365-575-410
Issue 1C
April 1998

Lucent Technologies
Bell Labs Innovations

Optical Translator (OT)

Installation Manual

Notice

The information in this document is subject to change without notice Although every effort has been made to make this document as accurate, complete, and clear as possible, Lucent Technologies Inc. and its predecessors assumes no responsibility for any errors that may appear in this document.

Federal Communications Commission (FCC) Notification and Repair Information[1]

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

Security

In rare instances, unauthorized individuals make connections to the telecommunications network. In such an event, applicable tariffs require that the customer pay all network charges for traffic. Lucent Technologies Inc. cannot be responsible for such charges and will not make any allowance or give any credit for charges that result from unauthorized access.

Trademarks

5ESS, LGX and ST are a registered trademarks of Lucent Technologies Inc.
DANTEL is a registered trademark of DANTEL Incorporated.
IBM is a registered trademark of International Business Machines Corporation.
MS-DOS is a registered trademark of Microsoft Corporation.
NCR is a registered trademark of NCR Corporation.
Thomas & Betts is a registered trademark of Thomas & Betts Corporation.
UL is a registered trademark of Underwriters Laboratories Inc.

Warranty

The terms and conditions of sale will include a five-year warranty on hardware and a one year warranty on software.

Document Ordering Information

The ordering number for this document is 365-575-410. To order this document within the USA, call 1-888-LUCENT-8 (1-888-582-3688). RBOC/BOC customers should process document orders or standing order requests through their Company Documentation Coordinator. For more ordering information, refer to "How to Order This Document" in the section titled "About This Document".

Customer Assistance and Technical Support

The Lucent Technologies Regional Technical Assistance Center (RTAC) provides a technical assistance telephone number that is monitored 24 hours a day. For technical assistance, call 1-800-225-RTAC.

This document was developed by the Lightwave Customer Technical Support Organization (CTS).

---

1. Language of statute.

We'd Like Your Opinion

We'd like your feedback on this document. Your comments can be of great value in helping us improve our documentation.

Document Title: **Optical Translator (OT) Installation Manual.**

Lucent Technologies Document Number: **365-575-410** Issue Number: **2C** Publication Date: **February 1998**

1. Please rate the effectiveness of this document in the following areas:

	Excellent	Good	Fair	Poor
Ease of Finding Information				
Clarity				
Accuracy				
Completeness				
Organization				
Appearance				
Examples				
Illustrations				
Overall Satisfaction				

2. Please check the ways you feel we could improve this document:

Please add details for the suggested improvement.

Feel free to write any comments below:

q Add more detail
q Improve the table of contents
q Improve the organization
q Include more figures
q Add more examples
q Make it more concise/brief
q Add more step-by-step procedures
q Add more trouble shooting information
q Make it less technical
q Add more/better quick reference aids

If we may contact you concerning your comments, please fill out the following:

Name:_____Telephone Number: (___)_____

Company/Organization:_____Date:_____

Address:_____

_____

When you have completed this form, please fax it to (508)-960-1665. **Thank you.**

OT INSTALLATION COMPLETION CHECKLIST

RING NAME _____

ORDER # _____ OFFICE NAME _____

Relay Rack # _____

ITEMS TO BE CHECKED	STATUS OF ITEM	INSTALLATION INITIALS
(1) Are the OTU circuit boards in slots and **unseated**		
(2) Do the OTU codes match the OTU slot numbers as specified in the installation order?		
(3) Is installation complete through **Section 6**?		
(4) Are the OT cabinet BDFB fuses **20 amps**?		
(5) Is any **material missing**? Any cabinet hardware missing?		
(6) Are OT DC Power Feeders identified at BDFB?		
(7) Are there any backplane pins bent or broken on circuit pack side of backplane? (If yes, list location and status.)		
(8) Are bays neat and fibers running to OLS protected?		

When you have completed this form, please FAX to:

Lucent Technologies Inc.
NGLN Project Management

FAX No. (404) 573-7398

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Figures

Figures

Figures

Figures

Tables

Tables

Tables

Tables

About this Document

Purpose

This manual provides instructions for installation of the Optical Translator (OT). For installations of the Optical Line System and the FT-2000 Large Capacity Terminal systems integrated with the OTU refer to 365-575-211 LCT Integration Manual for all system level tests.

This manual is not a service manual. Refer to 365-575-401, Optical Translator (OT) User/Service Manual for any activity involving circuit turn-up, regular maintenance, or trouble analysis.

Intended Audience

This installation manual is for personnel who will install Optical Translator equipment. It emphasizes Release 1.0 practices and procedures.

Reason for Reissue

This document, Issue 1B, replaces the *Optical Translator (OT) Installation Manual,* Issue 1/1A. This document was reissued to provide information with regard to recent product changes and updates.

Significant changes include the following:

- Installation of EMC side panels and EMC covers for OT Cabinet.
- Updates to the installation and testing instructions.

How to Use this Manual

This manual is divided into several sections. The sections are numbered in the order in which they are to be performed. This manual is intended ONLY for use in a central office environment in Network Equipment Building System (NEBS) installations and for installation and testing performed prior to turnover to central office personnel.

The sections in this document provide the following information:

- "About this Document" describes the purpose, intended audience, and organization of this document. Ordering information and procedures to comment on this document are included.
- Section 1, "Overall Installation and Test Considerations", provides a list of required tools and test equipment for OT equipment installation and testing, presents safety information, and gives a list of other related documentation. Training and technical support information is also presented.
- Section 2, "Platform Description", introduces the OT platform and describes the OT cabinet and miscellaneous mount configurations.
- Section 3, "Equipment Installation", describes how to uncrate and erect OT equipment.
- Section 4, "Wired Cable Installation", provides information about power cables, wired signal cables related to the OT, and their installation.
- Section 5, "Fiber Installation", provides information about fiber cables related to the OT and their installation.
- Section 6, "Powering", provides procedures for verifying cabinet/shelf ground and powering the cabinet/shelf.
- Section 7, "Start-up And Local Installation Testing", provides procedures for testing of circuit pack LEDs, miscellaneous discrete alarms, and laser outputs.
- Appendix A, "Fiber Cleaning", describes how to clean optical connectors.
- Appendix B, "Pin Replacement", describes how to repair backplane pins that need to be replaced.
- Appendix C, "DANTEL Alarm and Control Block Installation - Extended Miscellaneaous Discretes", describes installation and wiring of DANTEL Alarm and Control Block.
- Appendix D, "Harris C-1000 Centurion Installation - Extended Miscellaneous Discretes", describes installation and wiring of Harris C-1000 Centurion.

How to Order This Document

Lucent Technologies entities should use Form IND1-80.80 FA available through the Customer Information Center. Other customers should use the Mail Order or Telephone Order information given below: .

Customer	Mail Order	Telephone Order (Monday through Friday)
Commercial Customers*	Lucent Technologies Customer Information Center Attention: Order Entry Section 2855 N. Franklin Road P.O. Box 19901 Indianapolis, IN 46219	Within USA: 1-888-LUCENT-8 (1-888-582-3688) 7:30 a.m. to 6:30 p.m. EST FAX: 1-800-566-9568 From Canada: 1-800-255-1242 Australia and all European Countries: Toll: 1-317-322-6416 All Other Countries: Toll: 1-317-322-6646 Worldwide: FAX: 1-317-322-6699
RBOC/BOC	Process through your Company Documentation Coordinator	

* For commercial customers, a check, money order, purchase order number, or charge card number is required with all orders. Make checks payable to Lucent Technologies.

Onetime orders include a binder (if applicable) and document contents for the current issue in effect at the time of order. Also, you may request placement on a standing order list for all reissues of any document. The standing order list for each document provides automatic distribution for all reissues of the document. RBOC/BOC customers should process document orders or standing order requests through their Company Documentation Coordinator. For questions regarding standing orders, or to be placed on a standing order list, call the applicable Lucent Technologies Customer Information Center number listed above.

How to Comment on This Document

This manual was developed by the Lightwave Customer Technical Support Organization (CTS). The CTS welcomes your comments. A feedback form is located immediately after the title page of this document. Please fill out the form and fax it to 508-960-1665.

