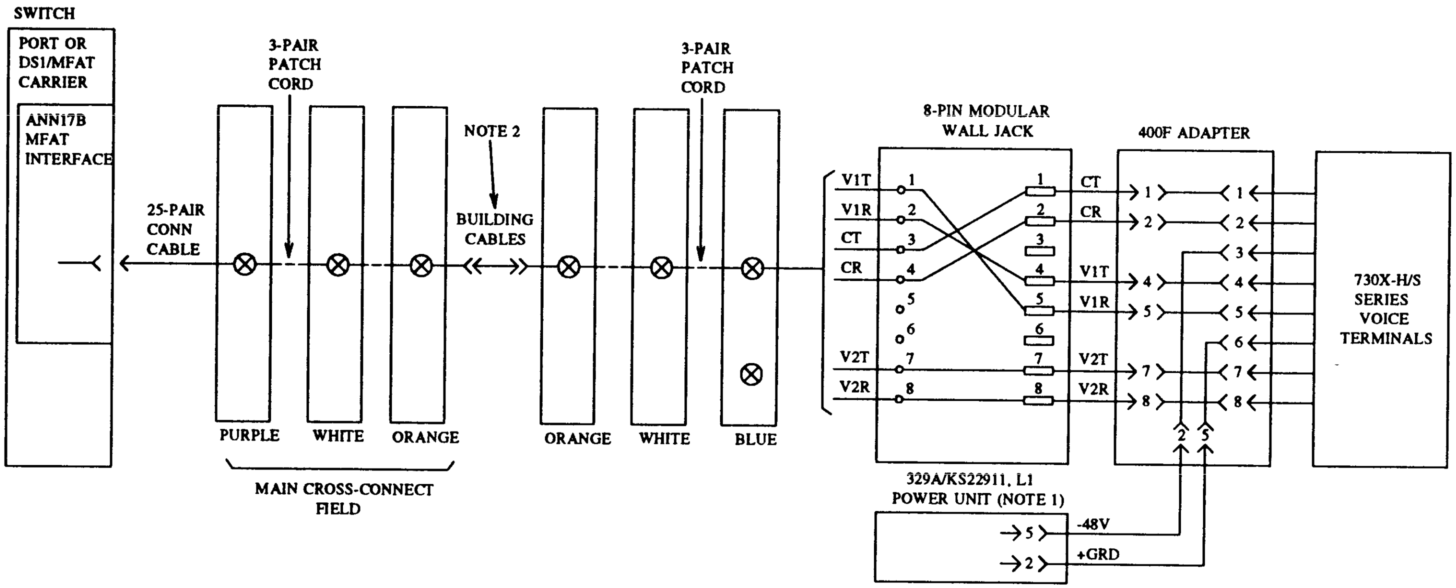


Figure 30-64. Typical Hybrid Electronic Voice Terminal (730X-H/S Series)

NOTES:

1. Auxiliary power unit enables voice terminals to operate at extended range.
2. If this is exposed cabling, see *Protection Devices for Hybrid or Digital Voice Terminal* section in this chapter for the power protection device.

See *chapter 10* for circuit pack connections and terminations.

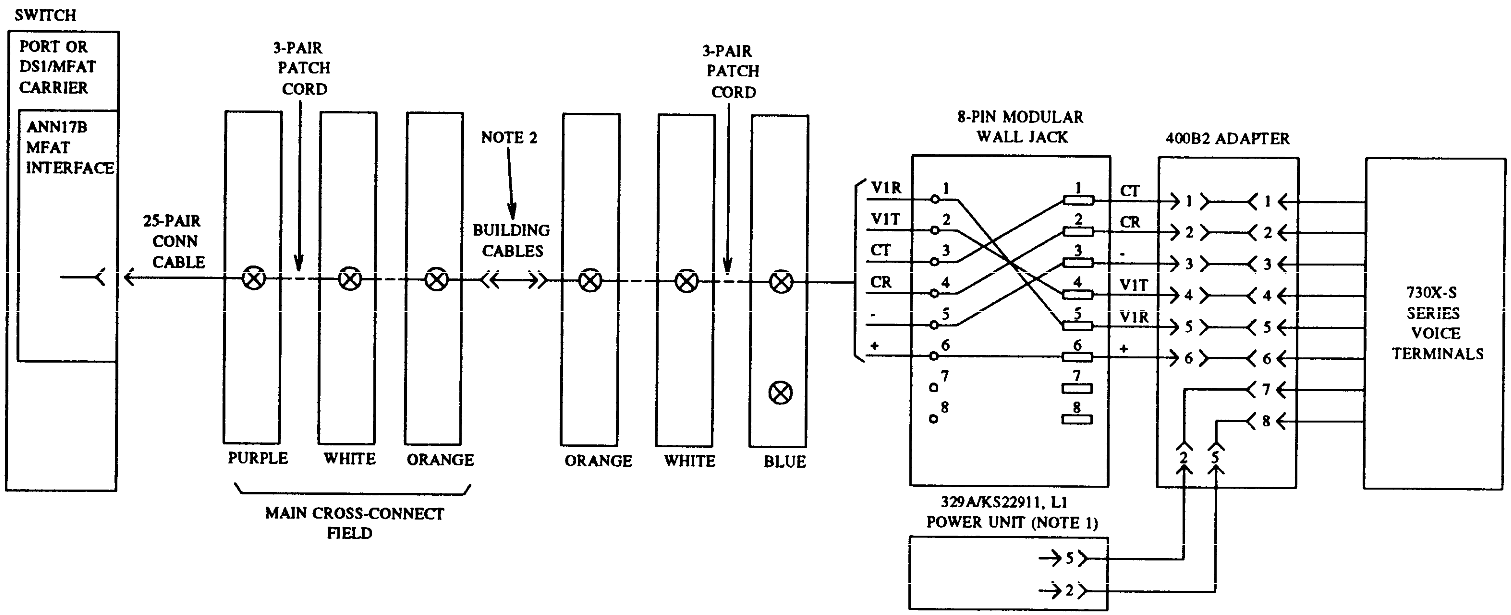


Figure 30-65. Typical Hybrid Electronic Voice Terminal (730X-S Series)

NOTES:

1. Auxiliary power unit enables voice terminal to operate at extended range.
2. If this is exposed cabling, see *Protection Devices for Hybrid or Digital* Voice *Terminals* section in this chapter for the power protection device.

See *chapter 10* for circuit pack connections and terminations.

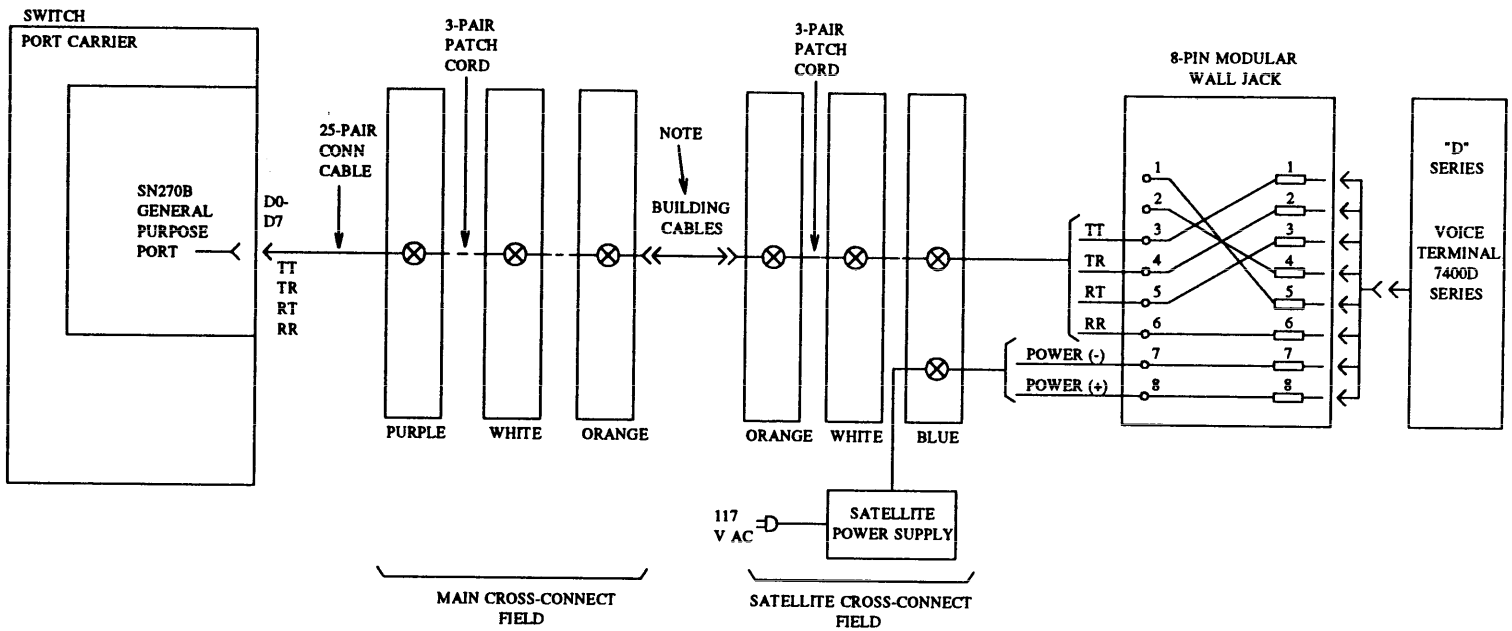


Figure 30-66. Typical Digital Voice Terminal Connections to Switch

NOTE: If this is exposed cabling, see *Protection Devices for Hybrid or* Digital Voice *Terminals* section in this chapter for the proper protection device.

PROTECTION DEVICES FOR HYBRID OR DIGITAL VOICE TERMINALS

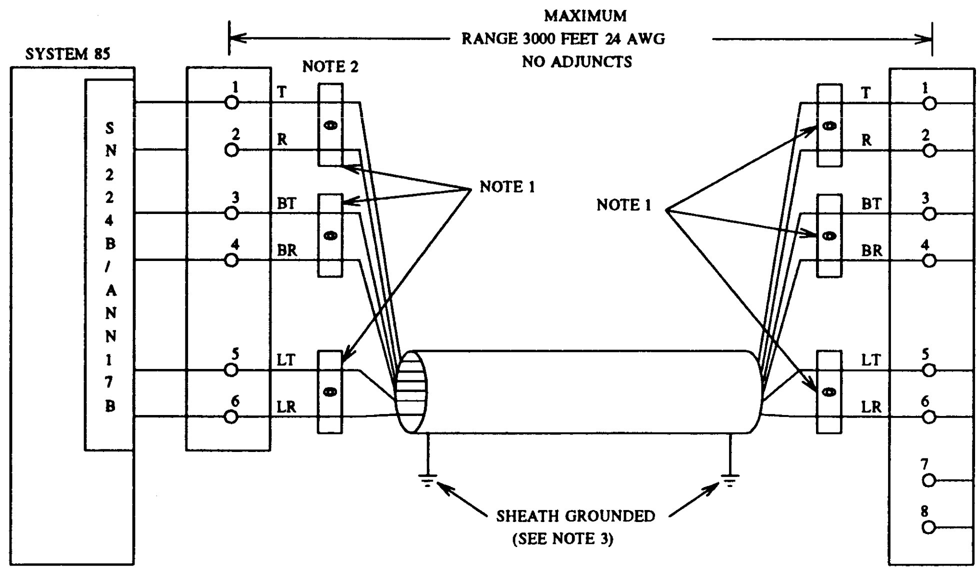


Figure 30-67. Port Powered 7200- and 7300-Type Hybrid Terminal

NOTES:

1. PDP or ITW protectors. Range is reduced if ITW protectors are used.
2. Switch-end protectors must be located adjacent to switch.
3. Cable must have an overall metallic sheath grounded at each end.

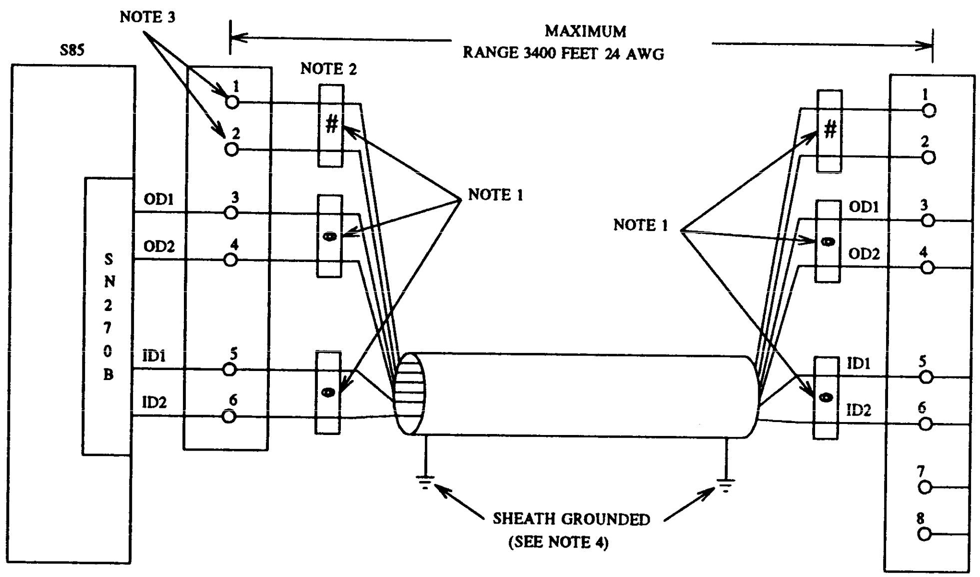


Figure 30-68. Port Powered 7400-Type Digital Terminal

NOTES:

1. Porta Delta Protector (PDP) or ITW protectors. # = standard protection range is reduced if ITW protectors are used.
2. Switch-end protectors must be located adjacent to switch.
3. Pair one not used in digital applications. Standard protection required.
4. Cable must have an overall metallic sheath grounded at each end.

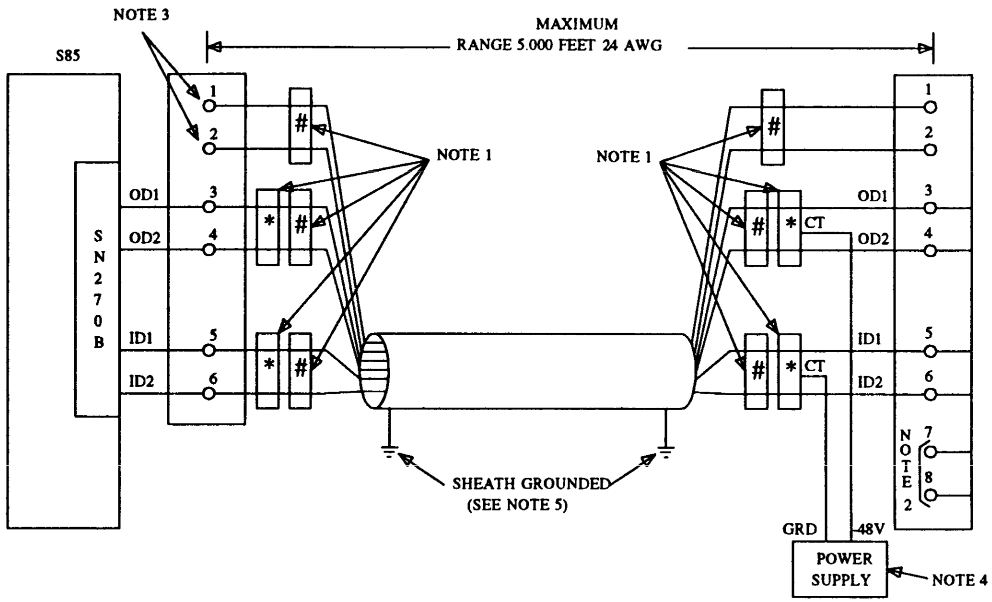
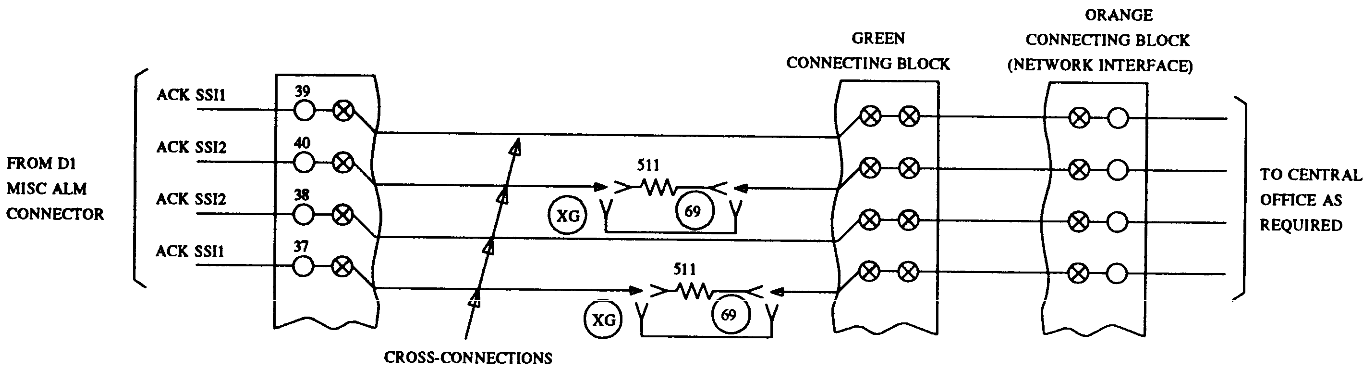


Figure 30-69. Locally Powered 7400-Type Digital Terminal

NOTES:

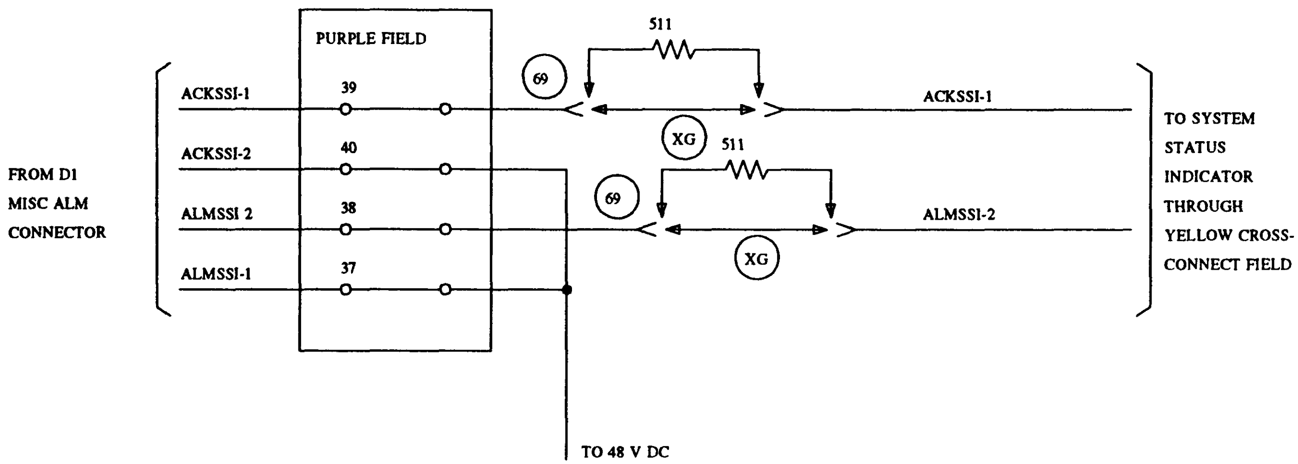
1. # = Standard protection * = Data link protectors
2. Power supply should be strapped to 7 and 8 to power adjuncts
3. Pair 1 not used in digital applications
4. Commercially powered digital terminal does not require power supply
5. Cable must have an overall metallic sheath grounded at each end

EXTENDING THE ALM AND ACK LEADS TO A REMOTE SYSTEM STATUS INDICATOR



OPTION	CONDITION
XG	UNEXPOSED CABLING USED
69	EXPOSED CABLING USED (511 RESISTOR MOUNTED AT CROSS-CONNECT FIELD ON 842155822 APPARATUS MOUNTING)

Figure 30-70. Alarms Connected Through the CO Only



OPTION	CONDITION
XG	UNEXPOSED CABLING USED
69	EXPOSED CABLING USED (511 RESISTOR MOUNTED AT CROSS-CONNECT FIELD ON 842155822 APPARATUS MOUNTING)

Figure 30-71. System Status Indicator Only

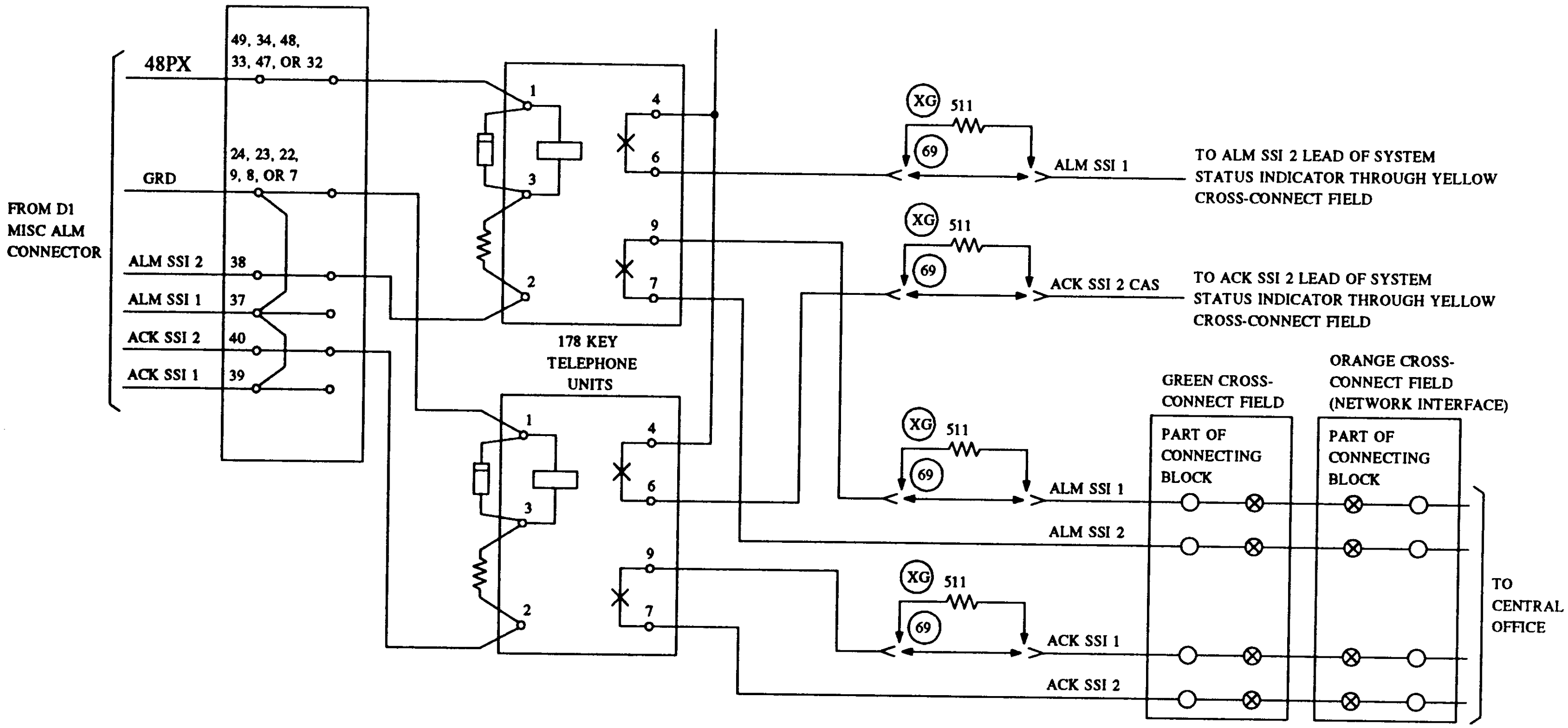


Figure 30-72. Alarms Connected to System Status Indicator and CO

AUXILIARY CABINET J58886N-2

The redesigned auxiliary cabinet, J58886N-2, now conforms to both the size and look of universal module cabinetry and hardware. The redesigned cabinet is 70 inches high by 32 inches wide and is 28 inches deep, including the rear doors. Both the traditional module frame and door have been replaced with that of the universal module.

The equipment connector panel is now incorporated within the cabinet, as are all power strip outlets. In addition, an improved power unit has been incorporated into the redesigned cabinet, as has a new fan unit. Locations of both the power unit and the fan assembly differ from those of the traditional cabinet.

These modifications do not require changes to current installation procedures, nor do they affect cabinet lineups. All external connections are identical to those made with the J58886N-1 auxiliary cabinet. In most cases, auxiliary cabinet connector panels are not used, because direct connections to auxiliary equipment are now fully supported.

Most importantly, power strip redesign results in altered powering capability and connectivity. It is critical that you review these changes before you proceed with auxiliary cabinet installation.

Please review this auxiliary cabinet redesign summary completely before you install the auxiliary cabinet and before connections to auxiliary equipment are made.

Auxiliary Cabinet Changes

This documentation supplement details the following changes to auxiliary cabinet hardware:

1. Conversion to universal module cabinetry: cabinet J58886N-2 replaces J58886N-1 for all future auxiliary cabinet shipments from the factory
2. Conversion to a new AC-to-DC power unit: the existing ITT 3947 rectifier has been eliminated, as has the J58889AK-1 AC power distribution unit
3. Conversion to a new power strip with both switched and nonswitched outlets
4. Conversion to a rear-mounted cabinet AC fan unit: this unit includes a removable, washable metal mesh filter

The following sections provided detailed information for each of these changes.

Auxiliary Cabinet Design: AC and DC Systems

CABINET APPEARANCE
IS IDENTICAL TO THE
UNIVERSAL MODULE

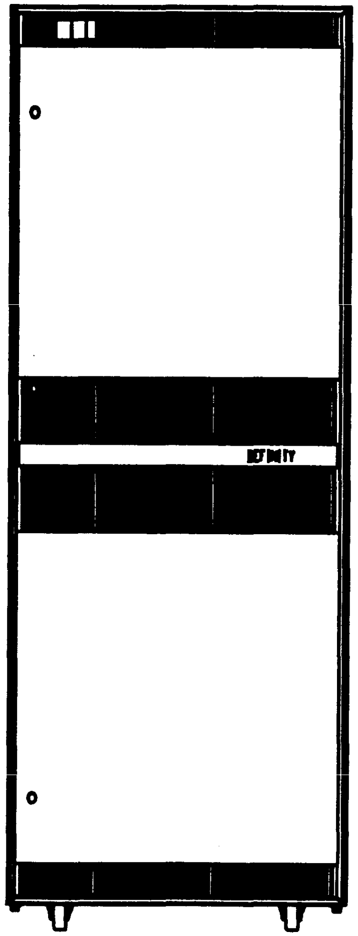


Figure 30-73. Auxiliary Cabinet (Front View)

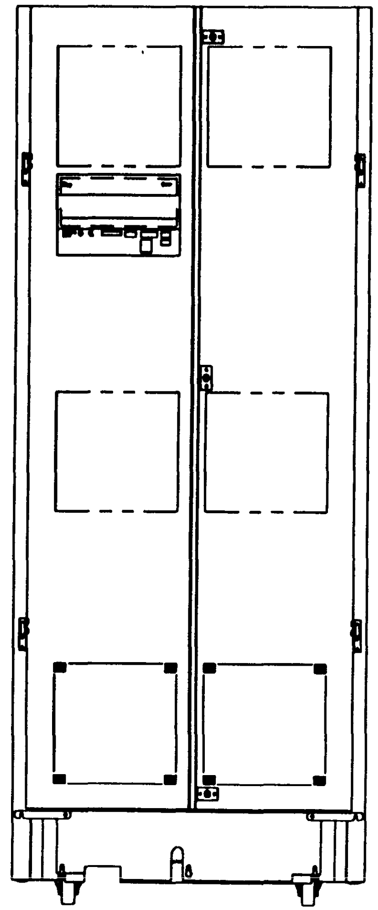


Figure 30-74. Auxiliary Cabinet (Rear View)

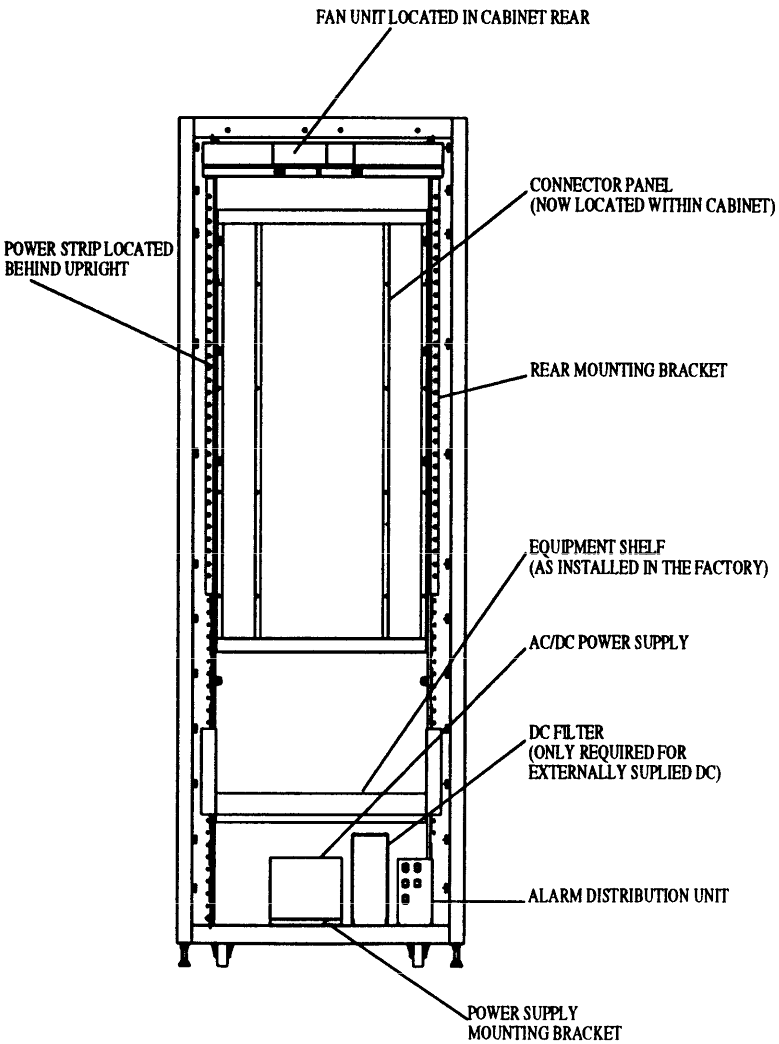


Figure 30-75. Auxiliary Cabinet (Front View with Door Removed)

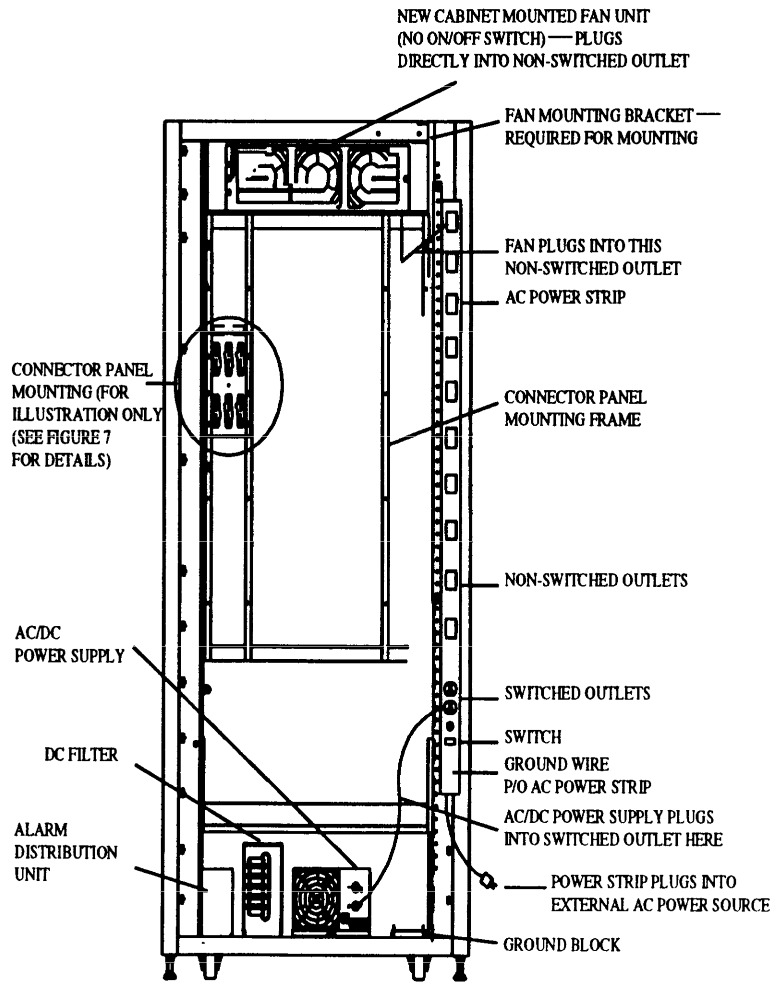


Figure 30-76. Auxiliary Cabinet (Rear View with Door Removed)

Auxiliary Cabinet Side and Top Views

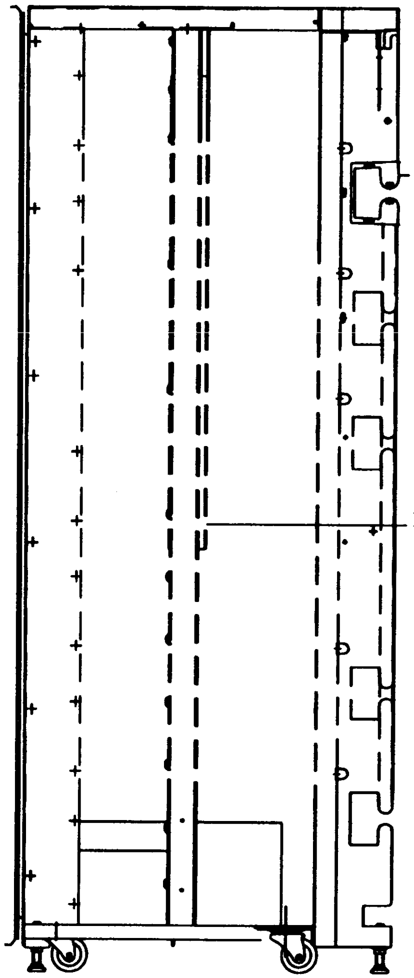


Figure 30-77. Auxiliary Cabinet (Side View)

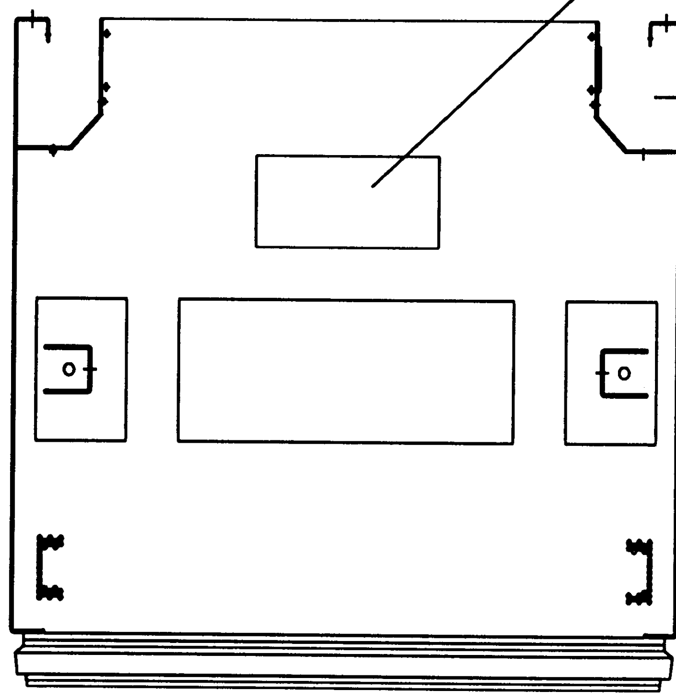


Figure 30-78. Auxiliary Cabinet (Top View)

Auxiliary Cabinet Power Specifics

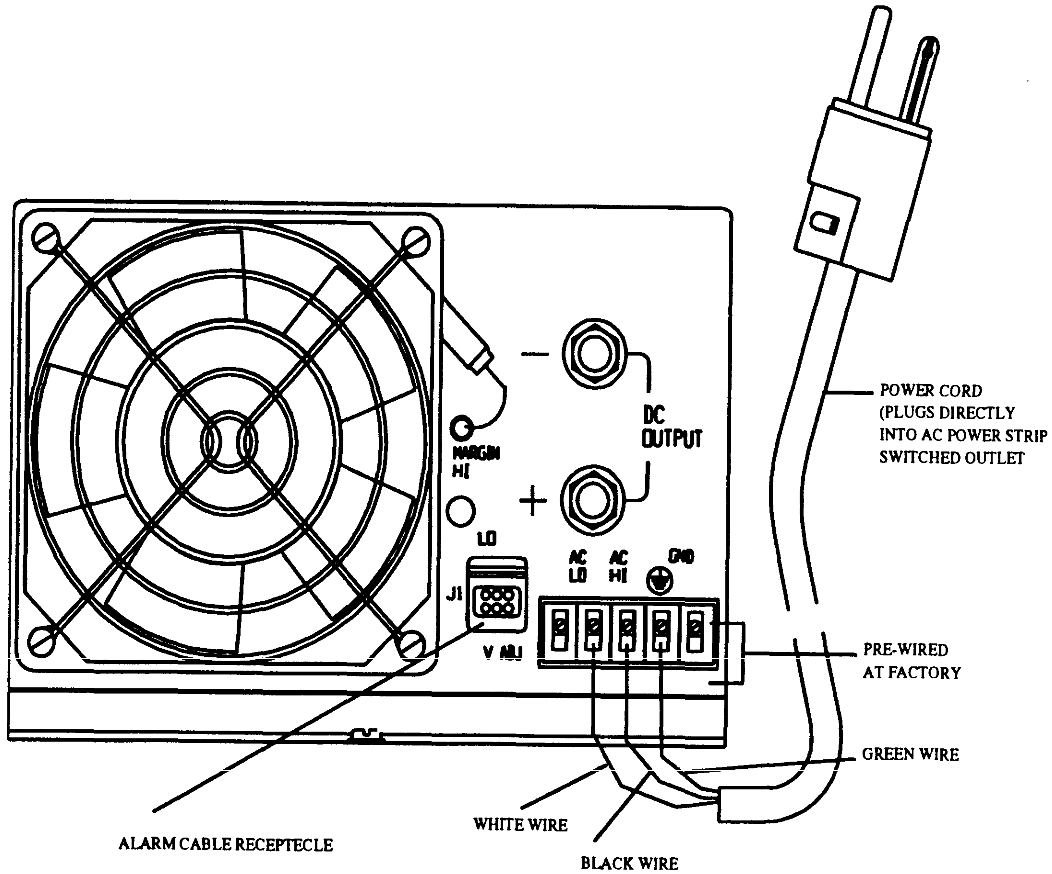


Figure 30-79. Auxiliary Cabinet AC to DC Power Supply (Rear View)

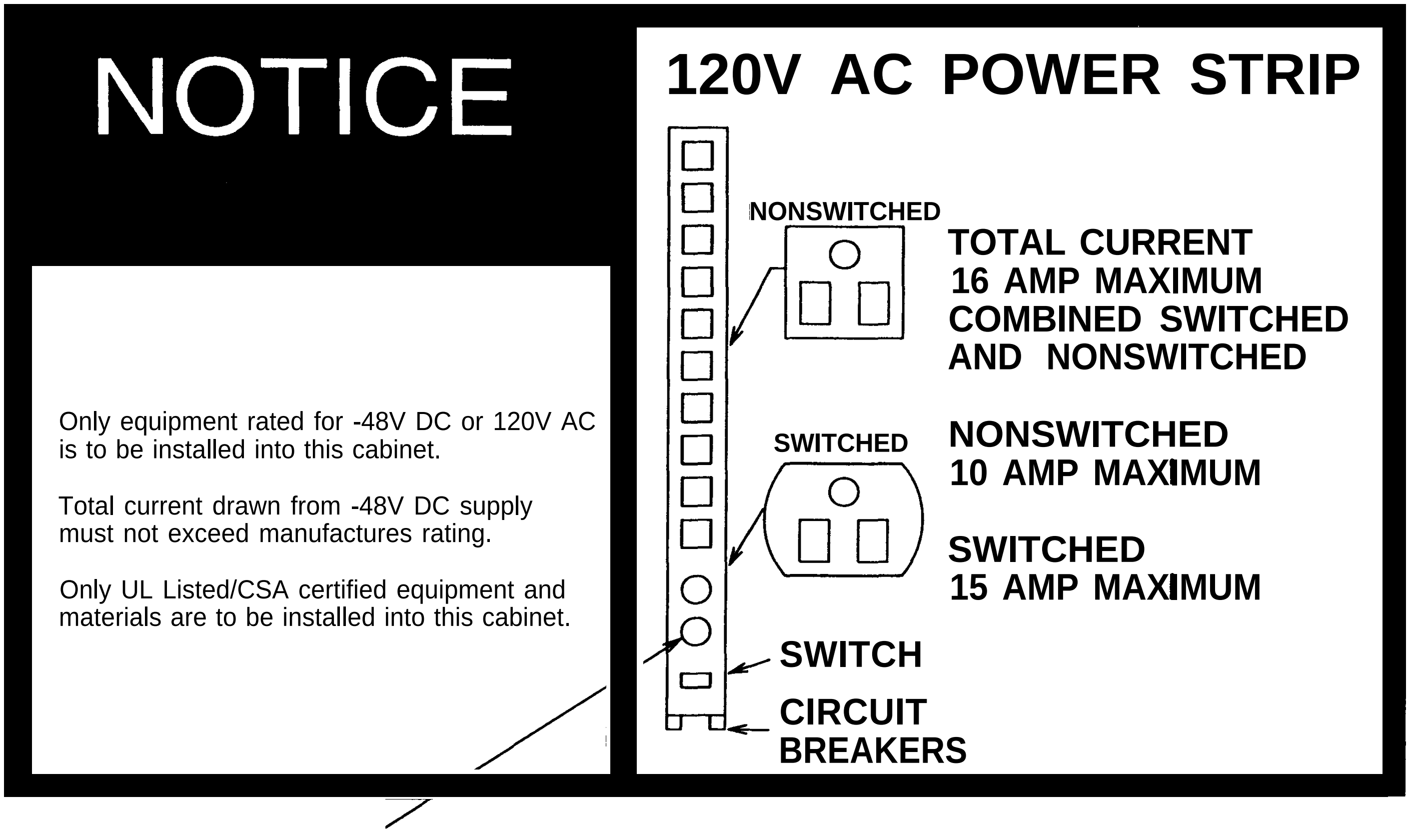


Figure 30-80. Auxiliary Cabinet Power Strip Options and Capacities

NETWORK SYNCHRONIZATION

The synchronization clock provides stratum 3 level timing consistency from the network to both System 85 and DEFINITY Generic 2 systems.

The following sections explain adapting System 85 and Generic 2 for the clock, making clock card switch settings, troubleshooting clock problems, and connecting the synchronization clock to System 85 and Generic 2.

Synchronization Clock Components

The synchronization clock is a Telecom Solutions Digital Clock Distributor™ for ensuring stratum 3 level timing consistency from the network.

The clock is housed in an AUDIX-sized cabinet that contains a shelf assembly with seven clock cards, either a dual power supply with battery backup for AC applications, or a connector with -48V and -48V RET terminals for DC applications. In addition, the synchronization clock includes an H600-293 Group 1 cable wired between clock backplane connector J13 and the back of the synchronization clock cabinet.

Synchronization clock cards include an alarm interface (PAI) card, two clock input (CI) cards, two stratum 3 (ST3) clock cards, and two composite clock timing output (TOCA) cards.

Figure 30-81 shows the synchronization clock carrier and associated cards. Table 30-18 lists synchronization clock components, card functionality, and associated AT&T comcodes.