If the feedback form is missing, fax your comments on this document to 508-960-1665.

Overall Installation and Test Considerations

1

Contents

Overall Installation and Test Considerations

1

Overview

This section presents: a list of required tools and test equipment for installation of OT cabinet or shelves, safety instructions including lightwave safety and ESD considerations, lists of OT documents and drawings, a list of documents for related Lucent Technologies equipment, information on training available, and Technical Support functions.

Required Tools and Test Equipment

Table 1-1 lists the tools, test sets, and accessories required for installation of OLS Equipment.

.

Table 1-1. Required Tools and Test Equipment

Description	Commercial or COMCODE	Lucent Technologies Installers Only	Notes
Multimeter	Fluke 8060A	ITE #5632 or ITE #6379A	For measuring 40-60 V DC and ground continuity
Anti-oxidation Material	NO-OX-ID “A” Compound	NO-OX-ID “A” Compound	For use only if cabinet or shelf has been scraped to make ground connection
ESD wrist strap	900486994	R TOOL #4987B	For ESD protection
Single Mode Fiber jumpers with ST II+ connectors (2 jumpers needed)	107149494 (FS1EP-EP-02)	107149494 (FS1EP-EP-02)	For optical local tests. (Minimum 2 ft. length) with yellow cladding
ST to ST Fiber Optic Coupling (2 needed)	105271142 (C3000A-2)	105271142 (C3000A-2)	
CLETOP Reel Type A			For fiber cleaning. Refer to Appendix A for more details.
CLETOP Reel Type B[a]			
CLETOP Stick Type			
Absorbond cleaner (300 wipes/pkg.)	900709379	RAMAC #1623413	
Optical power meter with ST connectors	HP8140A equipped with HP81401A or HPE5970A with81005VA Connector Adapter EXFO Model FOT-22AX	ITE #6550	For optical power measurements
Pin Repair Kit (optional, as required)	BERG MT370 Kit 106423859		For replacing any damaged METRAL pins Refer to Appendix B for more details.

Table 1-1. Required Tools and Test Equipment

Description	Commercial or COMCODE	Lucent Technologies Installers Only	Notes
Insertion/Extraction Tool Kit (optional, as required)	AMP 91261-1		For replacing ACTION PIN contacts in AMPLIMITE HDP-20 connectors (d-sub connectors) Refer to Appendix B for more details.
Wire Wrap Tool with bit for 26 Gauge wire.			For wire wrapping miscellaneous discrete cables from OT to the DANTEL or Harris EMDU.
A Sonet Frame OC-48 Signal	May be obtained from LCT or incoming signal to the OLS. Also available from Lucent Technologies OC-48 Optical Signal Source (**ITE Number 7089**) or from Tektronix ST2400 with option 12.		For testing output of OTU's

a. CLETOP Type B - The use of is not approved by Lucent Technologies for cleaning ST, FC/PC, and SC type connectors.

Additional Tools And Test Equipment

Refer to Appendix B for backplane pin repair tool information and Appendix A for optical connector cleaning information.

Installation Requirements

Table 1-2 lists the standard installation operations for OT Equipment.

Table 1-2. Installation Operations

	Procedure	Sections	Details
Standard Installation E, F, & I	Equipment Installation	Section 3	Mount, Drill, Erect, Assemble, and Ground Cabinet
	Wired Cable Installation	Section 4	Connect Power, Control, Alarm, and Non-Transmission Cables
	Fiber Installation	Section 5	Install Fibers
	Powering	Section 6	Power the OT Cabinet
	Start Up and Local Installation Testing	Section 7	Testing of OTU's and Miscellaneous Discrete Alarms.

Safety Instructions

Admonishments

This manual contains admonishments in the form of DANGERS, WARNINGS, and CAUTIONS. These admonishments, listed in order of priority, have the following definitions:

- Danger shows the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.
- Warning shows the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.
- Caution shows the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. Caution is also used for property-damage-only accidents. This includes equipment damage, loss of software, or service interruption.

These admonishments are noted by an alert symbol  .

IMPORTANT SAFETY INSTRUCTIONS
READ AND UNDERSTAND ALL INSTRUCTIONS.

When using this telecommunication equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

(1) Follow all warnings and instructions marked on the product.

(2) Slots and openings in this product at the back or bottom are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered.

(3) Opening or removing rear covers or sheet-metal parts may present exposure to high current or electrical energy levels, or to other risks.

(4) Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the product.

(5) Refer servicing to qualified service personnel.

(6) Use caution when installing and modifying telecommunications lines.

(7) Never install telecommunication wiring during a lightning storm.

(8) Never install telecommunication jacks in wet locations unless the jack is specifically designed for wet locations.

(9) Never touch uninsulated telecommunication wires or terminals unless the telecommunication line has been disconnected at the network interface.

(10) Installation must include an independent frame ground conductor to building ground. Grounding/bonding circuit continuity is vital for safe operation of this equipment. Never operate with grounding/bonding conductor disconnected.

(11) This product has two -48V DC ($\overline{=\!=\!=}$) input power feeders. Disconnecting one power feeder will not de-energize the product. To reduce the risk of injury, disconnect the two power supply cables when removing power from the system.

(12) Metallic telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as applicable.

(13) For continued protection against risk of fire, replace only with same type and rating of fuse.

(14) Use only Lucent Technologies manufactured, recognized circuit packs.

(15) This equipment is intended for installation in Restricted Access Locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.

(16) Power the unit only from -48V DC (⎓) sources providing Safety Extra Low Voltage(SELV) outputs.

(17) This equipment must be provided with a readily accessible input power disconnect device as part of the building installation (such as a main power disconnect switch or external circuit breakers).

SAVE THESE INSTRUCTIONS.

Lightwave Safety

Lucent Technologies Lightwave digital transmission systems and associated optical test sets use semiconductor laser transmitters. The lasers emit lightwaves, at or near infrared wavelengths, into lightguide cables. This light is at the red end of the visible spectrum. Direct exposure at close distances should be avoided.

⚠ WARNING:
Never view any unterminated optical connector with optical instruments other than indirect image-converting devices such as the FIND-R-SCOPE[1]. Viewing optics tend to focus the energy from an optical connector and, hence, increase the potential risk for injury.

Lasers and laser products are subject to federal and state regulations as well as Lucent Technologies laser safety requirements. The OT uses a Class I or Class IIIb laser as a transmitter. Under normal operation, the system is totally enclosed and fully protected by devices such that it presents no hazards to safety or health. Each system has been certified and registered with the National Center for Devices and Radiological Health (NCDRH) under the U.S. Food and Drug Administration (FDA) as a Class I system (exempt lasers and laser systems). All sections of the OT that can be removed and allow potential access to laser radiation have been identified. A warning label is provided on the rear of the shelf.

In addition, a compliance label stating that the system has been certified, along with the manufacturer's name and place of manufacture, is attached to each equipment bay. Figure 1-1 shows an example of a compliance label. The compliance label is located on the rear of the equipment bays (at eye level). Several Cautions, Notices and Danger Indications are also given on the rear label, be sure to read and observe them. The text in these labels now appears in both French and English, for an international market.