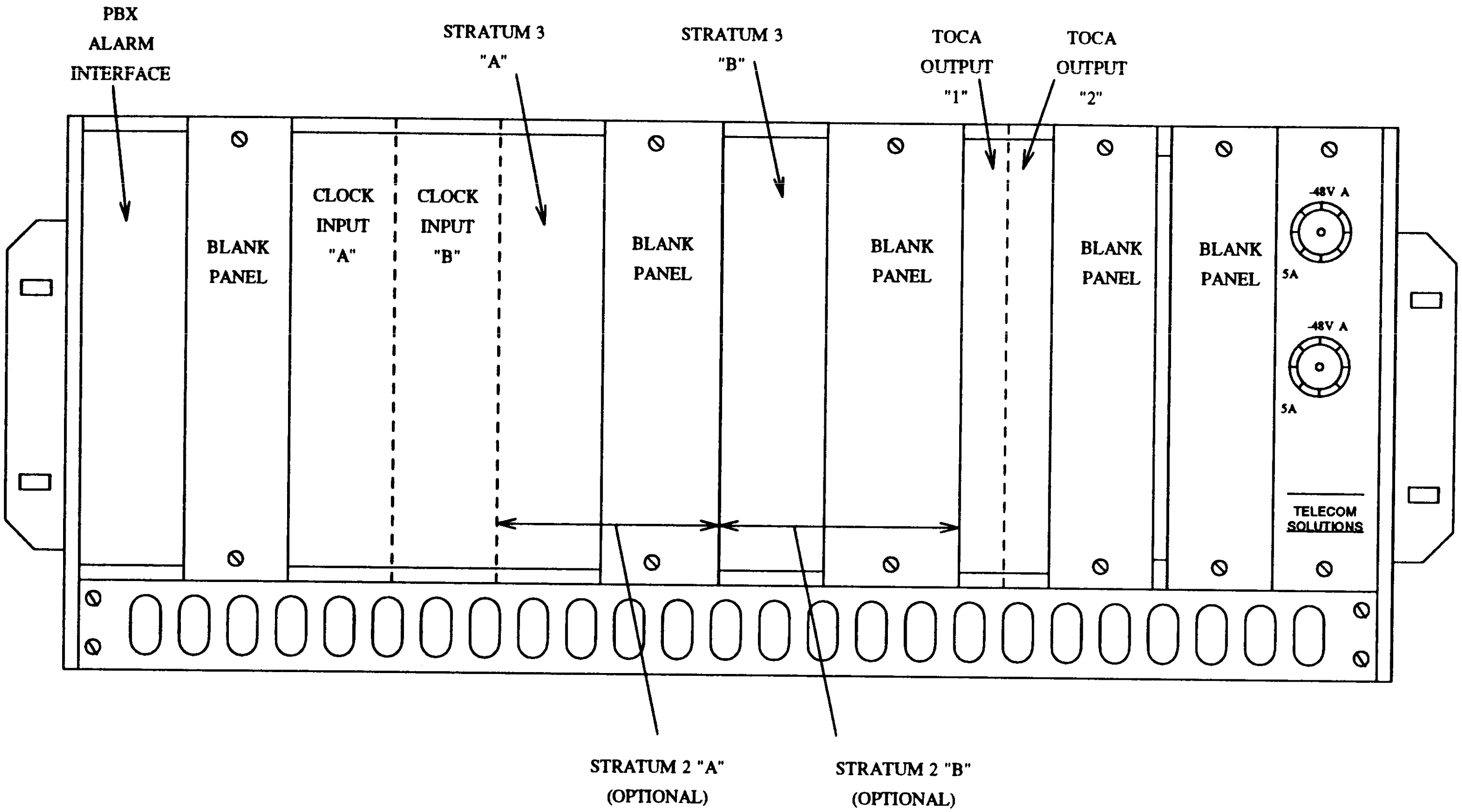


Figure 30-81. The Sychronization Clock Shelf

The following table lists clock components and associated AT&T comcodes.

TABLE 30-18. Clock Components, Functionality, and AT&T Comcodes

COMPONENT	FUNCTION	AT&T COMCODE
SHELF ASSEMBLY	HOUSES UP TO TWO TIMING OUTPUT CARDS, ONE ALARM INTERFACE CARD, TWO CLOCK INPUTS AND UP TO TWO STRATUM 3 CLOCKS.	405975608
CLOCK INPUT CIRCUIT PACK (CI)	RECEIVES DS1 INPUT REFERENCE AND FILTERS INCOMING JITTER.	405609215
TIMING OUTPUT COMPOSITE CLOCK (TOCA)	PROVIDES FOUR CC TIMING PORTS.	405975616
STRATUM 3 CLOCK (ST3)	PROVIDES STRATUM 3 HOLDOVER CLOCK AND INPUT REFERENCE STABILIZATION.	406292599
ALARM INTERFACE (PAI)	PROVIVEDS SYSTEM ALARM INTERFACE.	405976085
2.5 A-HOUR BATTERY PACK (GATES)		403302912
-48V POWER UNIT		406020735
BATTERY CHARGER		405999376

Synchronization Clock Card Displays

Synchronization clock card LED displays are shown in the following figure.

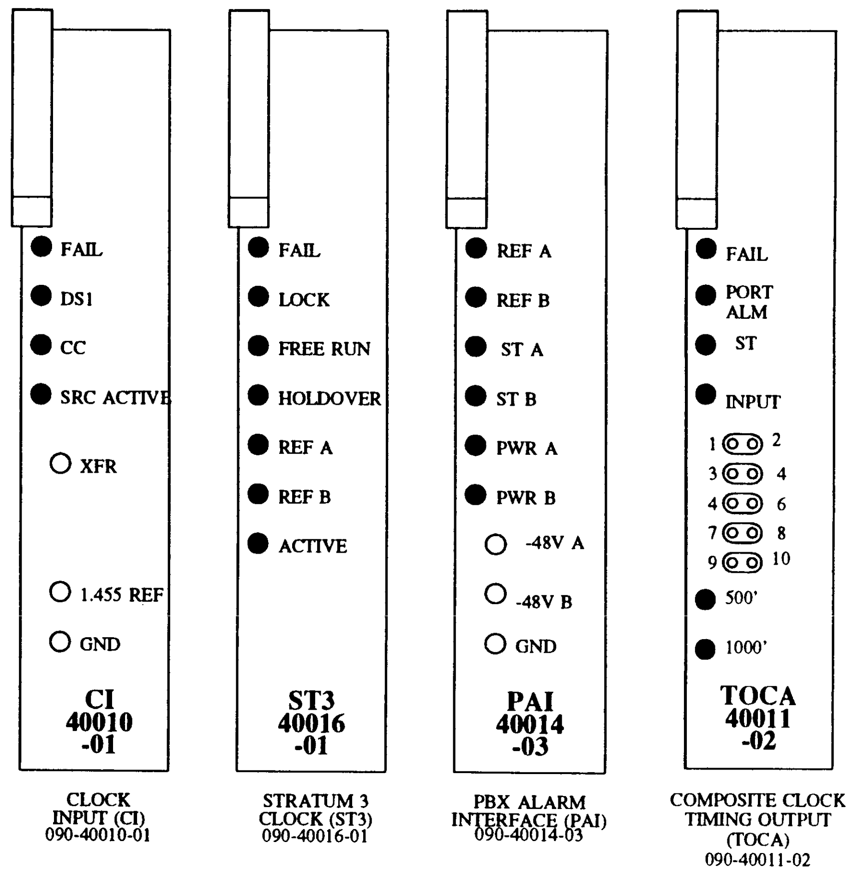


Figure 30-82. Synchronization Clock Card Displays

Synchronization Clock Installation Tasks

The synchronization clock comes fully assembled; card switch settings are the only changes necessary to the synchronization clock prior to installation.

All wiring between and within the clock shelf assembly and the clock cabinet is complete before the clock is shipped.

Installing the synchronization clock involves the following major tasks, each of which are described in subsequent sections of this book:

1. Determine floor plan and equipment room requirements; provide earthquake protection if necessary.
2. Make synchronization clock switch settings.
3. Connect the following equipment:
   - J58909A-1 cabinet
   - Traditional module, universal module, or TMS control carrier
   - Channel service unit
   - DS1/MFAT or common port carriers
   - CC carriers

   All of the above connections, with the exception of those between the channel service units and the DS1/MFAT or common port carriers, are made at the yellow cross-connect field. The number of cables requires connection points, cable types and connector types depends on the configuration of the system and of the clock.
4. Make AC or DC power connections.
5. Troubleshoot the synchronization clock as and if required.

Floor Plan Requirements and Stacking Considerations

Cable length between the synchronization clock and the System 85 or Generic 2 system must not exceed 3000 feet.

Cable length between the clock and the channel service unit (CSU) must not exceed 655 feet.

Cable length between the input terminals on the DC synchronization clock cabinet and the DC power panels (at the battery plant) must not exceed 600 feet with AWG 6.

The synchronization clock cabinet should not be stacked on other cabinets, nor should other cabinets be stacked on the synchronization clock cabinet. If stacking cabinets is necessary, never stack more than three high. An engineer must certify floor load capacity before any cabinets are stacked.

Stacked cabinets require that both the System 75 XE and synchronization clock cabinets be serviced from the same AC load center.

Earthquake Protection

Earthquake protection may be required for a two-cabinet configuration according to local code. For new or upgrade two-cabinet systems that require earthquake mounting, an earthquake protection kit must be installed as follows:

1. *Concrete Floors:* All four corners of the base synchronization clock cabinet must be anchored to a concrete floor using the bolts and floor-anchor hardware contained in ED-1E496-70 Group 5. Four 3 ½ by 2 ¾ inch (7-cm) long bolts fasten the cabinet to the floor; one or more disks may need to be removed to access the holes in front, and the power supply must be shifted to access the two holes in the rear.

   The earthquake protection hardware must be installed and the base cabinet bolted in place before the additional cabinet is added, since the two-cabinet arrangement should never be moved after both cabinets are attached.

2. *Raised Floors:* Conditional earthquake protection may be possible in raised-floor applications if all four corners of the base cabinet are anchored to a concrete subfloor under the raised floor using the hardware in ED-1E496-70 Group 4. This group includes four 24-inch (60-cm) threaded rods, which must be cut to size and inserted through the four holes in the base cabinet.

   For some older AUDIX-S to two-cabinet upgrades, four holes may need to be drilled over the documentation slot in the base cabinet so the front cabinet plate can be attached. Two additional holes may also need to be drilled under the power supply.

   Exposed components must be protected with a plastic sheet during drilling. All metal filing and drilling debris must be removed prior to powering up the system.

Power and Grounding Considerations

AC Systems

AC Feeder Circuit: The three modules in the power carrier use linear technology and therefore impose no special requirements on AC power distribution. A standard 120V AC, 15 Ampere-rated feeder circuit is recommended.

Safety Ground: The synchronization clock cabinet does not require additional grounding. The green wire safety ground is connected to the cabinet via the power carrier and the three conductor power cord. There is no need for additional cabinet grounding.

Single Point Ground Connection: The synchronization clock cabinet does not require a connection to the system single point ground.

Power Carrier Module Replacement: No danger of exposure to high voltage exists when replacing either of the redundant power supply modules or the battery charger module. Ensure, however, that the power module being serviced is turned off. In addition, ensure that AC input power is disconnected before servicing the module. Unplugging both AC synchronization cabinet power cords will interrupt DC power to the synchronization clock carrier, thus impacting service.

DC Systems

Power Lead Wire Size: The minimum wire size that can be used with the standalone synchronization clock cabinet is AWG 6. This size wire is necessary because the mimimum battery plant circuit breaker size is 20 Amperes and worst case wire temperature rise should be limited to 10 degrees C above ambient.

CAUTION

The AWG 6 wire is and should be a very tight fit in the mounting terminal strip. Take care when installing the wire, therefore, to insert the wire so that all strands fit within the terminal.

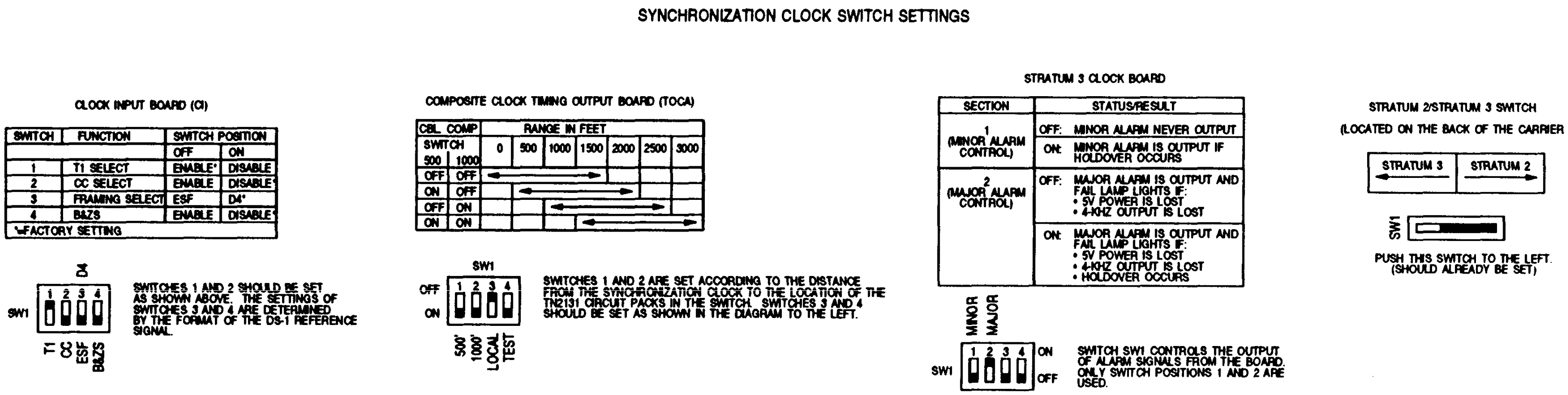
Distance Limitations: Cable length between the input terminals on the DC synchronization clock cabinet and the DC power panels (at the battery plant) must not exceed 600 feet with AWG 6.

Safety Ground: As with other DC cabinets, the cabinet skin must be connected to safety ground via the distribution conduit or by means of a strap to an adjacent DC cabinet. (You will find the ground lug at the upper left corner of the back of the cabinet.)

Synchronization Clock Installation Procedures

The following steps detail preparing an in-service DEFINITY™ Generic 2 or System 85 system for the synchronization clock once the clock has been properly mounted.

1. Ensure that all TN492C cabling is properly connected to all external alarms by connecting the D6 cable to the yellow wall field.
2. Connect all cables at the cross-connect field and run these cables from the cross-connect field to the synchronization clock, TN2131(s), and CSU(s).
3. Make AC or DC power and ground connections.
4. Modify synchronization clock circuit pack switch settings. Settings must be adjusted on circuit packs within the clock, on the two input (CI) cards, on the Stratum 3 clock cards, and on the output (TOCA) cards. Switch settings are defined in the following figure.



NOTE: On all four switches, white indicates the position of the slide switch.

Figure 30-83. Synchronization Clock Switch Settings

5. Set the "SW1" slide switch on the back of the clock toward the "STRATUM 3" label.

6. De-administer the TN463 (SCS) using PROCs 250 and 260.

   Using PROC 260, fields 12 and 13 must be displayed removed, and changed for both primary and secondary references.

   Using PROC 250, field 11 must be displayed, removed and changed. The TN463 will reside in either the TMS or MC depending on the configuration of the system.

   System administration is explained fully in *DEFINITY™ Communications System Generic 2 Administration Procedures* (555-104-506), and in *DEFINITY™ Communications System Generic 2 Administration of Features and Hardware* (555-104-507).

7. Use maintenance PROC 631 test 2 to busy out DS1s connected to the TN463s.

8. Remove TN463s from the carriers in which they reside. Depending on your system configuration, these circuit packs reside in either the TMS, CC/TMS, or MC.

9. Disconnect and remove the cables between the TN463s and their associated DS1 ports.

10. Using PROC 620, test 2, busy out T1 carriers.

11. Replace DS1 cables at the CSU as follows:

    — Disconnect the Group 380 or H600-307 cable from the CSU and replace it with an H600-274, Group 1 or Group 2.

    — Reconnect the Group 380 or H600-307 cable, which connects to the DS1 interface board, to the side of the H600-274 Y-cable marked SYSTEM.

    — Connect the other side of the Y-cable (marked CLOCK) to the yellow cross-connect cable, also marked CLOCK.

12. Based on switch configuration, install either the H-600-260 cable (for traditional single or multi-module systems) or H-600-271 cable (for universal modules) as follows:

Traditional modules

- *Single-module systems*

  a. Attach the AP1 connector on the H-600-260 cable to slot 02 (pins 010 through 024) on the rear of the backplane in the module control carrier(s). See Figure 30-84 for pin locations.

  b. Attach the rear connector panel (846387124) to the back of the switch cabinet at a location that can be reached by the Amphenol connector on the H-600-260 cable.

  c. From inside the cabinet, attach the Amphenol connector on the H-600-260 cable to the rear connector panel that you installed in step b.

  d. Connect the 25-pair cable (from the yellow cross-connect field) to the Amphenol connector on the rear connector panel.

- *Multi-module systems*

  a. Attach the AP1 connector on the H-600-260 cable to slot 20 (pins 010 through 024) on the rear of the backplane in the TMS carrier(s). (See Figure 30-84 for pin locations.)

  b. Attach the connector mounting bracket (846444289) to the black plastic flat cable clamp as shown in Figure 30-85.

  c. Connect the Amphenol connector on the H-600-260 cable to the connector mounting bracket.

  d. Connect the 25-pair cable (from the yellow cross-connect field) to the connector mounting bracket.

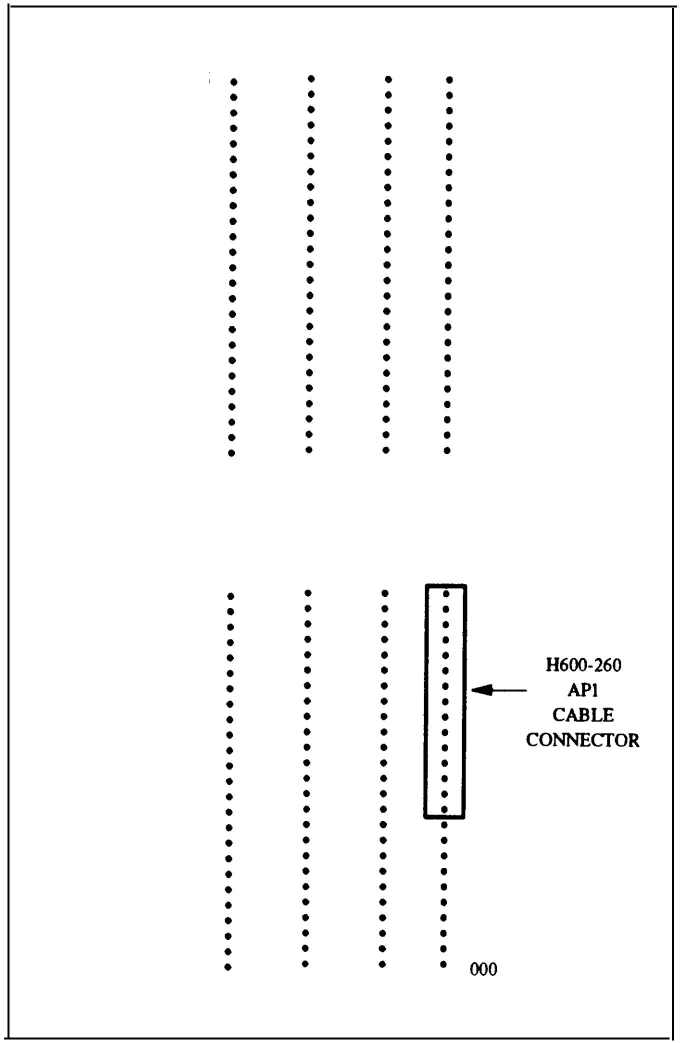


Figure 30-84. H-600-260 Cable Attachment to Backplane

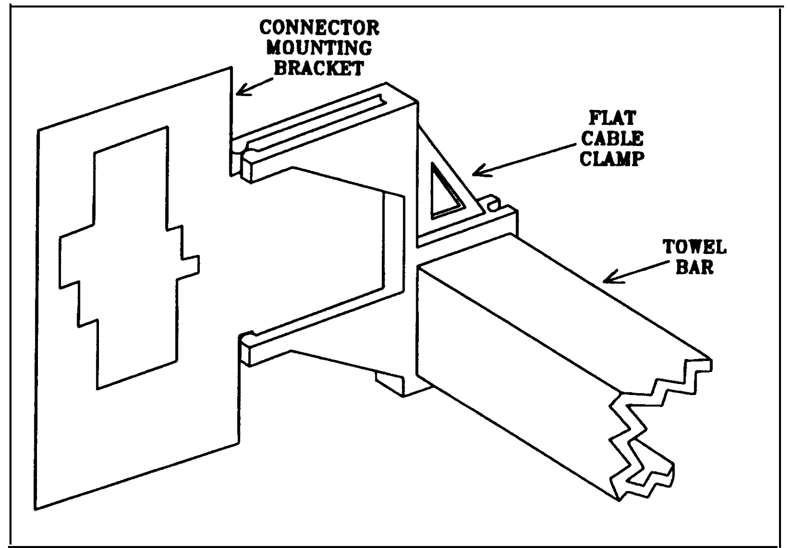


Figure 30-85. Connector Mounting Bracket

Universal modules

a. Attach the EXT CLK (AP1) connector on the H-600-271 cable to slot 14 (pins 010 through 024 and 110 through 124) on the backplane in the module control carrier(s). See Figure 30-86 for pin locations. Make sure that the other end of the H-600-271 cable is connected to the external clock (EXT CLK) connector on the connector panel. The external clock connector may not be labeled. It is the connector between LGI and RSVD1 on the connector panel.

b. Connect the 25-pair cable (from the yellow cross-connect field) to the external clock connector on the connector panel.

13. Insert the TN2131 (ECI) in the slot from which the TN463 was removed.

14. Connect the appropriate 25-pair cable to the synchronization clock.

15. Turn on the synchronization clock power supplies first, then the battery backup. Check LED displays for alarms associated with incorrect wiring
16. Return the DS1s and T1 carriers to service.
17. Run maintenance PROCs 618 and 625, test 1. Clear slips with PROC 625, test 2 if necessary.

The TN767 requires cable H600-307, Groups 1 through 8 between the DS1 port board and the H600-274 Group 2 Y-cable. The ANNlIE and ANN35 require cable 1-E434, group 380 (Group 1 and 2) or “Y” cable.

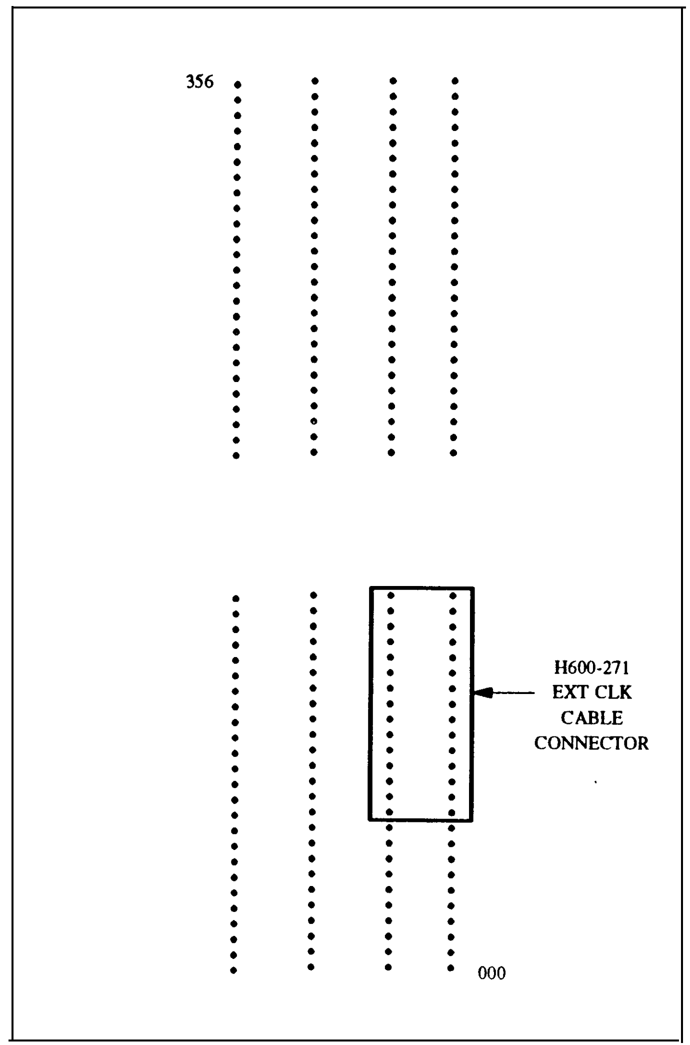


Figure 30-86. H-600-271 Cable Attachment to Backplane

Synchronization Clock Connectivity

The following figures and associated tables provide connectivity specifics for the following configurations:

- Single module system with or without duplicated traditional module controls: duplicated clock with two clock output boards
- Single module system with or without duplicated universal module controls: duplicated synchronization clock with two clock output boards
- Multi-module system with or without duplicated TMS: duplicated synchronization clock with two output boards

Wallfield Connectivity

The synchronization clock can be connected to a duplicated or unduplicated TMS/Mod. Control. If the clock is connected to an unduplicated module or TMS control, the clock requires wallfield space for 125 pair in consecutive blocks. If the clock is connected to a duplicated module or TMS control, the clock requires wallfield space for 150 pair in consecutive blocks.

Three options exist for making these wallfield connections. In order of preference these options are as follows:

- Yellow field — Already established but not dedicated to other equipment.
- Spare field — Generally available to meet small field needs such as the synchronization clock Convert needed area to a yellow field dedicated to the clock.
- 110A-300 — As a last resort install a new 110A-300 block on or near the main distribution field and dedicated to the clock.

An additional 25-pair block is needed to connect the EXTEQMJ and EXTEQMN leads to the block marked D6. Two sections (110C-4) of a 25 pair row must be popped from their mounts and daisy chained. Any wires to which these sections are connected must be cut and cleaned before the sections are chained. Label one block EXTEQMJ and one block EXTEQMN as shown in the following figure:

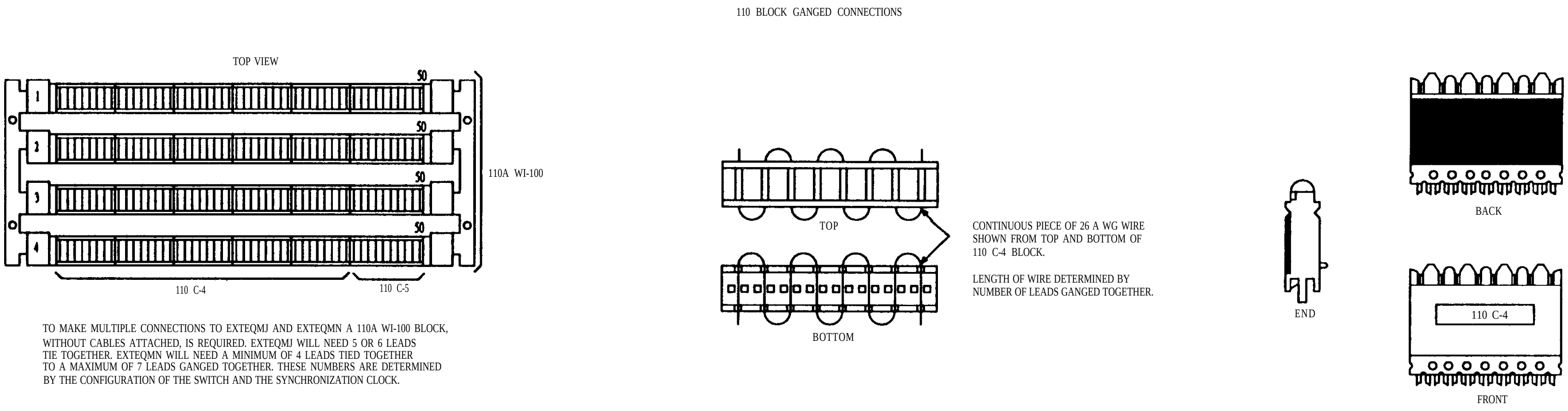


Figure 30-87. Making Wallfield Connections

Synchronization Clock and System Connectivity Tables

Lead names for the complete synchronization clock system are defined as follows. Lead designations are grouped by function rather than in alphabetical order. The first group comes from the synchronization clock. This group also includes the leads in J14 and J16 on the back of the clock carrier, which are not routed to the yellow wall field.

- TREFx - Timing reference 1 or 2, Tip lead DS-1 inputs.
- RREFx - Timing reference 1 or 2, Ring lead DS-1 inputs.
- REFxLST - One side of the alarm relay that indicates that a timing reference has been lost. x is 1 or 2. This can also indicate the failure of an input board.
- REFxRTN - The other side of the alarm relay.
- BREFLST - One side of the alarm relay that indicates that both timing references have been lost. This can also indicate the failure of both input boards.
- BREFRTN - The other side of the alarm relay.
- SCLKLST - One side of the alarm relay that indicates that one clock board has failed.
- SCLKRTN - The other side of the alarm relay.
- BCLKLST - One side of the alarm relay that indicates that both clock boards have failed.
- BCLKRTN - The other side of the alarm relay.
- SPWRLST - One side of the alarm relay that indicates that a power source has failed.
- SPWRRTN - The other side of the alarm relay.
- BPWRLST - One side of the alarm relay that that indicates that a power power sources have failed.
- BPWRRTN - The other side of the alarm relay.
- CCAxxT - Composite Clock output A, Tip leads. They come from output board 1 and can be numbered 01-10. Only the first four leads connect to the Yellow field.
- CCAxxR - Composite Clock output A, Ring leads. They come from output board 1 and can be numbered 01-10. Only the first four leads connect to the Yellow field.
- CCBxxT - Composite Clock output B, Tip leads. They come from output board 2 and can be numbered 01-10. Only the first four leads connect to the Yellow field.
- CCBxxR - Composite Clock output B, Ring leads. They come from output board 2 and can be numbered 01-10. Only the first four leads connect to the Yellow field.
- T03xxT - Output T03 Tip leads. They come from output board 3 and can be numbered 01-10. None of these leads connect to the Yellow Field.
- T03xxR - Output T03 Ring leads. They come from output board 3 and can be numbered 01-10. None of these leads connect to the Yellow Field.
- T04xxT - Output T04 Tip leads. They come from output board 4 and can be numbered 01-10. None of these leads connect to the Yellow Field.
- T04xxR - Output T04 Ring leads. They come from output board 4 and can be numbered 01-10. None of these leads connect to the Yellow Field.

TN2131 External Clock Interface Leads

- CLKSIGA - This alarm lead connects to a unique UNIT number on the TN492C and indicates a loss of input from Output board A in the Synchronization Clock or failure of the “A” circuitry on the TN2131.
- CLKSIGB - This alarm lead connects to a unique UNIT number on the TN492C and indicates a loss of input from Output board B in the Synchronization Clock or failure of the “B” circuitry on the TN2131.
- CLKSIGM - This alarm lead connects to a unique UNIT number on the TN492C and indicates a loss of both inputs from the Synchronization Clock or a failure after the joining of the “A” and “B” circuitry on theTN2131.
- EXTEQMN - This alarm lead connects to EXTEQMN on the TN492C and indicates a minor failure of CLKSIGA or CLKSIGB.
- EXTEQMJ - This alarm lead connects to EXTEQMJ on the TN492C and indicates a loss of output on the TN2131. It is a major failure.
- CCAT/R - The tip and ring inputs from Output board A of the Synchronization Clock. This is a 64 KHZ bipolar signal with a violation every eighth bit.
- CCBT/R - The tip and ring inputs from Output board B of the Synchronization Clock. This is a 64 KHZ bipolar signal with a violation every eighth bit.
- SCTL* - This lead is the synchronization control lead. It connects to the TMS Clock Oscillator (TN461) board or the Module Clock (TN460C) board via the backplane. When the signal is low, the System 85 will take synchronization from the Synchronization Clock System.
- LPSYNC* - This is the 8 KHZ TTL signal needed by the System 85 for synchronization. It connects to the TN461 or TN460C circuit packs via the backplane.
- RSENSEL 1/2 - These leads inform the carrier power converter of the current requirements of the TN2131 circuit pack. They connect only to the backplane.

TABLE 30-19. Duplicated TMS/Mod. Control—Duplicated Clock—Two Timing References

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
	REF1LST	G-W	6		UNIT1	BR-BK	28
	REF2LST	BR-W	8	D6	UNIT2	BK-BR	27
	BREFLST	S-W	10		UNIT3	S-BK	30
	SCLKLST	BL-R	12		UNIT4	BK-S	29
	BCLKLST	O-R	14	TN492C	UNIT5	BL-Y	32
	SPWRLST	G-R	16		UNIT6	Y-BL	31
	BPWRLST	BR-R	18		UNIT7	0-Y	34
EXTERNAL	REF1RTN	W-G	5		EXTEQMN		2
CLOCK	REF2RTN	W-BR	7	EXTEQMN	EXTEQMN		3
OUTPUT	SCLKRTN	R-BL	11		EXTEQMN		4
	SPWRRTN	R-G	15		EXTEQMN		5
	BREFRTN	W-S	9		EXTEQMJ		2
	BCLKRTN	R-O	13	EXTEQMJ	EXTEQMJ		3
	BPWRRTN	R-BR	17		EXTEQMJ		4
	TREF1	BL-W	2	CSU	T1	BL-W	2
	RREF1	W-BL	1	REF1	R1	W-BL	1
	TREF2	O-W	4	CSU	T1	BL-W	2
	RREF2	W-O	3	REF2	R1	W-BL	1
SYNC.	CCA01T	S-R	20	EXTERNAL	CCAT	BL-W	2
CLOCK	CCA01R	R-S	19	CLOCK	CCAR	W-BL	1
	CCB01T	BL-BK	22	INTERFACE	CCBT	BR-W	8
	CCB01R	BK-BL	21	MC/TMS(0)	CCBR	W-BR	7
	CCA02T	O-BK	24	EXTERNAL	CCAT	BL-W	2
	CCA02R	BK-O	23	CLOCK	CCAR	W-BL	1
	CCB02T	G-BK	26	INTERFACE	CCBT	BR-W	8
	CCB02R	BK-G	25	MC/TMS(1)	CCBR	W-BR	7

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL	CLKSIGA	O-W	4	D6	UNIT8	Y-O	33
CLOCK	CLKSIGB	W-O	3		UNIT9	G-Y	36
INTERFACE	CLKSIGM	W-G	5	TN492C	UNIT10	Y-G	35
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		6
MC/TMS(0)	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		5
EXTERNAL	CLKSIGA	O-W	4	D6	UNIT11	BR-Y	38
CLOCK	CLKSIGB	W-O	3		UNIT12	S-Y	40
INTERFACE	CLKSIGM	W-G	5	TN492C	UNIT13	Y-S	39
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		7
MC/TMS(1)	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		6
D6	EXTEQMN	R-BR	17	EXTEQMN	EXTEQMN		1
TN492C	EXTEQMJ	BR-R	18	EXTEQMJ	EXTEQMJ		1

TABLE 30-20. Duplicated TMS/Mod. Control-Duplicated Clock-Single Timing Reference

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
	REF1LST	G-W	6		UNIT1	BR-BK	28
	SCLKLST	BL-R	12	D6	UNIT2	BK-BR	27
	BCLKLST	O-R	14		UNIT3	S-BK	30
	SPWRLST	G-R	16	TN492C	UNIT4	BK-S	29
	BPWRLST	BR-R	18		UNIT5	BL-Y	32
EXTERNAL	SCLKRTN	R-BL	11	EXTEQMN	EXTEQMN		2
CLOCK	SPWRRTN	R-G	15		EXTEQMN		3
OUTPUT	REF1RTN	W-G	5		EXTEQMJ		2
	BCLKRTN	R-O	13	EXTEQMJ	EXTEQMJ		3
	BPWRRTN	R-BR	17		EXTEQMJ		4
	TREF1	BL-W	2	CSU	T1	BL-W	2
	RREF1	W-BL	1	REF1	R1	W-BL	1
SYNC.	CCA01T	S-R	20	EXTERNAL	CCAT	BL-W	2
CLOCK	CCA01R	R-S	19	CLOCK	CCAR	W-BL	1
	CCB01T	BL-BK	22	INTERFACE	CCBT	BR-W	8
	CCB01R	BK-BL	21	MC/TMS(0)	CCBR	W-BR	7
	CCA02T	O-BK	24	EXTERNAL	CCAT	BL-W	2
	CCA02R	BK-O	23	CLOCK	CCAR	W-BL	1
	CCB02T	G-BK	26	INTERFACE	CCBT	BR-W	8
	CCB02R	BK-G	25	MC/TMS(1)	CCBR	W-BR	7

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL	CLKSIGA	O-W	4	D6	UNIT6	Y-BL	31
CLOCK	CLKSIGB	W-O	3		UNIT7	O-Y	34
INTERFACE	CLKSIGM	W-G	5	TN492C	UNIT8	Y-O	33
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		4
MC/TMS(0)	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		5
EXTERNAL	CLKSIGA	O-W	4	D6	UNIT9	G-Y	36
CLOCK	CLKSIGB	W-O	3		UNIT10	Y-G	35
INTERFACE	CLKSIGM	W-G	5	TN492C	UNIT11	BR-Y	38
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		5
MC/TMS(1)	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		6
D6	EXTEQMN	R-BR	17	EXTEQMN	EXTEQMN		1
TN492C	EXTEQMJ	BR-R	18	EXTEQMJ	EXTEQMJ		1

TABLE 30-21. Unduplicated TMS/Mod. Control-Duplicated Clock-Two Timing References

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL CLOCK OUTPUT	REF1LST	G-W	6	D6* TN492C	UNIT1	BR-BK	28
	REF2LST	BR-W	8		UNIT2	BK-BR	27
	BREFLST	S-W	10		UNIT3	S-BK	30
	SCLKLST	BL-R	12		UNIT4	BK-S	29
	BCLKLST	O-R	14		UNIT5	BL-Y	32
	SPWRLST	G-R	16		UNIT6	Y-BL	31
	BPWRLST	BR-R	18		UNIT7	O-Y	34
	REF1RTN	W-G	5	EXTEQMN	EXTEQMN		2
	REF2RTN	W-BR	7		EXTEQMN		3
	SCLKRTN	R-BL	11		EXTEQMN		4
	SPWRRTN	R-G	15		EXTEQMN		5
	BREFRTN	W-S	9	EXTEQMJ	EXTEQMJ		2
	BCLKRTN	R-O	13		EXTEQMJ		3
	BPWRRTN	R-BR	17		EXTEQMJ		4
	TREF1	BL-W	2	CSU REF1	T1	BL-W	2
	RREF1	W-BL	1		R1	W-BL	1
	TREF2	O-W	4	CSU REF2	T1	BL-W	2
	RREF2	W-O	3		R1	W-BL	1
SYNC. CLOCK	CCA01T	S-R	20	EXTERNAL CLOCK INTERFACE MC/TMS(0)	CCAT	BL-W	2
	CCA01R	R-S	19		CCAR	W-BL	1
	CCB01T	BL-BK	22		CCBT	BR-W	8
	CCB01R	BK-BL	21		CCBR	W-BR	7

CROSS CONNECTS AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL CLOCK INTERFACE MC/TMS(0)	CLKSIGA	O-W	4	D6 TN492C	UNIT8	Y-O	33
	CLKSIGB	W-O	3		UNIT9	G-Y	36
	CLKSIGM	W-G	5		UNIT10	Y-G	35
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		6
	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		5
D6 TN492C	EXTEQMN	R-BR	17	EXTEQMN	EXTEQMN		1
	EXTEQMJ	BR-R	18	EXTEQMJ	EXTEQMJ		1

TABLE 30-22. Unduplicated TMS/Mod. Control-Duplicated Clock—Single Timing Reference

CROSS CONNECT AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL CLOCK OUTPUT	REF1LST	G-W	6	D6 TN492C	UNIT1	BR-BK	28
	SCLKLST	BL-R	12		UNIT2	BK-BR	27
	BCLKLST	O-R	14		UNIT3	S-BK	30
	SPWRLST	G-R	16		UNIT4	BK-S	29
	BPWRLST	BR-R	18		UNIT5	BL-Y	32
	SCLKRTN	R-BL	11	EXTEQMN	EXTEQMN		2
	SPWRRTN	R-G	15		EXTEQMN		3
	REF1RTN	W-G	5	EXTEQMJ	EXTEQMJ		2
	BCLKRTN	R-O	13		EXTEQMJ		3
	BPWRRTN	R-BR	17		EXTEQMJ		4
	TREF1	BL-W	2	CSU REF1	T1	BL-W	2
	RREF1	W-BL	1		R1	W-BL	1
SYNC. CLOCK	CCA01T	S-R	20	EXTERNAL CLOCK INTERFACE MC/TMS(0)	CCAT	BL-W	2
	CCA01R	R-S	19		CCAR	W-BL	1
	CCB01T	BL-BK	22		CCBT	BR-W	8
	CCB01R	BK-BL	21		CCBR	W-BR	7

CROSS CONNECT AT THE YELLOW FIELD							
From				To			
Connector	Lead Designation	Lead Color	Connecting Block Terminal	Connector	Lead Designation	Lead Color	Connecting Block Terminal
EXTERNAL CLOCK INTERFACE MC/TMS(0)	CLKSIGA	O-W	4	D6 TN492C	UNIT6	Y-BL	31
	CLKSIGB	W-O	3		UNIT7	O-Y	34
	CLKSIGM	W-G	5		UNIT8	Y-O	33
	EXTEQMN	G-W	6	EXTEQMN	EXTEQMN		4
	EXTEQMJ	S-W	10	EXTEQMJ	EXTEQMJ		5
D6 TN492C	EXTEQMN	R-BR	17	EXTEQMN	EXTEQMN		1
	EXTEQMJ	BR-R	18	EXTEQMJ	EXTEQMJ		1

TABLE 30-23. Field Terminations for ED-1E434, GRP 380 Cables

PBX END 50 Pin Connector Pin	**CSU END** 50 Pin Connector Pin	Wire Color
1,22	4,23	G
4,23	1,22	BR
5,48	26,47	W-BR
24		S
26,47	5,48	W-G
49		W-S

For Use When Connected to an H600-274, GRP 1 Cable

PBX END 50 Pin Connector Pin	**CSU END** DB15 Connector Pin	Wire Color
1,22	3	G
4,23	1	BR
5,48	9	W-BR
24		S
26,47	11	W-G
49		W-S

For Use When Connected to an H600-274, GRP 2 Cable

TABLE 30-24. Field Terminations for H600-307 Cables

PBX END 50 Pin Connector Pin	**CSU END** 50 Pin Connector Pin	Wire Color
2		W-BL
3		BL
22	23	G
23	22	BR
24		S
47	48	W-G
48	47	W-BR
49		W-S

For Use When Connected to an H600-274, GRP 1 Cable

PBX END 50 Pin Connector Pin	**CSU END** DB15 Connector Pin	Wire Color
2		W-BL
3		BL
22	3	G
23	1	BR
24		S
47	11	W-G
48	9	W-BR
49		W-S

For Use When Connected to an H600-274, GRP 2 Cable

Maintaining the Synchronization Clock

Synchronization clock troubleshooting and repair is limited to identifying and replacing failed cards. The following section outlines troubleshooting and replacement procedures by trouble scenario.

Synchronization Clock Card LED Indicators

No LEDs exist on the TN2131. However, synchronization clock cards contain a number of LEDs that reflect operating and alarm conditions. These indicators and the conditions that may prompt them are described below.

TABLE 30-25. Alarm Interface (PAI)

DESIGNATION	COLOR	DESCRIPTION
REFA	red	Loss of input reference A or failed CI A (REF1LST).
REFB	red	Loss of input reference B or failed CI B (REF2LST).
ST A	red	Failed Stratum A clock (SCLKLST)
ST B	red	Failed Stratum B clock (SCLKLST)
PWR A	green	-48 VDC A present (off = SPWRLST)
PWR B	green	-48 VDC B present (off = SPWRLST)

TABLE 30-26. Clock Input (CI)

DESIGNATION	COLOR	DESCRIPTION
FAIL	red	Card failure or loss of input signal.
DS1	green	DS1 source present.
CC	green	Composite-clock source present.
SRC ACTIVE	green	Card is currently on-line.

TABLE 30-27. Stratum 3 Clock (ST3)

DESIGNATION	COLOR	DESCRIPTION
FAIL	red	Card Failure
LOCK	red	Reference is out of ST3 pull-in tolerance; the ST3 has unlocked.
FREE RUN	red	ST3 has never been locked to a reference since power-up; ST3 is free-running.
HOLDOVER	red	The ST3 was locked to a reference; reference is now out of tolerance or missing; the ST3 is in holdover (holding last known frequency).
REF A	green	Receiving reference via CI card A.
REF B	green	Receiving reference via CI card B.
ACTIVE	green	This ST3 is providing the timing signal to output cards in the shelf.

TABLE 30-28. Composite-Clock Timing Output (TOCA)

DESIGNATION	COLOR	DESCRIPTION
FAIL	red	Card failure.
PORT ALM	red	One or more output ports failing.
ST	green	Reference present from ST clock.
INPUT	green	Reference present from CI.
500’	green	500 foot phase advance set.
1000’	green	1000 foot phase advance set.

NOTE: 1) Loss of both references produces a BREFLST (both references lost), Stratum clocks will be in holdover.

2) Loss of both Stratum clocks produces a BCLKLST (both clocks lost).

3) Loss of both -48 VDC produces a BPWRLST (both power lost).

The synchronization clock provides the basic alarm and status indications shown in the following table.

TABLE 30-29. Alarm Status Indicators

Condition	Alarm	Card Found On	J13
Input reference A lost or CI A failed	REF1LST	PAI	3/28
Input reference B lost or CI B failed	REF2LST	PAI	4129
Input references A and B lost or both CIs failed	BREFLST	PAI	5/30
Stratum clock A or B failed	SCLKLST	PAI	6/31
Stratum clocks A and B failed	BCLKLST	PAI	7/32
-48 VDC A a B lost	SPWRLST	PAI	8/33
-48 VDC A and B lost	BPWRLST	PAI	9/34
Timing output port failed	PRTA	TOCA	-

SYNCHRONIZATION CLOCK TROUBLE SCENARIOS

Input timing signal or CI unit failure

The active CI will transfer to the secondary and declare the input invalid with the following:

- High error rates
- Framing error greater than 2 out of 4
- Input frequency out of the stratum clock window
- Ail one's AIS signal
- Loss of signal

If a CI failure is suspected, do the following:

1. On the PAI, verify that the CI has failed by noting that only REF A or REF B alarm is lit.
2. If the CI card DS1 LED is dark and the FAIL LED is lit, suspect that the timing input reference signal has been lost. Restore service as outlined-in 555-104-117, *DEFINITY® Communications System Generic 2 Maintenance Procedures,* and 555-104-118, *DEFINITY® Communications System Generic 2 Maintenance Repair* Strategies.
3. If the CI card has failed (the FAIL and DS1 LEDs are lit), replace the CI card. Set the options on a replacement CI card identical to those on the failed card and insert it in the CI slot. Ensure that the FAIL LED on the new card remains off and that the DS1 LED and SRC ACTIVE LED light. The SRC ACTIVE LED will not light unless a manual transfer is done. To light the SRC ACTIVE LED, push the XFR button on the faceplate of the faceplate of the new CI card.
4. Ensure that the PAI card REF A and REF B alarms are off once the replacement CI is installed. It may take a few seconds for the PAI LEDs to go out.

Output Port or TOCA Card Failure

1. Scan the synchronization clock to find the TOCA card with either the PORT ALM or FAIL LED lit.
2. If only the PORT ALM LED is lit suspect a short circuit on one or more of the outputs. Remove the TOCA card temporarily and check the outputs for a short. If no short is found and the PORT ALM persists, replace the TOCA card.
3. Verify that the INPUT and ST LEDs are lit. The INPUT LED will light when a valid signal is received from a CI card. The ST LED will light with a valid signal from the stratum 3 clock.
4. Replace the failed TOCA card (FAIL LED lit); ensure the cable compensation switches on the replacement TOCA card are set identically to the failed card.
5. Verify that the FAIL LED on the new card remains dark and that the green INPUT LED is lit. The green ST LED will also light if the system is equipped with an ST3 card.

Synchronization Clock Failures or Input Reference Out of Tolerance

Tables 30-25 through 30-29 show LED interpretations. If other than a FAIL LED appears, suspect either a faulty reference or failed CI unit. Troubleshooting procedures and actions to be taken are as follows:

1. On the PAI, verify that the ST3 has failed by noting that only ST A or ST B alarm is lit.
2. If on the ST3 the LOCK LED is also lit, suspect that the input reference is out of the stratum 3 frequency tolerance. Check the CI and input reference for possible problems. If the LOCK and FREE RUN LEDs are lit, the ST3 was never connected to DS1. If the LOCK and HOLDOVER LEDs are lit input from DS1 has been lost and the ST3 in in holdover mode (holding the last known frequency). Investigate what has happened to DS1.
3. On the ST3 board, Switch 1 (SW1) offers customer options for controlling the output of alarm signals (see Figure 30-83).

TABLE 30-30. Unit Number Pin Numbers

Connector	Lead Designation	Lead Color	Connecting Block Terminal
D6	UNIT20	W-BL	1
	UNIT19	BL-W	2
	UNIT22	W-O	3
	UNIT21	W-O	4
	UNIT24	W-G	5
	UNIT23	G-W	6
		W-BR	7
	UNIT25	BR-W	8
	UNIT27	W-S	9
	UNIT26	S-W	10
	UNIT29	R-BL	11
	UNIT28	BL-R	12
	UNIT31	R-O	13
	UNIT30	O-R	14
	AUXCTMP	R-G	15
	UNIT32	G-R	16
	EXTEQMN	R-BR	17
	EXTEQMJ	BR-R	18
	AUXCRCT	R-S	19
	AUXCHO	S-R	20
	AUXCCB	BK-BL	21
	AUXCFRQ	BL-BK	22
	AUXCFAN	BK-O	23
		O-BK	24
	EXTPRMJ	BK-G	25
	EXTPRMN	G-BK	26
	UNIT2	BK-BR	27
	UNIT1	BR-BK	28

Connector	Lead Designation	Lead Color	Connecting Block Terminal
D6	UNIT4	BK-S	29
		S-BK	30
	UNIT6	Y-BL	31
	UNIT5	BL-Y	32
	UNIT8	Y-O	33
		O-Y	34
	UNIT10	Y-G	35
		G-Y	36
		Y-BR	37
	UNIT11	BR-Y	38
	UNIT13	Y-S	39
	UNIT12	S-Y	40
	UNIT15	V-BL	41
	UNIT14	BL-V	42
	UNIT17	V-O	43
	UNIT16	O-V	44
		V-G	45
	UNIT18	G-V	46
	RING0	V-BR	47
		BR-V	48
	RING1	V-S	49
	TIP1	S-V	50

This is the pin-out of the D6 cable which connects the TN492C External Alarm Interface cards, located in the common control carriers, to the yellow cross-connect field. The ****LST leads are connected to UNIT* leads that have not been used for some other external equipment.

PROCEDURE FOR INSTALLING THE 19-INCH EIA MOUNTING BRACKET

These paragraphs describe the procedure for installing the 19-inch Electronics Industries Association (EIA) mounting bracket. This bracket is compatible with all standard 19-inch EIA equipment and provides 14 vertical inches of mounting rail.

Before installation, check to see that the following items have been provided:

Quantity	Description	Comcode
2	Bracket adapter	846 633 857
12	Clip, fastener	406 440 289
12	Screw .190-24 x 1/2	840 059 596
8	Screw .216-24 x 3/8	900 464 009

To install the mounting bracket, refer to Figure 30-88 and complete the following steps:

1. Use the .216-24 x 3/8 screws to fasten the 19-inch EIA bracket adapters to the cabinet upright.

   NOTE If desired, the bracket adapter can be separated into two distinct halves by folding the bracket at the center.

2. Fasten the clips to the adapter bracket as shown in Figure 30-88.
3. Use the .190-24 x 1/2 screws to attach the EIA equipment to the bracket adapter as shown in Figure 1.

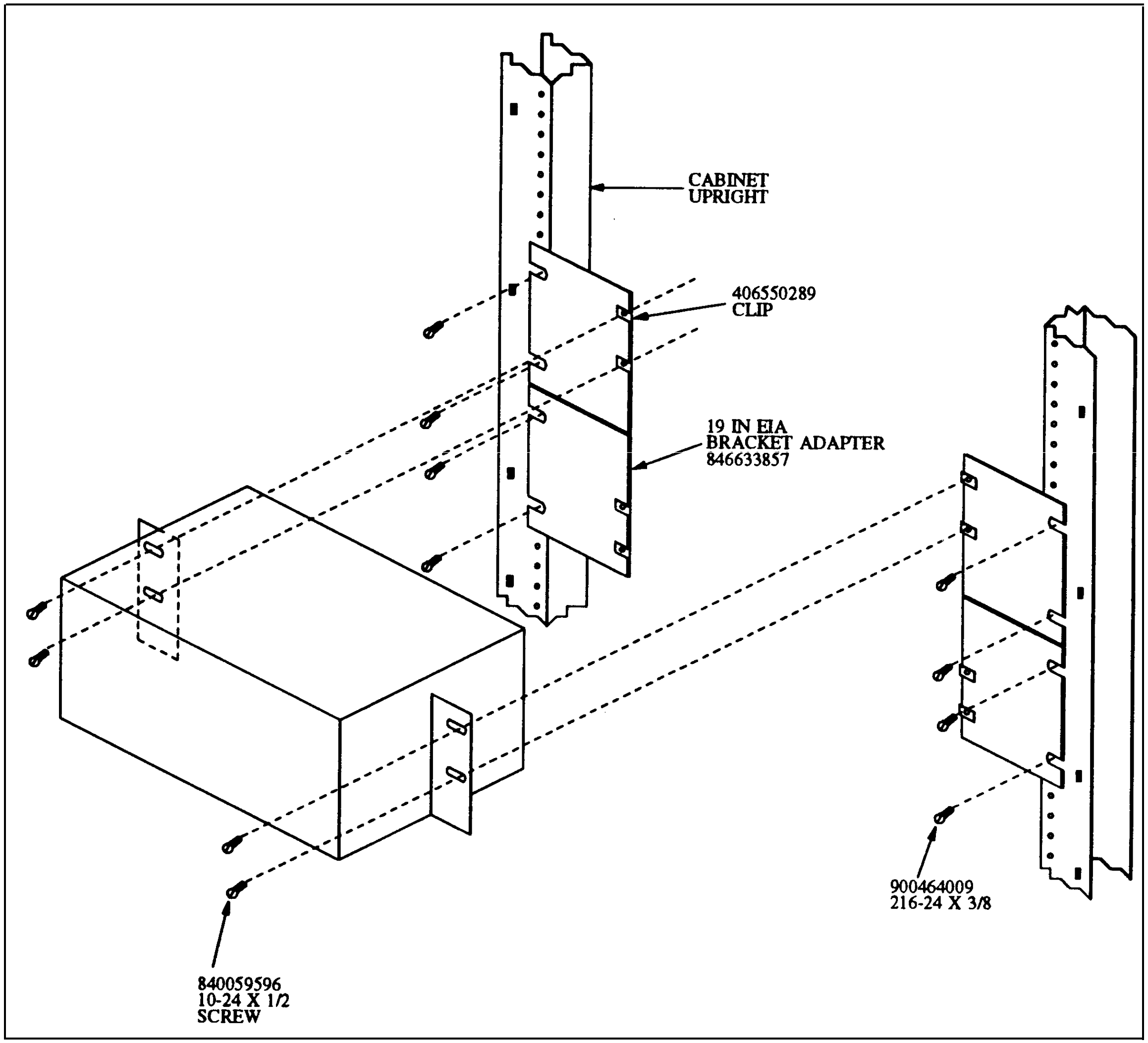


Figure 30-88. Mounting Equipment Using 19-inch EIA Bracket

31. TRANSMISSION EQUIPMENT

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DIGITAL SIGNALING EQUIPMENT

DS1 signaling provides a high performance digital communications interface to the AT&T System 85. Each channel may be used for digitized voice, data, or signaling transmission.

DS1 interface can be used as a tie-trunk between two System 85s. It is also used with the Remote Group feature. The DS1 interface may also be used in conjunction with transmission terminal products such as D4 channel banks, channel expansion multiplexer, channel covers those units multiplexer, and channel service units. This chapter covers those units that are considered part of the System 85.

CDS Installation

Channel Division Multiplexer (CDM) — The installation for the CDM used with DS1 switching is located under the *DS1 Trunk Port to Carrier or Another Colocated AT&T System 85* heading for use with Remote Groups. See *Remote Module/Group Installation/Test Service Manual* (555-103-117) which includes installation procedures for both central and remote locations. For other information see *Service Manual — Installation and Maintenance — Channel Division Multiplexer* (365-165-101).

CEM Installation

Channel Expansion Multiplexer (CEM) — The installation for the CEM used with DS1 switching is located under the *DS1 Trunk Port to Carrier or Another Colocated System 85* heading; for use with Remote Groups, see *Remote Module/Group Installation/Test Service Manual* (555-103-117) which includes installation procedures for both central and remote locations. For other information see *Service Manual — Installation and Maintenance — Channel Expansion Multiplexer — BCM 3200* (365-160-101).

CSU Installation

Channel service Unit (CSU) — The installation for the CSU used with DS1 switching is located under the *DS1 Trunk Port to Carrier or Another Colcated System 85* heading; for use with Remote Groups, see *Remote Module/Group Installation/Test Service Manual* (555-103-117) which includes installation procedures for both central and remote locations. For other information, see *55-1T1 Channel Service Unit Users*

Manual (999-100-1891S).

LOOP SIGNALING — TRANSMISSION SUPPORT EQUIPMENT

Transmission support equipment provides transmission and signaling range extension. It consists of:

- customer premises facility terminal (CPFT)
- packaged metallic facility terminal assemblies (PMFTA)
- 24V4 and 44V4 repeaters
- LORAIN voice-switched gain amplifier

The CPFT equipment consists of metallic facility terminal (MFT) circuit packs and terminal balancing networks housed in connectorized shelves (carriers). The CPFT is a standard arrangement which supplies all of the transmission and signaling functions required to terminate either 2-wire or 4-wire metallic facilities. The CPFT equipment can be installed in the auxiliary cabinet if it does not interface with interconnect equipment. If CPFT interfaces with interconnect equipment it must be mounted in a cabinet separate from the system.

The J99400 packaged metallic facility terminal assemblies (PMFTA) are housings that are self-contained and designed to accept metallic facility terminal (MFT) plug-in units. These housings are sized according to the number of circuits needed and are mounted on a wall, table, or floor. Installation instructions ae contained in an ED-7C233 Installation Sheet Assembly which is stored above the mounting shelf on in an unused circuit pack slot.

Type 24V4 repeaters are used to interface 600 ohm 2-wire trunk circuits (SN230B) and 4-wire 600 ohm loaded or nonloaded trunks. A 24V4 consists of a mounting shelf which holds pug-in components and test jacks. The 24V4 repeater can be used for voice and data transmission.

Type 44V4 repeaters can be used to interface 4-wire trunk circuits (SN233C) and 4-wire 600 ohm loaded or nonloaded trunks. A 44V4 repeater consists of two 227-type amplifiers, two 359-type equalizers, and a jack field. The mounting shelf, which has two complete repeaters, may be wired to accept any combination of amplifiers, equalizers and power supply arrangements necessary for a particular circuit.

The LORAIN voice-switched gain amplifier (VFR-5050,L1) is a circuit pack mounted in a 500-13 carrier in the auxiliary cabinet. Each carrier can handle a maximum of 13 circuit packs containing one circuit per pack. Connected with SN230B (CO trunk) circuit packs the 2-wire amplifier automatically adds fixed transmission gain.

DS1 Trunk Port to T1 Carrier or Another Colocated System 85

- Options Settings (as required)
- 55lV channel service unit

- The settings for each individual installation should be determined from the CSD (Customer System Document)
- Option switch locations

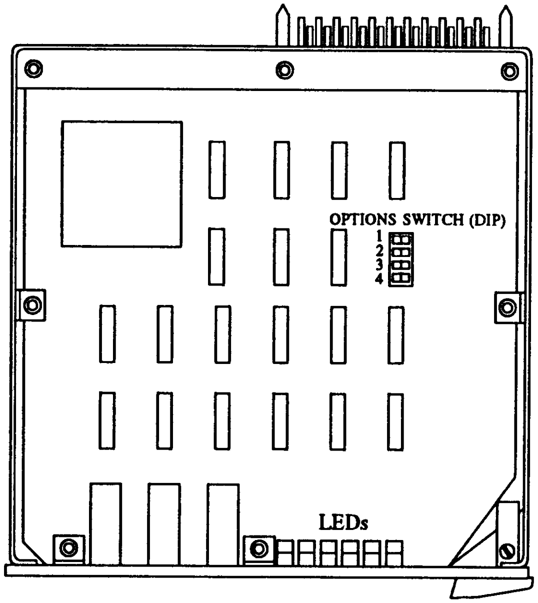


Figure 31-1. System Monitor Unit

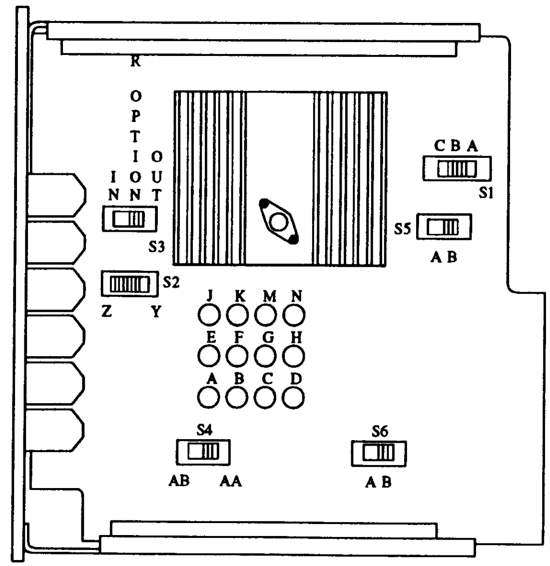


Figure 31-2. Office Repeater

TABLE 31-1. Signal Monitor Unit (SMU) Options

551 V SMU BOARD			
OPTION		SWITCH	SETTING
All Ones		1	C
		2	O
ESS		1	O
		2	C
Zeros	16	3	C
	50	3	O
Active Fault Locate		4	C

TABLE 31-2. Office Repeaters (OR) Options

551 V OR POWERING MODE DATA					
SCREW OPTIONS		**S2**	**S3**	**S4**	**S6**
60 MA LINE Line Power	C, E, K	N/A	N/A	AB	B
-48V with sealing current	C, E, K	Y	OUT	AA	B
-48V without sealing current	C, G, J	Y	OUT	AA	B

ARTIFICIAL LINE OPTION SELECTION		
dB LEVEL	**S1**	**S5**
0 db	C	NA
7.5 db	A	A
15 db	B	B

Channel Expansion Multiplexer (CEM) Options

The settings for each individual installation should be determined from the CSD.

Channel Division Multiplexer

Matrix Programming

The CDM has an address matrix which permits an individual channel to occupy any time slot by installing a matrix jumper. For example, channel 1 may be programmed to occupy time slot 24 and channel 2 may be programmed to occupy time slot 7, etc. On Model No. 2521-024, only the first eight channels can be programmed. Thirty matrix jumpers are provided with the CDM.

NOTE	The channel select matrix must always be programmed if any other 8-channel drop slots are to be used.

Channel and bandwidth selections are made by programming the matrix with the jumpers. The bandwidth requirements for each channel unit is one time slot with the exception of the 56/64 KXN DCUs which may occupy multiple time slots.

The following example is given on how to program the matrix. Assume that from a given site the following services are to be provided.

1. E&M service for one subscriber
2. 4.8 Kbps data service for one subscriber
3. 56/64 KXN data service for one subscriber operating at 256 Kbps when N=4

Bandwidth requirements:

- E&M circuit requires one drop and one insert time slot.
- 0-19.2 Kbps data channel requires one drop and one insert time slot.
- 56/64 KXN data channel requires four drop and four insert time slots.

Available time slots are 1, 5, 8, 9, 14, and 16.

WARNING

Do not use time slots 6, 12, 18, or 24 when the CDM is used in conjunction with the Channel Expansion Multiplexer (CEM). These time slots carry signaling information for the bundled voice channels.

Assign the channel units

- E&M service is channel 1, time slot 1.
- 0-19.2 data service is channel 2, time slot 5.
- 56/64 KXN data service is channel 3, time slots 8, 9, 14, and 16.

Record the channels on the Matrix Programming Guide. The matrix programming guide must be filled out for each direction of transmission.

TABLE 31-3. Matrix Programming Guide

MATRIX PROGRAMMING GUIDE								
	CDM CHANNEL UNIT TYPE							
SELECT TIME SLOT						DATA 56/64KXN	DATA 0-19	E&M
	CARD SLOT							
	8	7	6	5	4	3	2	1
1								_*_
2								
3								
4								
5							_*_	
6								
7								
8						_*_		
9						_*_		
10								
11								
12								
13								
14						_*_		
15								
16						_*_		
17								
18								
19								
20								
21								
22								
23								
24								

Programming the matrix — Loosen the thumbscrews at the top of the data service panel and let the panel swing down. Place the jumpers on the Drop and Insert matrices as shown in figure 31-3 using the Programming Guide. Close and secure the panel.

Drop insert channel select matrix.

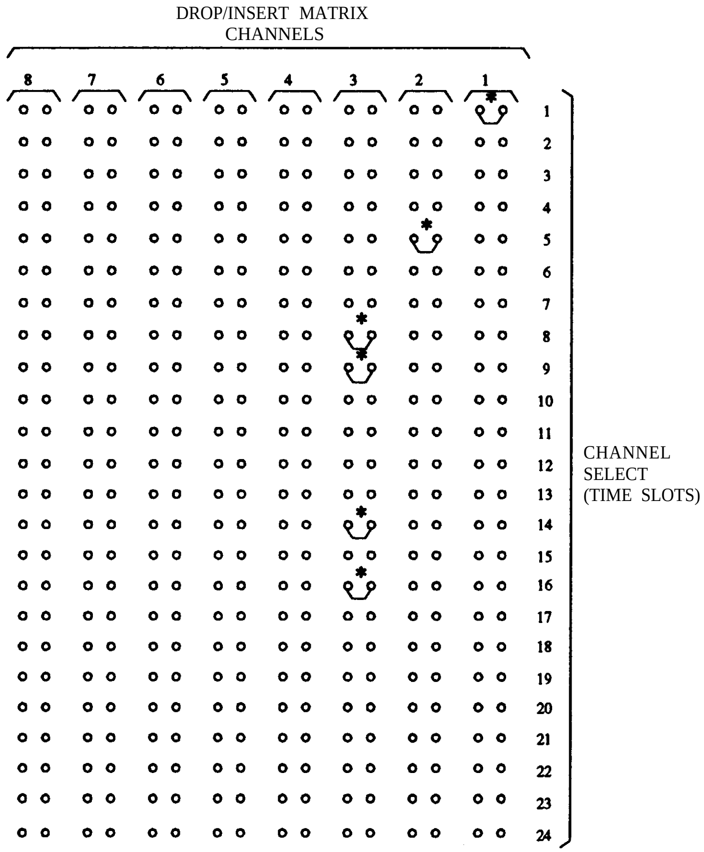


Figure 31-3. Jumper Placement on Drop and Insert Matrices

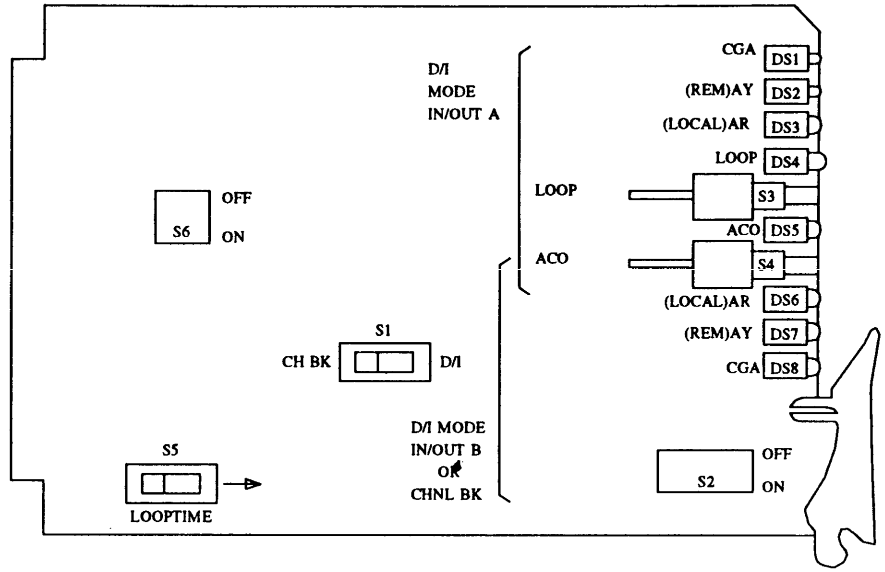


Figure 31-4. Alarm Unit (30005-001) Switch Diagram

TABLE 31-4. Switch S1-S6 for Alarm (30005-001)

SWITCH NO.	MODE	SWITCH POSITION	SWITCH DESCRIPTION	
S1		CH BK	CDM operates as a channel bank (terminating multiplex)	
		D/I	CDM operates as a drop and insert terminal (multiplex)	
S2		OFF (all sections)		
S3		Momentary pushbutton	Places terminal in loop if CD1 is in CGA and ACO is operated	
S4		Momentary pushbutton	ACO is momentary switch that turns off audible alarm in an alarmed condition	
S5	CH BK*	LOCAL	Source of Timing	Onboard clock
		LOOPED		Incoming DS-1 signal
	D/I	LOCAL		Alarm timing derived from on-board clock in alarmed condition
		LOOPTIME		Alarm timing derived from opposite direction DS-1 signal in alarmed condition
S6		OFF (all sections)		

● In the Channel Bank mode one CDM is usually optioned for LOCAL and the far end is optioned for LOOPED. The exception is when the DS-1 facility provides timing. In that case, both CDMs are optioned for LOOPED.

Four-wire E&M channel unit Option procedures

1. To set transmit attenuator

   a. For No. 30003-002 (figure 31-5), insert a 1004-Hz signal at the proper system level into the channel. Connect a dB meter (600 ohm bridged) to J 1. Set switches S2 and S3 as required to obtain a meter reading of +.84.

   b. For No. 30044-002 (figure 31-7), insert a 1004-Hz signal at the proper system level into the channel. Connect a dB meter (600 ohm bridged) to TP5 and TP6. Set switches S6 and S7 as required to obtain a meter reading of +.84.

2. To set receiver attenuator

   a. For No. 30003-002 (figure 31-5), connect a dB meter (600 ohm bridged) to J2. From a distant end transmitter, transmit a 1004-Hz signal at the proper system level. Set the switches on S8 and S9 to achieve the proper system level.

   b. For No. 30044-002 (figure 31-7), connect a dB meter (600 ohm bridged) to TP7 and TP8. From a distant end transmitter, transmit a 1004-Hz signal at the proper system level. Set the switches on S8 and S9 to achieve the proper system level.

3. On No. 30003-002, set switch S 10 as shown in table 31-5.

4. On No. 30044-002, set switches S2, S3, S5, and S10 as shown in table 31-6.

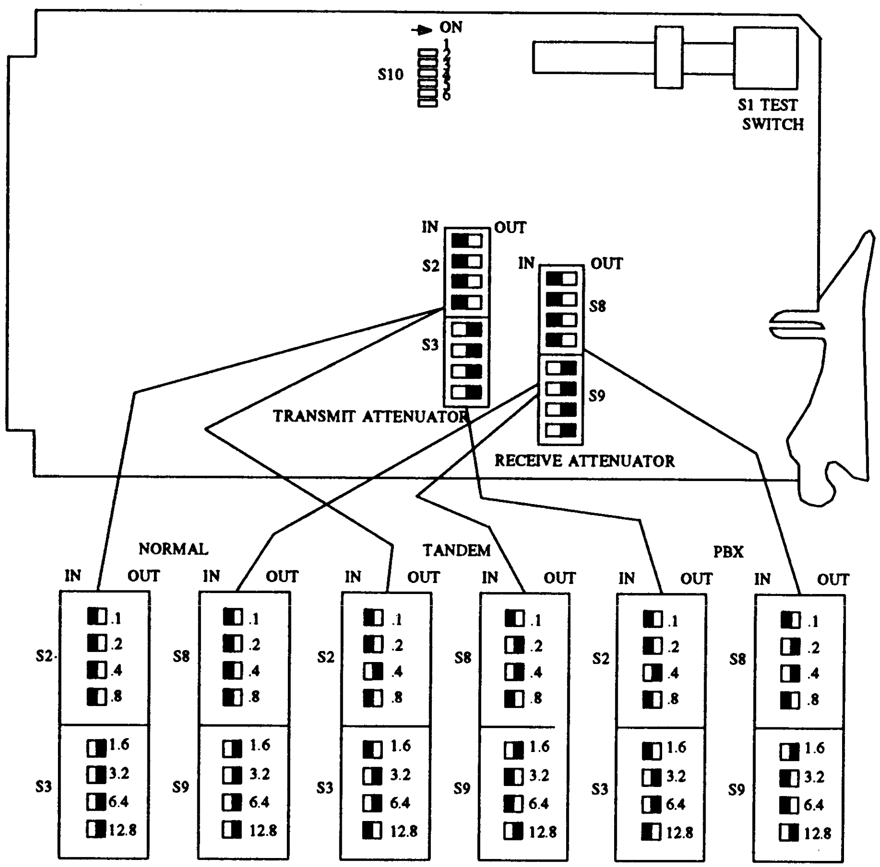


Figure 31-5. 30003-002 4-wire E&M Channel Unit

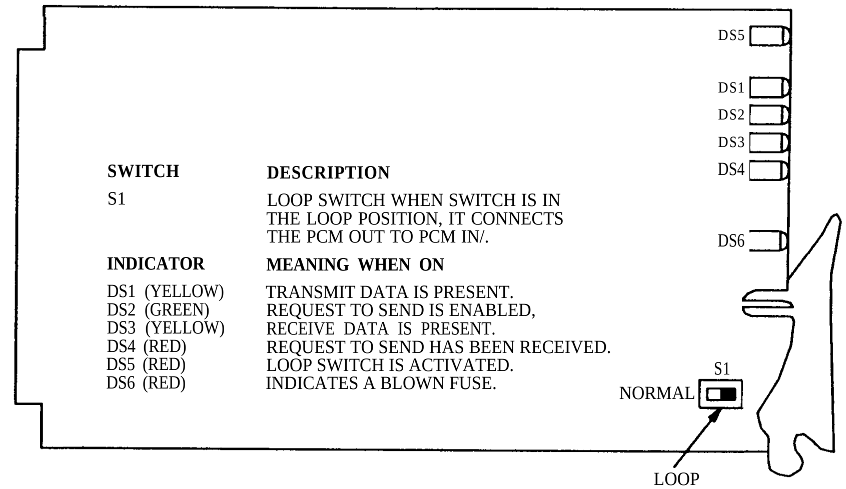


Figure 31-6. Switch Locations and Settings for 0 to 19.2 Kbps Asynchronous Data Channel Unit

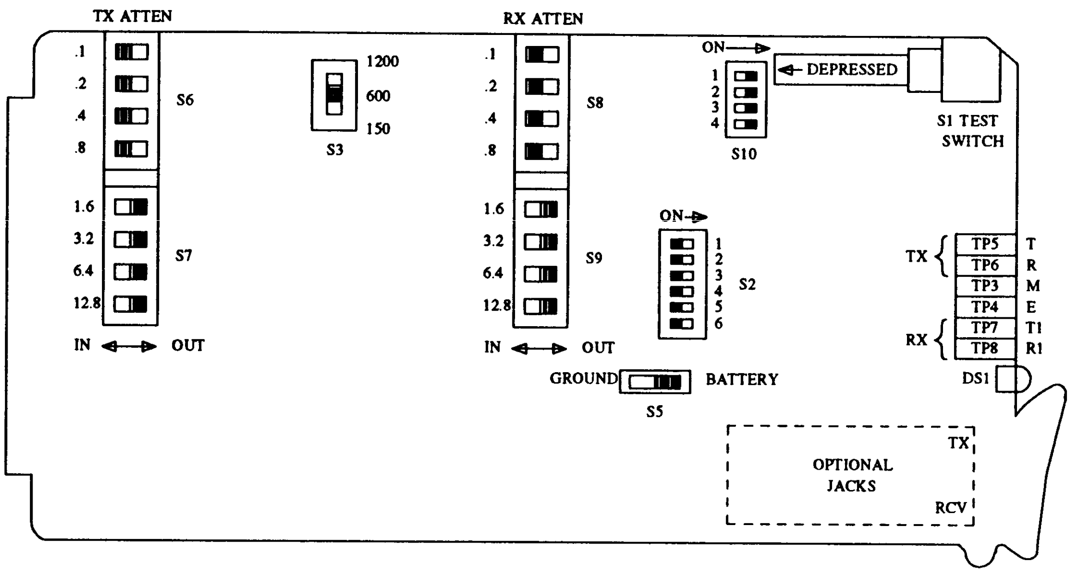


Figure 31-7. 30044-0024-Wire E&M Channel Unit Switch Location

TABLE 31-5. S10 Switch Settings for 30003-002 4-wire E&M Channel Unit

SWITCH	SECTION	SETTING	DESCRIPTION		
S10	1	OFF			
	2	OFF			
	3	ON	Type of Signaling	I	E-Lead switch setting for E&M signaling
		OFF		II	
		ON		III	
	4	OFF			
	5	OFF	E-lead routines on CGA*	Idle immediately	
	6				
	5	ON		Busy immediately	
	6	OFF			
	5	OFF		Idle immediately then busy after a delay	
	6	ON			

* Most PBX interfaces will require Type I signaling and idle immediately then busy after a delay. Types II and III signaling require a 4-connector (VF connector) CDM shelf.

TABLE 31-6. S2, S3, S5, and S10 Switch Settings for 30044-002 4-Wire E&M Channel Unit

SWITCH	SECTION	SETTING	DESCRIPTION	
S2	1 2	OFF OFF	E-lead routines on CGA	Idle immediately
	1 2	OFF ON		Busy immediately
	1 2	ON OFF		Idle immediately, then busy
	3 4	OFF ON	E&M Operation	E lead (Busy=GRD)
S5		GND		
S2	5	OFF		M lead (Busy=BAT)
S2	3 4	ON ON	PLR Operation	E-lead busy
S5		BAT		
S2	5	ON		M lead (Busy=GND)
S3		150 600 1200	150 ohms 600 ohms 1200 ohms	
S10	1 2 3 4	OFF OFF OFF OFF	Breaks connection to external equipment	

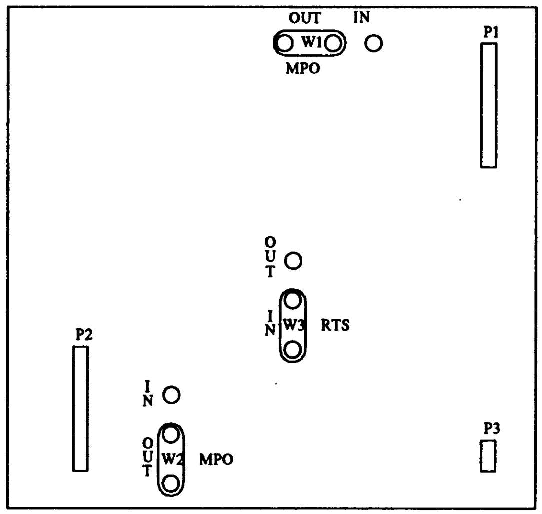


Figure 31-8. RS-422 Interface Subboard Switch Locations

TABLE 31-7. Option Settings (RS-422 Interface Subboard)

OPTION	SWITCH LOCATION	SWITCH POSITION	DESCRIPTION
(Transmit and receive)	W1, W2	IN	Tristate mode is activated. Both data and control bits are received/transmitted simultaneously on the same pair or wires.
		OUT (Normal setting)	Tristate mode is disabled. Unit transmits and receives data only.
RTS Channel Control	W3	IN	Enables insert strobe (Polled).
		OUT (Normal setting)	Insert strobe is enabled all the time (Nonpolled).

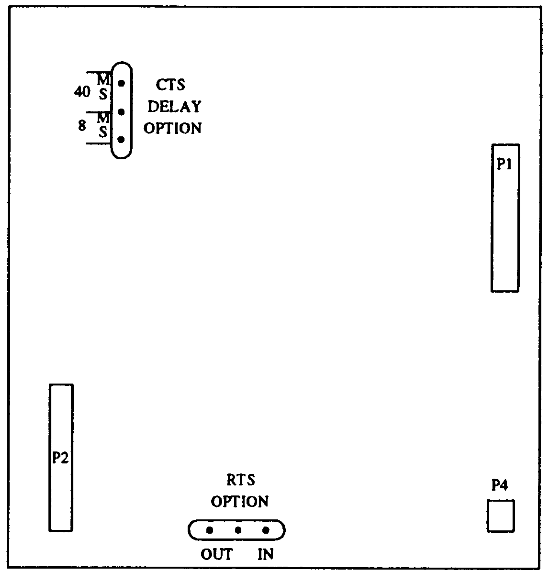


Figure 31-9. RS-232C Interface Subboard Option Plug Locations

TABLE 31-8. Option Settings (RS-232C Interface Subboard)

ALARM OPTION	SWITCH POSITION	DESCRIPTION
CTS	IN	Delays clear to send signal for 40 msec
	OUT (Normal setting)	Delays clear to send signal for 8 msec
RTS	IN	Enables insert strobe (Polled)
	OUT (Normal setting)	Insert strobe is enabled all the time (nonpolled)

56/64 Kbps synchronous data channel unit.

NOTE

Set the request to send switch per CSD.

Switch locations

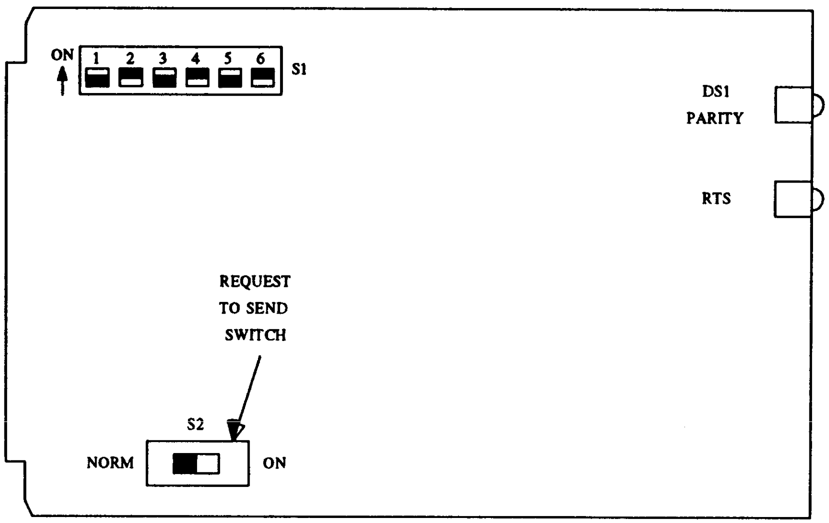


Figure 31-10. 56/64 Kbps Synchronous Data Channel Unit Switch Locations

V.35/RS-449 Subboard

Set the numbers V.35 or 449 position per the CSD.

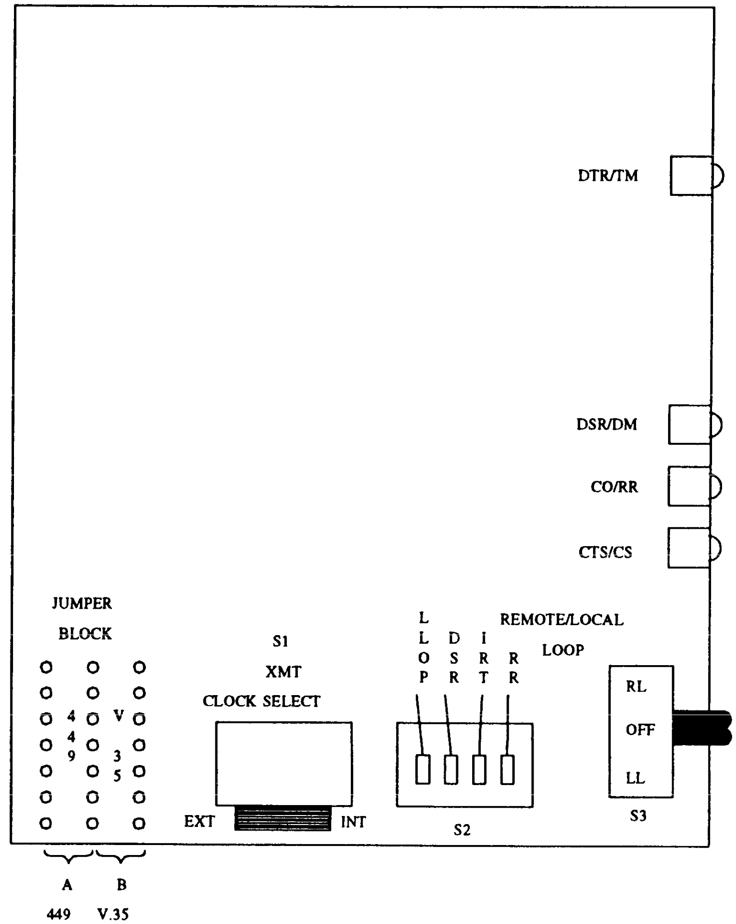


Figure 31-11. V.35/RS-449 Subboard Option Switch Locations

TABLE 31-9. Option Settings

SWITCH DESIGNATION	SWITCH	SECTION	SWITCH POSITION	DESCRIPTION	
POLL	S2	1	ON†	Enables polling	Polling application
			OFF*	Normal operation	
RSD		2	ON†	RS to CS = 0 msec	RS to CS delay
			OFF*	RS tp CS = 4 msec, normal operation	
TR1		3	ON†	Enables polling	Tristate
			OFF*	Normal operation	
RR		4	ON*	Receiver ready, normal operation	Receiver ready control
			OFF†	Receiver ready, continuous operation	
Remote/Local loop†			LL	Local loop (XMT PCM to RCV PCM)	Loop switch
			OFF	No loop	
			RL	Remote loop (RCV to XMT data)	
XMT clock select			INT*	Internal clock control	
			EXT	External clock control	

* Normal setting.
† Polled setting.
Located on front of board.

Equalization

TABLE 31-10. CDM Equalizers

PART NO.	DISTANCE
39004-001	0-150 feet
39004-002	150-450 feet
39004-003	450-750 feet
39004-004	Lightning arrester

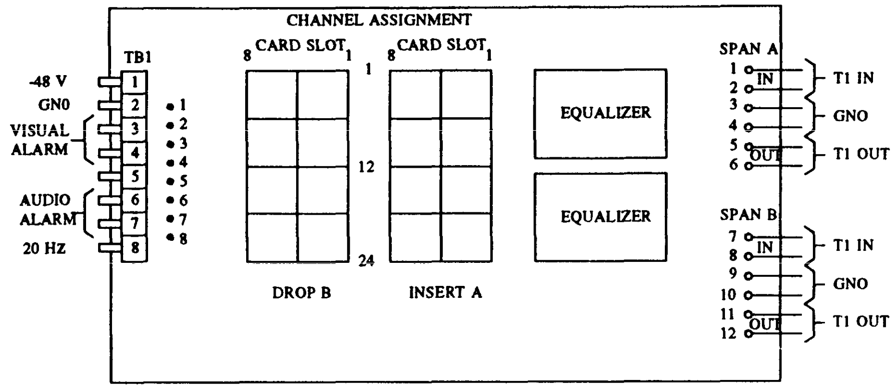


Figure 31-12. CDM Equalizer Locations

Setting the Equalization

a. Determine the proper equalizer using the CSD and table 31-10.

b. At the rear of the CDM, loosen thumbscrews at the top of the Data Service Panel and swing the panel down.

c. Unplug the equalizers — See figure 31-12.

d. Plug in the proper equalizers with component side out. The components are located on the lower half of the equalizers.

e. Close and secure the Data Service Panel.

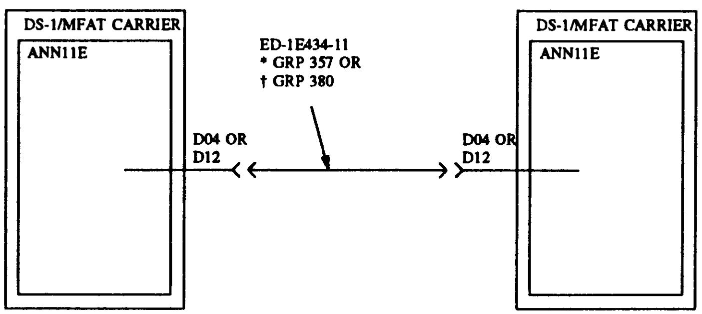
DS-1/MFAT Carrier-J58888N

The ANN11E can be used in a Line Only and a Line/Trunk mode. A backplane strap between pins 208 and 224 of the associated carrier slot is required for Line Only use. Slots 00 and 13 can only be used for the Line Only mode, so these straps are installed in manufacturing. Slots 05 and 18 can be used for Line Only and Line/Trunk modes; therefore the straps for these slots are a field-installed option. Use the CSD and the following table to set the options.

TABLE 31-11. Options for Strapping

OPTION	STRAPPING
Line & Trunk	No strapping required
Line Only	Strap Carrier Backplane pines 208 and 224 together on the appropriate slot

(See chapter 10 for circuit pack connections and terminations.)

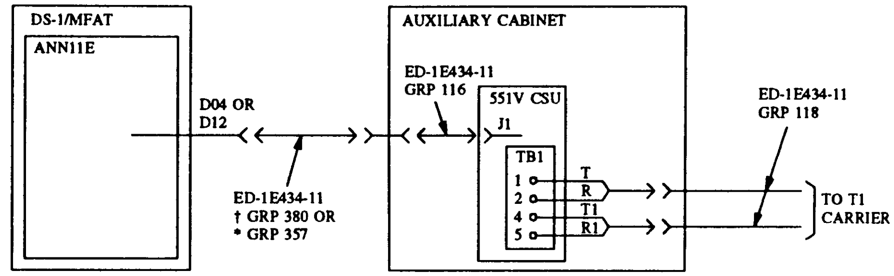


* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-13. Connections Between Two Colocated System 85s

Connections to T1 Carrier Using a 551V CSU

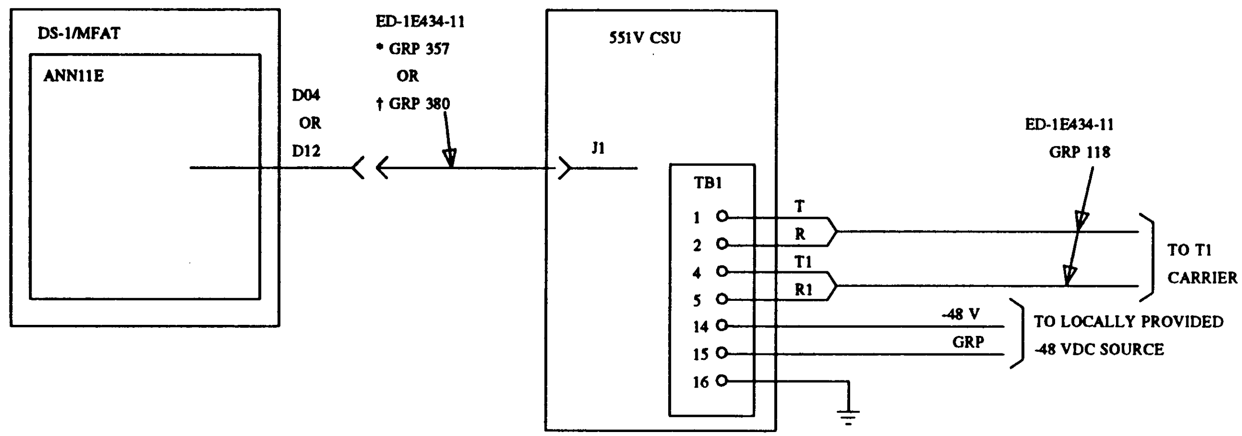
(See chapter 10 for circuit pack connections and terminations.)



* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-14. Equipment Located in Auxiliary Cabinet (Using a 551V CSU)

(See chapter 10 for circuit pack connections and terminations.)