1. Registered trademark of F. J. W. Industries, Inc.

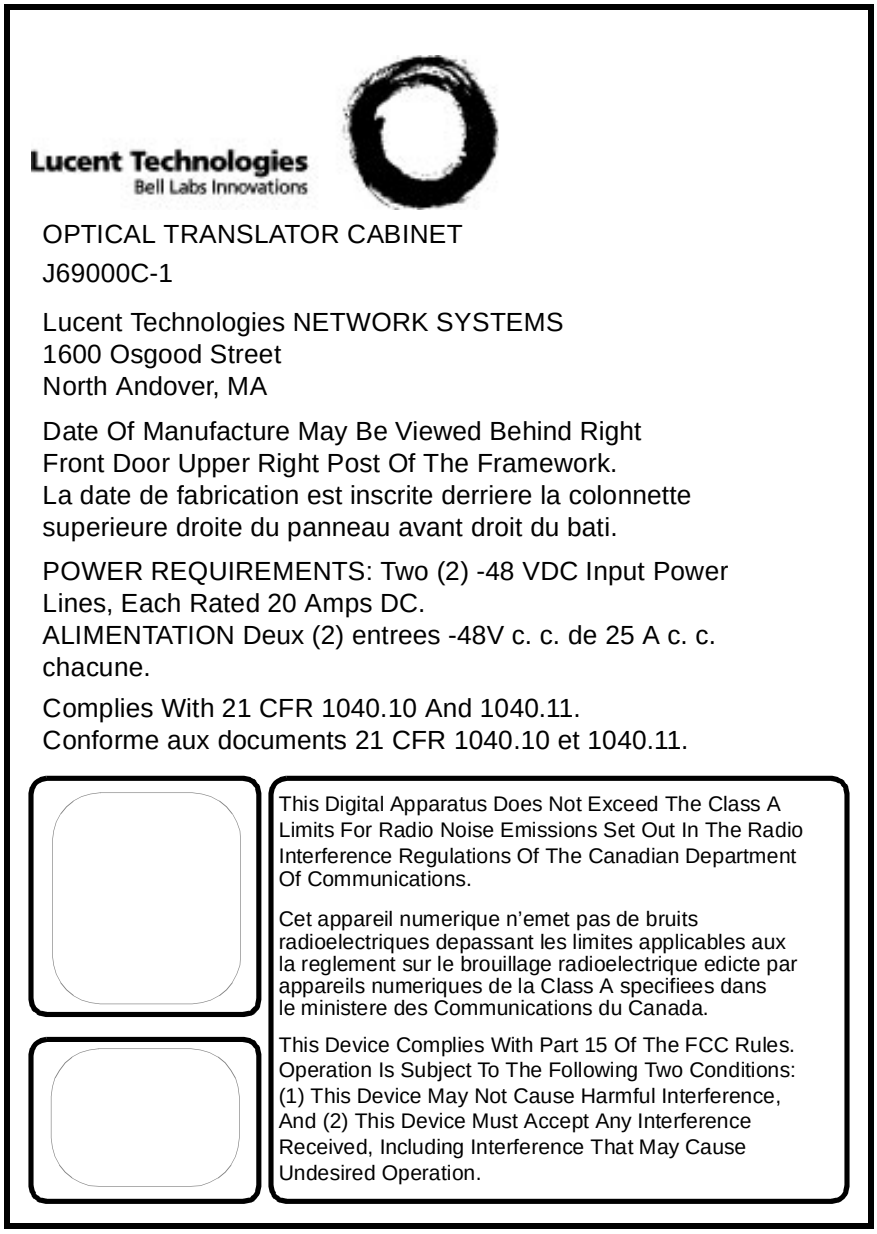


Figure 1-1. Compliance Label

Electrostatic Discharge (ESD) Considerations

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

Observe the following precautions when handling circuit packs to prevent damage by electrostatic discharge:

- Assume all circuits packs contain solid state electronic components that can be damaged by ESD.
- Wear (always) a grounded wrist strap (shown in Figure 1-2) or wear a heel strap and stand on a grounded, static-dissipating, floor mat when handling circuit packs (storing, inserting, removing, etc.) or when working on the backplane.
- Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Observe warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic packaging until ready to insert them into slots.
- Open (if possible) all circuit packs at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats.
- Store and transport (always) circuit packs in static-safe packaging.
- Keep all static-generating materials such as food wrappers, plastics, and styrofoam containers away from all circuit packs. Upon removal from bay, immediately put circuit packs into static-safe packages.
- Maintain (whenever possible) relative humidity above the 20 percent level.
- Keep the electromagnetic interference (EMI)/ESD protective front covers installed at all times except during an upgrade or maintenance procedure. Once a circuit pack is replaced in the shelf, close the front cover immediately.

To reduce the possibility of ESD damage, assemblies are equipped with grounding jacks to enable personnel to ground themselves using wrist straps while handling circuit packs or working on a shelf. The ESD grounding jack for the OT cabinet is located to the right of Complementary Shelf 1 about half way up from the bottom of the cabinet. It may be accessed directly when the cabinet doors are open or through the CIT/ESD access door when the cabinet doors are closed. The miscellaneous mount shelves have their ESD jacks located at the

lower right hand corner of each user panel or fuse panel. These jacks are labeled: Wrist Strap Ground. Wrist straps should be checked periodically with a wrist strap tester to ensure that they are working properly.

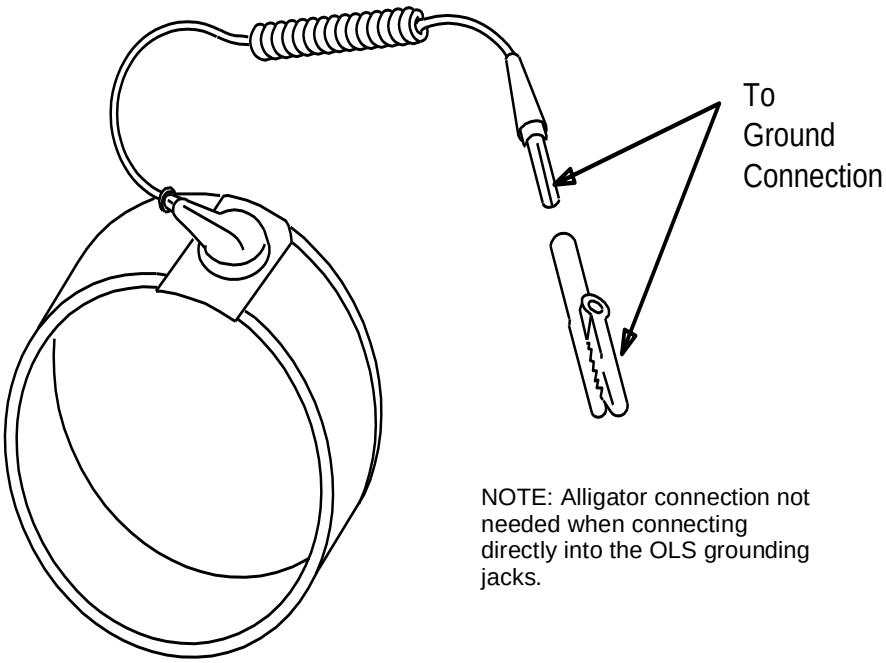


Figure 1-2. Static Control Wrist Strap

Related Documentation

OT Documents

The following documents provide additional information about the Optical Translator:

- Number: 365-575-400

  Title: Optical Translator (OT), Applications, Planning, and Ordering Guide

  Audience: System planners and engineers

  Content: Features, applications, general description, system planning/ engineering, and ordering information

- Number: 365-575-401

  Title: Optical Translator (OT), User/Service Manual

  Audience: End user maintenance personnel

  Content: Detailed description, technical specifications, operations and maintenance, and user interface descriptive/tutorial information

OT Drawings

- J69000C-1 Optical Translator Cabinet
- T-6G156-33 Optical Translator Interconnect Circuit
- T-6G156-30 Optical Translator System Circuit
- T-6G155-30 Optical Translator Shelf Circuit
- ED-7G044-30 Optical Translator Cabinet Framework
- ED-7G045-20 OT Cable Assembly
- ED-7G045-22 OT Interconnect Cable Assembly
- ED-7G045-30 Optical Translator Shelf Assembly
- ED-7G047-30 User/Fuse Panel/Power Indicating Assembly
- FPD 804-604-162 Optical Translator Cabinet Floor Plan Data Sheet
- 847823325 OT Installation Kit

Documents for Related Lucent Technologies Equipment

The following documents provide additional information about related equipment:

- 365-575-300

  Optical Line System (OLS) Applications, Planning, and Ordering Guide

- 365-575-301

  Optical Line System (OLS) User/Service Manual

- 365-575-310

  Optical Line System (OLS) Installation Manual

- 365-575-211

  FT-2000 OC-48 Large Capacity Terminal Integration Manual

- 365-575-210

  FT-2000 OC-48 Large Capacity Terminal Installation Manual

- 824-102-175

  FT-2000 OC-48 Large Capacity Terminal Operations Systems Engineering Guide

Training

No product offering is complete without a formal training package. The National Product Training Center will provide management courses for system planning, engineering and ordering, as well as training telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses is also available. Contact the Customer Training and Information Products Organization on 1-888-LUCENT-8 (1-888-582-3688) to enroll in training classes. To arrange suitcase sessions, call 1-614-764-5186.