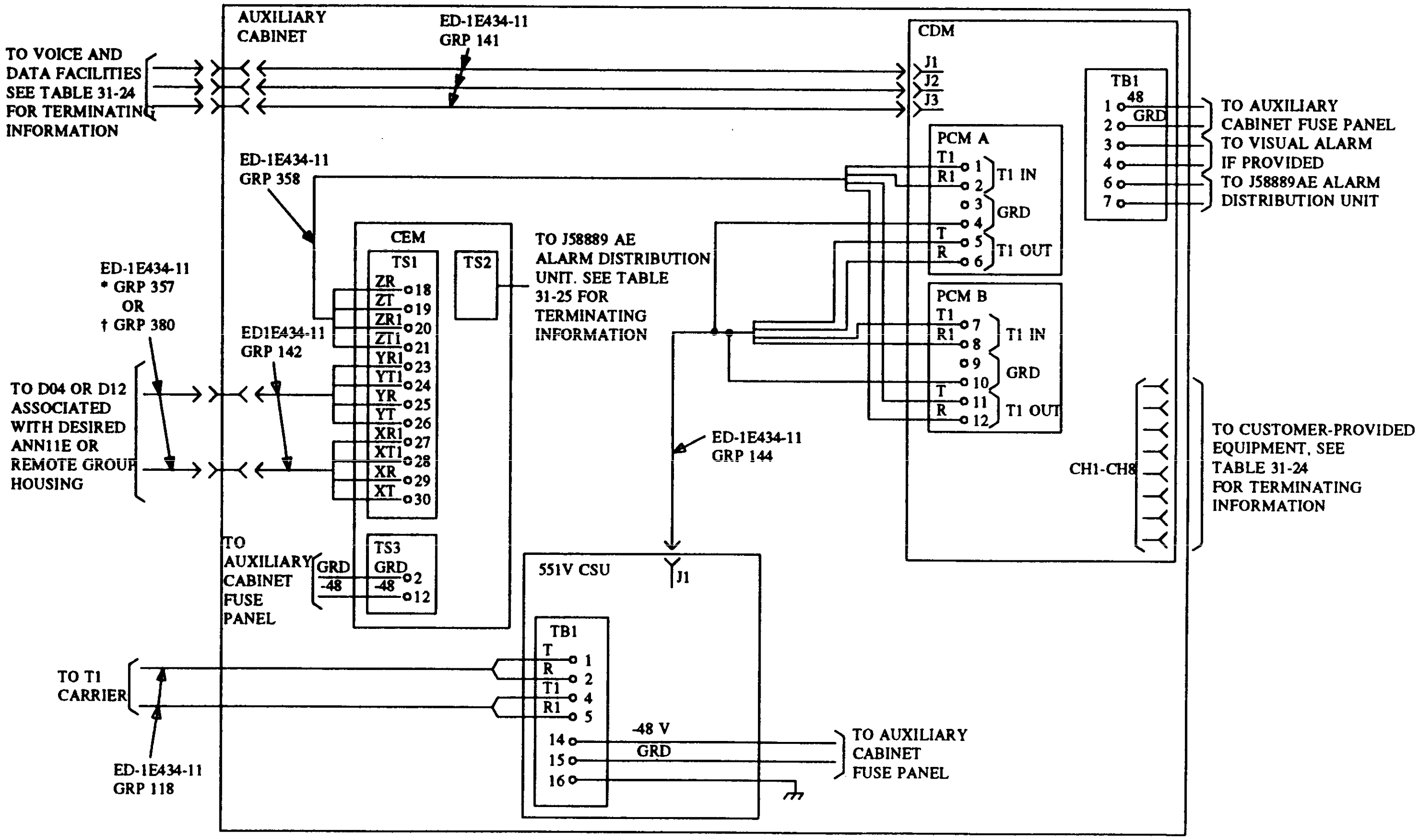


* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-15. Equipment Not Located in an Auxiliary Cabinet (Using a 551V CSU)

DS-1 Trunk Port to T1 Carrier Using CDM, CEM, and 551V CSU

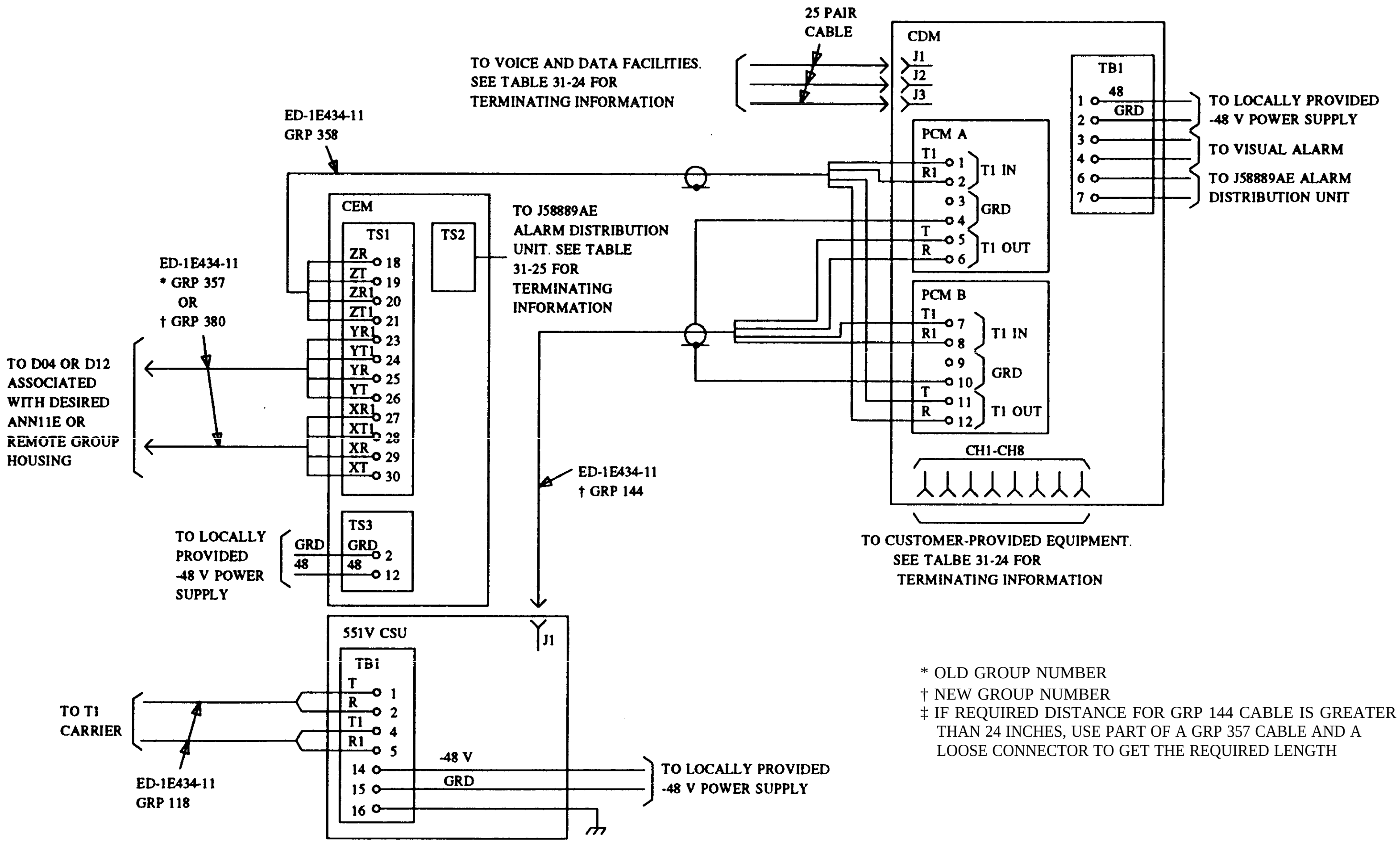
(See chapter 10 for ANN11E connections and terminations.)



* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-16. Equipment Located in an Auxiliary Cabinet

(See chapter 10 for circuit pack connections and terminations.)

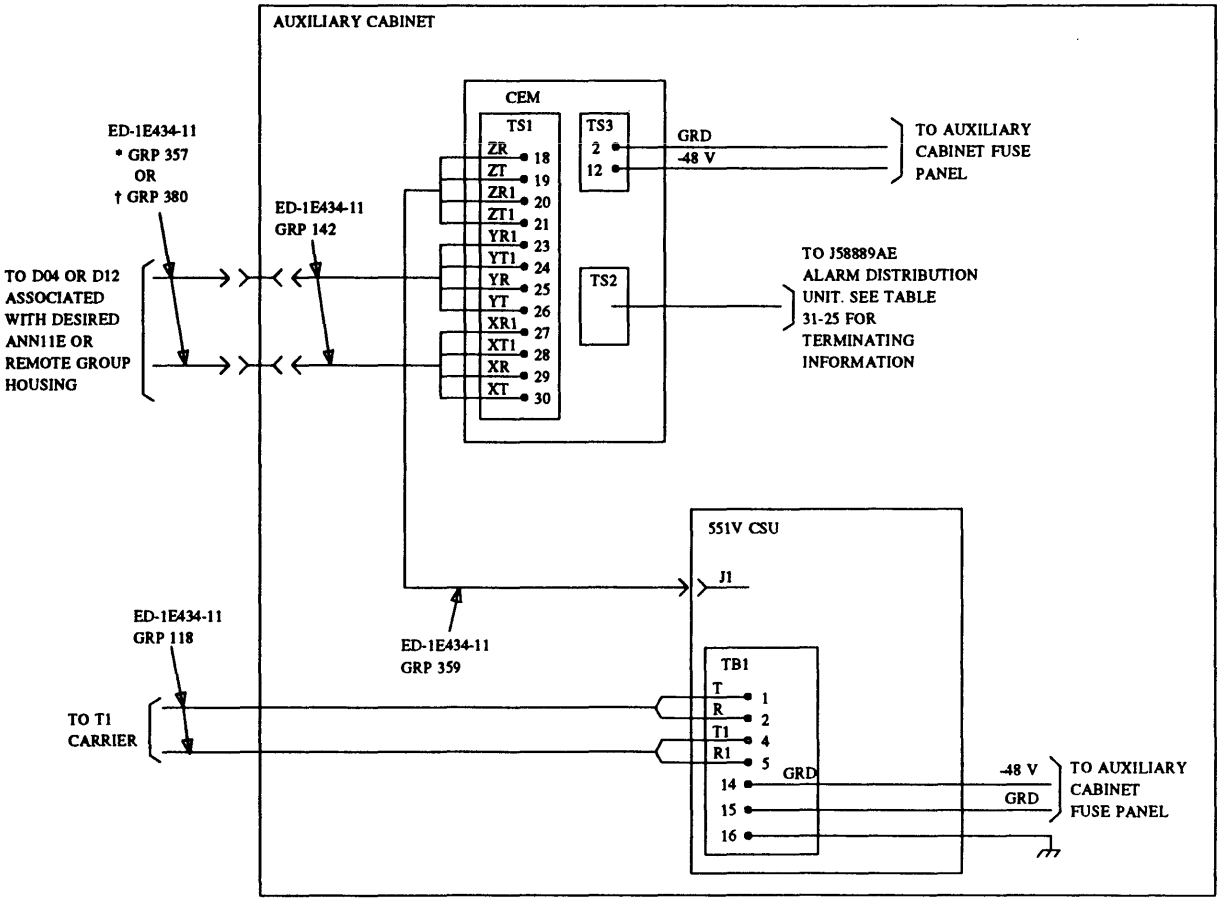


* OLD GROUP NUMBER
† NEW GROUP NUMBER
‡ IF REQUIRED DISTANCE FOR GRP 144 CABLE IS GREATER THAN 24 INCHES, USE PART OF A GRP 357 CABLE AND A LOOSE CONNECTOR TO GET THE REQUIRED LENGTH

Figure 31-17. Equipment Not Located in an Auxiliary Cabinet

DS-1 Trunk Port to T1 Carrier Using CEM and 551V CSU

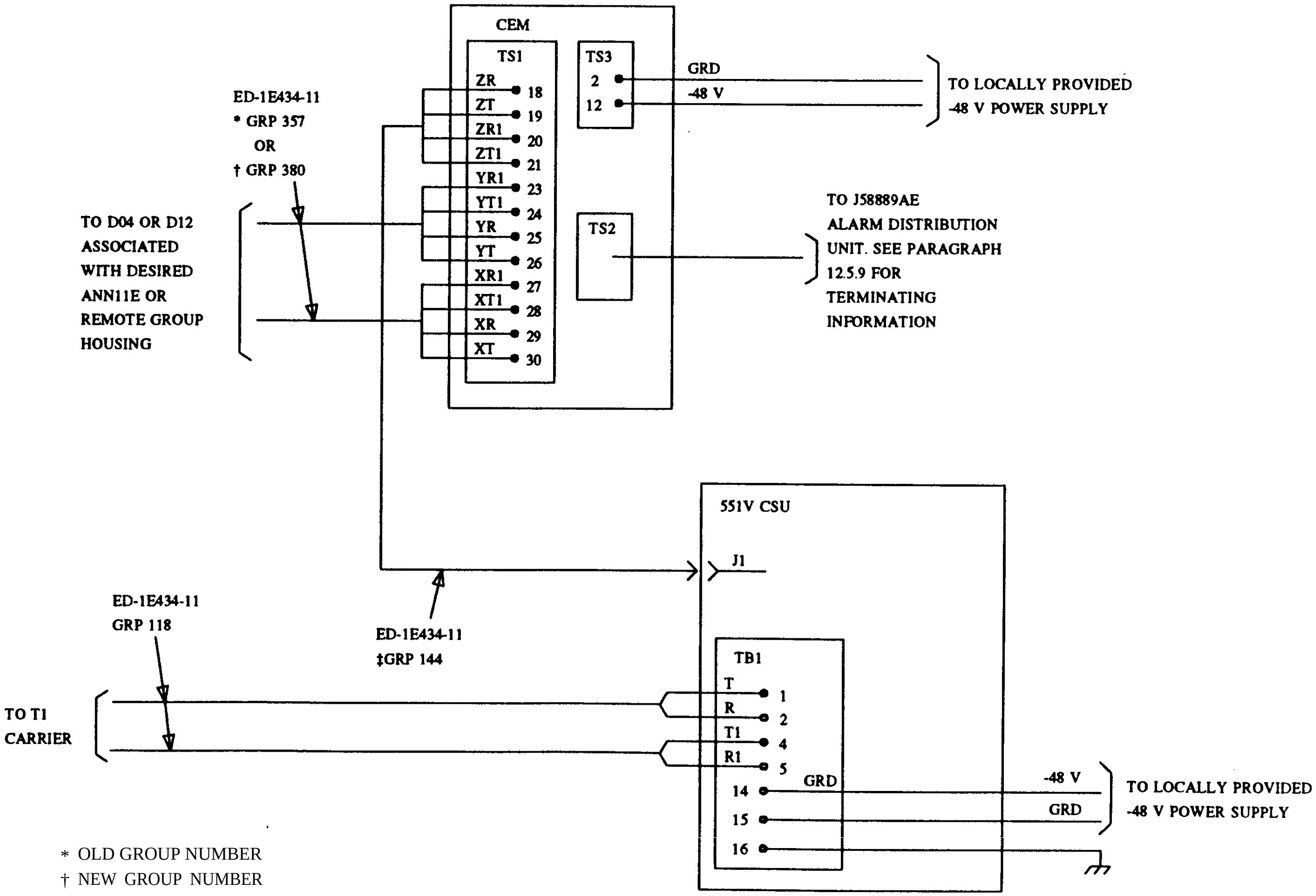
(See chapter 10 for circuit pack connection and terminations.)



* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-18. Equipment Located in an Auxiliary Cabinet

(See chapter 10 for ANN11E connections and terminations.)



* OLD GROUP NUMBER

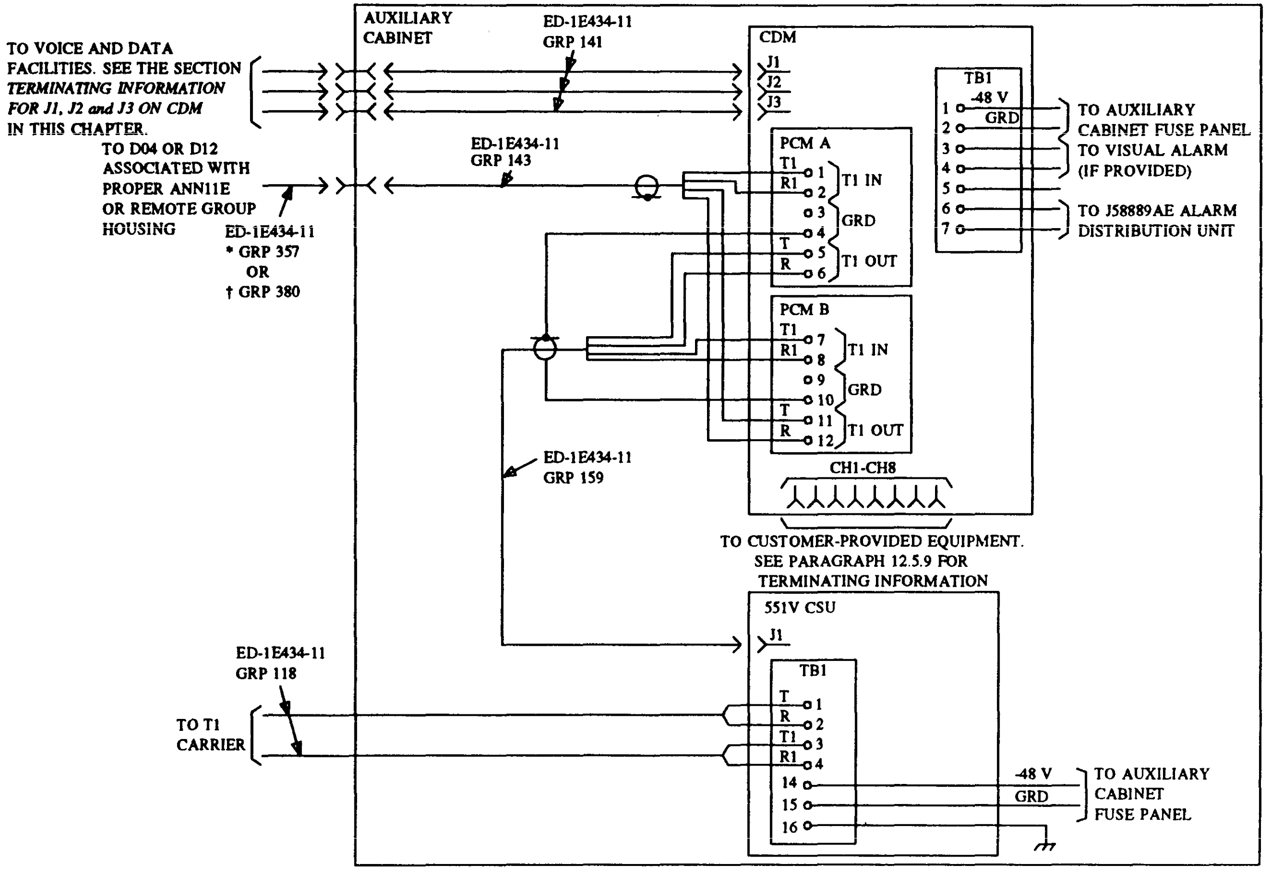
† NEW GROUP NUMBER

‡ IF REQUIRED DISTANCE FOR GRP 144 CABLE IS GREATER THAN 24 INCHES, USE PART OF A GRP 357 CABLE AND A LOOSE CONNECTOR TO GET THE REQUIRED LENGTH.

Figure 31-19. Equipment Not in an Auxiliary Cabinet

DS-1 Trunk Port to T1 Carrier Using CDM and 551V CSU

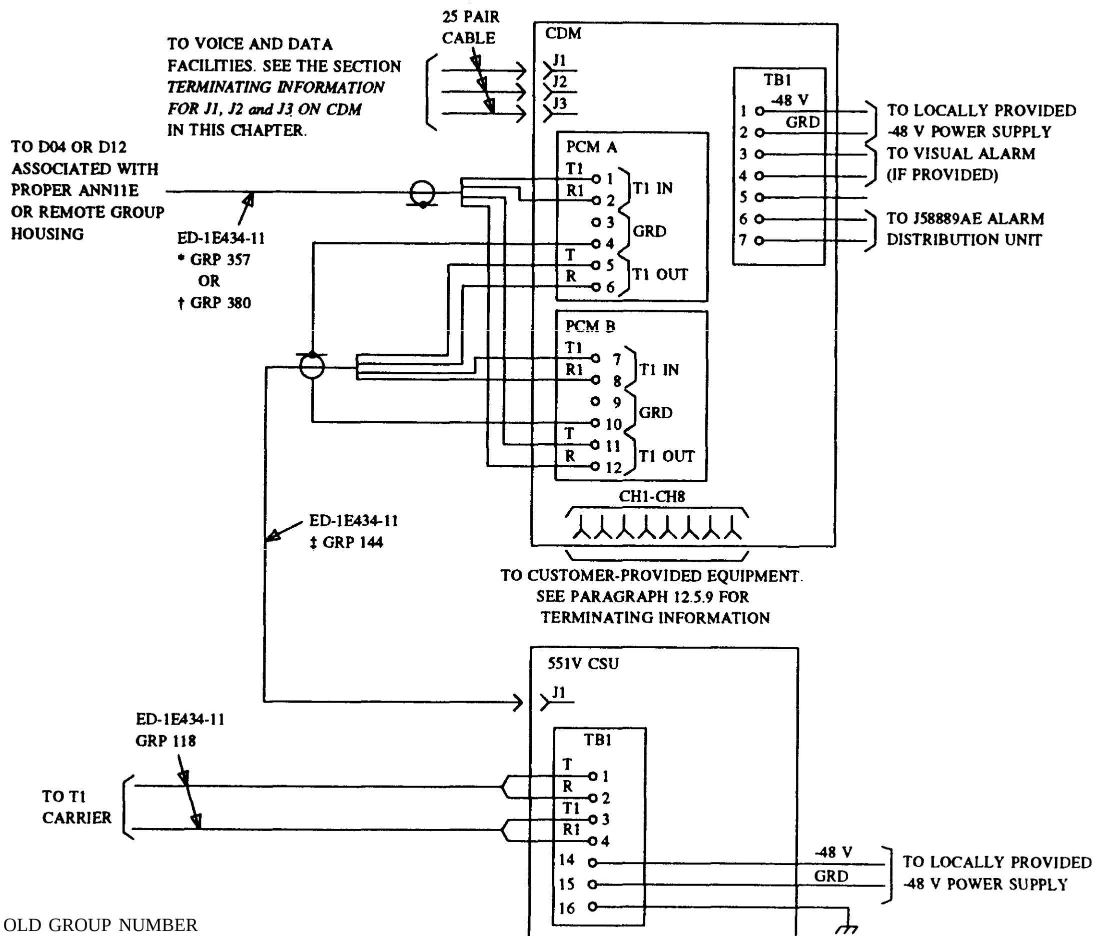
(See chapter 10 for ANN11E connections and terminations.)



* OLD GROUP NUMBER
† NEW GROUP NUMBER

Figure 31-20. Equipment Located in an Auxiliary Equipment

(See chapter 10 for ANN11E connections and terminations.)



* OLD GROUP NUMBER
† NEW GROUP NUMBER
‡ IF REQUIRED DISTANCE FOR GRP 144 CABLE IS GREATER THAN 24 INCHES, USE PART OF A GRP 357 CABLE AND A LOOSE CONNECTOR TO GET THE REQUIRED LENGTH

Figure 31-21. Equipment Not Located in an Auxiliary Equipment

Terminating Information for J1, J2, and J3 on CDM

TABLE 31-12. 24-Channel CDM (2521-024 Connections)

LEAD DESIGNATIONS FROM CDM CONNECTORS			CDM CHANNEL NO.	LEAD COLOR	TO CROSS-CONNECT FIELD			LEAD DESIGNATIONS FROM CDM CONNECTORS			CDM CHANNEL NO	LEAD COLOR	TO CROSS-CONNECT FIELD	
J1	J2	J3			CONN PIN NO.	CONN BLK TERM NO. (NOTE)		J1	J2	J3			CONN PIN NO.	CONN BLK TERM NO. (NOTE)
T	T1	E	1	W-BL	26	1	CONNECT	R	R1	M		G-BK	13	26
R	R1	M		BL-W	1	2	LEADS TO	T	T1	E	14	BK-BR	39	27
T	T1	E	2	W-O	27	3	CORRESPONDING	R	R1	M		BR-BK	14	28
R	R1	M		O-W	2	4	CONNECTING	T	T1	E	15	BK-S	40	29
T	T1	E	3	W-G	28	5	BLOCK	R	R1	M		S-BK	15	30
R	R1	M		G-W	3	6	TERMINALS	T	T1	E	16	Y-BL	41	31
T	T1	E	4	W-BR	29	7	FOR ASSOCIATED	R	R1	M		BL-Y	16	32
R	R1	M		BR-W	4	8	EQUIPMENT	T	T1	E	17	Y-O	42	33
T	T1	E	5	W-S	30	9		R	R1	M		O-Y	17	34
R	R1	M		S-W	5	10		T	T1	E	18	Y-G	43	35
T	T1	E	6	R-BL	31	11		R	R1	M		G-Y	18	36
R	R1	M		BL-R	6	12		T	T1	E	19	Y-BR	44	37
T	T1	E	7	R-O	32	13		R	R1	M		BR-Y	19	38
R	R1	M		O-R	7	14		T	T1	E	20	Y-S	45	39
T	T1	E	8	R-G	33	15		R	R1	M		S-Y	20	40
R	R1	M		G-R	8	16		T	T1	E	21	V-BL	46	41
T	T1	E	9	R-BR	34	17		R	R1	M		BL-V	21	42
R	R1	M		BR-R	9	18		T	T1	E	22	V-O	47	43
T	T1	E	10	R-S	35	19		R	R1	M		O-V	22	44
R	R1	M		S-R	10	20		T	T1	E	23	V-G	48	45
T	T1	E	11	BK-BL	36	21		R	R1	M		G-V	23	46
R	R1	M		BLBK	11	22		T	T1	E	24	V-BR	49	47
T	T1	E	12	BK-O	37	23		R	R1	M		BR-V	24	48
R	R1	M		O-BK	12	24						V-S	50	49
T	T1	E	13	BK-G	38	25						S-V	25	50

NOTE: One connecting block is associated with each of the CDM connectors J1-J3.

TABLE 31-13. Channel CDM (2521-008 Connections)

LEAD DESIGNATIONS FROM CDM CONNECTORS			CDM CHANNEL NO.	LEAD COLOR	TO CROSS-CONNECT FIELD			LEAD DESIGNATIONS FROM CDM CONNECTORS			CDM CHANNEL NO	LEAD COLOR	TO CROSS-CONNECT FIELD		
J1	J2	J3			CONN PIN NO.	CONN BLK TERM NO. (NOTE)		J1	J2	J3			CONN PIN NO.	CONN BLK TERM NO. (NOTE)	
T	T1	E	1	W-BL	26	1	CONNECT					G-BK	13	26	
R	R1	M		BL-W	1	2	LEADS TO					BK-BR	39	27	
T	T1	E	2	W-O	27	3	CORRESPONDING					BR-BK	14	28	
R	R1	M		O-W	2	4	CONNECTING					BK-S	40	29	
T	T1	E	3	W-G	28	5	BLOCK					S-BK	15	30	
R	R1	M		G-W	3	6	TERMINALS					Y-BL	41	31	
T	T1	E	4	W-BR	29	7	FOR ASSOCIATED					BLY	16	32	
R	R1	M		BR-W	4	8	EQUIPMENT					Y-O	42	33	
T	T1	E	5	W-S	30	9						O-Y	17	34	
R	R1	M		S-W	5	10						Y-G	43	35	
T	T1	E	6	R-BL	31	11						G-Y	18	36	
R	R1	M		BL-R	6	12						Y-BR	44	37	
T	T1	E	7	R-O	32	13						BR-Y	19	38	
R	R1	M		O-R	7	14						Y-S	45	39	
T	T1	E	8	R-G	33	15						S-Y	20	40	
R	R1	M		G-R	8	16						V-BL	46	41	
				R-BR	34	17						BLV	21	42	
				BR-R	9	18						V-O	47	43	
				R-S	35	19						O-V	22	44	
				S-R	10	20						V-G	48	45	
				BK-BL	36	21						G-V	23	46	
				BLBK	11	22						V-BR	49	47	
				BK-O	37	23						BR-V	24	48	
				O-BK	12	24						V-S	50	49	
				BK-G	38	25						S-V	25	50	

NOTE: One connecting block is associated with each of the CDM connectors J1-J3.

TABLE 31-14. Terminations for CH1-CH8 connectors on CDM

DATA CHANNEL CABLE CONNECTOR CABLE WIRING (CUSTOMER END)											
CDM							CONNECT TO CUSTOMER INTERFACE CONNECTOR PIN NO.				
	DATA LEAD DESIGNATION FOR INTERFACE TYPE										
CONN PIN NO.	INFOTRON V.3S (NOTE 1)	V.35 (NOTE 2)	RS-449 (NOTE 1)	RS-422	RS-232 (NOTE 3)	TTY	INFOTRON V.35	V.35	RS-449	RS-422	RS-232
1	GRD	GRD	GRD		GRD	GRD	1	1	1		1
2	TX1	TX1	SD1	SD1	TX1	OUT1	2	P	4	T	2
3	RX1	RX1	RD1	RD1	RX1	OUT2	3	R	6	T1	3
4	RTS	RTS	RS		RTS		4	c	7		4
5	CTS	CTS	CS		CTS		5	D	9		5
6		DSR	DM		DSR			E	11		6
7	SG	SG	SG		SG	OUT5	7*	B	19*		7*
8		CO	RR		CO	OUT7	13*	F	13		8
9			LL				19*		10		12*
10			RL			IN7			14		13*
11			TM			OUT6			18		14*
12									20*		16*
13									25*		19*
14	TX2	TX2	SD2	SD2		IN1	21	S	22	R	
15	TX CLK1	SCT1	ST1	RD2	SCT	IN3	15	Y	5	R1	15
16	RX2	RX2	RD2			IN2	22	T	24		
17	RX CLK1	SCR1	RT1		SCR	OUT3		V	8		17
18	RX CLK2	SCR2	RT2			OUT4	36	X	26		
19	TX CLK2	SCT2	ST2			IN4	34	AA	23		
20		DTR	TR		DTR	IN5		H	30		20
21									27*		
22									29*		
23									31*		
24									37*		
25						IN6					

NOTES

1. 37-pin D-type connector
2. 34-pin Winchester connector
3. 25-pin D-type connector

* Strap these terminals together in the connector.

TABLE 31-15. CEM TS2 Alarm Terminations

ALARM CONNECTIONS	
PINS	**DESIGNATION**
1+2	Office audible
3+4	Office visual
5+6	Remote equipment
7+22	Remote processor visual
10+25	Remote processor audible
8+9	Remote line z
14+15	Remote line y
11+12	Remote line x

LORAIN Voice Switched Amplifier

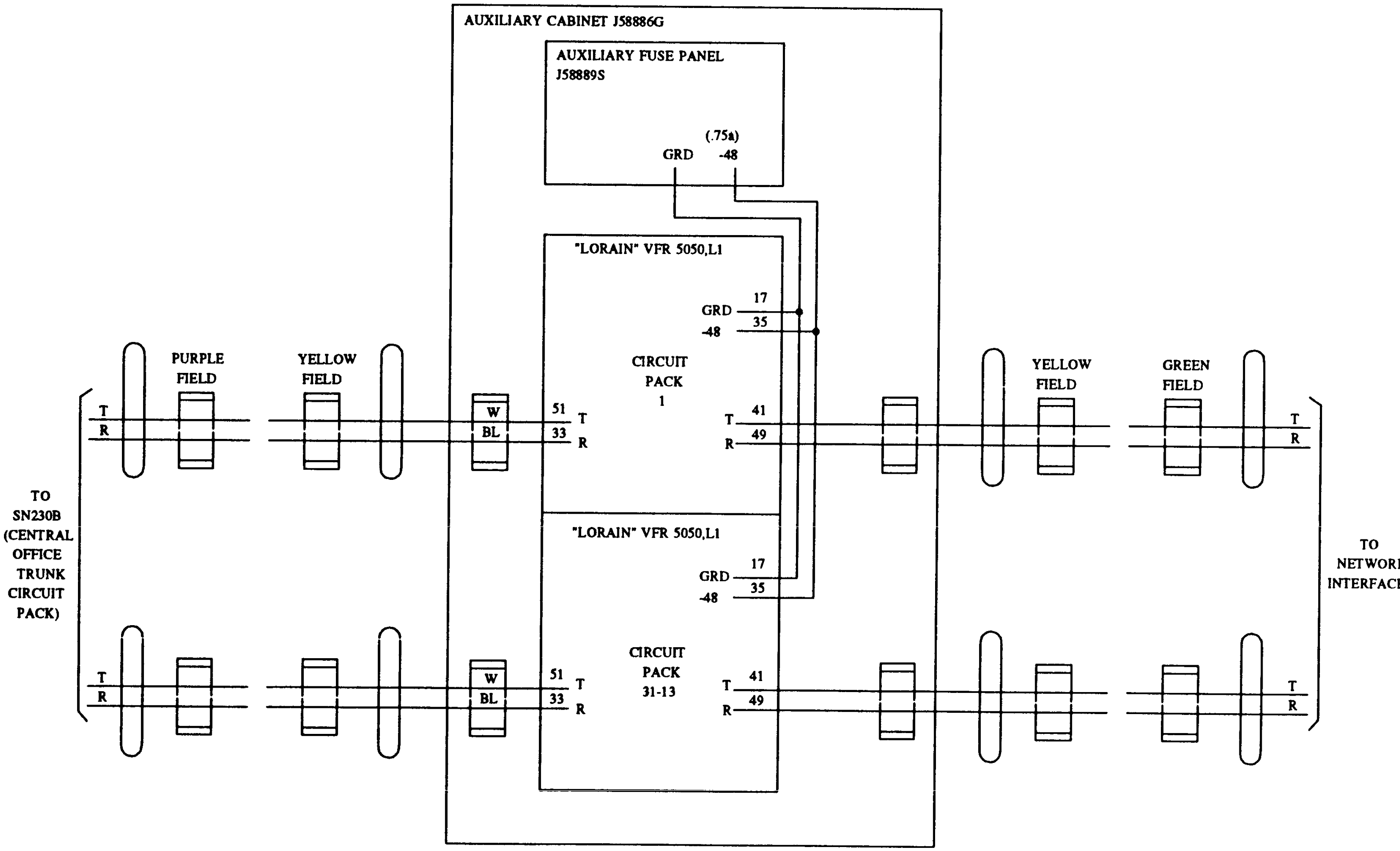


Figure 31-22. LORAIN Voice Switched Amplifier Connections

TABLE 31-16. LORAIN Voice Gain Amplifier Switch Settings

LORAIN VOICE GAIN AMPLIFIER	
FLAT GAIN	**SWITCH SETTING**
12dB	.5, .1, AND 2 OFF; 4 AND 8 ON
8dB	.5, 1, 2, AND 4 OFF; 8 ON
EQUALIZER	1, 2, 3, 4, AND 5 OFF
SENSITIVITY	NORM
SCREWS S1 AND S2	UP POSITION

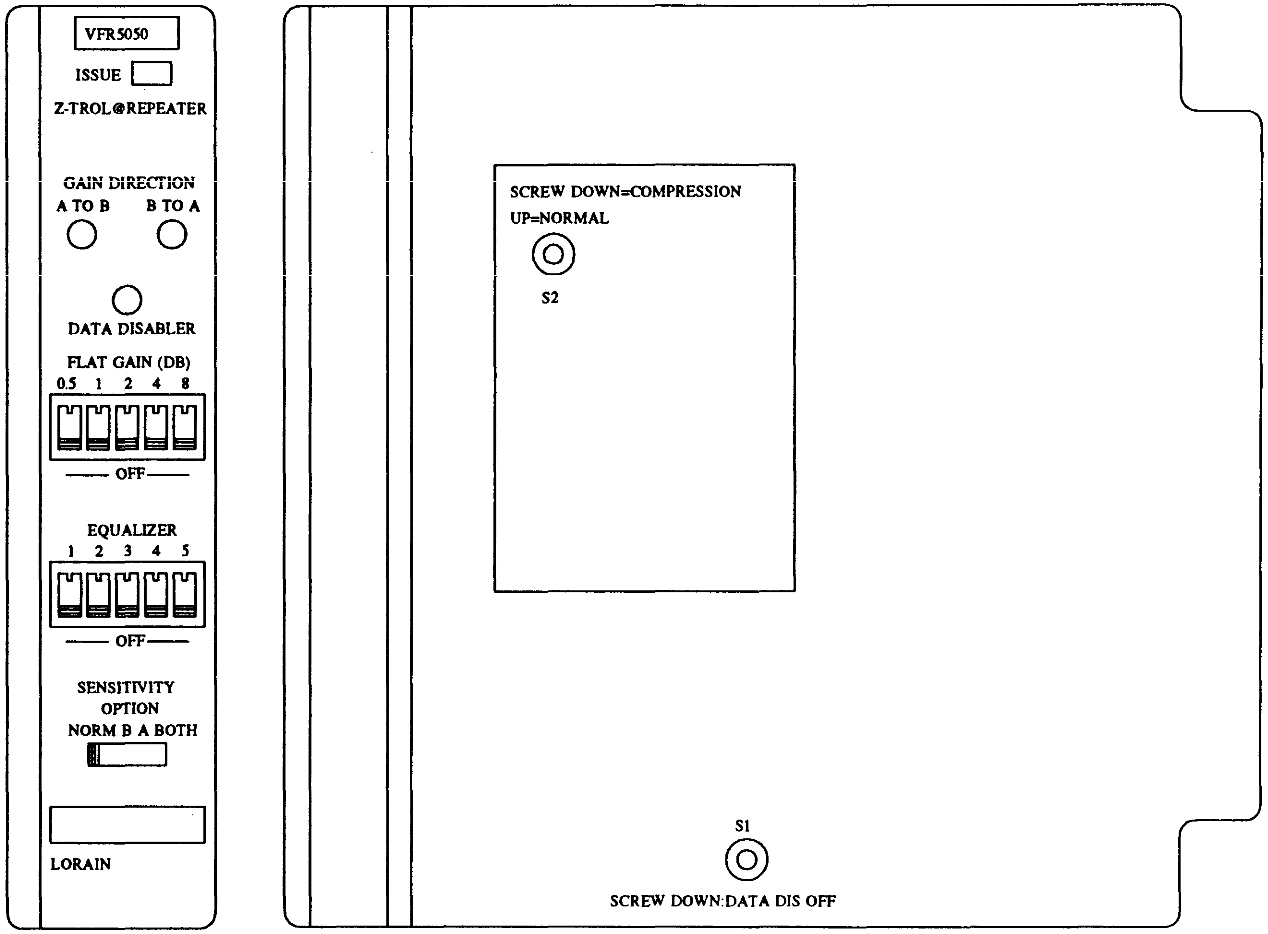


Figure 31-23. LORAIN Voice Gain Amplifier Switch Diagram

32. DATA EQUIPMENT

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ASYNCHRONOUS DATA UNIT (ADU) Z3A_

The ADU (Z3A_) is a Data Communications Equipment device that allows direct connection between RS232C equipment and the AT&T System 85. The ADU interfaces with the SN238 in the System 85. The ADU can be mounted in the auxiliary cabinet, a satellite closet, to a wall or cabinet by use of a velcro strip, or plugged directly into RS232 connector (Z3A2 only). (See chapter 10 for connections and terminations)

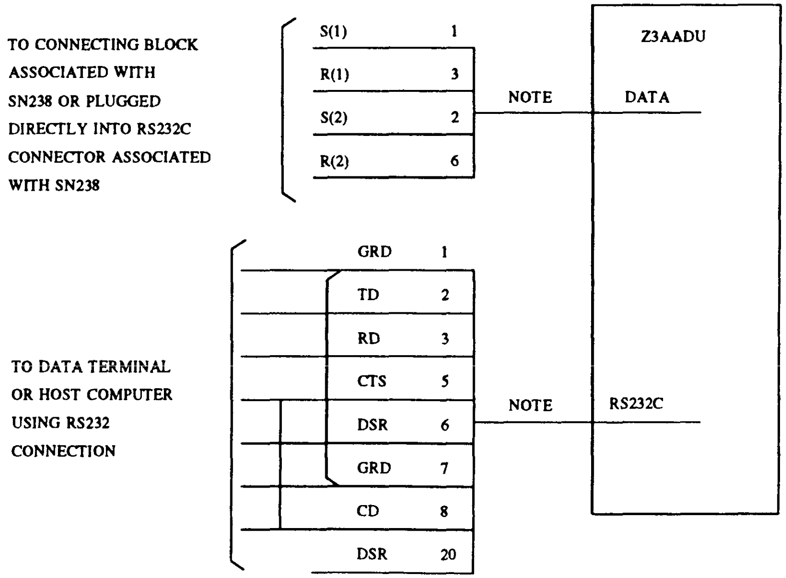


Figure 32-1. ADU Connections

TABLE 32-1. ADU (Z3A) Connection/Cables by Model Code

MODEL CODE	RS232C CONNECTOR	DATA CONNECTOR
Z3A1	25-pin plug on 3-ft cable	Modular
Z3A2	25-pin plug no cable	Modular
Z3A3	"110" patch cord	"110" patch cord
Z3A4	25-pin receptacle on 3-ft cable	Modular

Business Communications Terminal (BCT)

(See chapter 10 for circuit pack connections and terminations.)

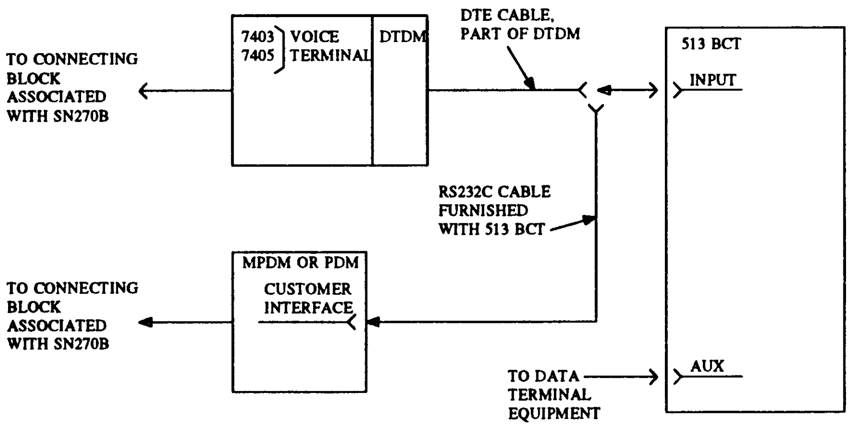


Figure 32-2. 513 BCT Connections

(See chapter 10 for circuit pack connections and terminations.)

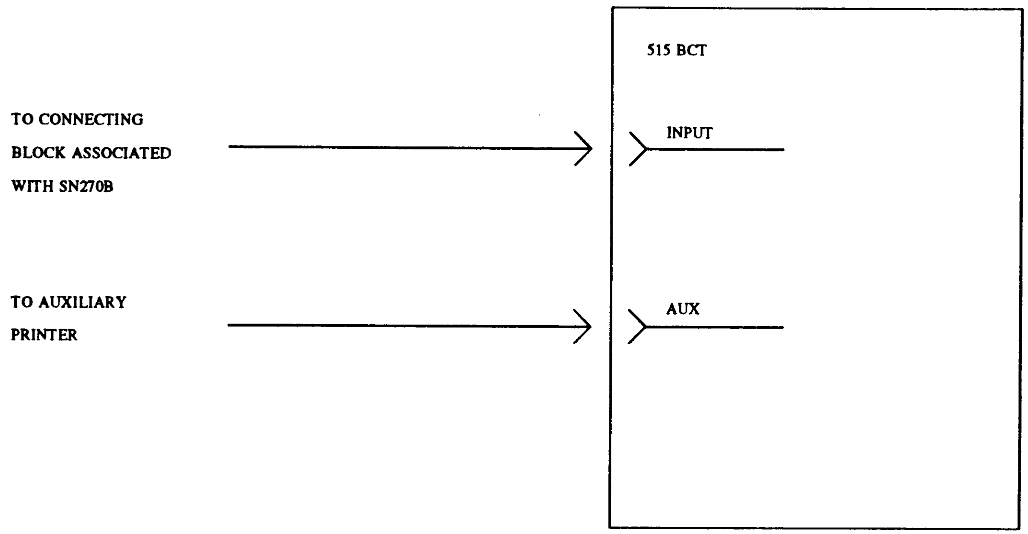
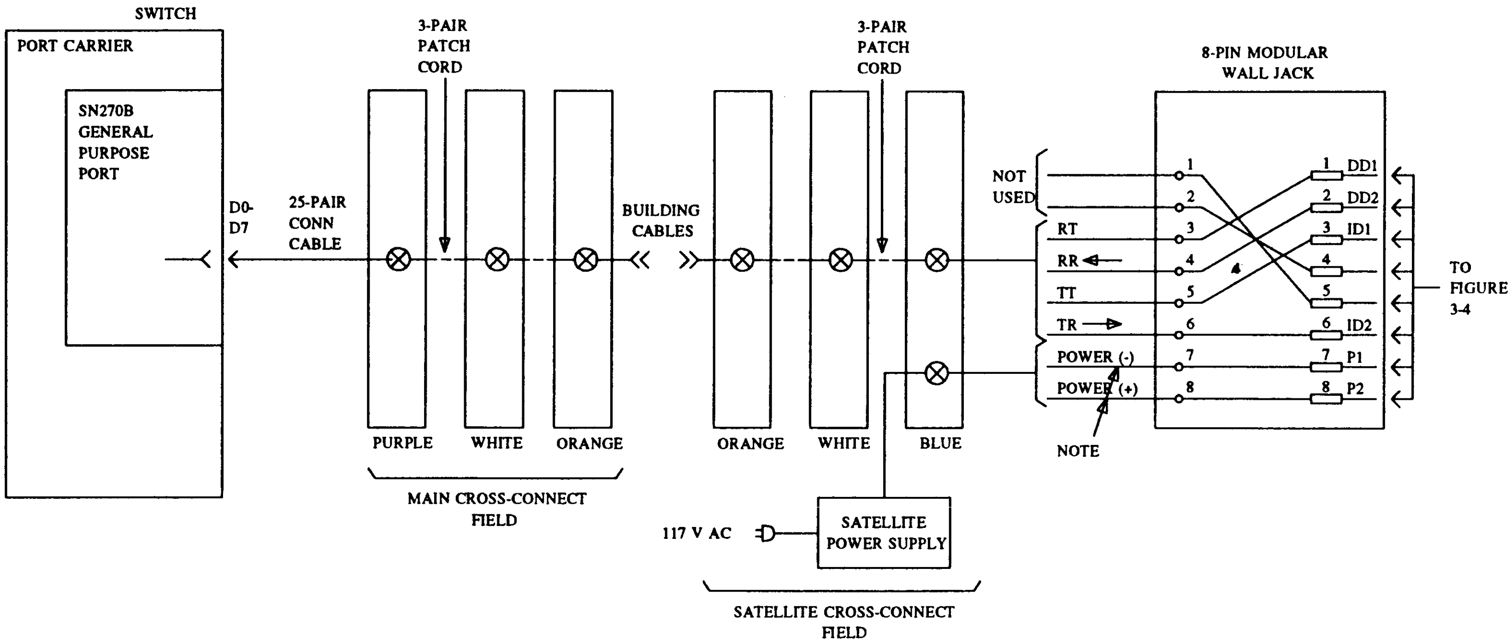


Figure 32-3. 515 BCT Connections

DATA CONNECTION TO THE SWITCH

(See chapter 10 for circuit pack connections and terminations.)