The following courses are provided by the National Product Training Center:

- Number: LW2251

  Title: Optical Translator (OT) Applications, Architecture, Planning, and Ordering

  Audience: Facility planners, account executives, equipment engineers, private telecommunications network technical consultants and design engineers.

  Content: OT applications, architecture (that is, bays shelves, circuit packs), operation, administration, maintenance, equipment and cabling specifications for engineering and ordering.

- Number: LW2651

  Title: Optical Translator (OT) Operation and Maintenance

  Audience: This course is designed for technicians, installers, maintenance engineers, technical support personnel, product evaluators, and anyone desiring to learn operation and maintenance procedures for the Optical Translator (OT).

  Prerequisite: A background in telephony and a basic understanding of digital transmission principles is necessary.

  Content: This one-day training course provides the participant with practical hands-on experience with required circuit packs, provisioning

appropriate options, conducting turn up and test procedures, and clearing routine cases of trouble. The student performs all of these tasks using standard documentation.

- Number: LW2451V

  Title: Optical Translator (OT) Installation

  Audience: Installers and anyone desiring installation information for the Optical Translator (OT).

  Prerequisite: TR2448 or equivalent knowledge

  Content: Video presentation covering OT installation and physical design.

Technical Support

Assistance in maintaining your installed system is available through the Regional Technical Assistance Center (RTAC) and the Customer Technical Support (CTS) organization. As shown in Figure 1-3, RTAC is your single point of contact. RTAC personnel troubleshoot field problems 24 hours a day over the phone and, if necessary, on site. For technical assistance, simply call **1-800-225-RTAC**.

RTAC organizations are supported by a centralized CTS for transmission products. The CTS maintains a close relationship with Bell Laboratories and other Lucent Technologies organizations to expedite resolutions and maintain contact with the development community.

The CTS has also established a technical support medium, CTS customer support tools. Many transmission products are currently supported by COACH, including the FT-2000 OC-48 Lightwave System. COACH is a system of computerized on-line support tools aimed at providing product news and bulletins, diagnostic services, compatibility information, and on-line documents. COACH tools provide you with the most up-to-date product information so that problems are either prevented or quickly resolved. COACH tools reside on a dedicated time-share computer accessible over toll free lines and are available 24 hours a day, 7 days a week. For information about how to access COACH, contact your local Account Executive.

Once connected to COACH, the user specifies which product to access and COACH grants the appropriate combination of tools and commands. The user reaches each one of these tools and commands through a centralized, menu-driven computer program. Every screen provides help in making appropriate menu selections. COACH users achieve proficiency quickly because of the consistency of menu selections among products.

The CTS strives to provide proactive and responsive technical customer support for all its products. Through the combined efforts of individual customer support groups and through COACH tools, the CTS provides you with the best possible customer support.

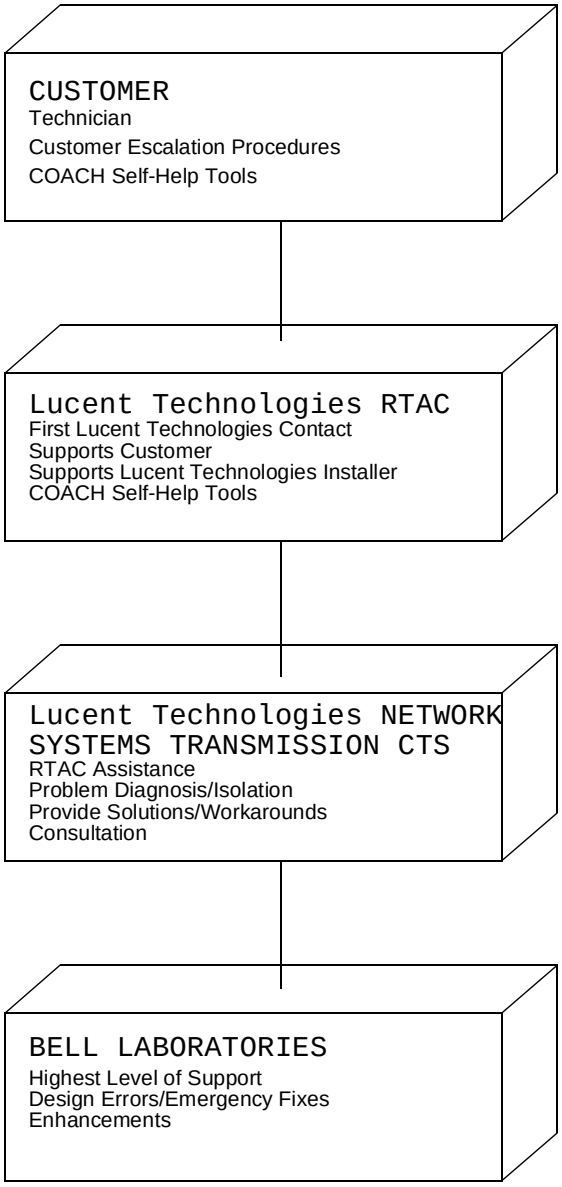


Figure 1-3. Product Support

COACH tools available to users are given in Table 1-3.

Table 1-3. COACH Tools

Diagnostic dictionary:	The diagnostic dictionary contains histories of previously encountered problems and descriptions of solutions or workarounds. Your support staff can use this tool when published documentation or standard diagnostic procedures fail to address a problem. Your support staff is allowed to enter problems and solutions into the customer input area of the diagnostic dictionary. CTS personnel evaluate data daily and, when appropriate, data is moved to a general area.
News and bulletins:	Immediately after a user logs into COACH tools, a news and bulletins tool displays bulletins containing urgent information relating to all the user's products. All users are automatically notified about urgent matters such as problems with scheduled releases, recalls of hardware or software, or scheduled maintenance for computer support. Less urgent messages are distributed through news items that can be sent to individuals or categories of users. Notification of news appears on the screen immediately following current bulletins.
Compatibility data:	Occasionally, hardware/software configuration problems arise when new software generics are issued. The compatibility data tools permit users to view the correct hardware configuration associated with a specific software generic. The user simply enters the appropriate software generic number and COACH responds with page-formatted lists of circuit packs compatible with the selected software generic. This tool also contains the latest issue numbers of customer documentation.
COACH user's guide:	COACH supplies an on-line version of its user's guide. The COACH user's guide includes instructions on using customer support tools and documents any changes to previous versions of the guide.

Platform Descriptions

2

Contents

Platform Descriptions

2

Overview

This section introduces the OT product line. It provides views of the OT Cabinet physical design and the miscellaneously mounted configuration. Applications of the OT are shown along with a description of the miscellaneous discrete alarm operation.

Introduction

The Optical Translator (OT) is an addition to the Optical Line System (OLS) Product Line that will allow for improved economics for applications such as Wavelength Add/ Drop (WAD), multi-vendor compatibility, and extended reach between offices.

The Optical Translator (OT) cabinet supports up to a maximum of thirty two (32) Optical Translator Units (OTUs). Each OTU circuit pack operates independently allowing for maximum system flexibility. The OTU has a broadband input capability allowing it to receive OC-48 STM-16 signals with wavelengths in the 1310 nm and 1550 nm range. Each OTU outputs an OC-48 STM-16 signal at a code specific wavelength which is OLS compatible.

An OTU may be used to translate an optical input to another wavelength or as an optical regenerator of the same wavelength. Being used in this capacity, OTUs are capable of performing Wavelength Add/Drop (WAD) or providing signal regeneration capability previously requiring an LCT in Release 1 OLS/LCT. When replacing an LCT, the OT makes available an additional Sonet node which is critical in SONET rings limited to 16 nodes.

Release 1.0 of OT is available in the following equipment configurations:

- OT Cabinet with System Controller Shelf and Complementary Shelves 1 & 2, mounted in cabinet with interconnecting wiring installed. (List 1)

- Miscellaneous Mounted System Controller Shelf and Complementary Shelves 1 & 2 with interconnecting cables provided. (List 10)
- Miscellaneous Mounted System Controller Shelf (List 11)
- Miscellaneous Mounted Complementary Shelf 1 (List 12) with interconnecting cables provided to System Controller Shelf .
- Miscellaneous Mounted Complementary Shelf 2 (List 13) with interconnecting cables provided to System Controller Shelf and Complementary Shelf 1.

OT Cabinet

The OT cabinet is 6 feet high, 34 inches wide, and 24 inches deep. The cabinet houses three shelves, one being the System Controller shelf while the other two being Complementary Shelf One and Two. Each shelf comes equipped with its own EMC cover.The shelves combine to provide slots for thirty two (32) Optical Translator units (OTUs). Each OTU has an input and output optical connection. The fibers that mate with these connections originate or terminate external to the OT cabinet. A fully loaded OT cabinet will have a total of sixty-four fibers entering/ exiting the cabinet.

Two heat baffles separate the shelves within the cabinet. The CIT DCE connector (for use with future releases) and the ESD jack are accessed through a small door located in the right front door. With the doors open, the CIT DCE connector and the ESD jack have direct accessibility. Figure 2-1 shows the cabinet with its front doors closed while Figure 2-2 shows the cabinet with its doors removed. Figure 2-3 shows the cabinet with front doors and EMC front covers removed allowing the thirty two (32) OTU’s and their shelves to be viewed.

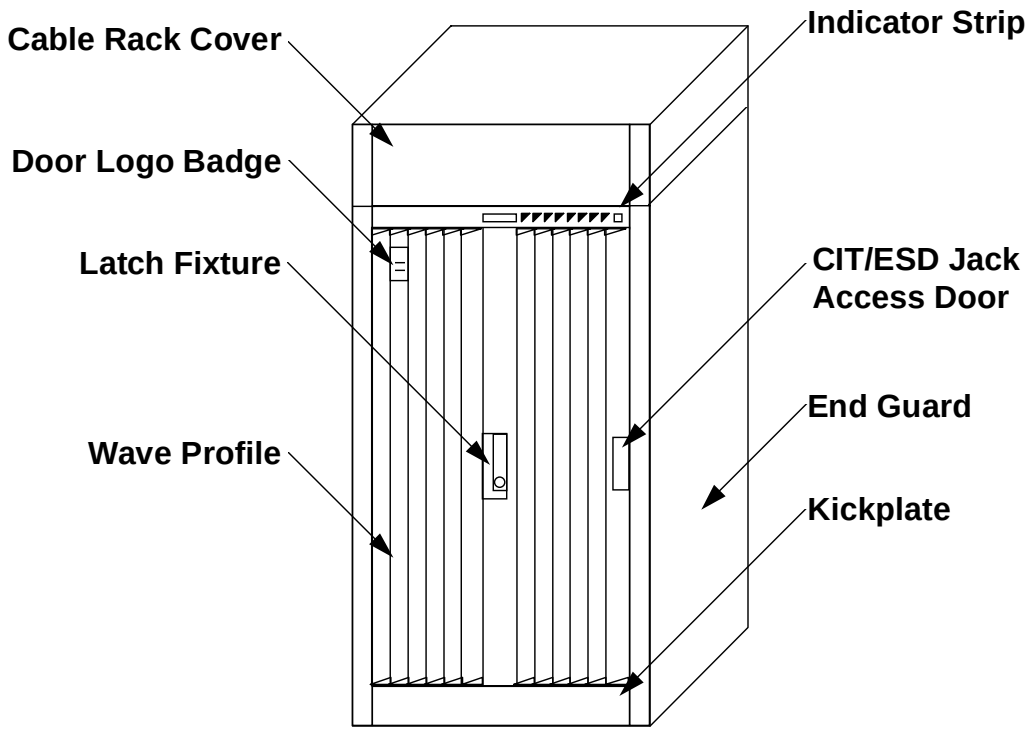


Figure 2-1. OT Cabinet (Doors Closed)

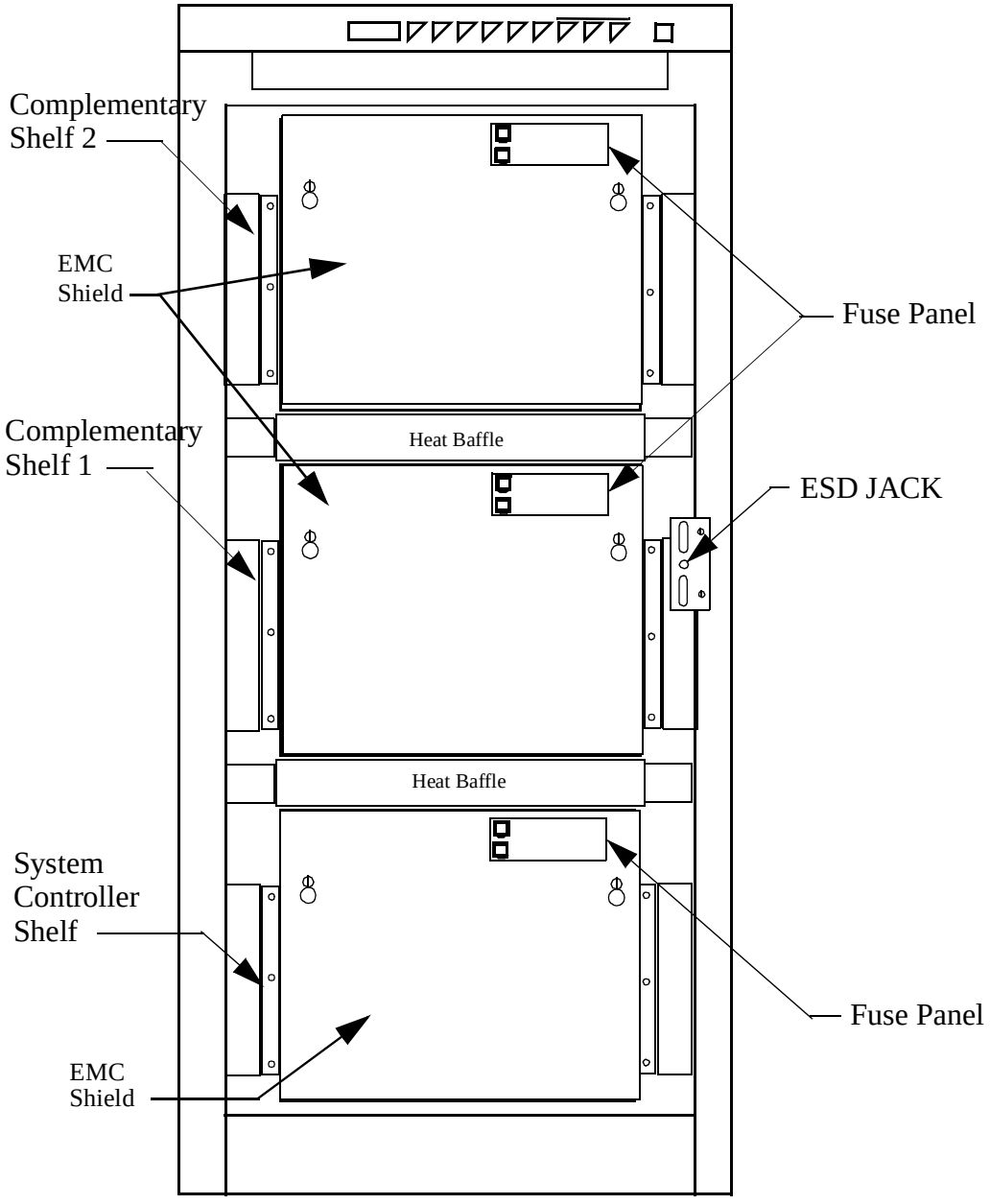


Figure 2-2. OT Cabinet (Doors Removed)