NOTE:
Power leads are not connected to processor data module (PDM).

Figure 32-4. Digital Voice Terminal and Data Terminal Connections to Switch (Sheet 1 of 2)

(Connections for PDM, DTDM can be found in the *Data Modules — PDM, MPDM, TDM, MTDM, DTM* section of this chapter.)

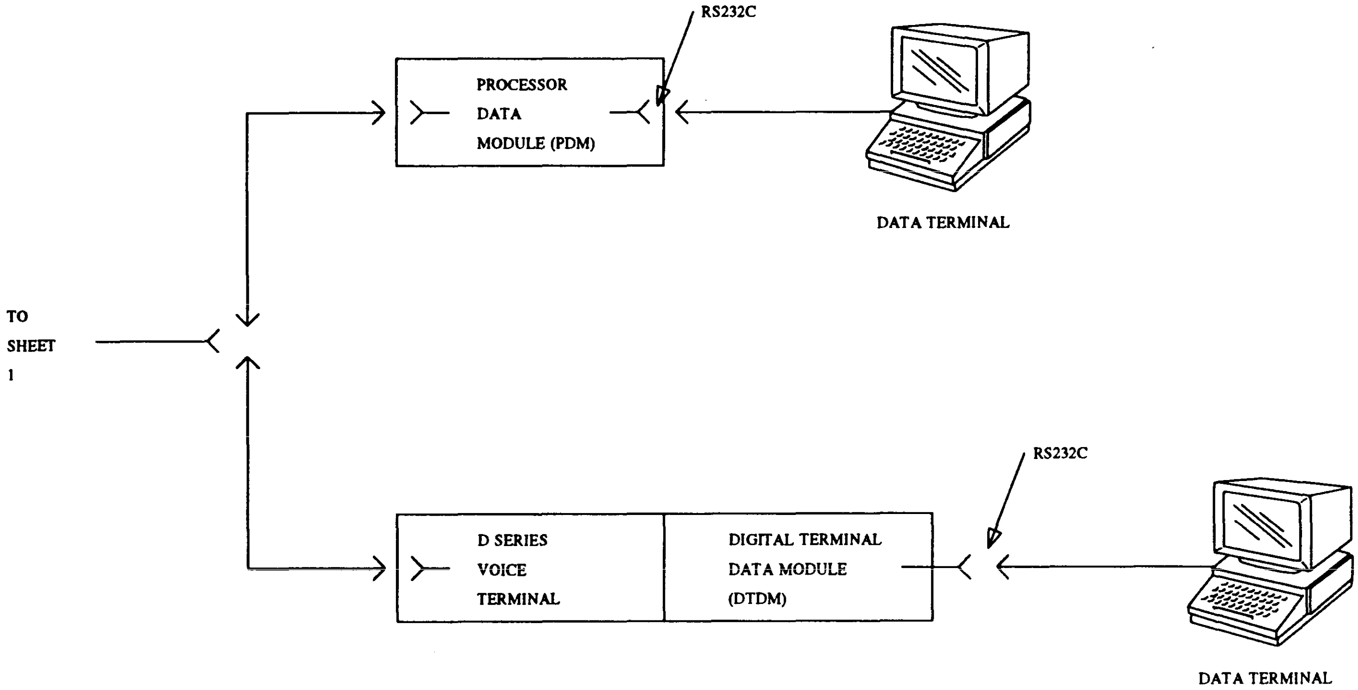


Figure 32-4. Digital Voice Terminal and Data Terminal Connections to Switch (Sheet 2 of 2)

(See chapter 10 for circuit pack connections and terminations.)

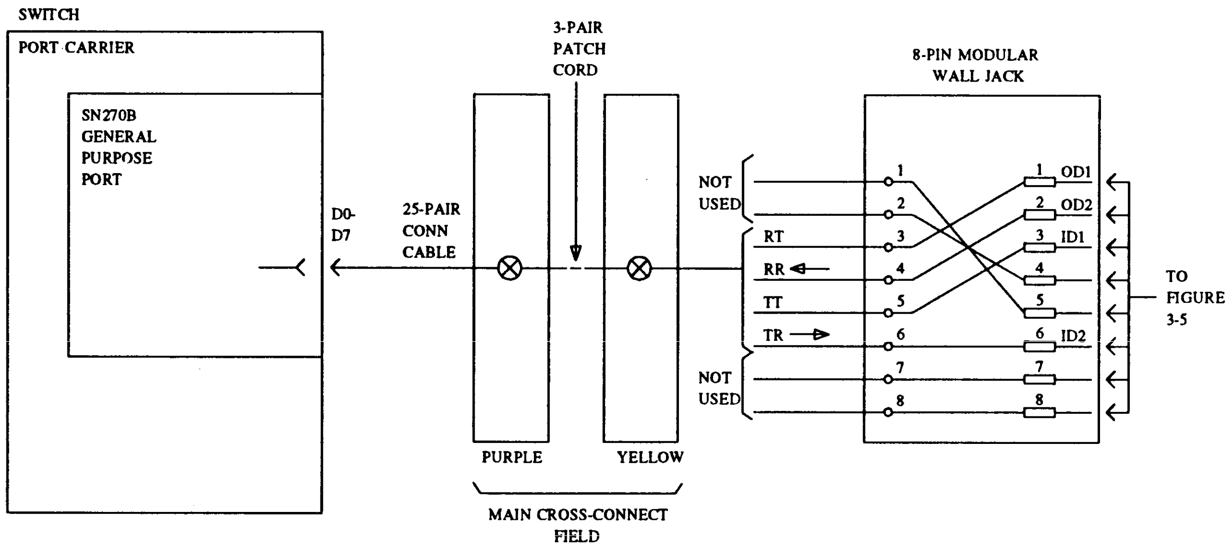


Figure 32-5. Data Channel Connection to Switch (Sheet 1 of 2)

(Connections for TDM can be found in the *Data Modules — PDM, MPDM, TDM, MTDM, DTM* section of this chapter.)

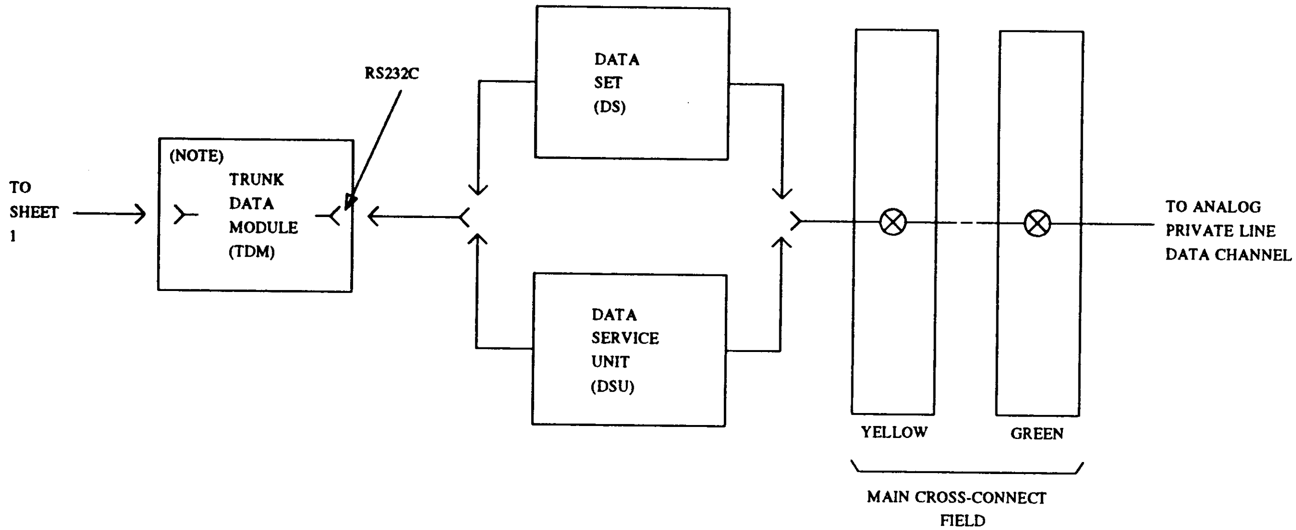


Figure 32-5. Data Channel Connection to Switch (Sheet 2 of 2)

DATA MODULES — PDM, MPDM, TDM, MTDM, DTDM

Processor Data Module (PDM) Installation and Connections

The PDM (DSU700A) is a Data Communications Equipment (DCE) type equipment that allows Data Terminal Equipment (DTE) and computer systems within the System 85 environment to access the system data switching capabilities.

Stand-alone configurations and multiple-mounting configurations are available. In the multiple-mounting configuration (in a rack that holds eight data modules), the faceplate is reversed to display panel callouts for vertical mounting.

Options

To set the signal ground to frame connection option, the PDM must be removed from the mounting. For use with the System 85, the frame ground and the signal grounds are isolated. To isolate the grounds, the option screw should be loosened (not making contact). The option screw is shown in figure 32-6.

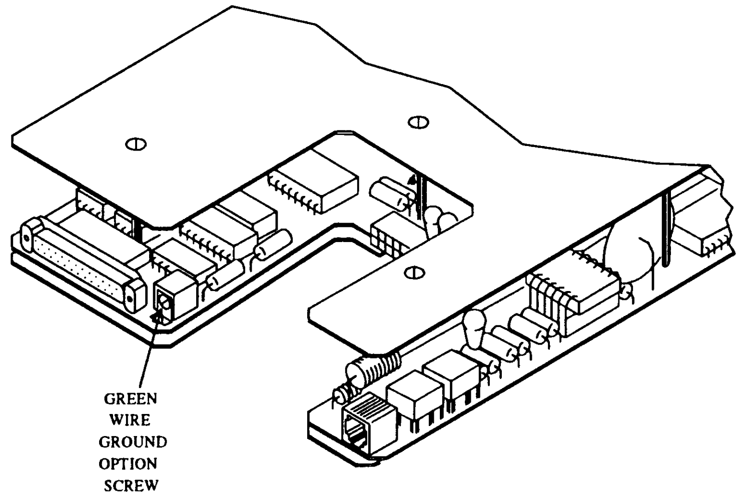


Figure 32-6. Signal Ground to Frame Ground Connection Option Switch Location

Located behind the front cover in the upper right-hand corner of the face plate is a panel of 30 switches — 25 for options and 5 for spares.

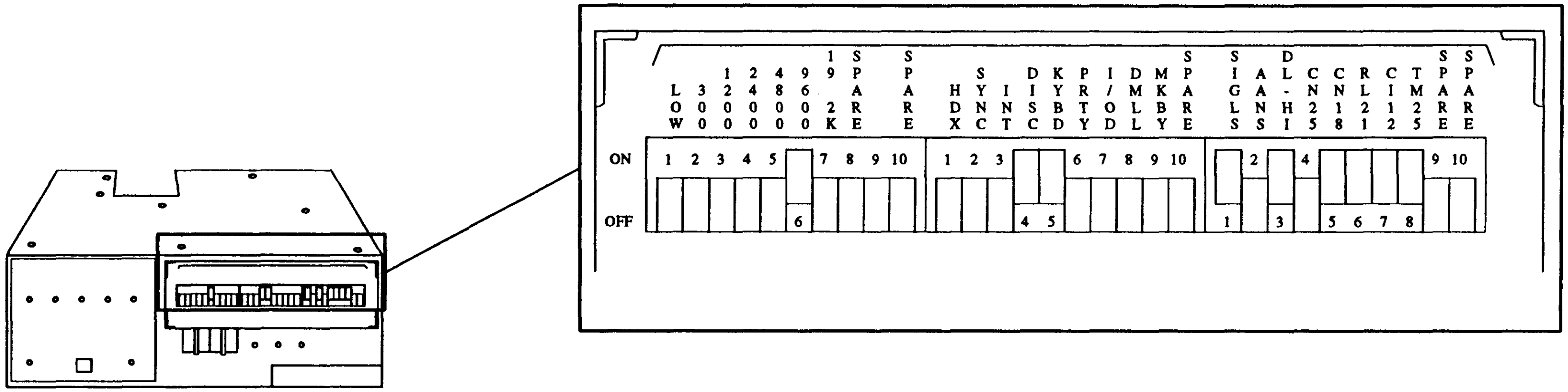


Figure 32-7. PDM Option Switch Panel

TABLE 32-2. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
LOW *	ON	Low-speed
	OFF	-
300 *	ON	300
	OFF	-
1200 *	ON	1200
	OFF	-
2400 *	ON	2400
	OFF	-
4800 *	ON	4800
	OFF	-
9600 *	ON	9600
	OFF	-
19.2 kb/s *	ON	19.2 kb/s
	OFF	-
64 kb/s *	ON	64 kb/s (HDX switch must be OFF)
	OFF	-
HDX	ON	Half-duplex
	OFF	Full-duplex
SYNC	ON	Synchronous Operation
	OFF	Asynchronous Operation
INT	ON	Internal timing (SYNC must be ON)
	OFF	External timing (SYNC must be ON)
DISC	ON	Long space signal (SYNC must be OFF)
	OFF	-
KYBD	ON	ASCII dialing enabled
	OFF	ASCII dialing disabled

* More than one switch can be set ON at a time. The PDM and its data module will select the highest common speed.

TABLE 32-2. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
PRTY	NOTE	
	NOTE	
I/OD	NOTE	
	NOTE	
DMLL	ON	Data set ready lead on during local loop testing
	OFF	
MKBY	ON	PDM looks busy in self-test and local loop test
	OFF	
SIGLS	ON	Signal loss disconnect feature
	OFF	
AANS	ON	Automatic answer feature enables
	OFF	Automatic answer feature disables
DLHI	ON	PDM will dial at highest speed selected
	OFF	Dials according to CH input
CN25 *	ON	EIA CN lead connected to pin 25
	OFF	EIA CN lead not connected to pin 25
CN18 *	ON	EIA CN lead connected to pin 18
	OFF	EIA CN lead not connected to pin 18
RL21	ON	EIA Remote Loop Circuit lead connected to pin 21
	OFF	EIA Remote Loop Circuit lead not connected to pin 21
CI12	ON	EIA CI lead connected to pin 12
	OFF	EIA CI lead not connected to pin 12
TM25 *	ON	EIA CI lead connected to pin 25
	OFF	EIA CI lead not connected to pin 25

* Only one of these three switches may be in the ON position at one time.

NOTE

Select one of the four parity types using the PRTY and I/OD switches.

PARITY	PRTY SETTING	I/OD SETTING
EVEN	ON	OFF
ODD	ON	ON
ZERO	OFF	OFF
ONE	OFF	ON

Installation

Stand-alone installation Ensure that faceplate is turned for horizontal operation. Open the magnetically latched front cover. Align the circuit pack with the extruded rails on the stand-alone mounting. Slide the circuit pack in the mounting until the circuit pack latch handle is flush with the front edge of the mounting. Replace the rear cover if necessary.

(See chapter 10 for circuit pack connections and terminations.)

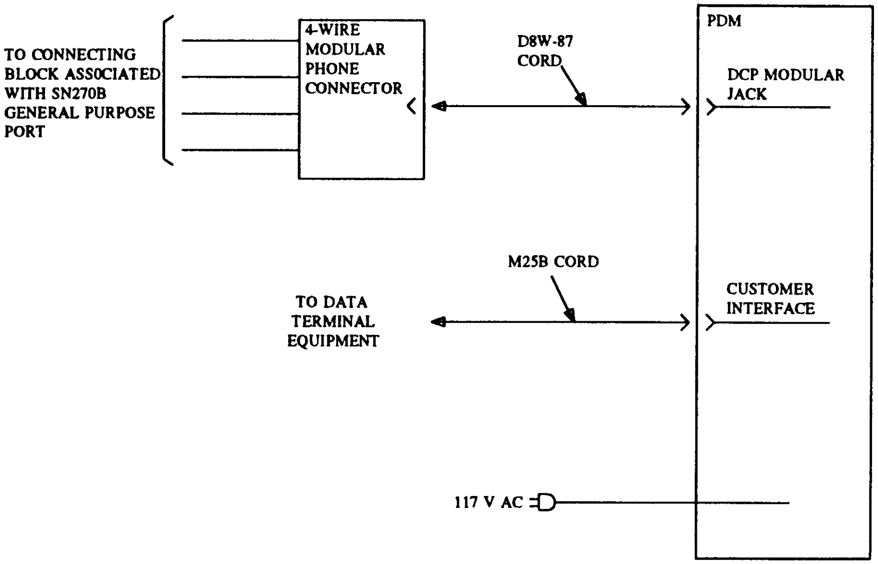


Figure 32-8. Stand-Alone Connections

Mutiple-mount installation Ensure that faceplate is turned for vertical operation. Open the mechanically hinged front panel of the 71A mounting. Align the PDM circuit pack with the extruded rails in the mounting. Slide circuit pack in the mounting until the circuit pack latch handle is flush with front edge of the mounting.

(See chapter 10 for circuit pack connections and terminations.)

TABLE 32-3. Multiple-Mount Connections

PIN NO. (J1)	LEAD DESIGNATIONS	PDM LOCATION NO.	FUNCTIONS
27,2	0D1,0D2	1	TRANSMIT PAIR
28,3	1D1,1D2	1	RECEIVE PAIR
30,5	0D1,0D2	2	TRANSMIT PAIR
31,6	1D1,1D2	2	RECEIVE PAIR
33,8	0D1,0D2	3	TRANSMIT PAIR
34,9	1D1,1D2	3	RECEIVE PAIR
36,11	0D1,0D2	4	TRANSMIT PAIR
37,12	1D1,1D2	4	RECEIVE PAIR
39,14	0D1,0D2	5	TRANSMIT PAIR
40,15	1D1,1D2	5	RECEIVE PAIR
42,17	0D1,0D2	6	TRANSMIT PAIR
43,18	1D1,1D2	6	RECEIVE PAIR
45,20	0D1,0D2	7	TRANSMIT PAIR
46,21	1D1,1D2	7	RECEIVE PAIR
48,23	0D1,0D2	8	TRANSMIT PAIR
49,24	1D1,1D2	8	RECEIVE PAIR

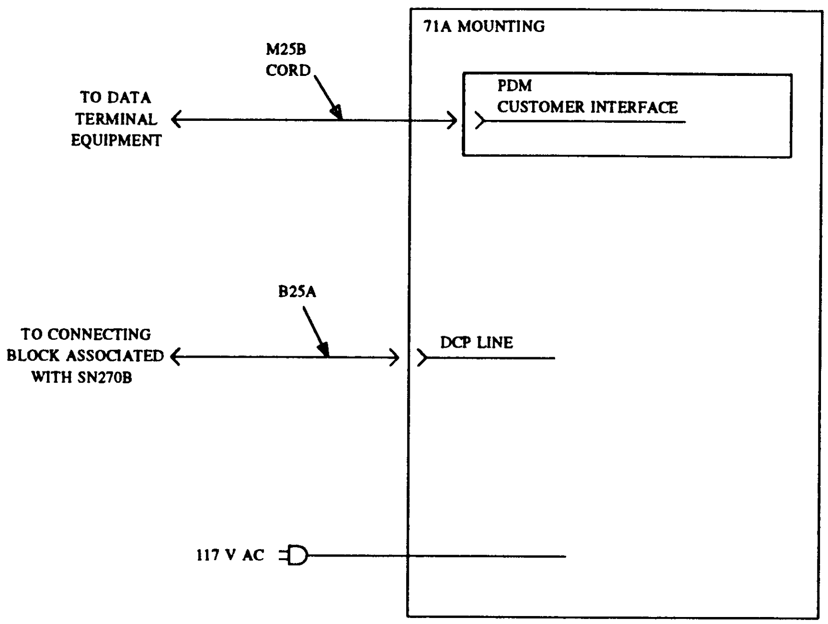


Figure 32-9. Multiple-Mount Installation Diagram

Modular Processor Data Module (MPDM)

The MPDM consists of a main printed wiring board circuit pack and modular data interface circuit pack. The main MPDM circuit pack holds both the data interface circuit pack and an optional ACU interface printed wiring board circuit pack. The MPDM can either be mounted in a stand-alone or multiple mounting.

Options

To set the signal ground to frame connection option, the MPDM must be removed from the mounting. For use with the AT&T System 85, the frame ground and the signal grounds are isolated. To isolate the grounds, the option screw should be loosened (not making contact). The option screw is shown in figure 32-10.

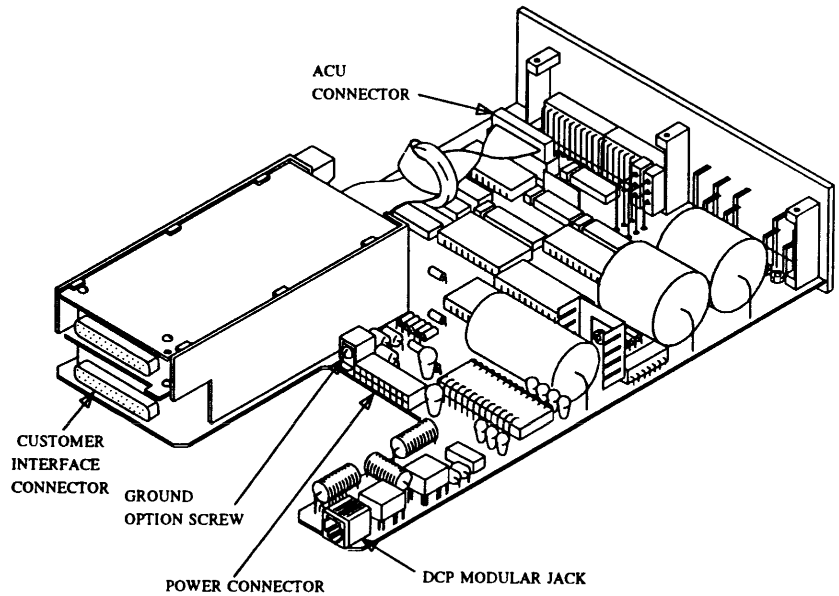


Figure 32-10. Signal Ground to Frame Ground Connection Option Switch Location

The MPDM faceplate is equipped with two dip switches for setting the options. Position 10 of the 12-position switch is a spare. The optional RS232C is equipped with one 8-position dop switch with Position 7 and 8 being spares.

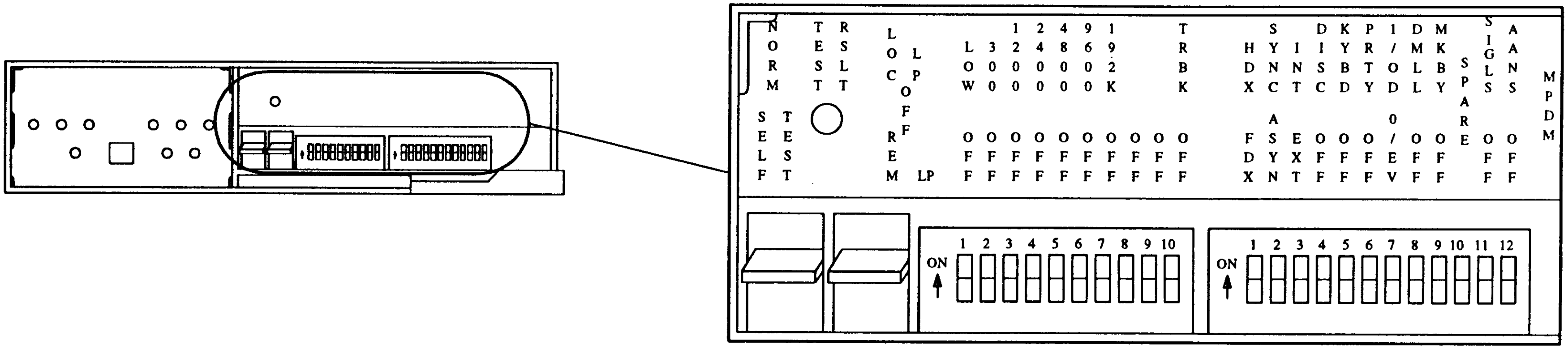


Figure 32-11. MPDM Faceplate Switches Diagram

TABLE 32-4. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
LOW *	ON	Low-speed
	OFF	-
300 *	ON	300
	OFF	-
1200 *	ON	1200
	OFF	-
2400 *	ON	2400
	OFF	-
4800 *	ON	4800
	OFF	-
9600 *	ON	9600
	OFF	-
19.2 Kb/s *	ON	19.2 Kb/s
	OFF	-
56 Kb/s *	ON	56 Kb/s (SYNC and INT will automatically be selected)
	OFF	-
64 Kb/s *	ON	64 Kb/s (SYNC, INT, and FDX will automatically be selected)
	OFF	-

* More than one switch can be set on at a time. The MPDM and its data module will select the highest common speed.

TABLE 32-4. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
TRBK	ON	MPDM will end a call by recognizing three breaks - SYNC must be OFF, DISC must be ON.
	OFF	Three breaks disconnect is disabled.
HDX	ON	Half-duplex.
	OFF	Full-duplex.
SYNC	ON	Synchronous.
	OFF	Asynchronous.
INT	ON	Internal timing. (SYNC must be ON)
	OFF	External timing. (SYNC must be ON)
DISC	ON	Disconnects from keyboard diailed calls after 2-second spacing.
	OFF	Will not disconnect from keyboard dialed calls after 2-second spacing.
KYBD		Enables ASCII Keyboard dialing.
	OFF	Disables ASCII keyboard dialing - must be OFF if MPDM contains ACU circuit pack.
PRTY	NOTE	KYBD must be ON for this switch to be operational.
	NOTE	
I/OD	NOTE	
	NOTE	
DMLL	ON	RS232C Lead CC is turned on during the local loop test mode.
	OFF	-
MKBY	ON	MPDM looks busy in self-teat and local loop modes.
	OFF	-
SIGLS	ON	Signal loss disconnect - system must receive an update message every 4 seconds or it will disconnect.
	OFF	
AANS	ON	Automatic Answer feature is ON.
	OFF	Automatic Answer feature is OFF.

NOTE: Select one of four parity types using the PRTY and I/OD switches.

Parity	PRTY Setting	I/OD Setting
Even	ON	OFF
Odd	ON	ON
Zero	OFF	OFF
One	OFF	ON

TABLE 32-4. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
TM25*	ON	EIA TM lead circuit is connected to Pin 25.
	OFF	EIA TM lead circuit is disconnected from Pin 25.
RL21	ON	EIA remote loop circuit is connected to Pin 21.
	OFF†	EIA remote loop circuit is disconnected from Pin 21.
DL-HI	ON	MPDM dials at highest selected speed.
	OFF	MPDM dials at speed of EIA pin 23 (CH) input.
CN25*	ON	EIA CN lead is connected to Pin 25.
	OFF	EIA CN lead is not connected to pin 25.
CN18*	ON	EIA CN lead is connected to Pin 18.
	OFF	EIA CN lead is not connected to Pin 18.
CI12	ON	EIA CI lead is connected to Pin 12.
	OFF†	EIA CI lead is not connected to Pin 12.

* Only one of these options can be on at any one time.
† Recommended setting.

Installation

Connect the 34-conductor ribbon on the main MPDM circuit pack to the data interface circuit pack ribbon connector. Slide the data interface circuit pack (component side down) into the lower level of the plastic chassis.

If required, slide the ACU interface circuit pack (component side down) on the upper level of the plastic chassis on the main MPDM circuit pack. Attach the 20-pin conductor ribbon cable of the ACU pack to the 20-pin connector on the main MPDM circuit pack.

Open the magnetically latched front cover. Align the assembled MPDM with the rails of the mounting. Slide the MPDM into the mounting until the latch handle is flush with the front edge of the mounting. Replace the rear cover if necessary.

(See chapter 10 for circuit pack connections and terminations.)

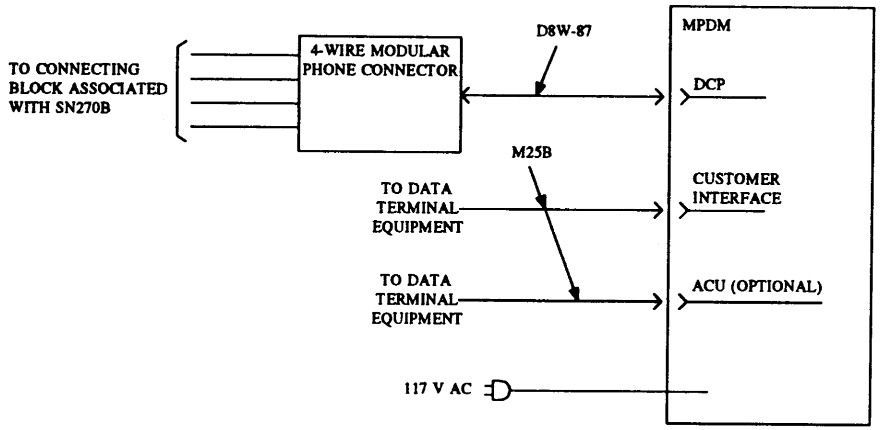


Figure 32-12. MPDM Connections (Stand-Alone Mounting)

TABLE 32-5. MPDM Connections (Multiple-Mount Application)

MOUNTING SLOT NO.	DCP LINE	LEAD DESIGNATIONS (NOTE)	FUNCTIONS
1	27,2 28,3	0D1,0D2 IDl,ID2	Transmit Pair Receive Pair
2	30,5 31,6	0D1,0D2 IDl,ID2	Transmit Pair Receive Pair
3	33,8 34,9	0D1,0D2 IDl,ID2	Transmit Pair Receive Pair
4	36,11 37,12	0D1,0D2 ID1,ID2	Transmit Pair Receive Pair
5	39,14 40,15	0D1,0D2 ID1,ID2	Transmit Pair Receive Pair
6	42,17 43,18	0D1,0D2 ID1,ID2	Transmit Pair Receive Pair
7	45,20 46,21	0D1,0D2 ID1,ID2	Transmit Pair Receive Pair
8	48,23 49,24	0D1,0D2 ID1,ID2	Transmit Pair Receive Pair

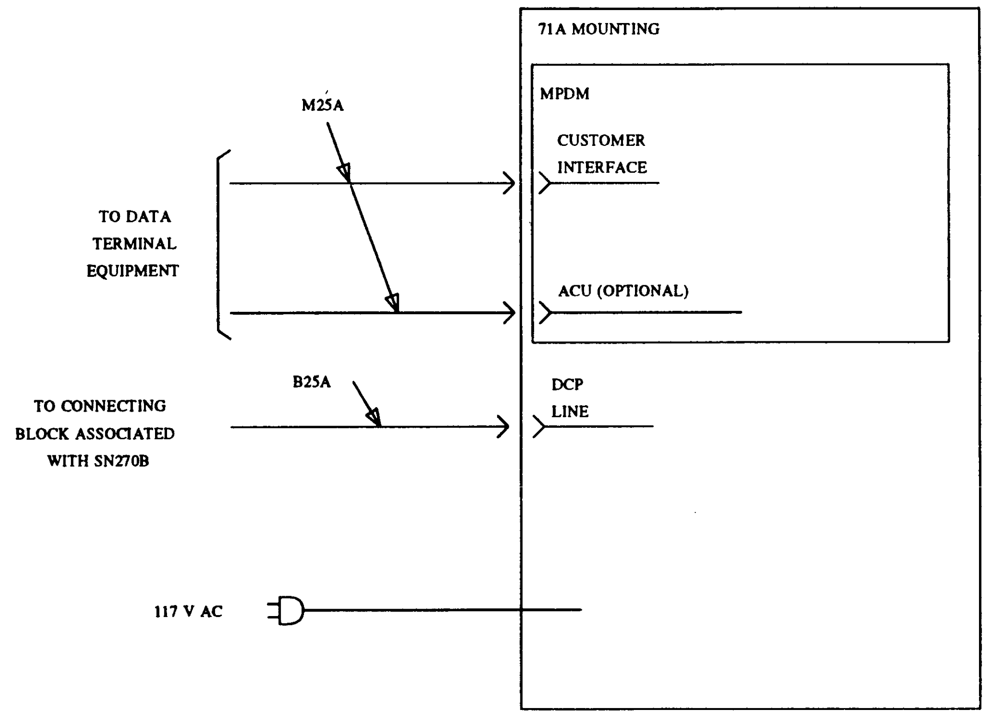


Figure 32-13. Diagram of MPDM Connections (Multiple Mount)

Trunk Data Module (TDM)

The TDM is a Data Terminal Equipment type device used to interface the System 85 data capabilities to conventional analog data channel via a modem or data service unit using an RS232C interface.

Options

To set the signal ground frame connection option, the TDM must be removed from the mounting. For use with the System 85, the frame ground and the signal grounds are isolated. To isolate the grounds, the option screw should be loosened (not making contact). The option screw is shown in figure 32-14.

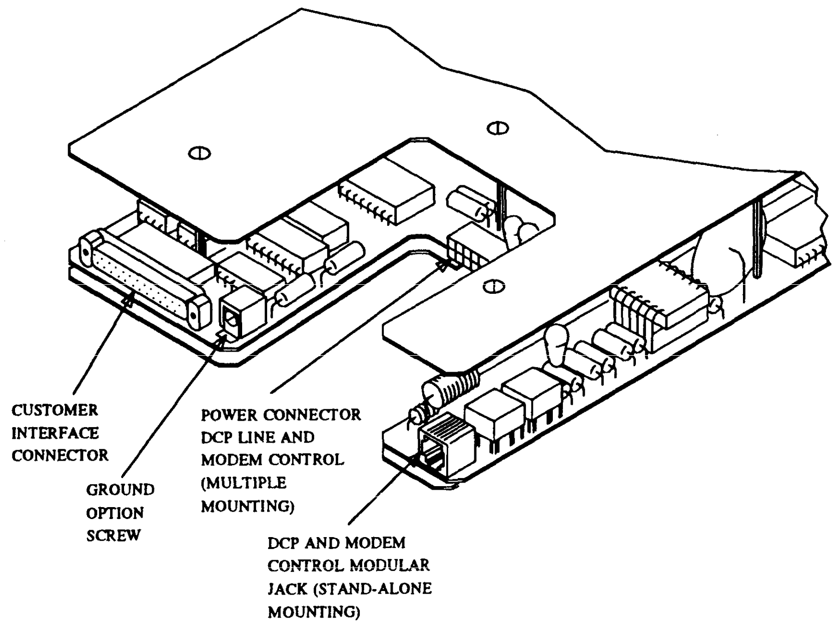


Figure 32-14. Signal Ground to Frame Ground Connection Option Switch Location

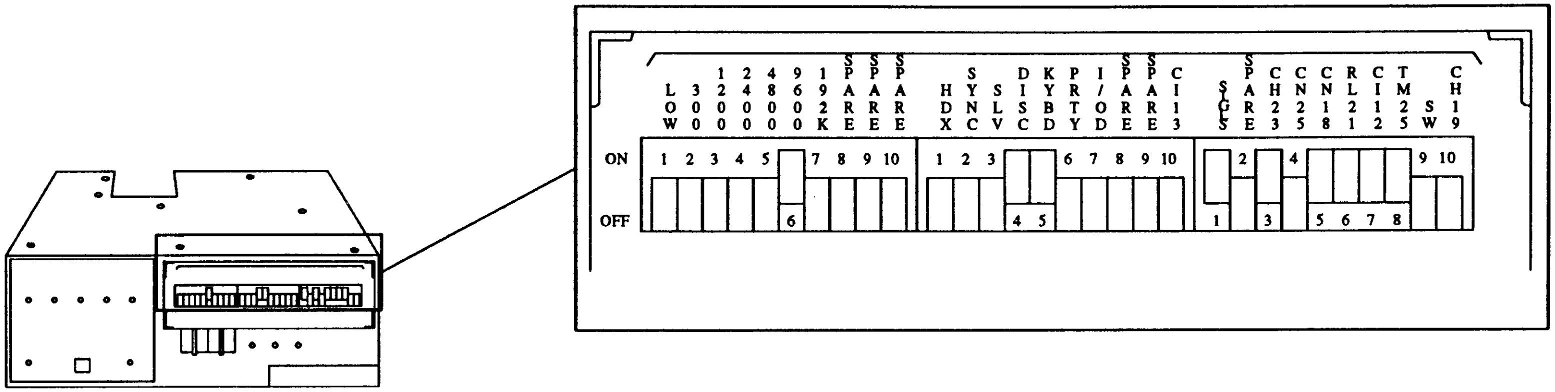


Figure 32-15. TDM Front Panel Switches

TABLE 32-6. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
LOW*	ON	Low speed
	OFF	-
300*	ON	300
	OFF	-
1200*	ON	1200
	OFF	-
2400*	ON	2400
	OFF	-
4800*	ON	4800
	OFF	-
9600*	ON	9600
	OFF	-
19.2 kb/s*	ON	19.2 Kb/s
	OFF	-

* More than one switch can be set ON at a time. The TDM and its data module will select the highest common speed.

TABLE 32-6. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
HDX	ON	Half-duplex.
	OFF	Full-duplex.
SYNC	ON	Sunchronous operation.
	OFF	Asynchronous operation.
SLV	ON	Slave timing. (SYNC must be in ON position)
	OFF	Internal timing. (SYNC must be in ON position)
DISC*	ON	Permits 2-second spacing signal to terminate a call SYNC must be OFF
	OFF	-
KYBD*	ON	Enables ASCII keyboard dialing.
	OFF	Disables ASCII keyboard dialing.
PRTY	NOTE	
	NOTE	
I/OD	NOTE	
	NOTE	
CI13	ON	Connects EIA and CI2 to Pin 13 - allowing TDM to select proper speed of modem being interfaced.
	OFF	Disconnects EIA lead CI2 to Pin 13.
SIGLS	ON	Enables signal loss disconnect feature.
	OFF	Disables signal loss disconnect feature.
CH23	ON	EIA CH circuit is connected to Pin 23.
	OFF	EIA CH Circuit is disconnected from Pin 23.

* Option is ignored if the SW option is ON

NOTE: Select on of four parity type using the PRTY and I/OD switches

PARITY	PRTY OPTION SETTING	I/OD OPTION SETTING
EVEN PARITY	ON	OFF
ODD PARITY	ON	ON
ZERO PARITY	OFF	OFF
ONE PARITY	OFF	ON

TABLE 32-6. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
CN25	ON	Connects EIA CN lead to Pin 25 - TM25 must be OFF
	OFF	Disconnects EIA CN lead from Pin 25
CN18	ON	Connects EIA CN lead to Pin 18
	OFF	Disconnects EIA CN lead from Pin 18
RL21	ON	Connects EIA RL lead to Pin 21
	OFF	Disconnects EIA lead from Pin 21
CI12	ON	Connects EIA CI lead to Pin 12
	OFF	Disconnects EIA CI lead from Pin 12
TM25	ON	Connects EIA TM lead to Pin 25 - CN25 must be OFF
	OFF	Disconnects EIA TM lead from Pin 25
SW	ON	Allows TDM to interface to analog switched network modems
	OFF	Allows TDM to interface to private line modems
CH19	ON	Connects EIA lead CH2 to Pin 19 - SW must be ON
	OFF	Disconnects EIA lead CH2 from Pin 19

Connections

Stand-alone mounting Ensure the faceplate is turned for horizontal operation. Open the magnetically hinged front cover. Align the circuit pack with the rails on the stand-alone mounting. Slide the circuit pack in the mounting until the circuit pack latch is flush with the front edge of the mounting. Replace the rear cover if required.

(See chapter 10 for circuit pack terminations and connections.)

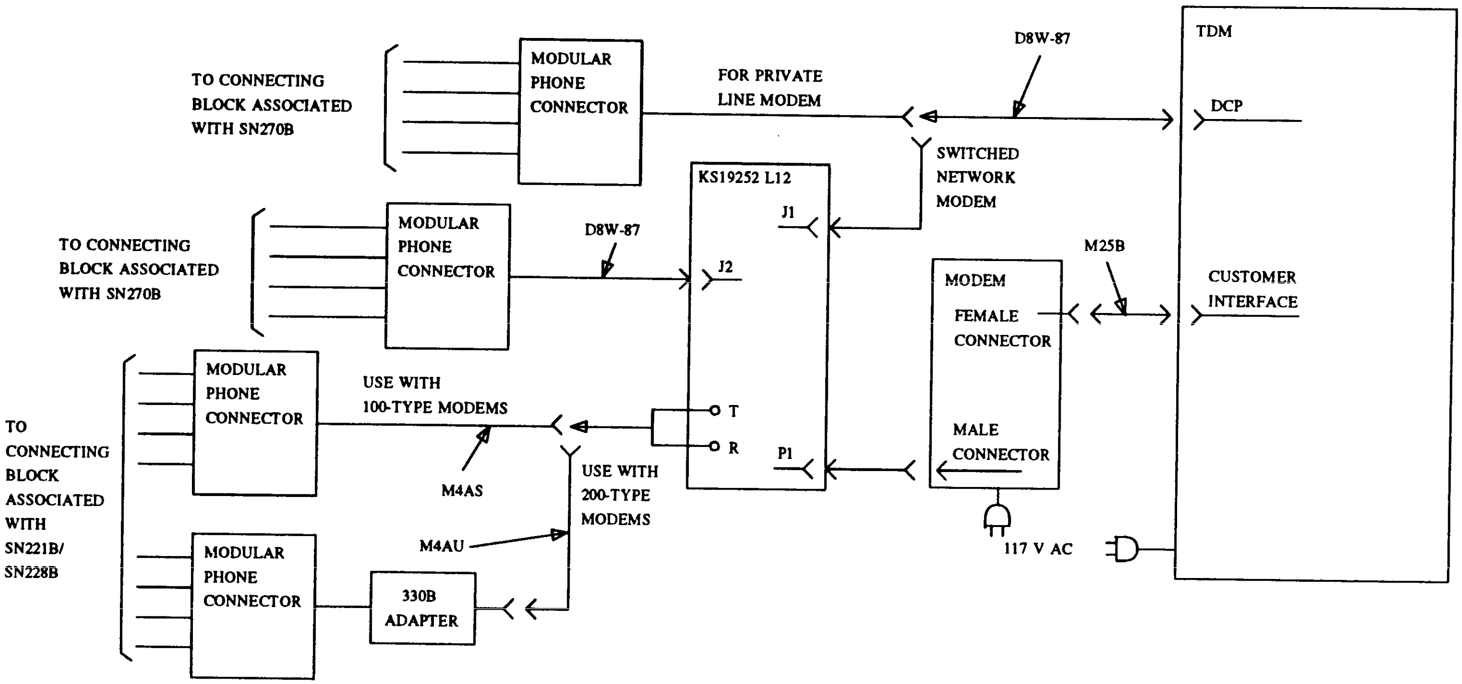


Figure 32-16. Connections

Multiple-mount connections Ensure the faceplate is turned for vertical operation. Open the magnetically latched front panel. Align the circuit packs with the extruded rails of the mounting. Slide the circuit pack in the mounting until the latch is flush with the front of the mounting.

(See chapter 10 for circuit pack terminations and connections.)

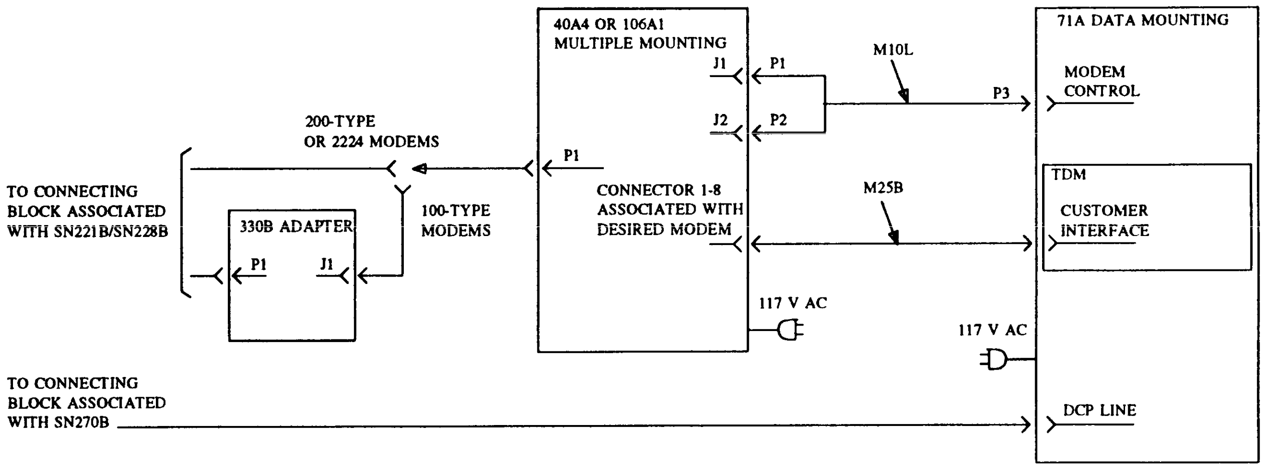


Figure 32-17. Connections Using 40A4 or 106A1 Mounting

(See chapter 10 for circuit pack terminations and cross-connections.)

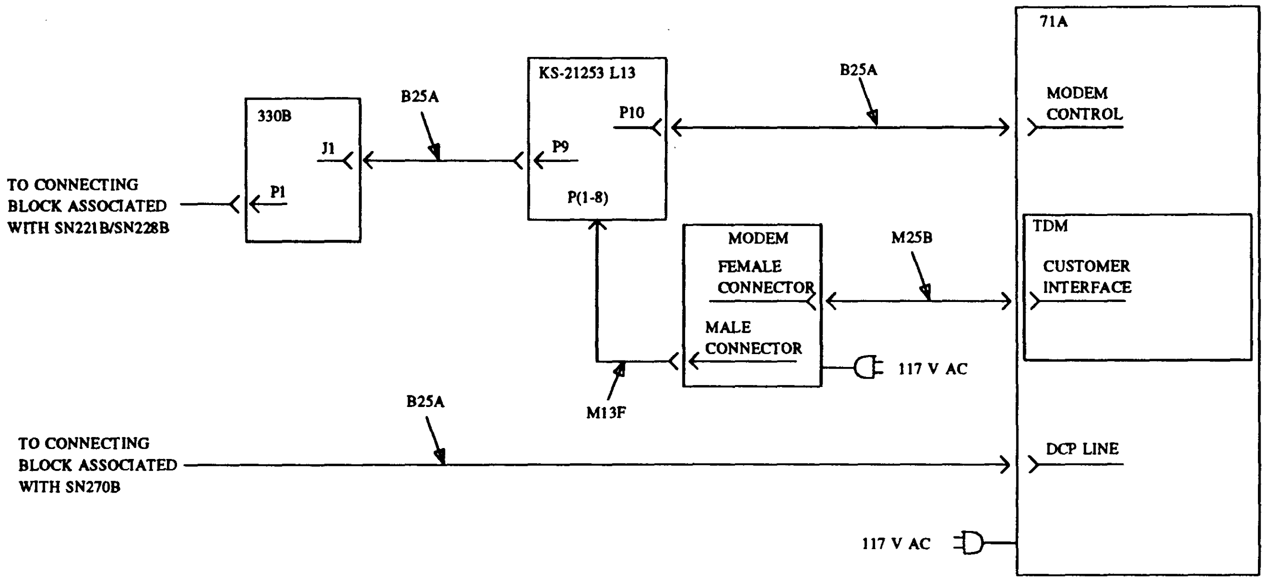


Figure 32-18. Connections using 201CR and/or 208BR Modems

Modular Trunk Data Module (MTDM)

The MTDM is a data terminal equipment type device used to interface the System 85 data capabilities to a conventional analog data channel via a modem or data service unit using an EIA RS232C interface.

Options

To set the signal ground to frame connection option, the MTDM must be removed from the mounting. For use with the System 85, the frame ground and the signal grounds are isolated. To isolate the grounds, the option screw should be loosened (not making contact). The location of the screw is shown in figure 32-19.

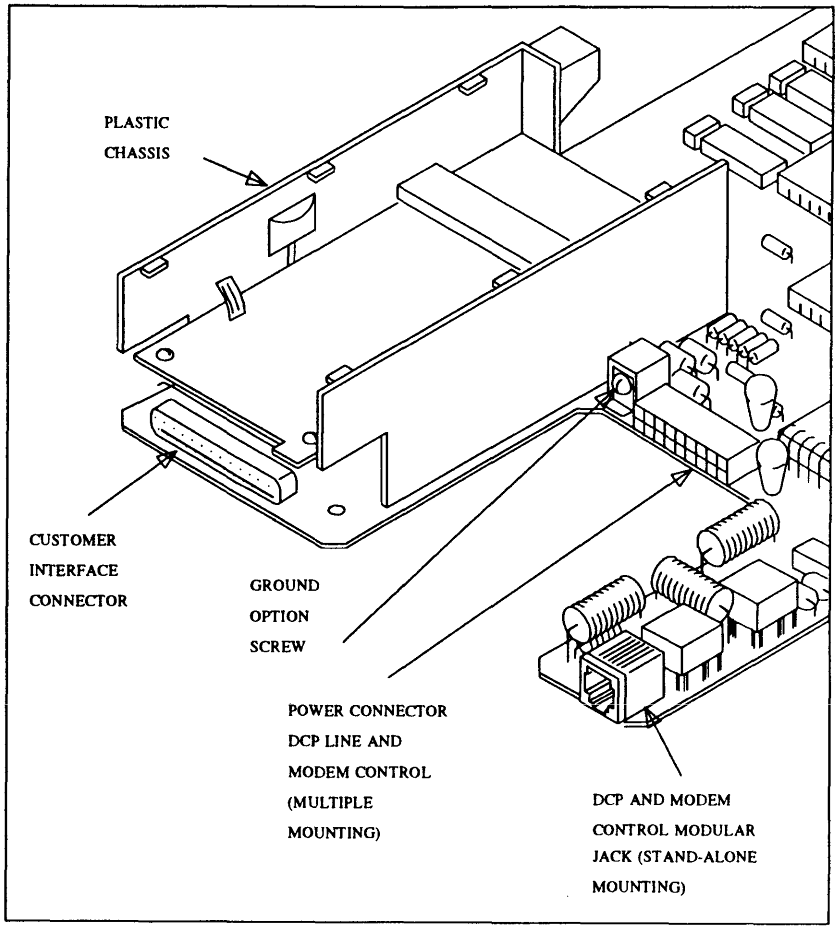


Figure 32-19. Ground Option Screw

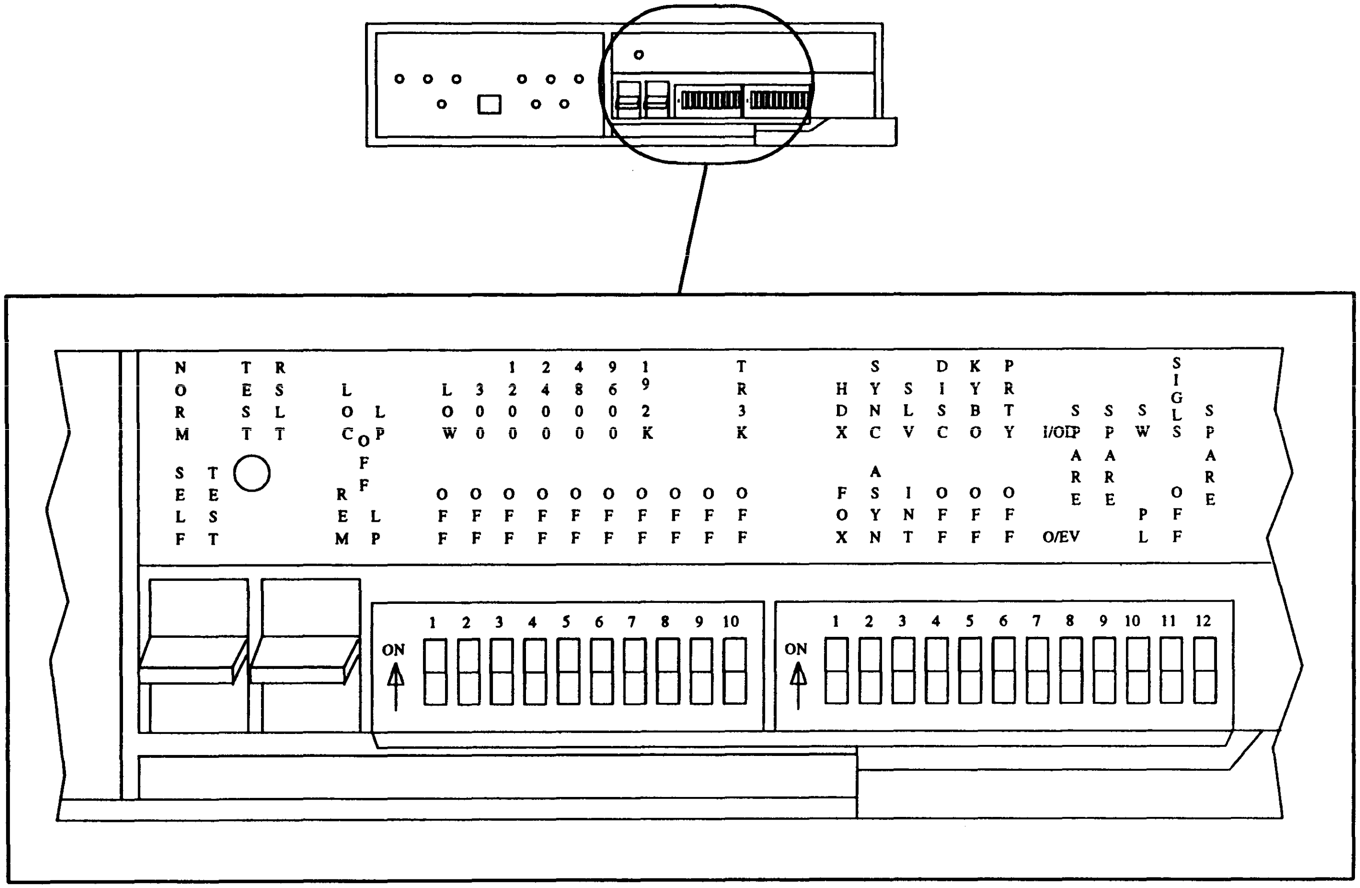


Figure 32-20. The MTDM is Equipped with Two DIP Switches Confining 19 Selectable Options and 3 Spares.

TABLE 32-7. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
LOW*	ON	Lowspeed
	OFF	
300*	ON	300
	OFF	-
1200*	ON	1200
	OFF	-
2400*	ON	2400
	OFF	-
4800*	ON	4800
	OFF	-
9600*	ON	9600
	OFF	-
19.2 kb/s*	ON	19.2 kb/s
	OFF	-
56 kb/s*	ON	56 kb/s (SYNC, AND SLV WILL AUTOMATICALLY BE SELECTED)
	OFF	
64 kb/s*	ON	64 kb/s (SYNC, INT, AND FDX WILL AUTOMATICALLY BE SELECTED)
	OFF	

* More than one switch can be set one at a time. The MPDM and its data module will select the highest common speed.

TABLE 32-7. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
TRBK	ON	Enables triple break disconnects.
	OFF	Disables triple break disconnects.
HDX-	HDX (ON)	Half-duplex
FDX	FDX (OFF)	Full-duplex.
SYNC	SYNC (ON)	Synchronous operation
ASYN	ASYN (OFF)	Asynchronous operation
SLV	SLV (ON)	Slave timing
INT	INT (OFF)	Internal timing.
DISC	ON	Enables disconnect after 2 seconds of spacing signal (option is ignored if SW is ON).
	OFF	Disables disconnect after 2 seconds of spacing signal.
KYBD	ON	Enables ASCII keyboard dialing.
	OFF	Disables ASCII keyboard dialing.
PRTY	NOTE	
	NOTE	
I/OD-	NOTE	
O/EV	NOTE	
SW-	SW (ON)	MTDM can be paired with analog switched network modems.
PL	PL (OFF)	MTDM can be paired with private line modems.
SIGLS	ON	Enables signal loss disconnect.
	OFF	Disables signal loss disconnect.

NOTE: Select one of four parity types using the PRTY and the I/OD switches.

PARITY	PRTY SETTING	O/EV-I/OD SETTING
EVEN PARITY	ON	OFF
ODD PARITY	ON	ON
ZERO PARITY	OFF	OFF
ONE PARITY	OFF	ON

TABLE 32-7. Option Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
CI12	On	Connects EIA lead CI to pin 12.
	Off	Disconnects EIA lead CI from pin 12.
CN25	On	Connects EIA lead CN to pin 25 - TM25 must be off.
	Off	Disconnects EIA lead CN from pin 25.
TM25	On	Connects EIA lead TM to Pin 25 - CN 25 must be off.
	Off	Disconnects EIA lead TM from pin 25.
CI13	On	Connects EIA lead CI 2 to pin 14 - SW must be on.
	Off	Disconnects EIA lead CI 2 from pin 13.
CI18	On	Connects EIA lead CN to pin 18.
	Off	Disconnects EIA lead CN from pin 18.
CH23	On	Connects EIA CH lead to pin 23.
	Off	Disconnects EIA CH lead from pin 23.
RL21	On	Connects EIA RL lead to pin 21.
	Off	Disconnects EIA RL lead from pin 21.
CH19	On	Connects EIA lead CH 2 circuit to pin 19.
	Off	Disconnects EIA lead CH 2 circuit from pin 19.

Installation

Attach the 34-conductor ribbon cable on the main MTDM circuit pack to the data interface circuit pack ribbon connector. Slide the data interface circuit (component side down) on the lower level of the plastic chassis. Open the front cover and align the assembled MTDM with the rails of the mounting. Slide the MTDM into the mounting until the latch is flush with the front edge of the mounting. Replace the rear cover if necessary.

(See chapter 10 for circuit pack terminations and connections.)

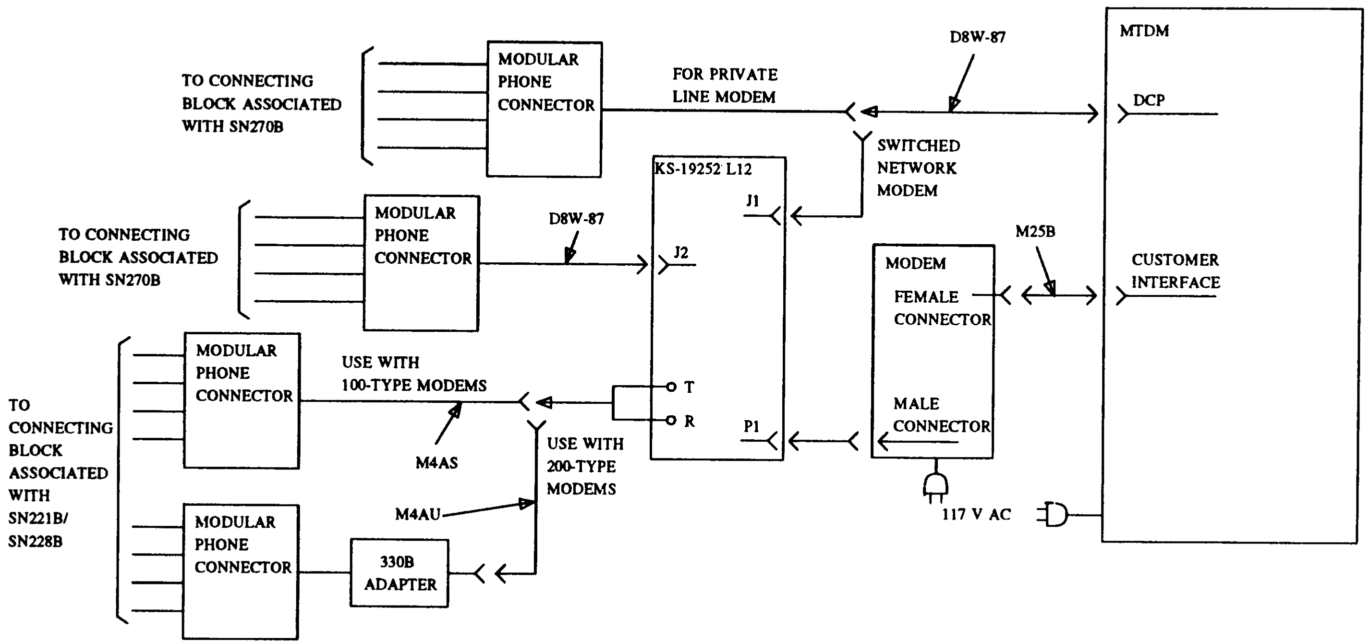


Figure 32-21. Stand-Alone Mounting Connections

(See chapter 10 form circuit pack terminations and connections.)

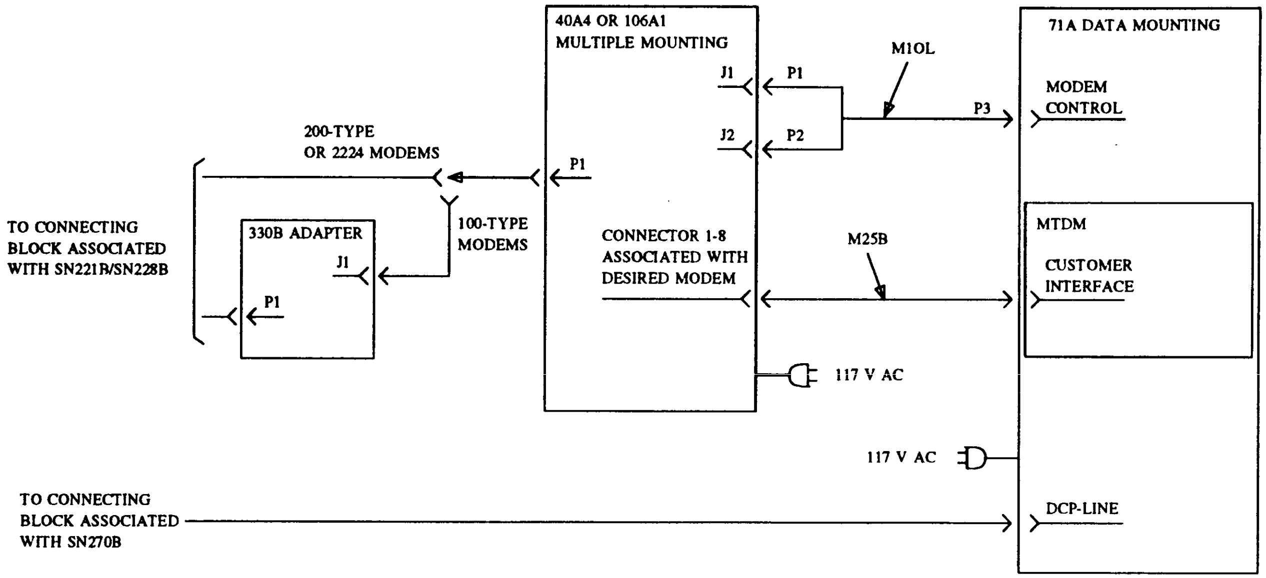


Figure 32-22. Multiple-Mount Connections with 40A4 or 106A1 Mounting

(See chapter 10 for circuit pack connections and terminations.)

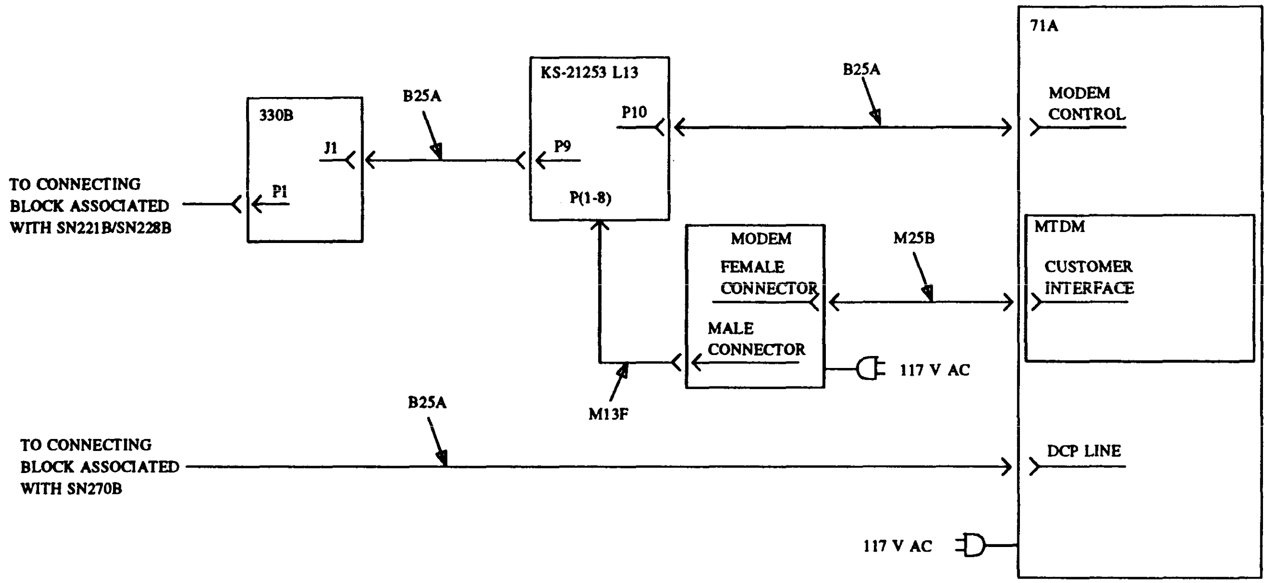


Figure 32-23. Multiple-Mount Connections with 201CR and 208BR Modems

Digital Terminal Data Module (DTDM)

The DTDM is a data communication equipment that transmits and receives serial data over a 4-wire, System 85 channel. The DTDM operates as an adjunct to a digital voice terminal and depends on the line interface circuit of the digital voice terminal to communicate with the System 85. The system can switch the DTDM to communicate with another data module.

Options

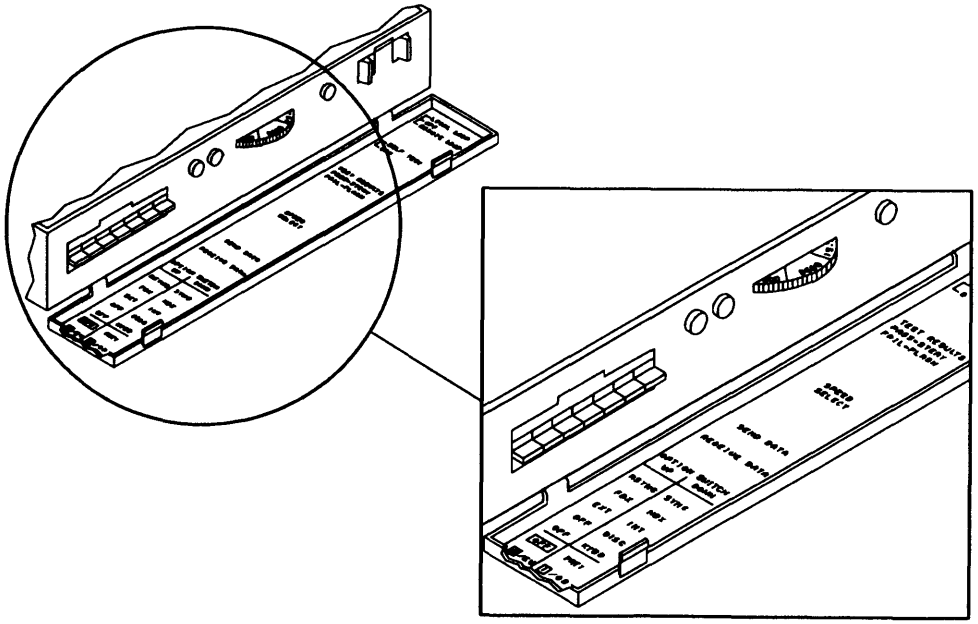


Figure 32-24. Option Switch Locations

Speed Select Options

The thumbwheel switch selects data rates of LOW, 300, 1200, 2400, 4800, 9600, and 19.2kb/s. The switch is located behind the side cover. The numbers on the switch corresponding to the speed selected should be visible. To establish a call, the other end of the connection must have at least one common speed selected. The other data module, in conjunction with the DTDM, will select the highest common proper speed during handshaking. Once a call is established, the DTDM will ignore any changes in the speed select switch setting.

The DTDM is equipped with seven option switches. The options must be selected prior to placing a data call and must be compatible with the options of the data terminal and with the module being called.

TABLE 32-8. DTDM Option Switch Settings

SWITCH NAME	SWITCH SETTING	OPTION DESCRIPTION
ASYNC/ SYNC	Up	Asynchronous operation
	Down	Synchronous operation
FDX/ HDX	Up	Full-duplex
	Down	Duplex
EXT/ INT	Up	External timing
	Down	Internal timing
DISC*	Up	Off
	Down	Permits 2 seconds of spacing signal from a DTE to terminate a call
KYBD	Up	Disables ASCII dialing
	Down	Enables ASCII dialing
PRTY	Note	
	Note	
0-Even/ 1-Odd	Note	
	Note	

* ASYNC/SYNC must be Down-Asynchronous

NOTE: Select one of four parity types using the PRTY and the O-EV/1 OD switches:

PARITY	PRTY SETTING	0 EV/1 OD SETTING
Even Parity	Down	Up
Odd Parity	Down	Down
Zero Parity	Up	Up
One Parity	Up	Down

Installation

Before the DTDM can be installed to the digital voice terminal, the proper D kit of parts must be obtained. For a 12-inch configuration (7403D), use the D181169 kit. For a 15-inch configuration (7405D), use the D181169 kit. For and 18-inch configuration (7405D with function key module), use a D181171 kit.

CAUTION

Disconnect the line cord from the voice terminal and the connecting block on the wall to avoid destroying the DTDM internal circuitry.

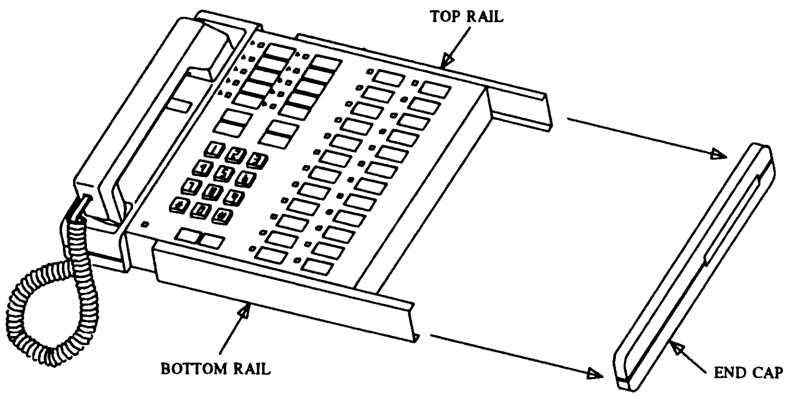


Figure 32-25. Remove End Cap, Then Top and Bottom Rail.

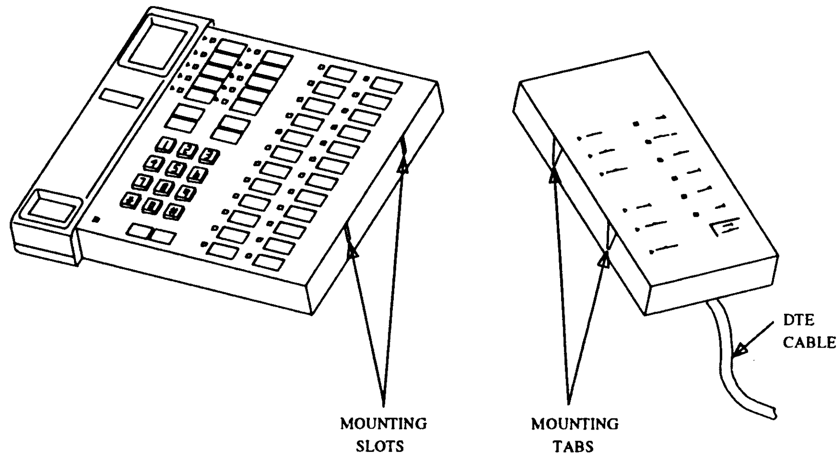


Figure 32-26. DTDM Attachment to Voice Terminal

Locate the proper top and bottom rails from the D parts kit. Install both the top and bottom rails, then the end rails. Refer to paragraph for an illustration.

Turn the configuration over and on the bottom, remove the DTDM cover. Install the ribbon cable assembly (from the D parts kit) between the interface connectors of the digital voice terminal and DTDM.

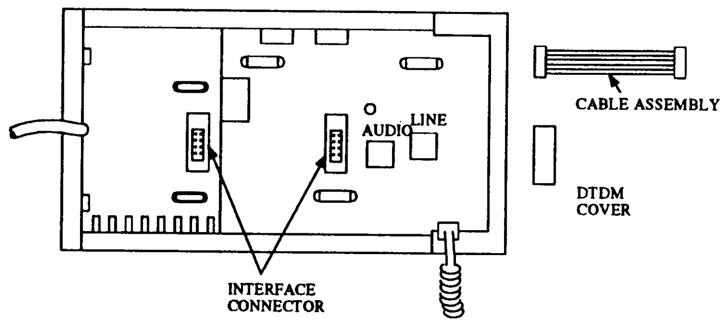


Figure 32-27. DTDM Attached to Voice Terminal (Bottom View)

Install the adapter plate on the back of the configuration.

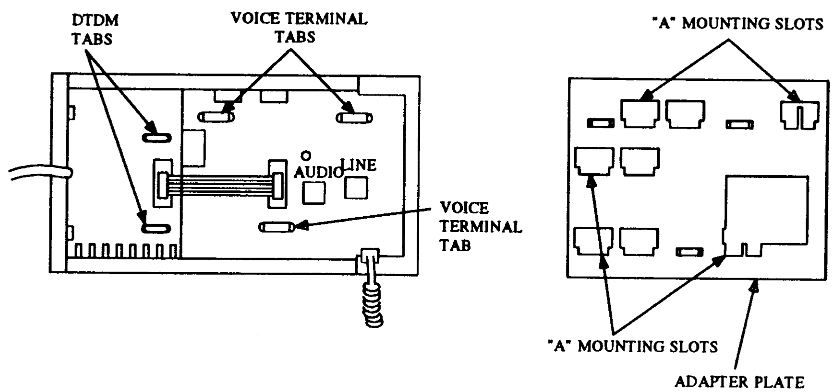


Figure 32-28. Adapter Plate Installation

Connect the line cord to digital voice terminal, connect the handset if required, then attach the configuration to a wall mounting or to a stand for desk mounting.

(See chapter 10 for circuit pack terminations and connections.)

* If AC power is not from a local AC outlet, but from an AC power strip in a connecting closet, the power is connected at proper connecting block in the closet. The 4008 adapter is then not required.

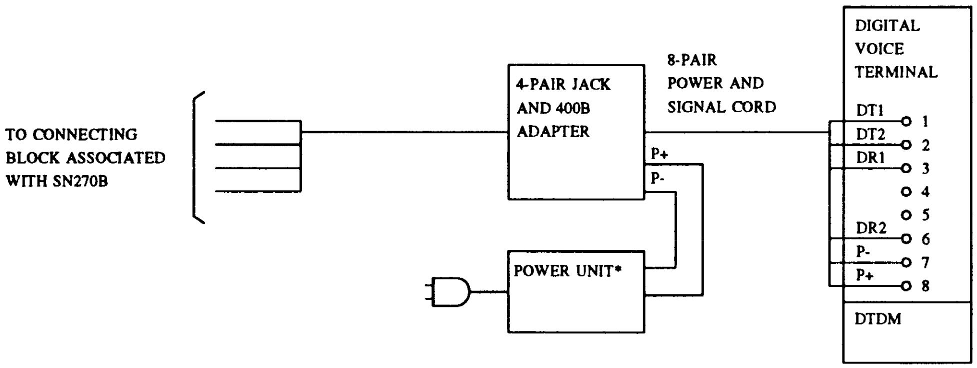


Figure 32-29. Connections to Digital Voice Terminal

DATA MODULES — 3270 TYPE

3270T or 3270A Data Modules

CAUTION Power cord must be inserted into the data module with notched side up.

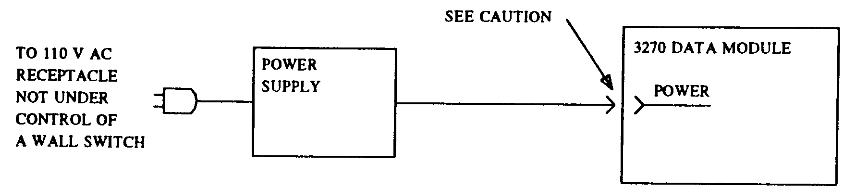


Figure 32-30. AC Power Connections

(See chapter 10 for circuit pack terminations and connections.)

NOTE This connection is only required when the optional analog telephone is installed.

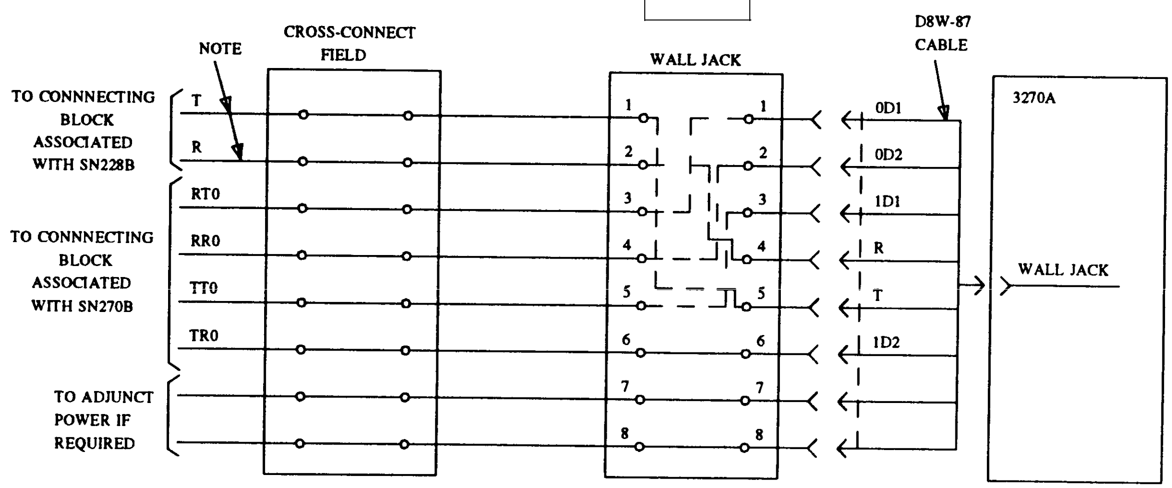


Figure 32-31. Connections to the AT&T System 85

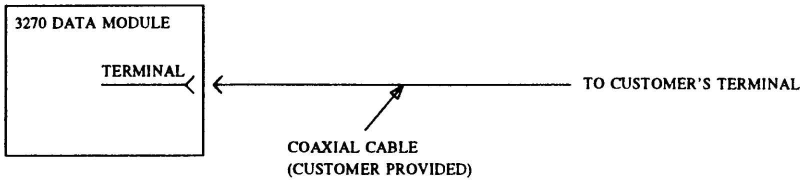


Figure 32-32. Connections to the Terminal

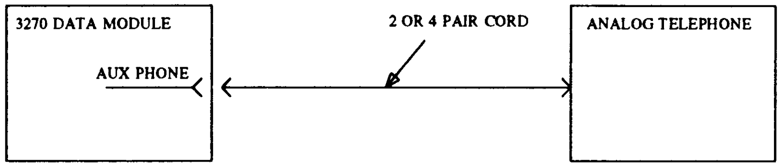


Figure 32-33. Connections to the Analog Telephone Set (Optional)

3270C Data Module

Mounting the data module Cabinet mounting. Place the 3270C data module housing in the desired location. The 3270C data module can be readily mounted in a 19-inch cabinet. To mount the data module in a 23-inch or 25-inch cabinet, extra mounting hardware is required.

Wall mounting — perform the following steps to wall mount the data module.

a. Mount a plywood backboard to the wall. The backing should measure at least 28 inches in width by 22 inches in height and be a least 3/4-inch thick.

b. Place two of the 3/4-inch wood screws 25-3/8 inches apart near the top of the plywood backing.

c. Insert the screws far enough to temporarily hold the wall-mounting bracket.

d. Holding the wall-mounting bracket with the slotted holes at the top, place the bracket over the two screws, then tighten.

e. Insert wood screws in remaining seven holes of the wall-mounting bracket, then tighten.

f. Loosen the wing nut clamps on the retainer bracket. Slide the bracket to the right to free the hinged bracket.

g. Swing the hinged bracket away from the wall.

h. Position the data module so the rear of the data module faces the hinge.

i. Slide the U bracket on the under side of the data module until the rear edge meets the L bracket.

Tighten the screw on the back of the hinged bracket against the base of the data module.

k. Swing the hinged bracket with the mounted data module housing closed.

l. Slide the retainer bracket to the left and tighten the wing nuts to secure the hinged bracket.

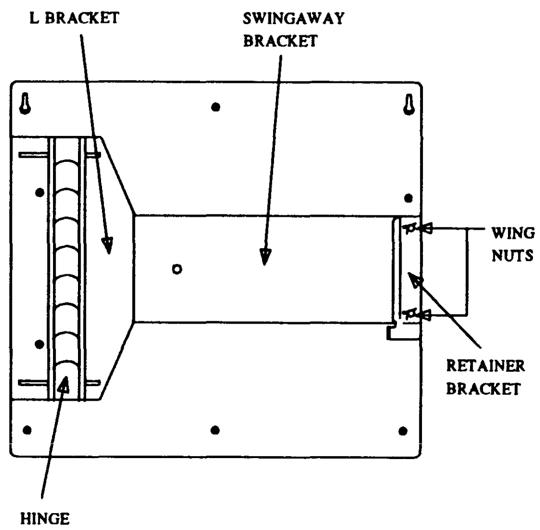


Figure 32-34. Hinged Bracket Diagram

Install the 3270C circuit packs into the 3270C data module.

NOTE	The 3270C data module will hold four CAB1 circuit packs. The circuit packs should be installed starting at the bottom slot and working to the top.

Remove the front cover from the 3270C data module.

Place the circuit pack to be installed in the desired slot so the LEDs appear along the bottom of the front panel.

Open the latch on the front of the circuit pack and slide into the housing. Ensure that the connector on the rear attaches to the connector inside the 3270C data module rear panel. The coaxial cable connectors should exit out the holes in the rear panel.

Close the latch on the circuit pack. Repeat the procedure for other circuit packs.

Replace the front cover.

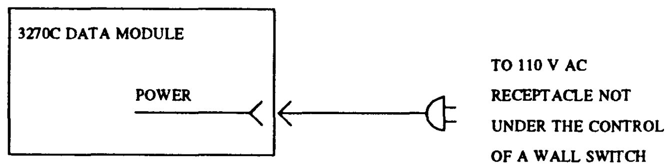


Figure 32-35. AC Power Connections (3270C Data Module)

(See chapter 10 for circuit pack connections and terminations.) (See table 32-9 for DCP connections and terminations.)

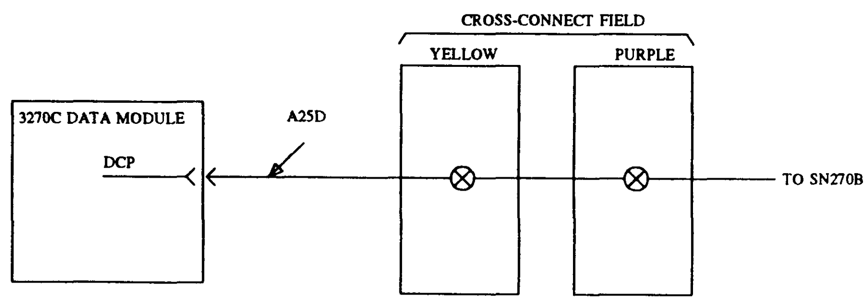


Figure 32-36. Connections to the System 85 (3270C Data Module)

Connectors 1A and 1B are associated with slot 1, connectors 2A and 2B are associated with slot 2, and so forth.

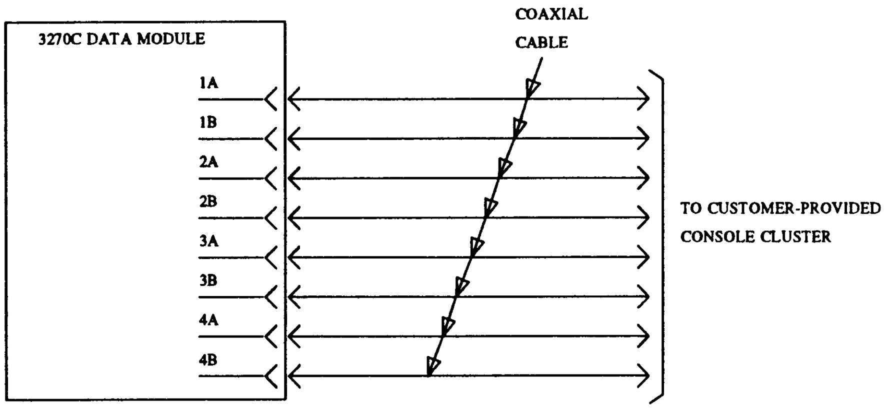


Figure 32-37. Connections to the Cluster Controller (3270C Data Module)

TABLE 32-9. DCP Terminations and Connections (Notes 1 and 2)

PIN NO.	LEAD DESIGNATION	CIRCUIT PACK NO.	PORT	FUNCTION
27,2	OD1 , OD2	1	B	Transmit Pair
28,3	1D1, 1D2	1	B	Receive Pair
30,5	OD1 , OD2	1	A	Transmit Pair
42, 6	1D1, 1D2	1	A	Receive Pair
33,8	OD1 , OD2	2	B	Transmit Pair
34,9	1D1, 1D2	2	B	Receive Pair
36,11	OD1 , OD2	2	A	Transmit Pair
37, 12	1D1, 1D2	2	A	Receive Pair
39, 14	OD1 , OD2	3	B	Transmit Pair
40, 15	1D1, 1D2	3	B	Receive Pair
42, 17	OD1 , OD2	3	A	Transmit Pair
43, 18	1D1, 1D2	3	A	Receive Pair
45, 20	OD1 , OD2	4	B	Transmit Pair
46,21	1D1, 1D2	4	B	Receive Pair
48, 23	OD1 , OD2	4	A	Transmit Pair
49,24	1D1, 1D2	4	A	Receive Pair

Note 1: Signals are referenced to the 3270C Data Module (transmitted by or received from the data module). These signals are transmitted over a 25-pair cable to the cross-connect field on the AT&T System 85 switch.

Note 2: The leads associated with the 3270C and SN270 are translated as:

OD1	RT0
OD2	RR0
1D1	TT0
1D2	TR0

EIA-RS232C CONNECTIONS

(See chapter 10 for circuit pack connections and terminations.)

Connections for Z3A_ADU located in the section entitled *Asynchronous Data Unit (ADU) Z3A* in this chapter.

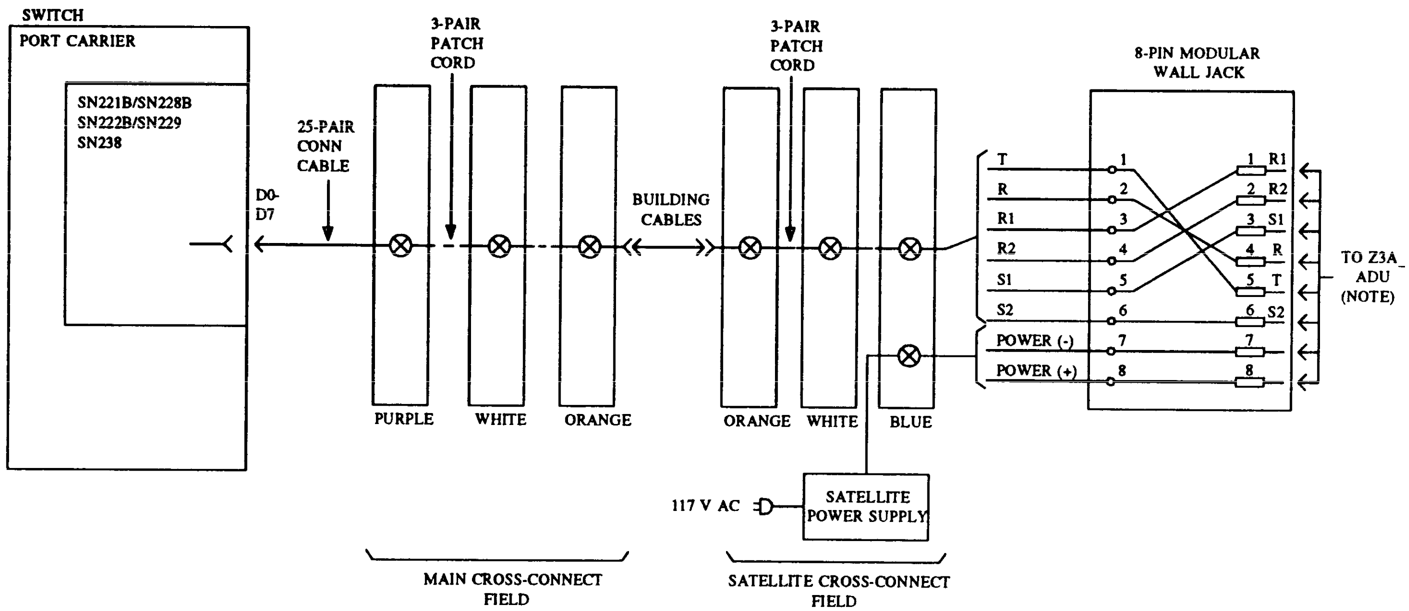


Figure 32-38. EIA Standard RS232C Interface Connections to System Cabinets

Multiple Asynchronous Data Unit (MADU)

Stand-Alone Mounted MADU

The stand-alone mounting allows one MADU circuit pack to be mounted on desk or table near the Host Computer. The user will than have access to eight data ports on the System 85.