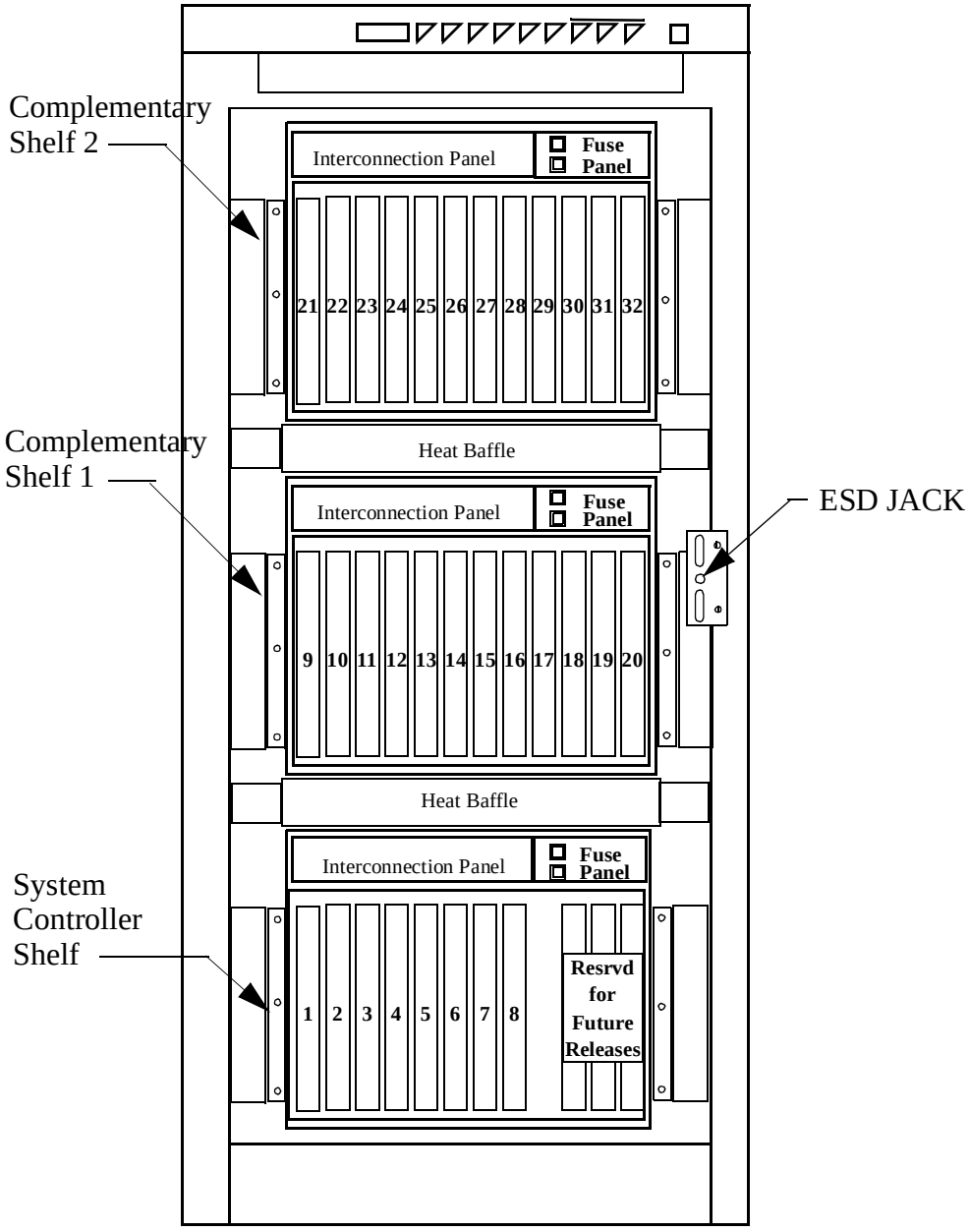


Figure 2-3. OT Cabinet (Doors and EMC Shields Removed)

Cabinet Indicator Strips

The OT cabinet has an indicator strip located at the top of the cabinet for displaying alarm and status information. The three green PWR-ON LEDs will be the only functional LEDs on the indicator strip for R1-OT. The remaining LED's on the indicator strip as well as the ACO push-button are non-functional with R1-OT. They have been wired and installed for future OT releases. Connectorized cabling connects the indicator strip to the three shelves below. The indicator strip for the OT cabinet is shown in Figure 2-4.

Figure 2-4. Indicator Strip For OT Cabinet

LED and Push-button Descriptions

The definitions that have been planned for the LEDs located on the user panel for future releases are listed in Table 2-1.

Table 2-1. Indicator Strip LED Indications

LED	Status	Indications
CR (red)	Critical	Critical active alarm level
MJ (red)	Major	Non-service-affecting unprotected failure that may mask the reporting of another service-affecting failure.
MN (Yellow)	Minor	Non-service-affecting failure, protected failure
ABN (Yellow)	Abnormal	Abnormal condition initiated through a CIT command. For example, loopback, forced switch
FE ACTY (Yellow)	Far End Activity	An alarm or status condition exists at a far-end OLS
NE ACTY (Yellow)	Near End Activity	An alarm or status condition exists at the local terminal
PWR-ON (Green) Lower Shelf	Power On	System Controller Shelf is receiving a -48 volt source
PWR-ON (Green) Middle Shelf	Power On	Complementary Shelf 1 is receiving a -48 volt source
PWR-ON (Green) Upper Shelf	Power On	Complementary Shelf 2 is receiving a -48 volt source
ACO (Green) (SW & LED)	Alarm Cutoff	Audible office alarms are silenced and parallel telemetry indications are turned off

OT Shelf Descriptions

The OT cabinet is comprised of the following three (3) shelves.

- System Controller Shelf
- Complementary Shelf 1
- Complementary Shelf 2

System Controller Shelf Description

Each System Controller Shelf is powered by two independent -48 Volt power sources (A&B), each independently fused at 10 Amps, and each having a power filter with a low voltage shutoff. The low voltage shutoff occurs at a nominal

voltage of 38 volts with a turn on of 42 volts nominal. A miscellaneous discrete alarm is provided with each filter to indicate when a fuse failure or a low voltage shutoff occurs.

The shelf provides slots to hold eight (8) OTU circuit packs. Each slot is defined by a numbered designation label. Three additional slots have been provided for control circuit packs for use in future releases. These slots will remain empty for R1-OT. The front of the shelf, except for the fuse panel, is then enclosed by an EMC cover.

The System Controller Shelf is the lowest shelf in the OT cabinet and is shown in Figure 2-5 without its EMC cover.

.

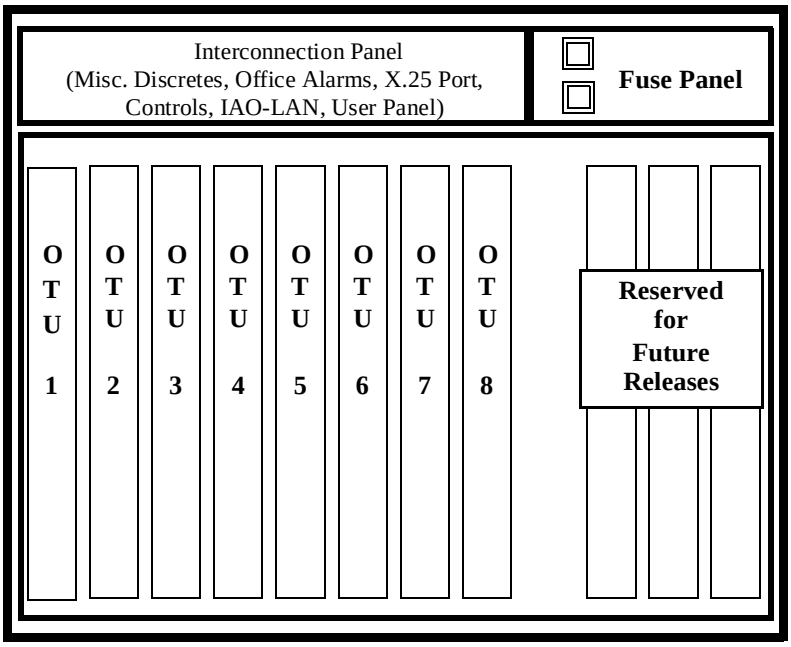


Figure 2-5. System Controller Shelf

Complementary Shelf 1 and 2

Each Complementary Shelf is powered by two independent -48 Volt power sources (A&B), each independently fused at 10 Amps, and each having a power filter with a low voltage shutoff. The low voltage shutoff occurs at a nominal voltage of 38 volts with a turn on of 42 volts nominal. A miscellaneous discrete

alarm is provided with each filter to indicate when a fuse failure or a low voltage shutoff occurs.