Before connecting the MADU, it should be removed from the mounting and the options verified or set as required. The option information is given in figure 32-39 and table 32-10. After the options are set, the MADU circuit pack should be reinserted into the housing.

Make the connections shown in figure 32-40.

Make the AC power connections shown in figure 32-41.

Multiple Mounted MADU

The MADU Circuit Packs (BPP2) are inserted in a 72A data mounting which is then mounted in a data cabinet.

The mounting flange on the left side of the 72A mounting is reversible so the mounting can be used in a 23- or 25-inch wide cabinet. For use in a 23-inch cabinet, the bracket should be mounted so that the shorter edge sticks out. For use with a 25-inch cabinet, the longer edge should stick out.

Before installing the MADU circuit pack, verify or set the options. The option information is given in figure 32-39 and table 32-10. The hinged front cover must be opened to install the circuit packs. To help facilitate cable installation, the circuit packs should be installed from right to left. After all the circuit packs are installed, close the front gate.

Open the hinged rear panel of the carrier, then loosen the screw holding the reversible cable bracket. Refer to figure 32-44 for the proper positioning of the cables and the reversible cable bracket.

Install the TO BUILDING WIRING cables. Use figure 32-41 for the proper connections and figure 32-44 to properly run the cables. After the TO BUILDING WIRING cables are installed, partially tighten the screw on the cable bracket.

Plug a transformer in the power distribution box on the rear cover. Make the connections shown in figure 32-43.

Install the TO HOST COMPUTE cables, Use figure 32-42 for the proper connections and figure 32-44 to properly run the cables. After the TO HOST COMPUTER cables are installed, tighten the screw on the cable bracket.

Plug the power cord. attached to the power distribution box into a 117 V AC outlet in the data cabinet.

MADU Option Switch Settings

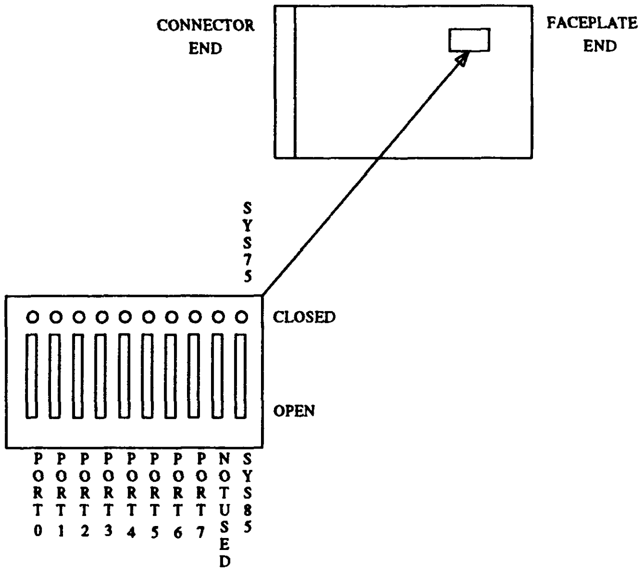


Figure 32-39. Switch Location and Description (MADU)

TABLE 32-10. Option Settings and Functions for DIP Switches (MADU)

DIP Switch Positions and Functions		
Switch:	**Position:**	**Function:**
Port 0	Closed Open	Enables busy-out from computer port pin 25 for MADU port 0 Disables busy-out from computer port pin 25 for MADU port 0
Port 1	Closed Open	Enables busy-out from computer port pin 25 for MADU port 1 Disables busy-out from computer port pin 25 for MADU port 1
Port 2	Closed Open	Enables busy-out from computer port pin 25 for MADU port 2 Disables busy-out from computer port pin 25 for MADU port 2
Port 3	Closed Open	Enables busy-out from computer port pin 25 for MADU port 3 Disables busy-out from computer port pin 25 for MADU port 3
Port 4	Closed Open	Enables busy-out from computer port pin 25 for MADU port 4 Disables busy-out from computer port pin 25 for MADU port 4
Port 5	Closed Open	Enables busy-out from computer port pin 25 for MADU port 5 Disables busy-out from computer port pin 25 for MADU port 5
Port 6	Closed Open	Enables busy-out from computer port pin 25 for MADU port 6 Disables busy-out from computer port pin 25 for MADU port 6
Port 7	Closed Open	Enables busy-out from computer port pin 25 for MADU port 7 Disables busy-out from computer port pin 25 for MADU port 7
—	Open Closed	Not used Not used
SYS 85 SYS 75	Open Closed	Adapts all eight MADU ports for AT&T System 85 Adapts all eight MADU ports for AT&T System 75

(The connections and termination for SN238 are shown in chapter 10.) (The connecting information for the TO BUILDING WIRING is shown in table 32-11.) (The connecting information for a leg of the M48C cable is shown in figure 32-45.) (The connecting information for a leg of the M48G cable is shown in figure 32-46.)

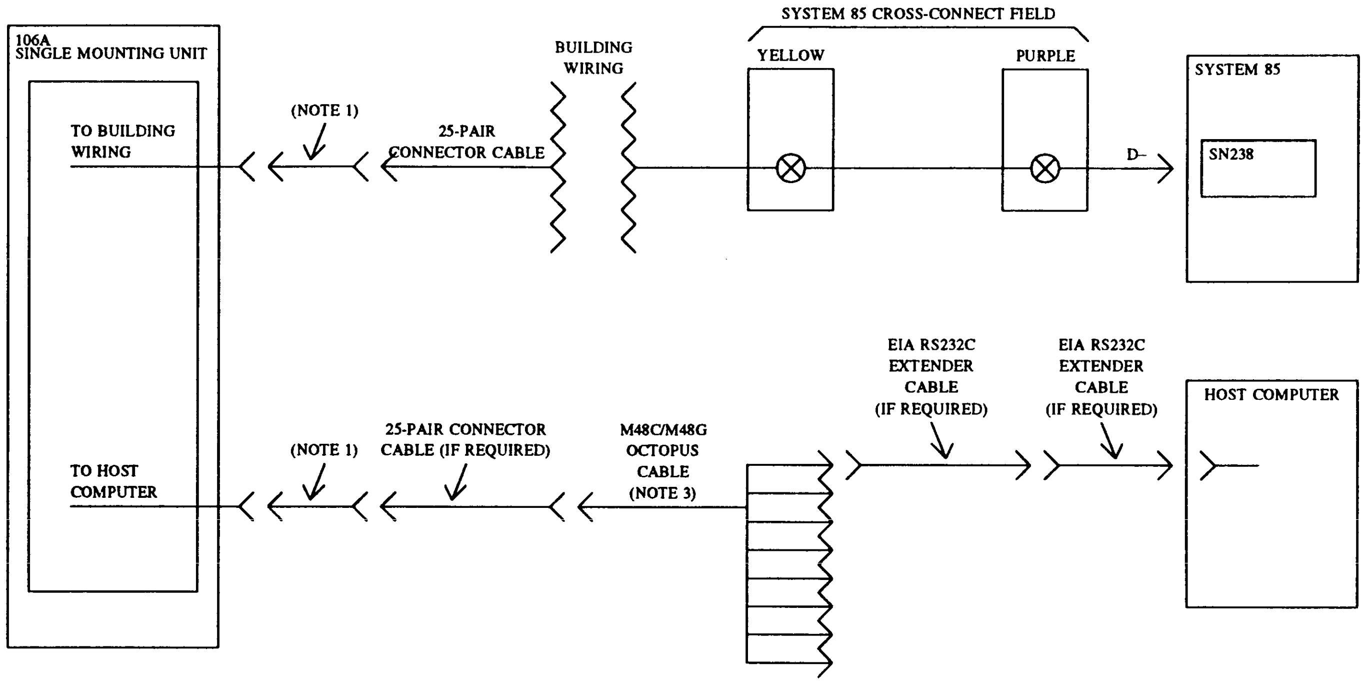


Figure 32-40. 25-Pair Cable Connections — Stand-Alone Mounting

NOTES:

1. 50-pin center feed male connector to 50-pin end feed connector adapter cable, 2 feet long. This cable is not required if the 25-pair connector cable is quipped with a center feed connector.
2. This adapter is required when pin 25 on the host computer is used to busy out a port. The wiring information for the RS232 adapter is shown n table 32-13. The option switch for that port must be properly set. (See figure 32-39 and table 32-10 for switch location and settings.)
3. Use M48C cable with DTE, use M48G for DCE.

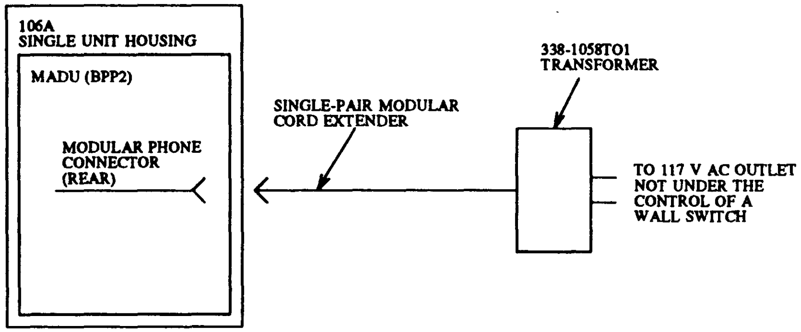


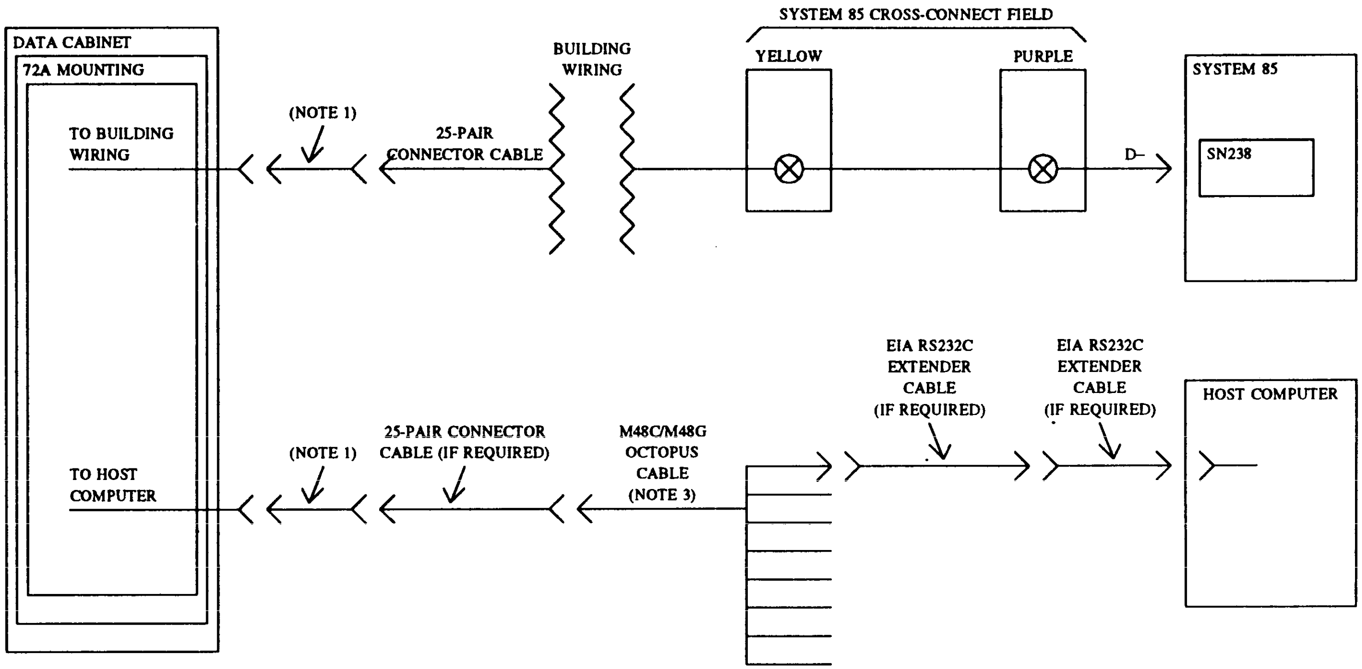
Figure 32-41. AC Power Connection — Stand-Alone Mounting

ACPower

The modular connector on the rear of the unit is 4-pair connector. The single-pair modular connector will snap into place and use the correct pins of the connector.

25-Pair Cable Connections (Multiple Mounted)

(The connections and termination for SN238 are shown in chapter 10.) (The connecting information for the TO BUILDING WIRING is shown in table 32-11.) (The connecting information for a leg of the M48C cable is shown in figure 32-45.) (The connecting information for a leg of the M48G cable is shown in figure 32-46.)



NOTES

1. 50-pin center feed male connector to 50-pin end feed connector adapter cable, 2 feet long. This cable is not required if the 25-pair connector cable is equipped with a center feed connector.
2. This adapter is required when pin 25 on the host computer is used to busy out a port. The wiring information for the RS232 adapter is shown n table 32-13. The option switch for that port must be properly set. (See figure 32-39 and table 32-10 for switch location and settings.)
3. Use M48C cable with DTE, use M48G for DCE.

Figure 32-42. 25-Pair Cable Connections — Multiple Mounted

AC Power (Multiple Mounted)

The modular connector on the rear of the unit is a 4-pair connector. The single-pair modular connector will snap into place and use the correct pins of the connector.

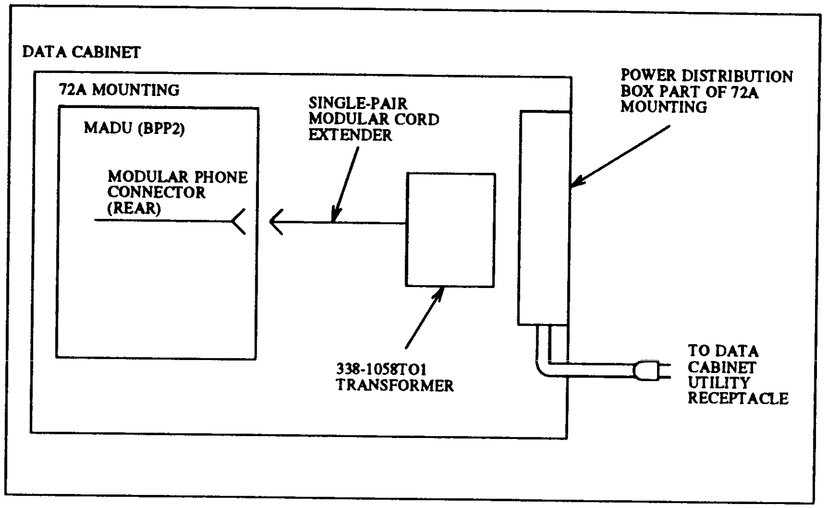


Figure 32-43. AC Power Connections — Multiple Mount

MADU Cable Routing (Multiple)

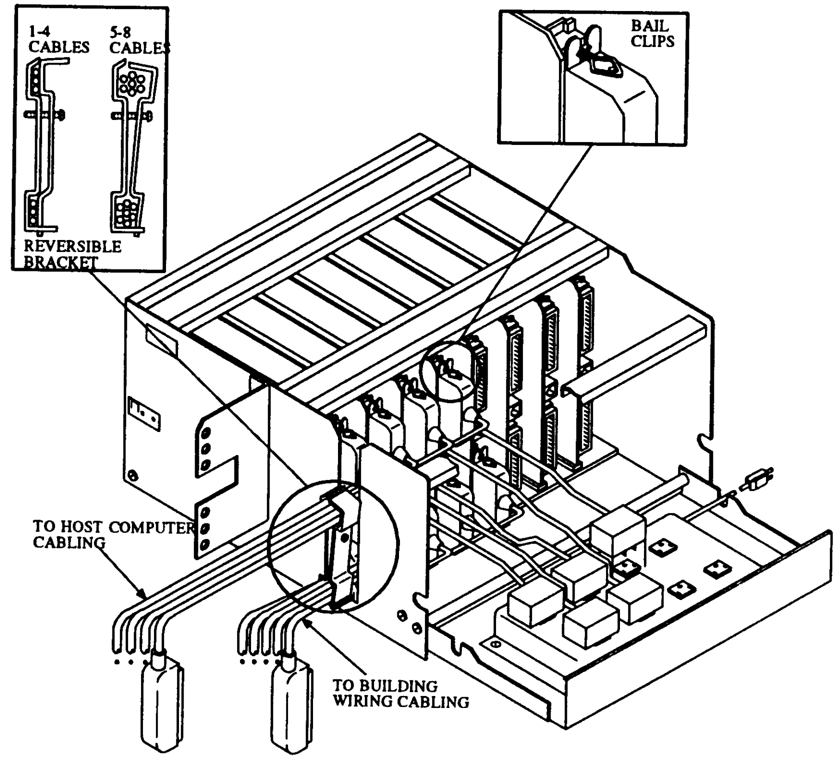


Figure 32-44. Cable Routing for Multiple Mounted MADU

BUILDING WIRING (Lead Designations)

TABLE 32-11. Connecting Information for TO BUILDING WIRING Connector

BUILDING WIRING CONNECTOR		PORT NO.	CONNECTING BLOCK NO.	LEAD COLOR
PIN NO.	LEAD DESIGNATION			
27	R1	0	3	W-O
2	R2	0	4	O-W
28	S1	0	5	W-G
3	S2	0	6	G-W
30	R1	1	9	W-S
5	R2	1	10	S-W
31	S1	1	11	R-BL
6	S2	1	12	BL-R
33	R1	2	15	R-G
8	R2	2	16	G-R
34	S1	2	17	R-BR
9	S2	2	18	BR-R
36	R1	3	21	BK-BL
11	R2	3	22	BL-BK
37	S1	3	23	BK-O
12	S2	3	24	O-BK
39	R1	4	27	BK-BR
14	R2	4	28	BR-BK
40	S1	4	29	BK-S
15	S2	4	30	S-BK
42	R1	5	33	Y-O
17	R2	5	34	O-Y
43	S1	5	35	Y-G
18	S2	5	36	G-Y
45	R1	6	39	Y-S
20	R2	6	40	S-Y
46	S1	6	41	V-BL
21	S2	6	42	BL-V
48	R1	7	45	V-G
23	R2	7	46	G-V
49	S1	7	47	B-BR
24	S2	7	48	BR-V

Lead Designations (TO HOST COMPUTER)

TABLE 32-12. Connecting Information for TO HOST COMPUTER Connector

TO HOST COMPUTER		PORT NO.	M48C/M48G CABLE ARM NO.	TO HOST COMPUTER		PORT NO.	M48C/M48G CABLE ARM NO.
PIN NO.	LEAD DESIGNATION			PIN NO.	LEAD DESIGNATION		
26	BB	0	1	38	BB	4	5
1	AAB	0	1	13	AAB	4	5
27	BUS	0	1	39	BUS	4	5
2	CBF	0	1	14	CBF	4	5
28	CD	0	1	40	CD	4	5
3	BA	0	1	15	BA	4	5
29	BB	1	2	41	BB	5	6
4	AAB	1	2	16	AAB	5	6
30	BUS	1	2	42	BUS	5	6
5	CBF	1	2	17	CBF	5	6
31	CD	1	2	43	CD	5	6
6	BA	1	2	18	BA	5	6
32	BB	2	3	44	BB	6	7
7	AAB	2	3	19	AAB	6	7
33	BUS	2	3	45	BUS	6	7
8	CBF	2	3	20	CBF	6	7
34	CD	2	3	46	CD	6	7
9	BA	2	3	21	BA	6	7
35	BB	3	4	47	BB	7	8
10	AAB	3	4	22	AAB	7	8
36	BUS	3	4	48	BUS	7	8
11	CBF	3	4	23	CBF	7	8
37	CD	3	4	49	CD	7	8
12	BA	3	4	24	BA	7	8

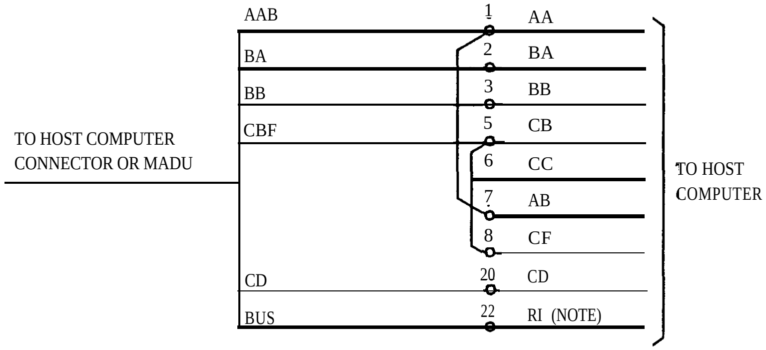


Figure 32-45. M48C Octopus Cable Connecting Information

NOTE: Busy Out adapter must be used if pin 1-8 or 25 on the host computer is used to busy out a port.

TABLE 32-13. RS232C Busy Out Adapter Connecting Information

RS232C BUSY OUT ADAPTER		
M48C Pin	connects to	Host Pin
1		1
2		2
3		3
5		5
6		6
7		7
8		8
20		20
22		25
		18

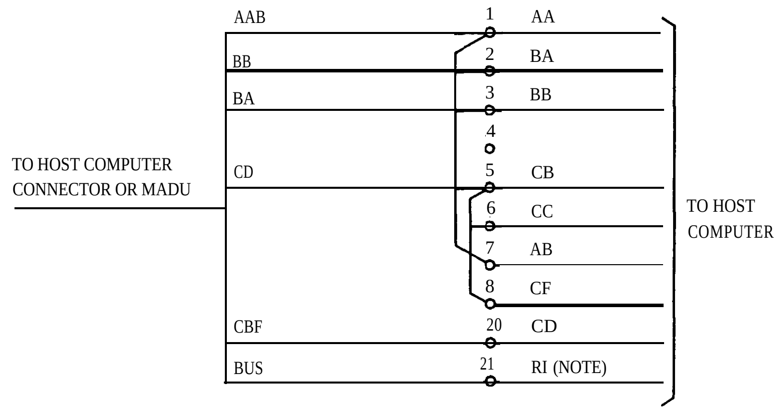


Figure 32-46. M48G Octopus Cable Connecting Information

NOTE: Busy Out adapter must be used if pin 18 or 25 on the host computer is used to busy out a port.

PC 6300/7300 CONNECTION TO SYSTEM 85

There are two methods available for connecting the PC 6300 and 7300 to the System 85. One method uses a 740D voice terminal. The other method uses an optional messaging cartridge mounted in the voice terminal (7404D, 7403D, 7405D, or 7407D).

PC Voice Data Set/PC/Switch Connection to System 85.

Installing the optional messaging cartridge in the 7404D — the cartridge plugs into the cartridge receptacle.

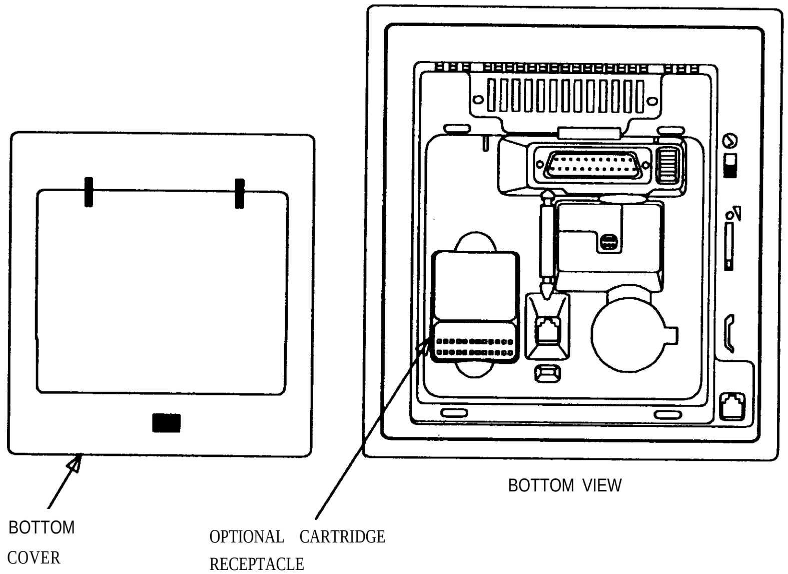


Figure 32-47. 7404D Cartridge Receptacle

(See chapter 10 for SN270B connecting and terminating information.)

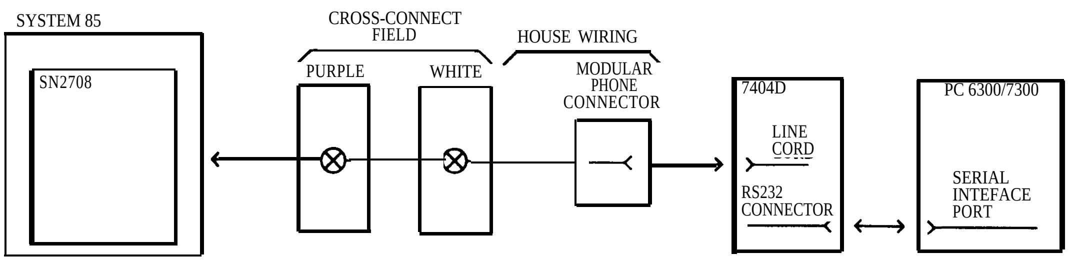


Figure 32-48. PC Switch/Connection Package I and II to System 85

Isolating Data Interface (IDI) — 105A

The 105A IDI can be used in the applications shown in table 32-14. In these applications, the external processor must be within 400 feet of the System 85 control cabinet. Cable group 304 should be used from the cabinet to the EDI house, cabling can not be used.

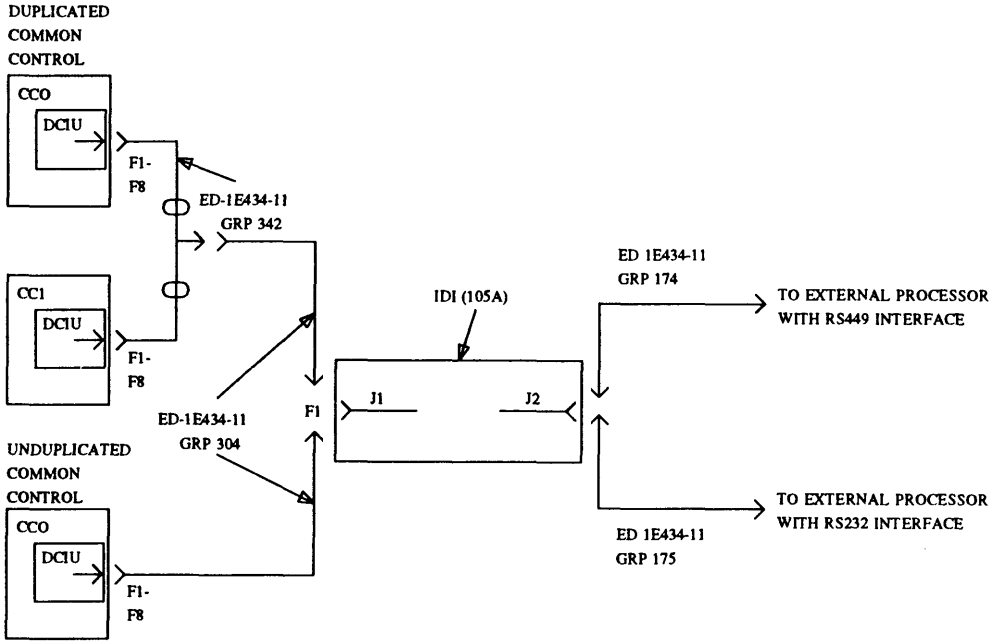


Figure 32-49. IDI Diagrammed with Duplicate and Unduplicated CC

TABLE 32-14. Approved IDI Applications

DCIU	EXTERNAL PROCESSOR
S85 R1 DCIU	S85 R1 DCIU
S85 R2 DCIU	S85 R2 DCIU
DIMENSION 2000 DCIU	DIMENSION 2000 DCTU
DIMENSION 600 DCIU	DIMENSION 600 DCTU
AUDIX 2000	AUDIX 2000
	AP16
	3B5 AP
	3B2

ABBREVIATIONS

AP	Applications processor
ADM	Asynchronous data module
ADS	Asynchronous data stand
ADU	Asynchronous data unit
BRIC	Basic rate interface card
BRIP	Basic rate interface port
BRISM	Basic rate interface simulator and monitor
CBC	Coupled bonding conductor
CDM	Channel-division multiplexer
CEM	Channel-expansion multiplexer
CPE	Customer-premises equipment
CSD	Customer system document
CSSO	Customer service support organization
CSU	Channel service unit
DCN	Data-communications interface unit
DCTOPS	DC triple-output power supply
DCP	Digital communications protocol
DDPM	Distributed digital-port multiplexer
DMI	Digital multiplexed interface
DOSS	Delivery operations support system
DSC	Dedicated switch connection

DTE	Data terminal equipment
DTS	Disk-tape system
HA	Host adapter
HCMR	High-capacity minirecorder
INADS	Initialization and administration system
MAAP	Maintenance and administration panel
MADU	Modular asynchronous data unit
PPG	Programmable processor gateway
PPN	Processor port network
RMATS	Remote maintenance, administration, and traffic system
RMSS	Removable mass-storage subsystem
SAT	System-access terminal
SCSI	Small computer system interface
SMDR	Station message detail recording
SM	System management
SMT	System-management terminal
TID	Terminal identification
TDM	Trunk data module
TOPS	Triple-output power supply
TRACS	Translations, recovery, additions, and conversion system
VMAAP	Visual maintenance and administration panel

GLOSSARY

24th-channel signaling	Digital signal level-1 (DS1) signaling in which the signaling for each of the first 23 channels is multiplexed onto the 24th channel, thereby providing a full 64 Kbps for user data on each of the first 23 channels. Also called *clear-channel signaling, out-of-band signaling,* and *alternate voice/data signaling.* See also **common-channel signaling.**
3B2 Messaging Server	A software application that combines voice and data messaging services for telephone users whose extensions are connected to a System 75 or System 85.
3B2 Messaging Server station	The agent workstation — that is, a telephone plus a PC and its associated software — used with the 3B2 Messaging Server.
800 service	A service that allows incoming calls to be made from certain geographical areas to an assigned number for a flat-rate charge based on expected usage. See also **MEGACOM®.**
9-track tape drive	A tape drive with nine tracks used to record call-detail records on magnetic tape.
A-code	See **authorization code.**
AAPI	See **adjunct applications-process interface.**
access security	The capability of a communications system to grant or deny access to facilities or services, including network access, based on a unique personal identifier such as speaker verification.
access trunk	See **access tie trunk.**
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 communications system or tandem to a serving office or service node.
account code	A dialed code used with call-detail recording that allows a call to be charged to a specific department's or project's account.
Accumaster™ Trouble Tracker	A network-management system that enables users to monitor the performance of private communications system-based networks from a central location.
ACCUNET® reserved 1.5 service	A digital service offered by AT&T that provides 1.5-Mbps digital facilities between two or more specified points at scheduled times.
ACCUNET® digital service	A digital service offered by AT&T that provides switched digital connectivity via the public network to allow pairs of compatible endpoints to exchange data, video, digital encrypted voice, and/or graphics at up to 64 Kbps.

ACCUNET® T1 service A digital service offered by AT&T that provides a dedicated 1.5-Mbps digital facility, using terrestrial channels and one of two specified signal formats.

ADC See **analog-to-digital converter.**

ADFTC See **analog/digital-facility test circuit.**

adjunct A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor. For example, a 3B2 computer dedicated to logging and processing call-detail records received from a communications system is serving as an adjunct to the communications system.

adjunct applications-process interface (AAPI) A call-processing interface between sessions of the bus interface processor (BIP) and other call processors. When AAPI is used, messages are received from adjuncts over the interprocess path, translated into Oryx/Pecos messages, and sent to the proper process for action. Oryx/Pecos messages are received from other processes, translated into the proper adjunct message format, and passed to the BIP for transmission to the adjunct. The AAPI also interfaces with other adjunct applications to mask a multiadjunct configuration from the applications on the local switch processing element (SPE).

adjunct-switch application interface (ASAI) An AT&T recommendation for interfacing adjuncts and communications systems, based on the International Telegraphic and Telephone Consultative Committee (CCITT) Q.932 specification for layer 3.

ADM See **asynchronous data module.**

administer To access, establish, or change parameters associated with the services and features of a system.

administration The process of accessing, establishing, or changing parameters associated with the services and features of a system.

administrator A person who accesses, establishes, or changes the parameters associated with the services and features of a system.

ADU See **asynchronous data unit.**

alarm An indication that a failure has occurred. The three levels of alarms are major, minor, and warning. Alarms are displayed on the alarm log. Major and minor alarms are also reported to a remote monitoring system. See also **major alarm, minor alarm,** and **warning alarm.**

alphanumeric display An LED or LCD unit on certain telephones and attendant consoles that visually represents information in letters and numbers for the telephone user.

ALU See **arithmetic logic unit.**

AMA See **Automatic Message Accounting.**

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, phase, or resistance.
analog/digital-facility test circuit	A maintenance circuit resident in the communications-system processor port carriers for use in testing the hardware associated with modem pooling.
analog telephone	A telephone that receives acoustic voice signals and sends analog electrical signals along the 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 the port card and maintains error counters and thresholds. See also **archangel.**
ANI	See **automatic number identification.**
announcement	A recorded message that gives a calling party information about the status of the call.
answer supervision	A signal sent by the terminating communications system to the originating communications system — or intermediate charging point such as a central office (CO) — indicating that an incoming call has been answered. On receiving this signal, the originating communications system or other charging point begins tracking charges for the call if charges apply. When either party ends the call by going on-hook, the serving communications system removes answer supervision as an indication to the other communications system to disconnect.
answerback	A response to a page from a code-calling or loudspeaker-paging system that causes the paging party to be connected to the responding user.
answerback channel	A group of dedicated circuits that can be used by a paged party to answer a page.
AP	See **applications processor.**
APLT	See **advanced private-line termination.**

appearance button	A button on a telephone that accesses a software process that is associated with an extension. Lights next to the button go on when a user makes outgoing calls, receives incoming calls, or holds calls. Any two-light button on a multiappearance telephone can be assigned as an appearance button. See also **appearance** and **shared appearance.**
application	A computer program, or set of programs, that allows users and administrators to perform specific tasks. For example, call-detail acquisition and processing (CDAP) and traffic are applications.
applications processor (AP)	A minicomputer that is an adjunct to a communications system and is used in user-controlled applications such as Message Center.
applications program	See **application.**
archangel	The network-control microprocessor located in a switch processing element (SPE). The archangel controls operation of the control channel by granting bus usage to a specific angel or group of angels. See also **angel.**
architecture	The organizational structure of a system, including hardware and/or software.
arithmetic logic unit (ALU)	The area in a central processor that performs arithmetic and logic functions.
ASAI	See **adjunct-switch application interface.**
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 communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters.
asynchronous data module (ADM)	A data module that allows data terminal equipment (DTE) to communicate with the Integrated Services Digital Network basic rate interface (ISDN-BRI).
asynchronous data stand (ADS)	An asynchronous data unit (ADU) that is built into the base of a digital telephone and is used to connect RS-232C equipment such as a data terminal with the communications system via the telephone's data link. See also **asynchronous data unit.**
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. See also **synchronous data transmission.**
asynchronous data unit (ADU)	A data circuit-terminating equipment (DCE) device that allows direct connection between RS-232C equipment and a communications system.
asynchronous transmission	See **asynchronous data transmission.**

AT&T service node — A facility housing the AT&T communications equipment that provides customers and/or local exchange companies (LECs) access to the AT&T public network.

Audio Information Exchange — See **AUDIX.**

AUDIX (Audio Information Exchange) — 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. See also **AUDIX Standalone.**

AUDIX host switch — With distributed communications system (DCS) centralized AUDIX, the one communications system that must have an AUDIX machine that can be used to serve AUDIX subscribers on that communications system and AUDIX subscribers on other communications systems in the DCS cluster.

AUDIX networking — See **networked AUDIX.**

automatic calling unit (ACU) — An automatic dialing device that enables a machine to place calls over a communications system. Also called an *autodialer*.

automatic circuit assurance (ACA) — A service that helps to identify possible trunk malfunctions. If a communications system finds a trunk that repeatedly exceeds a set of established long-call and short-call threshold levels, the communications system reports the trunk to the attendant as potentially defective.

AUTOVON access — The capability of a communications system to interface with special military voice circuits on the Automatic Voice Network (AUTOVON). See also **Automatic Voice Network.**

aux — Auxiliary.

auxiliary trunk — A trunk used to connect auxiliary equipment, such as radio paging equipment, to a communications system.

backup terminal — A telephone used with Centralized Attendant Service (CAS) to answer calls at a branch location when the attendant at the main location is not available.

bandwidth — The difference, expressed in hertz, between the highest and lowest frequencies in a range of frequencies that determine channel capacity.

barrier code — A code used to limit access to the Remote Access feature of a communications system.

basic rate interface card (BRIC) — An interface for the basic rate interface simulator and monitor (BRISM) between multiple basic rate interface (BRI) connections and a 3B computer. See also **basic rate interface simulator and monitor (BRISM).**

basic rate interface port (BRIP) — The port that provides the basic rate interface (BRI) between a DEFINITY™ Generic 2 Communications System and BRI terminals or terminal adapters.

basic rate interface simulator and monitor (BRISM)	An Integrated Services Digital Network basic rate interface (ISDN-BRI) test tool.
basic rate interface (BRI) virtual circuit	The software port location to which a BRI terminal maps. A virtual circuit card contains 12 (O through 11) virtual circuits.
basic rate interface (BRI) virtual port	The electrical port location to which a BRI port maps. The BRI port is physically located on a circuit card in the universal module. Each of the three virtual circuit cards used for BRI has four virtual BRI ports. See also **virtual circuit card, basic rate interface port,** and **universal module.**
baud	In telecommunications applications, a unit of transmission speed equal to the number of signal events per second.
BCT	See **business communications terminal.**
binary-coded decimal (BCD)	Either of two standard codes for the representation of characters. A standard 4-bit code permits the representation of decimal numbers, with each decimal digit represented by a 4-digit binary number.
BIP	See **bus interface processor.**
bipolar signal	A digital signal that uses either a positive or negative excursion, usually alternating, for one state and ground for the other.
bisync	See **binary synchronous communications.**
bit (binary digit)	One unit of information in binary notation, having two possible states or values: 0 or 1.
bit rate	The speed at which bits are transmitted, usually expressed in bits per second. Also called *data rate.* See also **bits per second (bps)** and **baud.**
bits per second (bps)	The number of binary units of information that are transmitted or received per second. See also **data rate** and **baud.**
BLMM	See **base-level maintenance monitor.**
blocking	A condition in which end-to-end connections cannot be made on calls because of a full load on all possible services and facilities.
bootstrap memory	An area of read-only memory (ROM), undisturbed by removal of operating power, that is used to initialize a processor for operation.
bootstrap program	A program contained in bootstrap read-only memory (ROM) that copies an operating system from hard disk to main memory. See also **bootstrap memory.**
BOS	See **bit-oriented signaling.**

bps	See **bits per second.**
BRI	See **basic rate interface.**
BRIC	See **basic rate interface card.**
Bridged Call	A feature that allows multiple voice terminals to share access to an appearance, permitting these terminals to make or answer calls on the shared appearance and permitting any one of them to join (bridge onto) a call already set up on that appearance.
bridging	The connection of one circuit in parallel with another without disturbing the first.
BRIP	See **basic rate interface port.**
BRISM	See **basic rate interface simulator and monitor.**
BRI terminal	A terminal used with the basic rate interface (BRI).
BSC	See **binary synchronous communications.**
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 digital terminal data module (DTDM) or a processor data module (PDM) as a special-purpose terminal for services provided by an applications processor (AP) or, with a System 75, as a system access terminal (SAT) for data entry and retrieval.
busy light field (BLF)	On an attendant console, a field used to display the busy or idle status of associated extensions.
busy out	To remove a maintenance object (MO) from service. The MO is out of service until it is released, preventing call-processing software from using the busied-out resource.
Busy Verification	A feature that allows attendants and/or selected telephone users to verify the busy or idle status of an apparently busy resource — for example, an extension or a trunk. If the resource is active on a call, the verifying attendant or telephone user can bridge onto the connection.
BX.25	An AT&T 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. See also **CCITT** and **X.25.**
bypass tie trunk	A one-way, outgoing tie trunk from a tandem communications system to a main communications system in an electronic tandem network (ETN).

byte A sequence of (usually eight) bits processed together.

cabinet Housing for racks, shelves, or carriers that hold electronic equipment.

cable 1. The physical connection between two pieces of equipment — for example, cable from a data terminal to a modem — or betwwen a piece of equipment and a termination field — for example, circuit pack input/output (I/O) cables. 2. To connect two devices or a device and a termination field electrically or photonically.

cable connector The connector on the end of a cable. A cable connector connects wires on a cable to specific leads on telephone or data equipment. A cable connector is either a cable jack (female) or a cable plug (male).

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 processing A sequence of actions needed to connect, disconnect, and otherwise manage voice and data calls in a communications system.

call-progress tone One of a set of tones, such as ringback tone, busy tone, or reorder tone, that a caller can receive from a communications system to indicate the status of a call or the facilities used by the call.

call vectoring A method that manages inbound calls, using routing tables to uniquely define treatments for each call type. The call type is based on the dialed number or trunk-group termination to a vector via vectoring directory numbers. The vectors are customer-programmable using commands that resemble a high-level programming language to specify what treatments the call should be given.

carrier A mounting rack for plug-in circuit cards.

CBC See **Call-by-Call Service Selection** or **coupled bonding conductor.** Both terms are abbreviated to *CBC.*

CCITT (Comitee Consultatif International Telephonique et Telegraphique) an international body that sets universal standards for data communication, includlng Integrated Services Digital Network (ISDN). CCITT members are from telecommunications companies and organizations around the world.

CCM See **call coverage module.**

CCMS See **control-channel message set.**

CCS See **Concurrent Context Switch** or **hundred call seconds.** Both terms are abbreviated to *CCS.*

CCSA See **Common-Control Switching Arrangement.**

CEM See **channel-expansion multiplexer.**

central office (CO)	The location of telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling. More than one CO can serve the same area.
central-office (CO) trunk	A telecommunications path that provides access from a communications system to the public network through the local CO.
central processing unit (CPU)	The part of a computer that interprets and executes instructions.
central processor	See **central processing unit.**
Centralized System Management (CSM)	An operations-support software tool that provides system-management applications such as terminal change management (TCM), facilities management (FM), traffic management (TM), and cost management (CM). The hub for these applications is an integrated and centralized database containing communications system translation information, user records, and equipment inventory data for System 85 and DIMENSION® Feature Package 8 (FP8). System 75 has its own fully integrated system-management capability, which CSM can access remotely.
channel	A telecommunications transmission path for voice and/or data.
channel bank	Terminal equipment for a transmission system used to multiplex individual channels using frequency-division multiplexing (FDM) or time-division multiplexing (TDM).
channel-division multiplexer (CDM)	A device that connects directly to a System 75 or a System 85 digital signal level-1 (DS1) port to provide point-to-point or multipoint nonswitched private-line data connections over the same digital facility that carries inter-communications system traffic. The CDM allows any number of preselected channels from a DS1 facility to bypass the communications system and/or teerminate while passing the other channels to the communications system normally. The CDM is compatible with both robbed-bit (voice-grade) and alternate voice/data (AVD) signaling techniques, and provides a number of interface options, such as RS-232C, RS-449, and V.35.
channel-expansion multiplexer (CEM)	A device that doubles the channel capacity of a 1.544-Mbps digital signal level-1 (DS1) private-line facility by compressing up to 48 voice-band channels onto a single DS1 facility. Only 64-Kbps voice and voice-band data signals up to 4.8 Kbps can be compressed; however, the CEM can be configured to pass selected 64-Kbps channels uncompressed so that compressed and uncompressed channels can share the same DS1 facility.
channel service unit (CSU)	See **network channel-terminating equipment.**
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.
clock bus	A conductor or group of conductors carrying clock signals.
cluster	Two or more nodes connected by BX.25 signaling links and tie trunks in a distributed communication system (DCS) network.

CM	See **Connection Manager,** or **Cost Management.** Both terms are abbreviated to *CM.*
common port carrier	The port carrier used by both System 75 and System 85. See **port carrier.**
communications system	The software-controlled processor complex that interprets dialing pulses, tones, and/or keyboard characters and makes the proper interconnections both within the communications system and external to the communications 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.
compatible E & M	A method of permitting two communications systems to connect directly via an analog wire pair (the E signaling lead and the M signaling lead), avoiding costly signaling units.
control channel	The transmission path between the archangel on a switch processing element (SPE) and the angel on each port circuit card in port networks (PNs) controlled by that SPE. See also **angel** and **archangel.**
coupled bonding conductor (CBC)	A conductor that is connected between a communications system single-point ground and the protector ground terminal. The CBC is run adjacent to protected pairs in an associated cable. The mutual coupling between the CBC and the pairs reduces potential differences in terminating equipment.
CPE	See **customer-premises equipment** and **customer-provided equipment.** Both terms are abbreviated to *CPE.*
CPS	See **customer-premises system.**
CPU	See **central processing unit.**
CSM	See **Centralized System Management.**
CSSO	See **Customer Service Support Organization.**
CSU	The terms *channel service unit* and *customer service unit* are both abbreviated to *CSU* and are both synonymous with *network channel-terminating equipment.* See **network channel-terminating equipment.**
customer-premises equipment (CPE)	Equipment on the customer side of an interface between the customer and a facility, for which the customer has responsibility.
customer-provided equipment (CPE)	Customer-owned equipment that is not provided as part of a system but is intended to be connected to it.
Customer Service Support Organization (CSSO)	The AT&T service organization responsible for remote maintenance and administration of AT&T communications systems.

customer service unit (CSU) — See **network channel-terminating equipment.**

customer system document (CSD) — The document shipped with every communications system from the AT&T Denver Works factory that details the custom hardware and software configuration shipped to a customer for a communications-system order.

cut-through connection — A method of establishing a connection to a distant central office (CO) or communications system and then dialing the called number directly to the distant end. The connection is made by either a telephone or a tie trunk between local and distant communications systems. The local communications system sets up a talking connection to the distant communications system and then relinquishes control of the call to the distant communications system. The distant communications system can then return dial tone for subsequent dialing and call routing.