Each shelf supplies slots to hold up to twelve(12) OTU circuit packs. On Complementary Shelf 1 the slots are labeled OTU 9 through OTU 20 while Complementary Shelf 2 has slots 21 through 32. Both shelves come equipped with an EMC cover which encloses the entire front of the shelf except for the fuse panel. Complementary Shelf 1 is the middle shelf within the OT cabinet while Complementary Shelf 2 is the upper shelf.

Complementary Shelf 1 and 2 are shown without their EMC covers in Figure 2-6 and Figure 2-7 respectively.

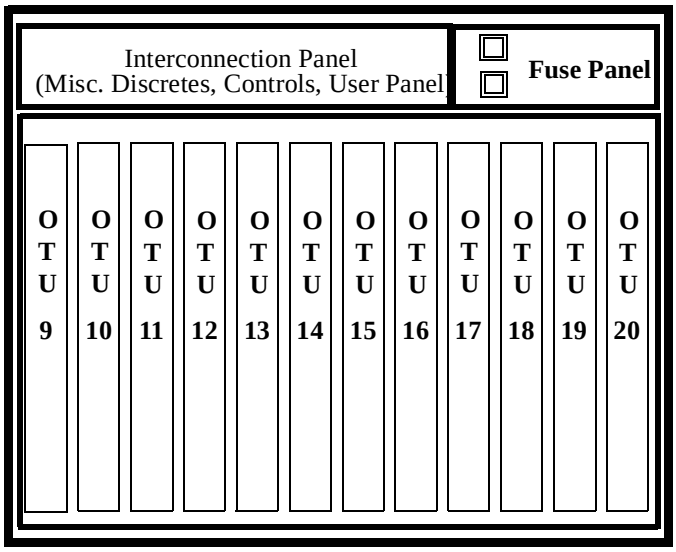


Figure 2-6. Complementary Shelf 1

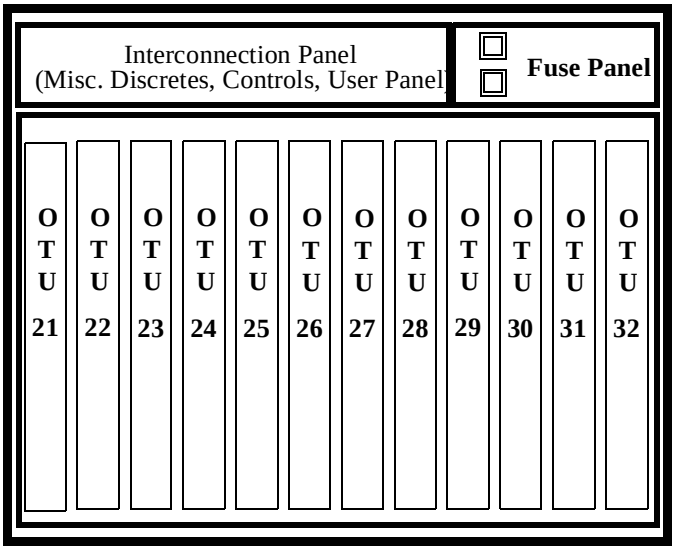


Figure 2-7. Complementary Shelf 2

Interconnection Panel

The top of each OT shelf contains an interconnection panel to provide interconnections between the three shelves and to provide external interfaces for the OT functions. Except for power, all the cabling entering the interconnection panel is connectorized with D-subminiature connectors. Power cables use a push-on type connector and are factory installed in the OT cabinet (List 1). All access to the connectors is from the front.

Shelf Interfaces

The shelf interfaces for the two Complementary Shelves 1 and 2 are identical and active for R1-OT. The System Shelf has a different interconnection panel with some interfaces active and others available for future releases.

Complementary Shelf Interfaces:

The interconnection panel for Complementary Shelves 1 and 2 is shown in Figure 2-8.

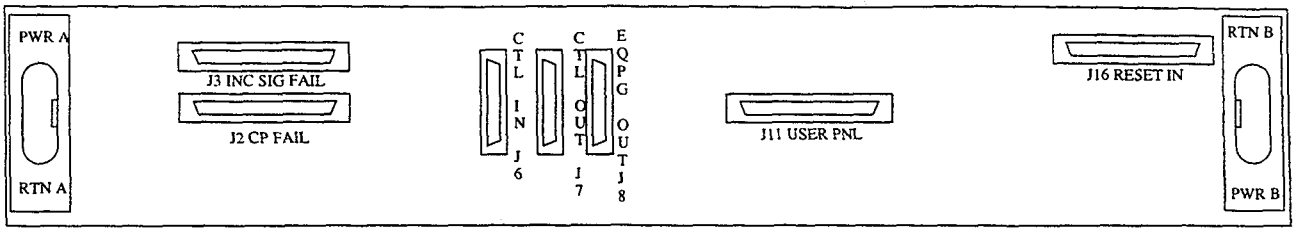


Figure 2-8. Complementary Shelf Interconnection Panel

The following external interface connectors are active and used in R1-OT.

- INC SIG FAIL J3: This connector provides an interface to the Incoming Loss of Signal Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- CP FAIL J2: This connector provides an interface to the Circuit Pack Failure Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- PWR: These connectors provide an interface to the -48V DC power filters from source A and source B. They are installed at the factory for List 1 OT with cabinet.

Connectors J6, J7, J8, J11, and J16 are used for intercabinet or intershelf connections. They are installed at the factory for List 1 OT with cabinet.

System Shelf Interfaces:

The interconnection panel for the System Shelf is shown in Figure 2-9.

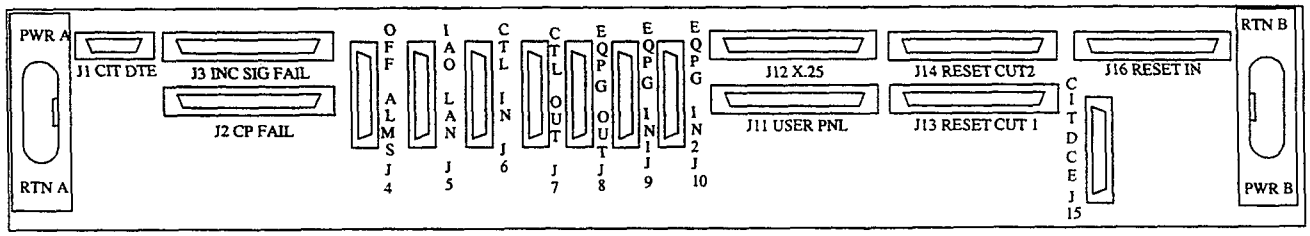


Figure 2-9. System Shelf Interconnection Panel

The following external interface connectors are active and used in R1-OT.

- INC SIG FAIL J3: This connector provides an interface to the Incoming Loss of Signal Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- CP FAIL J2: This connector provides an interface to the Circuit Pack Failure Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- PWR: These connectors provide an interface to the -48V DC power filters from source A and source B. They are installed at the factory.

The following connectors are provided for future releases.

- X.25 J12: This connector provides an interface to a message-based operations system that uses X.25 protocol and the Transaction Language 1 (TL1) message language.
- OFF ALMS J4: This connector provides an interface to the local office audible and visible alarms.
- CIT DCE J15: This connector provides an interface to the CIT (DCE) port behind the right front door that allows local access.
- CIT DTE J1: This connector provides an interface to a modem that allows dial-up Craft Interface Terminal access.
- IAO LAN J5: This connector provides an interface for the INTRAOFFICE LAN LINE to be used in future releases.

Connectors J7, J9, J10, J11, J13, and J14 are used for intershelf connections. They are installed at the factory for List 1 OT with cabinet. Connector J6 is shipped with a termination installed. Connectors J8 and J16 are not used in R1-OT.

OT Cabinet Fuse Panel

Each shelf in the OT cabinet has its own fuse panel. The fuse panels for each shelf have a common design and are identical. Each fuse panel contains the A and B bus fuses, and labeling identifying the fuse amperage and voltage.