DAC — See **dial access code** and **digital-to-analog converter.** Both terms are abbreviated to *DAC.*

DACS — See **digital access and crossconnect system.**

data-carrier detect (DCD) — A data circuit-terminating equipment (DCE) signal that shows whether the received data-channel line signal is within appropriate limits as defined by the DCE. See also **data circuit-terminating equipment.**

data channel — The means of transmission for and the intervening equipment used in the transfer of information in a given direction.

data circuit-terminating equipment (DCE) — The equipment — usually a modem, data module, or packet assembler/disassembler — used for terminating the circuit that provides the connection between terminal endpoints. The circuit itself is not considered part of the DCE.

Data Communications Access (DCA) — On a System 85, a feature that uses a unique analog data port to provide access to on-premises host computers for data endpoints with an analog interface (modem). These endpoints include analog telephones and attendant consoles. On a System 75, the equivalent functionality is provided by using the same analog-line port circuit used to interface with analog telephones.

data communications equipment (DCE) — See **data circuit-terminating equipment.**

data-communications interface unit (DCIU) — An interface between the System 85 main processor and application processors (APs), AUDIX equipment, or, in a distributed communications system (DCS), other communications systems. The DCIU consists of four circuit packs in the common-control carrier (CCC). See switch communications interface for the equivalent System 75 interface.

data link — The configuration of physical facilities enabling end terminals to communicate directly with one another.

data module An interconnection device between a basic rate interface (BRI) or Digital Communications Protocol (DCP) interface of System 75 and System 85 and data terminal equipment (DTE) or data circuit-terminating equipment (DCE).

data port A point of access to a computer that uses trunks or lines for transmitting or receiving data.

data terminal An input/output (I/O) device that has either switched or direct access to a host computer or to an applications processor (AP).

data terminal equipment (DTE) The equipment that makes up the endpoints in a connection over a data circuit. For example, in a connection between a data terminal and a host, the terminal, the host, and their associated modems or data modules make up the DTE. DTE usually consists of the following functional units: control logic, buffer store, and one or more input or output devices or computers. DTE can also contain error control, synchronization, and telephone-identification capabilities.

DCE See **data circuit-terminating equipment.**

DCIU See **data-communications interface unit.**

DCIU link A hardware communications link that connects two data-communications interface units (DCIUs).

DCTOPS See **DC triple-output power supply.** See also **triple-output power supply.**

DC triple-output power supply (DCTOPS) A carrier power supply, in a DC-powered system, that provides +5 VDC, –5 VDC, and –48 VDC to half of a carrier. Two DCTOPS are needed to power a full carrier.

DDPM See **distributed digital-port multiplexer.**

Dedicated Switch Connection (DSC) A feature that functions as a hardwired link between two ports on a communications system, providing a full-time line between the assigned endpoints. Once administered, the connection remains intact until removed.

default A value assigned automatically when a user chooses not to assign a value. The user has the option of accepting or changing the default.

Delivery Operations Support System See **DOSS.**

demand test A maintenance test initiated on request by a service technician or customer to diagnose a problem on a maintenance object (MO).

demultiplexer A device used to separate two or more signals that were previously combined by a compatible multiplexer and transmitted over a single channel.

destination switch The communications system serving the local endpoint that terminates the data call.

device interface 1 (DI-1) A circuit card that, with the device interface 2 (DI-2) circuit card, provides the control interface between the processing complex and the mass-storage subsystem. The DI-1 resides in the processing complex.

digital	The representation of information in discrete elements such as off and on or 0 and 1.
digital-access and crossconnect system (DACS)	A reconfigurable, central-office (CO) system used to crossconnect digital signal level-1s (DS-1s). A DACS takes DS-1s as inputs and also outputs DS-1s.
Digital Communications Protocol (DCP)	An AT&T proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two information (I-) channels and one signaling (S-) channel.
Digital Data Communications Message Protocol® (DDCMP)	A Digital Equipment Corporation protocol that provides error control by requesting retransmission if an error is detected. Call-detail records are transmitted from a Call Detail Recording Utility (CDRU) to a polling device in a packed binary-coded decimal (BCD) character representation using the AT&T proprietary message set layered on the DDCMP.
digital facility	A switching or transmission facility specifically designed to handle digital signals.
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 23 64-Kbps data channels and one 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 telephone	A telephone that converts analog voice signals into digital electrical signals to be sent along the telephone line. Digital telephones use Digital Communications Protocol (DCP) and are served by two pairs of the basic rate interface (BRI) or wire. Digital telephones include the 7400 series, the PT510, and the business communications terminal (BCT).
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 Digital Communications Protocol (DCP) signals.
digital-to-analog converter (DAC)	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 dedicated telecommunications channel, connected to or terminated on the trunk side of a communications system, on which information, such as voice and data, is transmitted and/or received in digital form only.
digital voice terminal	See **digital telephone.**
digroup	A digitally multiplexed group of 24 channels.
DIP	See **dual in-line package.**
disk drive	A mechanical device that stores data on and retrieves data from one or more disks.

diskette	A flexible platter coated with magnetic material and used as a storage medium.
disk-tape system (DTS)	In System 85 and DEFINITY™ Communications System Generic 2, a disk-based mass-storage unit that physically houses the disk drive, the tape drive, and the DC-to-DC power converter for powering the drives. The DTS replaces the high-capacity minirecorder (HCMR) and reduces the system reload time.
display telephone	A telephone equipped with an alphanumeric display. Display telephones include the 7405D with D401A display module, 7406D, 7407D, and the business communications terminal (BCT).
distributed digital-port multiplexer (DDPM)	A device used to multiplex up to 20 Digital Communications Protocol (DCP) and basic rate interface (BRI) terminals onto a 4-wire T1 facility that terminates on the TN499 network multiplexer interface (NMI) circuit pack on a System 85.
DMA	See **direct memory access.**
DMI	See **digital multiplexed interface.**
DOSS	The AT&T order-management system that provides the capability to marketing branch office (MBO) personnel to configure AT&T general business systems (GBS) and large business systems (LBS) products; provide price quotes for these products and related services; order the necessary equipment from suppliers; arrange for installation; and transmit information to factory order-processing systems, corporate billing systems, and corporate compensation accounting systems.
DRAM	See **dynamic random-access memory.**
DTMF signaling	See **dual-tone multifrequency signaling.**
DTS	See **disk-tape system.**
dual in-line package (DIP)	A rectangular housing for integrated circuits. Two parallel rows of pins connect the enclosed integrated circuits to the outside world.
dual-tone multifrequency (DTMF) signaling	Pushbutton signaling from telephones using the voice transmission path. The code for DTMF signaling provides 16 distinct signals, each composed of two voice-band frequencies.
duplex data link	Electronic equipment that permits automatic transmission of digital information between two points simultaneously in both directions.
duplicated common control	Two processors ensuring continuous operation of a communications system. While one processor is online, the other functions as a backup. The backup processor goes online periodically or when a trouble condition occurs.
duplicated module	A module in which the following components are duplicated: the switch processing element (SPE), the tone/clock circuit card in the processor port network (PPN), and the tone/clock circuit card in any expansion port networks (EPNs).

duplication	The use of redundant components to improve availability. When a duplicated subsystem fails, its backup redundant subsystem automatically takes over.
dynamic random access memory (DRAM)	Semiconductor random-access memory (RAM) that requires short-interval refreshing to retain its contents. See also **RAM.**
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.
echo suppressor	A device that detects speech signals transmitted in either direction on a 4-wire circuit and introduces loss in the opposite direction of speech transmission to suppress echos. See also enhanced remote echo.
EFC	See **electronic flipcharts.**
electromagnetic interface (EMI)	High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.
electronic flipcharts (EFC)	In the context of the maintenance and administration panel (MAAP), a collection of text files in which each word in a procedure is a text file. These files are the source of the paper flipcharts.
electronic power feed (EPF)	An electronic circuit breaker controlled by a microprocessor that is present on some AT&T DEFINITY™ Communications System Generic 2 basic rate interface (BRI) port circuit cards. The EPF controls the power delivered to a terminal by a circuit card.
electronic switching system	See **ESS™.**
enabled	An operational state in which a device is ready and able to function.
end-to-end signaling	The transmission of touch-tone signals generated by dialing from a telephone user to remote computer equipment. A connection must first be established over an outgoing trunk from the calling party to the computer equipment. Additional digits can then be dialed to transmit signaling information to be processed by the computer equipment.
EPF	See **electronic power feed.**
EPN	See **expansion port network.**
EPN control carrier	A carrier containing the maintenance circuit card and tone/clock circuit card for an expansion port network (EPN) and, optionally, port circuit cards.
equalization	The process of compensating for transmission distortion with fixed or adaptive circuitry.

ESS™ (electronic switching system)	A class of modem switching systems developed by AT&T in which the control functions are performed principally by electronic data processors operating under the direction of a stored program.
ETN	See **electronic tandem network.**
expansion interface (EI)	A port circuit card in a port network (PN) that provides the interface between a PN's TDM bus and LAN bus, and a fiber-optic link. The EI carriers five types of information: circuit-switched data, packet-switched data, network control, timing control, and DS1 control. In addition, the EI communicates with the master maintenance circuit card to provide the expansion port network's (EPN's) environmental and alarm status to the switch processing element (SPE).
expansion port network (EPN)	A port network (PN) controlled by a switch processing element (SPE) that is connected to the TDM bus and LAN 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).
facility	The equipment constituting a telecommunications transmission path. See also **trunk** and **line.**
fault	A physical defect in a hardware component of a system that causes improper circuit operation. Faults are considered intermittent when they occur with no predictable frequency and solid when they occur in a regular pattern.
feature	A function or service provided by a hardware or software product.
Generic 1	The marketing name for System 75 R1V4 that is used in conjunction with the product-line name DEFINITY™, as in DEFINITY Generic 1.
Generic 2	The marketing name for System 85 R2V5 that is used in conjunction with the product-line name DEFINITY™, as in DEFINITY Generic 2.
hardwired	Permanently connected via hardware.
high-capacity minirecorder (HCMR)	A tape recorder that drives a tape cartridge containing a copy of the programs, parameters, and translations used by the communications-system common control (CC). The HCMR provides nonvolatile communications-system bootstrap and translation storage, and reloads the central processor's memory whenever power to the memory is interrupted or memory is lost. See also **removable mass-storage subsystem.**
host adapter (HA)	A System 85 circuit pack used to connect the module processor bus to the small computer systems interface (SCSI) bus.
host-adapter processor (HAP)	A microprocessor used on a host-adapter (HA) circuit pack. The HAP manages the level-3 protocol that translates system requests into level-2 command descriptor blocks (CDBs), manages local resources, and creates small computer systems interface (SCSI) data paths.
host computer	A computer, connected to a network, that processes data from various data-entry devices.
hybrid	In the context of data processing, the ability to process both analog and digital communications.

hybrid telephone A telephone with characteristics of both analog and digital telephones.

INADS See **Initialization and Administration System.**

Initialization and Administration System (INADS) A software and hardware tool used by AT&T services personnel located at Customer Service Support Organizations (CSSOs) or the National Customer Support Center (NCSC) to initialize, administer, and troubleshoot customer communications systems remotely.

LAN See **local area network.**

LAN bus A high-bandwidth bus that transmits packets at a rate of 40 Mbps.

LED (light-emitting diode) 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-network interface (PNI) circuit cards, communications-system node interface circuit cards, and digital signal level-1 (DS1) converter circuit cards. Lightwave transceivers convert electrical signals to optical signals and vice versa.

line A transmission path between a communications system or central-office (CO) switching system and a telephone 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.

local storage unit (LSU) A device that collects and stores call-detail records either for direct output to a processor or output device or, more commonly, for periodic output to a central polling device.

Look-Ahead Interflow A feature that enhances call vectoring interflow so that calls will interflow only to those remote locations that can accept the calls. The call vectoring capabilities at both the sending and receiving communications systems and the Integrated Services Digital Network (ISDN-PRI) — private and public network — connectivity between the locations are used to route a call only when accepted by the receiving communications system.

LSU See **local storage unit.**

MAAP See **maintenance and administration panel.**

MADU See **modular asynchronous data unit.**

maintenance and administration panel (MAAP)	A device used by service technicians to administer a DIMENSION® PBX or a System 85.
maintenance object (MO)	A term used by the AT&T Services organization for a unit that can be maintained. An MO can be a hardware component — for example, a circuit card, telephone, or trunk — or a software process.
maintenance tests	Tests that detect and diagnose problems. Each maintenance test consists of a sequence of stimuli applied to a circuit or a software function; the response to the test is compared with the expected results. Maintenance tests can be demand tests, short tests, long tests, destructive tests, nondestructive tests, periodic tests, scheduled tests, initialization tests, and audits.
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 located on the attendant console and maintenance or alarming circuit card, logged to the alarm log, and reported to a remote maintenance facility, if applicable.
Malicious Call Trace (MCT)	A feature that allows the system to trace a call originating within or outside a communications system if that call is determined to be malicious. On activation of MCT by an attendant or telephone user, the calling extension or trunk is identified and the attendant takes control of receiving the needed information and deactivating MCT. An optional customer-provided tape recorder can be used to record the conversation between the malicious caller and the called party.
Manager II	
MF	See **multifrequency.**
MFAT	See **multifunction analog terminal.**
MFDT	See **multifunction digital terminal.**
MFET	See **multifunction electronic terminal.**
MFT	See **multifunction telephone.**
minor alarm	An indication of a failure that could affect customer service. Minor alarms are automatically displayed on LEDs located on the attendant console and maintenance or alarming circuit card, logged 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. Also called a *data set.*
modular asynchronous data unit (MADU)	A rack-mounted equipment unit housing up to eight plug-in asynchronous data units (ADUs).

modular data module (MDM)	An interface between data terminal equipment (DTE) and the Digital Communications Protocol (DCP) of a communications system. The interfaces that can be converted to DCP are RS-232C, RS-449, and V.35. The two types of MDMs are the modular processor data module (MPDM) and the modular trunk data module (MTDM).
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).
multifrequency (MF)	A signaling method using pairs of frequencies from a group of six frequencies that are generally used for interoffice signaling.
multifunction analog terminal (MFAT) (73nn series)	See **multifunction telephone.**
multifunction digital terminal (MFDT) (74nn series)	See **multifunction telephone.**
multifunction electronic terminal (MFET) (72nn series)	A multiappearance telephone that connects to a communications system through a hybrid port using the same AT&T proprietary protocol originally made available to interface multibutton electronic telephone (MET) sets with the DIMENSION® PBX and HORIZON® communications system. MFET models include the 7203H and the 7205H telephones.
multifunction telephone (MFT)	Any multibutton electronic telephone (MET), multifunction analog terminal (MFAT), multifunction digital terminal (MFDT), or multifunction electronic terminal (MFET) telephone set.
multiplexer	A device used to combine a number of individual channels into a 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.
National Customer Support Center (NCSC)	An AT&T Services group that provides technician support and phone-in help for users of the System 75, System 85, DIMENSION® PBX, and DEFINITY™ Communications System.
National Software Support Center (NSSC)	An AT&T Services group that provides technician support and phone-in help for users of 3B computers and PCs.
NCSC	See **National Customer Support Center.**
network	A series of points, nodes, or stations connected by communications channels.
PAM	See **pulse-amplitude modulation.**
PCM	See **pulse-code modulation.**

permanent data connection	A switched connection that simulates a full-time line between data endpoints. See also **dedicated switched connection** and **permanent switched call.**
permanent virtual circuit (PVC)	A continuous logical circuit between the processors of two communications systems that carries distributed communications system (DCS) messages between the communications systems over a data-communications interface unit (DCIU) link. More than one PVC can be established on the same DCIU link. PVCs are needed for proper operation of the DCS data features.
physical location	The physical address, such as cabinet number, carrier number, slot number, and circuit number, of a cabinet, carrier, slot, or circuit. Physical location can also mean the location of a component connected to a communications system.
PI	See **processor-interface circuit card.**
PIB	See **processor-interface circuit card.**
port	A data- or voice-transmission access point on a device that is used for communicating with other devices.
port carrier	A carrier containing port circuit cards, power units, and service circuits.
port data store (PDS)	The System 85 TN440B circuit pack that buffers, stores, and reformats pulse-code modulation (PCM) voice and data transmission, and provides an interface between serial data in the ports and parallel data in the time-slot interchanger (TSI).
port-network connectivity	The interconnection of port networks (PNs), regardless of whether the configuration uses director switched connectivity.
port-network interface (PNI)	A port circuit card in a port network (PN) that provides the interface between a PN's TDM bus and LAN bus, and a fiber-optic link. The PNI carries five types of information: circuit-switched data packet-switched data, network control, timing control, and digital signal level-1 (DS1) control. The PNI also contains the remote archangel for communications between a remote port network (RPN) and its controlling switch processing element (SPE). In addition, the PNI communicates with the master maintenance circuit card to provide the RPN's environmental and alarm status to the SPE.
port-network link (PNL)	The hardware that provides a bridge between two port networks (PNs) in direct-connectivity configurations and between a PN and a switch node in switched-connectivity configurations. In direct-connectivity configurations, the PNL consists of the two port-network interface (PNI) circuit cards residing on the PNs and the hardware connecting the PNIs: lightwave transceivers that convert the PNI's electrical signals to optical signals, the copper wire that connects the PNIs to the lightwave transceivers, a full-duplex fiber-optic cable, and appropriate connectors. In switched-connectivity configurations, the PNL consists of the PNI circuit card residing on the PN, the switch-node-interface (SNI) circuit card residing on the switch node, and the hardware connecting the two circuit cards: lightwave transceivers, copper wire, a full-duplex fiber-optic cable, and appropriate connectors.

port tester	A portable tool that connects to ports and port wiring, and isolates problems to a telephone, a port circuit card, or the wiring between them.
PPG	See **programmable processor gateway.**
PPN	See **processor port network.**
premises distribution system (PDS)	A cabling system that consolidates wiring for a customer's on-site and remote telephones and data terminals, and channels transmissions to the communications system.
premises lightwave system (PLS)	A cabling system that consolidates fiber-optic wiring for a customer's on-site and remote telephones and data terminals.
PRI	See **primary rate interface.**
PRISM	See **primary rate interface simulator and monitor.**
Private Network Interface (PNI)	A private-line access link between an electronic tandem network (ETN) tandem communications system and a Software-Defined Network (SDN) serving office.
PROC	See **procedure.**
procedure	A method for displaying or changing specific translations. For example, procedure 054 word 2 is used to assign Automatic Callback (ACB) to a particular button on a telephone.
process identifier (PID)	A field in an AT&T standardized facility information element (ASF-IE) associated with a process. The contents are numbers (0 through 127) that define the specific ASF. Every ASF has a unique PID.
processing complex	The circuit cards in a processor-port-network (PPN) control carrier that are allocated to the switch processing element (SPE).
processor data module (PDM)	A device that provides an RS-232C data circuit-terminating 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 interface (PI) circuit card	A circuit card that provides a BX.25 signaling link to adjuncts and/or to other distributed communications system (DCS) nodes for a System 75 XE, System 75 R1V3, or DEFINITY™ Communications System Generic 1.
processor port network (PPN)	A port network (PN) controlled by a switch processing element (SPE) that is directly connected to that PN's TDM bus and LAN bus.
processor port network (PPN) control carrier	A carrier containing the maintenance circuit card, tone/clock circuit card, and switch processing element (SPE) circuit packs for a processor port network (PPN) and, optionally, port circuit cards.

programmable processor gateway (PPG)	A feature built into the TN563 circuit pack that offers an external serial interface to a DEFINITY Manager™ II terminal. In addition, two asynchronous data unit (ADU) ports on the TN630 provide access to the processor at speeds of up to 19.2 Kbps. These ports provide the same basic communications functionality available on the remote interface and the diagnostic processor.
protocol	A set of conventions governing the format and timing of message exchanges.
protocol converter (PC)	A device consisting of hardware, software, or a combination of both that allows two systems, each using a different protocol, to communicate and exchange messages with each other.
provisioning	A process that identifies the needs of a customer, translates those needs into equipment and functions, and delivers a working system.
PSC	See **premises services consultant and permanent switched call.** Both terms are abbreviated *PSC.*
pulse-amplitude modulation (PAM)	A modulation technique in which an analog signal, such as speech, modulates a carrier signal consisting of a series of precisely timed pulses of equal amplitude. See also **pulse-code modulation.**
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.
PVC (polyvinyl chloride)	A thermoplastic resin that is frequently used for cable sheathing. See **permanent virtual circuit.**
RAM	See **random-access memory.**
random-access memory (RAM)	Computer memory whose contents can be changed at any time.
RBQ	See **ringback queuing.**
read-only memory (ROM)	Computer memory that can be read repeatedly but cannot be changed.
read operation	The process of retrieving information from memory.
Remote Carrier	See **Remote Group.**
Remote Carrier Group	See **Remote Group.**

Remote Group A feature that allows a group of port circuits — equivalent to one or more port circuit packs but fewer than one module — to be located up to 100 miles from a communications system, communicating through digital signal level-1 (DS1) facilities. Telephones and data terminals connected to these circuits operate as if they were installed at the central location. Digital and EIA-trunk interfaces can be made remote, but the Remote Group feature does not allow local analog trunk interfaces to the remote group. See also **remote module.**

Remote Maintenance, Administration, and Traffic System (RMATS) A centrally located system that can remotely provide maintenance, administration, and traffic measurement for the System 85 or other similar equipment.

remote module A hardware configuration that allows one or more network modules to be located up to 25,000 feet from the common control (CC) by using fiber-optic cable. See also **Remote Group.**

removable mass-storage subsystem (RMSS) A processor-based tape-storage device that replaces the high-capacity minirecorder (HCMR) to provide nonvolatile system bootstrap and translation storage for the System 75.

reverse battery signaling A form of DC supervisory signaling on 2-wire analog trunks that indicates answer and disconnect supervision by reversing the polarity of the tip and ring leads.

RMATS See **Remote Maintenance, Administration, and Traffic System.**

RMSS See **removable mass-storage subsystem.**

ROM See **read-only memory.**

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.

run tape The transfer of communications-system translation information from the processor memory to tape, providing a backup for the system memory. Run tape is usually done after translation changes are made so that a copy of the changes will remain on the tape, in case system problems require reloading the processor memory from tape.

SAT See **system-access terminal.**

SCI See **switch communications interface.**

SCSI See **small computer system interface.**

SCSI bus interface controller chip (SBICC) A very-large-scale-integration (VLSI) microchip used on the TN630 host adapter (HA) card as an interface to the small computer system interface (SCSI) bus.

SHOPS See **Software and Hardware Order Processing System.**

SID	See **station identification number** and **small computer system interface (SCSI) identification.** Both terms are abbreviated to *SID.*
signaling	The sending of control and status information between devices to set up or take down a connection.
signaling system number 7	The standard being developed by the CCITT to provide interoffice signaling — for example, signaling from a central office (CO) to a toll office, a toll office to a toll office, and a toll office to a CO. When implemented, signaling system 7 will replace common channel interoffice signaling (CCIS). See also **common channel interoffice signaling.**
simplex data link	Electronic equipment that permits automatic transmission of digital information in only one direction at a time. See also **duplex data link.**
single-line set	See **single-line telephone.**
single-line telephone	An analog telephone served by a single-line tip-and-ring circuit. Single-line telephones can have only one appearance of one extension. The model 2500 and the 71-series terminals are single-line telephones. See also **multiappearance telephone.**
slot	A track in a carrier used to guide the plug end of a circuit card to the pins on the carrier backplane. The slot number is part of a circuit card's address.
SM	See **system management.**
SM-SPE	See **system-management switch processing element.**
small computer system interface (SCSI)	An American National Standards Institute (ANSI) bus standard that provides a high-level command interface between host computers and peripheral devices.
small computer system interface (SCSI) controller	The entities on the SCSI bus other than the host adapters (HAs). The six controller types are direct access (hard disk), sequential access (tape), printer, processor, write-once read-multiple (optical disk), and read-only direct access (optical disk).
small computer system interface (SCSI) identification (SID)	A number (0 through 7) uniquely identifying each host adapter (HA) and controller on the SCSI bus. The SID identifies parties arbitrating or being selected for bus use. In the case of arbitration, relative priority is determined from the SID (7 is highest priority).
SMDR	See **Station Message Detail Recording.**
SMDR units	Two adjuncts, the direct output adjunct and the 9-track magnetic tape adjunct, that record Station Message Detail Recording (SMDR) records generated by a DIMENSION® PBX and/or System 85.
SMT	See **system-management terminal.**
SN	See **switch node.**

SNA	See **Systems Network Architecture.**
soft switch	A planned transfer of system control from one processor to another without affecting service.
software	A set of computer instructions designed to perform one or more tasks.
Software and Hardware Order Processing System (SHOPS)	The AT&T Denver Works factory order processing system that accepts orders from DOSS for general business systems (GBS) and large business systems (LBS) products manufactured at the Denver location and provides the detailed configuration information for the factory to custom build each order. For these orders SHOPS configures the modules, cabinets, carriers, circuit packs, and cabling according to AT&T Bell Laboratories configuration guidelines, generates the requisite paperwork for the factory to custom build and ship the system, generates the cartridge tape containing the operating system (and for System 85, the custom translation) software for the type of system ordered, and generates the Customer System Document (CSD) showing the hardware (and for System 85, the software) custom configuration details of the system shipped to the customer.
Software-Defined Network (SDN)	An AT&T private networking service created by specialized software within the public network. SDN is designed to carry voice and data traffic between customer locations as well as to off-network locations, and offers a pricing structure based on communications usage, distance, and access-line charges.
solid fault	A fault that occurs on a regular basis — usually each time a periodic or demand test is performed.
source endpoint	The origination of a data call from a local endpoint that is served by the originating communications system. The source endpoint includes basic rate interface (BRI), Digital Communications Protocol (DCP), and analog line interfaces.
SPA	See **speech-processing adjunct.**
SPE	See **switch processing element.**
Speak-to-Me (STM)	A text-to-speech system used to access and listen to stored text messages reproduced by a user-acceptable, text-to-speech voice synthesizer — for example, Message Center messages, — from any touch-tone telephone.
special access	A provision whereby a telephone, data terminal, or communications system can be provided with connections directly into a long-distance carrier service, bypassing the local central office (CO). Also called *direct access.*
speech-processing adjunct (SPA)	A device that implements speaker verification and a variety of other speech-response information services.
speed calling	A form of Abbreviated Dialing (AD) that allows a user to automatically dial any prestored number by dialing an abbreviated code.
Standard Serial Interface (SSI)	A communications protocol developed by AT&T Teletype Corporation that operates at 56 Kbps and is used to interface an applications processor (AP) with 400-series printers and the 500 Business Communications Terminal (BCT).

STARLAN A 1-Mbps PC local area network (LAN) linking intelligent workstations, asynchronous terminals, printers, modems, and host computers. STARLAN functions as a standalone PC network in small offices, departments, and workgroups, and can accommodate any size business that needs, for example, to share files and printers, and exchange electronic mail.

station A telephone served by a communications system.

Station-Busy Indication (SBI) A feature that provides a visual indication at a multifunction telephone of either the switch-hook status of a particular other multifunction telephone or the busy/idle status of an extension assigned to one or more single-line telephones. Any feature or function status light can be assigned to provide the visual indication.

station identification (SID) number The direct distance dialing (DDD) address — consisting of 10 digits with the North American numbering plan (NANP) — of the originating party provided in the address-digits field of the calling-party-number information element (IE) in the Integrated Services Digital Network primary rate interface (ISDN-PRI) setup message.

Station Message Detail Recording (SMDR) In a System 75, another name for the Call Detail Recording Utility (CDRU). In a System 85, a specific call-detail recording capability consisting of a communications system adjunct that provides buffering plus either a 9-track tape image of call-detail records or a direct output of records suitable for printing.

statistical multiplexing A form of time-division multiplexing (TDM) that uses a microprocessor control unit to dynamically allocate available bandwidth.

status indicator See **status light.**

status information Information defining the current state of call processing within a communications system.

status light An indicator light showing the status of an appearance by the state of the light (on, flashing, fluttering, or off).

stimulus signaling A signaling method that reports stimuli but does not request specific operations. With stimulus signaling, a button press is reported simply as a button press, not as the activation of the feature associated with the button, as with functional signaling. The signaling in the Digital Communications Protocol (DCP) message set is primarily stimulus signaling. See also **functional signaling.**

Stored Number Display A feature that displays, on a telephone's alphanumeric display, the stored number associated with any Abbreviated Dial (AD) button or access code assigned to that telephone.

stored program control Software programs that control system operation.

stored program A set of instructions in computer memory specifying the operations to perform and the location of the data on which these operations are performed.

straight line set (SLS)	A single-appearance telephone that appears to System 85 as a multiappearance telephone. Whenever single-appearance telephones are used as signaling terminals, the Terminal Busy Indication feature requires that these telephones be administered as SLSs. Whenever single-appearance telephones are given bridging capabilities, the Bridged Call feature requires that these telephones be administered as SLSs.
subscriber	A user authorized to access a specific service. For example, in the context of AUDIX service, a subscriber is a telephone user authorized to access the AUDIX system to send and retrieve messages.
subtending switch	A lower-order communications system in a hierarchical private network.
switch	Any kind of telephone switching system,
switch administrator	A person responsible for specifying features and/or services available to users of a communications system.
switch communications interface (SCI)	An interface between the System 75 switch processing element (SPE) and applications processors (APs), AUDIX equipment, or other communications systems in a distributed communications system (DCS) configuration. The SCI provides for the System 75 the same functionality that the data-communications interface unit (DCIU) provides for the System 85 and DIMENSION® PBX. See also **processor interface circuit card.**
switch hook	The button, located under the handset on a telephone, that is automatically activated or deactivated when the user lifts or replaces the handset — that is, goes off-hook or on-hook.
switched access	A call that originates from a local exchange carrier (LEC) to an inter-LATA (local access and transport area) carrier network.
switched connectivity	For DEFINITY™ Communications System Generic 2, a configuration in which port networks (PNs) are connected through the center-stage switch (CSS).
switched Digital Communications Protocol interface (SDCPI)	An interface that physically connects a processor data module (PDM) to the switched Digital Communications Protocol (DCP) subsystem in an applications processor (AP). The SDCPI provides a 64-Kbps link for downloading AP software into the 515 Business Communications Terminal (BCT).
synchronization	The process in which proper phase alignment to a transmitter is made so that the beginning and end of a character, message, time slot or frame can be readily identified for information retrieval.
synchronous data transmission	A method of transmitting data in which discrete signal elements are transmitted at a fixed and continuous rate. Synchronous data transmission requires that the timing of the transmission be synchronized between the sending and receiving devices. See also **asynchronous data transmission.**
synchronous transmission	See **synchronous data transmission.**
system management (SM)	The process of provisioning, administering, and maintaining a communications system.
system-management terminal (SMT)	An administration device for System 85 that is similar to the maintenance and administration panel (MAAP). The SMT allows access to and the ability to change the translation information associated with System 85 features.

system manager	See **switch administrator.**
system reload	A process that allows stored data to be written from a tape into the system memory.
system-status indicator	A light that indicates the busy or idle condition of a release-link trunk (RLT). System-status indicators can also monitor the queue warning status for Call Management System (CMS) splits.
system upgrade	The process of changing existing communications-system software to a more recent version of software that adds new feature functionality — for example, upgrading a System 85 from R2V3 to R2V4. New or additional hardware may also be required.
Systems Network Architecture (SNA)	An International Business Machines Corporation communication architecture for distributed computer networks.
T1	A digital transmission standard that in North America carries traffic at the digital signal level-1 (DS1) rate of 1.544 Mbps.
T1 digital carrier	The digital transmission system in common use throughout the North American public network.
TA	See **terminal adaptor.**
tandem	The switched connection of an incoming trunk to an outgoing trunk.
tandem node	A communications system in a network that receives a signal from another communications system and passes the signal on to still another communications system. In an electronic tandem network (ETN), a tandem node provides electronic-tandem switching features and hunk-to-trunk switching functions. A tandem node within an ETN provides the logic to determine the best route for a network call, possibly modifies the digits released and allows or denies certain calls to certain users.
tandem switch	See **tandem node.**
tandem through	The switched connection of an incoming trunk to an outgoing trunk without human intervention.
tandem tie-trunk network (TTTN)	A private network that interconnects several customer communications systems by dial-repeating tie trunks. Access to the various communications systems is dictated by codes that must be individually dialed for each system.
tandeming	The process of passing a signal from one trunk to another trunk through a network node.
TDD	See **telecommunications device for the deaf.**
TCPA	See **turnkey customer-provided access.**
TDM	See **time division multiplexing,** or **trunk data module.** Both terms are abbreviated to *TDM*.
TE1	An Integrated Services Digital Network (ISDN) terminal that is either a digital telephone or an integrated telephone-data terminal.

TE2 A data terminal with an X.25 or RS-232C interface that requires a terminal adaptor (TA) to plug into an Integrated Services Digital Network (ISDN) interface.

telecommunications device for the deaf (TDD) A device used by a calling party who is hearing-impaired. When the hearing-impaired party dials E911 and the call is connected to a primary public safety answering point (PSAP), the calling party presses the space bar of the TDD. This generates a tone that alerts theE911 agent that the calling party is hearing-impaired. The agent then transfers the call to a similar TDD device, located in the primary PSAP area, to handle the call.

temporary signaling connection (TSC) The out-of-band D-channel signaling connection between parties that is provided by a public or private Integrated Services Digital Network (ISDN) to transport pass messages, user information, and other noncall control messages. The TSC can consist of explicit connections, following the formal TSC procedure, and implicit connections, using the ISDN feature capabilities procedure, between tandem switching points.

tenant service A service that allows a large communications system to appear to users as many small independent communications systems, allowing a single system to be shared among a wide assortment of user groups called *tenants.* Tenant Service is useful for major airports, industrial parks, large medical centers, and large office complexes. See also **Partitioning.**

terminal adaptor (TA) A device that converts standard non-Integrated Services Digital Network (ISDN) interfaces — for example, X.25 and RS-232C — to ISDN interfaces.

Terminal Busy Indication (TBI) See **Station Busy Indicator.**

terminal change management (TCM) The process of administering telephone, extension, and/or line-related parameters for a communications system.

Terminal Dialing A feature that allows a user to set up and take down data calls directly from the keyboard of a data terminal. Also called *Keyboard Dialing.*

terminal emulation The imitation of all or part of one computer system by another, primarily by hardware, so that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated system.

terminal-endpoint identifier (TEI) An 8-bit subfield of the address field in a link-access procedure on the D-channel (LAPD) frame. The TEI is used by level 3 only during level-2-to-level-3 initialization. The TEI is used by level 2 to identify an endpoint on a port. Only TEI-0 is used on a primary rate interface (PRI).

terminating/originating appearance One of the two kinds of appearances assigned on a System 85. When a terminating/originating appearance is idle, calls can be either received or made using the appearance. See also **originating-only appearance.**

test display mode	A display mode entered automatically by a communications system, causing automatic exit of the currently active display mode, whenever a user activates Station Test by dialing the telephone-test dial access code (DAC). While the display is in test display mode, all display feature-button presses are processed by the system in the context of Station Test rather than the assigned button function, and the only messages sent to the display are those generated as part of the telephone test.
TID	See **terminal identification.**
tie trunk	A dedicated telecommunications channel connecting two communications systems.
time-division multiplexed bus	See **TDM bus.**
time-division multiplexing (TDM)	Multiplexing that divides a transmission channel into successive time slots. See also **multiplexing.**
time-multiplexed switch (TMS)	An element of a time-division switching network that effectively operates as a very-high-speed space-division switch whose input-to-output paths can be changed to rearrange the interconnection of successive time-slot interchange time slots. See also **time-slot interchange.**
time-slot interchanger (TSI)	An element of a time-division switching network-that separates and switches time-division-multiplexed signals arriving from multiple calls.
timeout	The expiration of a preassigned time interval, during which a specified condition persisted. Timeout is normally associated with an automatic action — for example, in Loudspeaker Paging, after a timeout, the paging amplifiers and speakers are automatically released.
tip lead	One of the two conductors in a 2-wire pair.
TM	See **traffic measurement/reporting** and **traffic management.** Both terms are abbreviated to *TM*.
TME	See **terminal-endpoint-identifier management entity.**
TMS	See **time-multiplexed switch.**
TOD	See **time/date display mode.**
TOD and date display	See **time/date display mode.**
tone ringer	A device with a speaker instead of a ringer that is used in telephones to alert the user.
TOPS	See **triple-output power supply.**
TRACS	See **Translations, Recovery, Additions, and Conversion System.**

tractor feed	A mechanism used to advance paper for a printer.
traditional module	In System 85 R2V1-V4, the module-control cabinet and up to three port cabinets that function as a single switching module.
traffic	The flow of voice and data communications through a communications system.
traffic management (TM)	The ongoing process of monitoring a communications system and adjuncts, the number and types of channels required between switching points, and the call-handling capacity of the switching points.
traffic measurement/reporting (TM)	The process of collecting data about the use of system resources and generating reports based on this data to guide the engineering of system changes and plan the staffing of certain workstations, such as attendant consoles and Automatic Call Distribution (ACD) agent positions.
Transfer	A feature that allows a multifunction (digital or hybrid) telephone user to transfer a call by pressing the Transfer button, which places the current call on hold, calling or selecting the appearance of a third party, and completing the transfer by pressing the Transfer button a second time.
transfer rate of information bits (TRIB)	The number of information — not control and signaling — bits passing a given point in the data stream per second. For example, if 64 Kbps are transmitted and 8000 of those bits are control and signaling bits, the TRIB is 56 Kbps.
transient condition	A state of call processing that quickly passes into and out of existence. Examples of transient conditions include the following: a line is ringing; a line is in a dialing state, such as dialing and hearing dial tone; a line is receiving Call Waiting, Attendant Call Waiting (ACW), or Priority Calling tones; or a line is receiving busy, intercept, reorder, or ringback tones. Also called a *transient state.*
translation	Specific information assigned to a terminal or to a communications system to customize it for the user. For example, the assignment of Automatic Callback to the third button on a telephone is a translation.
translation freeze interval	The time during which operations or a customer's translations prevent administrative changes from being incorporated. Any changes made by the customer during this interval must be reentered when the system is rebooted with the modified original translations.
Translations, Recovery, Additions, and Conversion System (TRACS)	An applications software program, running on a Digital Equipment Corp. VAX® 11/780 computer using the UNIX® operating system, that allows the customization of a customer's translations for a System 85. (VAX® is a registered trademark of the Digital Equipment Corporation.)
TRIB	See **transfer rate of information bits.**
triple-output power supply (TOPS)	A carrier power supply, in an AC-powered system, that provides +5 VDC, -5 VDC, and –48 VDC to half of a carrier. Two TOPS are needed to power a full carrier.
trunk	A dedicated telecommunications channel between two communications systems or central offices (COs).

Trunk Busy Indication (TBI)	See **Facility Busy Indication.**
trunk data module (TDM)	A device that provides the interface for connection between off-premises private-line trunk facilities and a System 75 or a System 85. The TDM 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	Trunks that can be used interchangeably between two communications systems or central offices (COs).
Trunk Group Busy (TGB) indicators	See **Trunk Group Busy/Warning indicators.**
Trunk Group Busy/Warning (TGB/TGW) indicators	1. A visual indication when all trunks in a particular group are busy (TGB). TGB is usually provided on one of the lights associated with a Direct Trunk Group Select button on the attendant console. 2. A visual indication when a customer-selected number of trunks in a particular group is busy (TGW). TGW is usually provided on one of the lights associated with a direct trunk group.
Trunk Group Warning (TGW) indicators	See **Trunk Group Busy/Warning indicators.**
trunk hunting	The process of selecting an idle trunk in a trunk group.
trunk port	The data- or voice-transmission access point on a device that is used for each circuit associated with a trunk.
TSC	See **temporary signaling connection.**
TSI	See **time-slot interchanger.**
TTC	See **touch-tone calling.**
TTTN	See **tandem tie-trunk network.**
twisted pair	Two copper wires used for the transmission of voice and/or data
UCD	See **Uniform Call Distribution.**
UDM	See **universal data module.**
UDP	See **Uniform Dial Plan.**
UM	See **Unified Messaging.**
UNC	See **universal digital channel.**
unconvertible	See **undownloadable.**

universal bus interface	A control-complex circuit card for universal modules that interfaces the module processor to the cabinet's TDM buses, LAN bus, and clock bus. See also **universal module.**
universal data module (UDM)	A data module that can function as both data circuit-terminating equipment (DCE) and a data-terminal equipment (DTE) interface.
universal module	A single-cabinet replacement for a traditional System 85 R2 call-processing module using high-circuit-density technology to provide more circuitry in less space, usually at a lower cost. The universal module architecture is a combination of System 85 and System 75 architectures that uses a modified System 85 module-control (MC) complex to operate a System 75 processor port network (PPN), thus allowing System 75 port circuit cards to be used on System 85.
universal-module-control cabinet	A common cabinet configured with a universal-module-control complex, common port network (PN), and power supply.
universal-module-control carrier	The System 85 module that consists of DEFINITY™ Communications System Generic 1 and 2 port technology and design, DEFINITY™ Communications System Generics 1 and 2 intramodule network fabric, and a modified System 85 R2V4 module-control carrier.
universal-module processor	A module processor that serves the port hardware common between DEFINITY™ Communications System Generic 1 and 2.
universal port carrier (UPC)	Obsolete. See **port carrier or common port carrier.**
UNIX® system	An operating system that is licensed by AT&T and used on all AT&T 3B2 and 3B5 computers and AT&T 3B5 AP and AP16 applications processors.
vintage	The period of time that a circuit card has been in existence — as specified, for example, by the card's release and version.
virtual board	See **virtual card.**
virtual card	One of the three electrical circuit-card locations mapped by a circuit card located on a universal module.
virtual call	See **noncircuit (virtual) call.**
virtual circuit	The entire path between two end processors. A virtual circuit can consist of more than one communications link and is also used in packet switching. In the data-communications interface unit (DCIU) application, the terms *data path* or *control path* are used instead of *virtual circuit.*
virtual equipment location	The DEFINITY™ Communications System Generic 2 electrical equipment location referenced by an equipment location on the universal module.

visual maintenance and administration panel (VMAAP)
A program running in the UNIX® operating system that emulates operations of the maintenance and administration panel (MAAP) used with the System 85 and DIMENSION™ PBX. VMAAP can be used interactively like the MAAP. It can also be called by another program. See also **MAAP.**

VLSI
See **very large-scale integration.**

VMAAP
See **virtual maintenance and administration panel.**

voice coupler
An electrical isolation device used to pass audio signals into a system.

voice-grade trunk
A channel that carries voice calls and analog voice-band data calls.

voice mail
Messages that any subscriber to a voice-mail system can record in advance, distribute to other subscribers, receive, and store by using a telephone as an input/output (I/O) device. See also **voice-mail system.**

voice-mail system
A message-handling system — either a communications-system adjunct or PC based — that allows subscribers to record messages and distribute them to other subscribers, and to receive and store recorded messages. See also **AUDIX** and **voice mail.**

voice service
The switching and transmission of voice frequencies.

voice terminal
A single-appearance or multiappearance telephone.

voice-terminal display
See **alphanumeric display.**

WAN
See **wide area network.**

warning alarm
An indication of a failure that has caused minimal or no degradation of service. Warning alarms are displayed on the maintenance circuit card's LED and logged to the alarm log. Typically, a warning alarm affects only one user — for example, only one extension or telephone — and is used to identify conditions, such as a missing telephone, or faulty facilities.

warning tone
A tone provided over a telephone, used to caution users of a variety of conditions, such as the possibility of interruption by an attendant or other user, or the possibility that the connection is about to be taken down. For example, System 85 can return a warning tone when a call would unexpectedly route over higher-cost toll facilities. The features for which the communications system is able to provide a warning tone include Automatic Alternate Routing (AAR) and Automatic Route Selection (ARS). See also **intrusion tone.**

WATS (Wide Area Telecommunications Service)
A service that allows calls to certain areas for a flat-rate charge based on expected usage.

WATS trunk	A one-way outgoing telecommunications channel used to place a WATS call, or a one-way incoming telecommunication channel used to receive an 800-service call.
wide area network (WAN)	A network that provides communications services to a geographic area larger than that served by a local area network. See also **local area network.**
Wide Area Telecommunications Service	See **WATS.**
word	A subdivision of a procedure. For example, word 2 of procedure 054 is used to assign the Automatic Callback button (System 85 R2 and DEFINITY™ Communications System Generic 2 only).
write operation	A software and hardware function that puts information into a computer's memory.
X.25	A CCITT standard that specifies the interface between user data terminal equipment (DTE) and data circuit-terminating equipment (DCE).
X.25 packet software	Programs designed to implement the CCITT standard X.25 protocol.
Z3A4 asynchronous data unit (ADU)	A circuit that converts FCC signals into RS-232C levels. The Z3A4 ADU can also extend the usual RS-232C 50-foot limit to 40,000 feet.

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