Under normal conditions, power is supplied to the shelf from both the A and B supplies. Should there be a fuse failure, the fuse capacity is sufficient to handle the current supplied from one source. The cover on the fuse holder will illuminate during a fuse failure to indicate that the fuse is blown.

The fuse panel is shown in Figure 2-10.

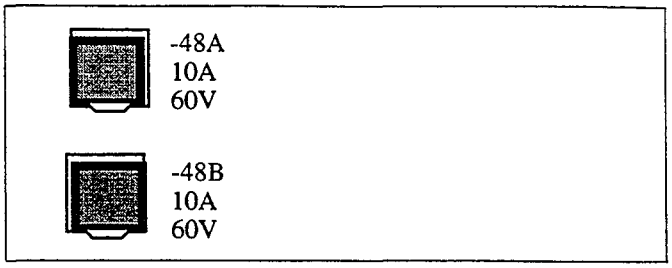


Figure 2-10. OT Cabinet Fuse Panel

OT Power Filter

Power Filters are provided for the A and B power sources on each shelf. They are wired in series with the respective fuses for each source. Each filter has a low voltage cutoff that will operate at a nominal 38 Volts and turn back on at 42 Volts nominal. A miscellaneous discrete contact is provided with each filter so a fuse failure or low voltage cutoff may be reported independently for each power source.

Miscellaneously Mounted OT

The miscellaneously mounted versions of OT(List 10 through List 13) are provided for applications requiring mounting other than an OT cabinet. The bay frame is supplied by the customer or ordered separately. The miscellaneous mount versions would be used in applications where space is limited. The shelves must be mounted on site and the interconnecting wiring must be installed on site.

The miscellaneous mounted OT shelves are identical to the shelves in the OT cabinet except for the following differences:

- The power ON indicators that were on the cabinet indicator strip are incorporated within the fuse panels. The alarm indicators will be those of the OLS controling the OT in future releases.
- Each shelf is equipped with a heat baffle mounted below each shelf.

Figure 2-11 shows a miscellaneously mounted OT (List 10) mounted to an 800 Type bayframe.

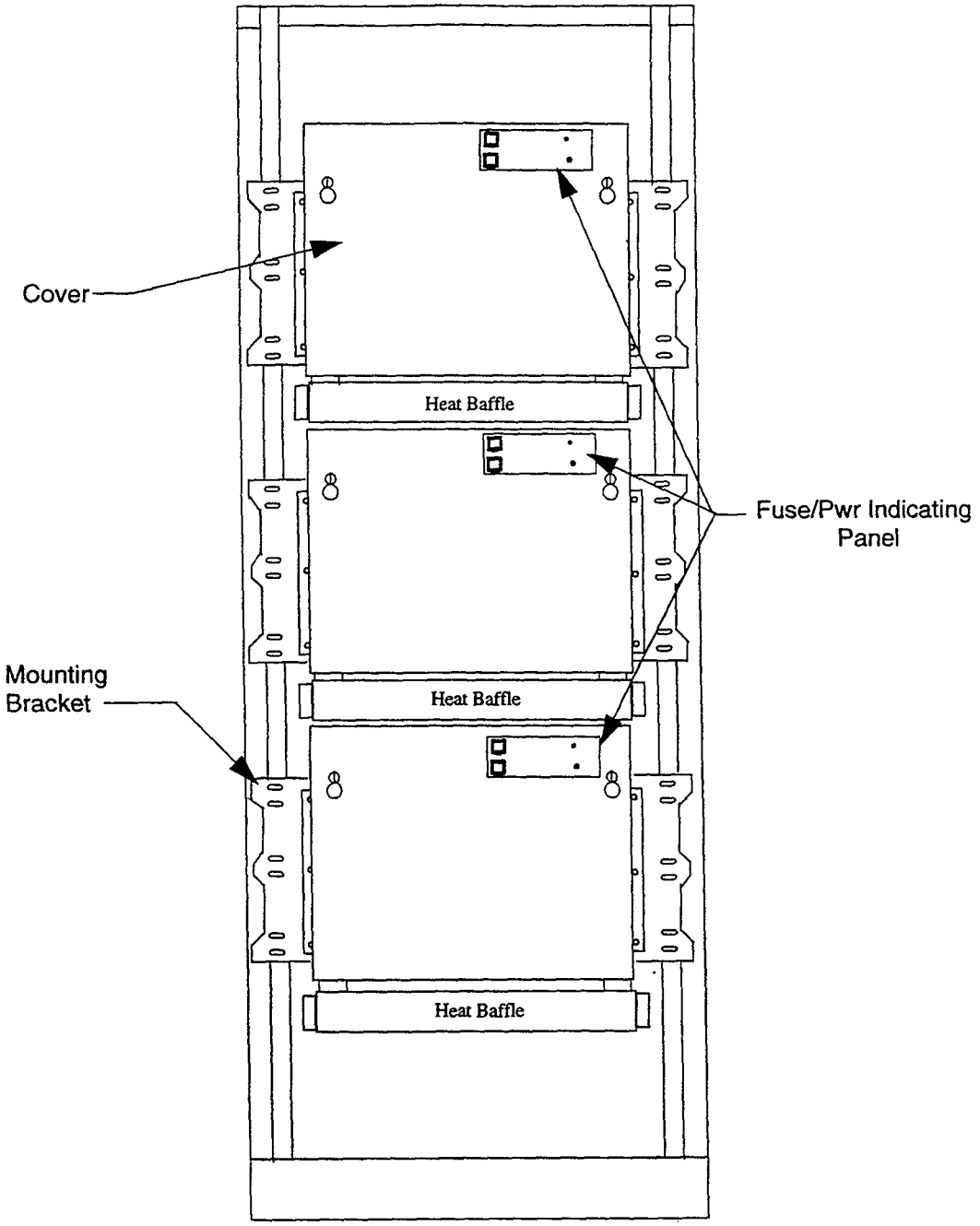


Figure 2-11. Miscellaneously Mounted OT (List 10)

Figure 2-12 shows the System Shelf fuse panel provided with initial production shelves of miscellaneously mounted OT. The alarm indicators that were located at the top of the OT cabinet were relocated to this panel along with the CIT (DCE) port connector. Once it was determined that the OT would be under control of the OLS in Release 3 OLS, the alarm indicators and CIT (DCE) connector were removed. The fuse panel become identical to the complimentary shelf fuse panels shown in Figure 2-13. These panels have a power ON LED and ESD connection located on each panel.

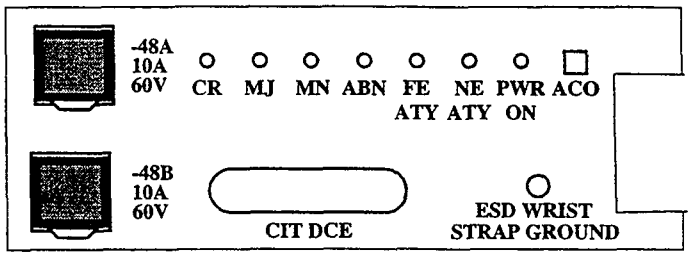


Figure 2-12. Miscellaneously Mounted System Shelf (initial production) User/ Pwr Indicating Panel

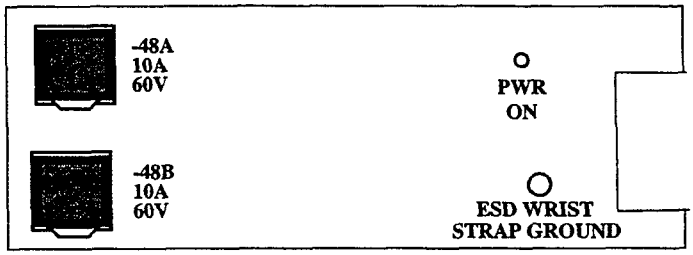


Figure 2-13. Miscellaneously Mounted Shelf Fuse/Pwr Indicating Panel

Available Versions of Miscellaneous Mount

- List 10 - Incudes the System Controller Shelf with Complementary Shelves 1 and 2. Power cables and shelf interconnecting cables are provided.
- List 11 - Includes the System Contoller Shelf and single shelf power cables.
- List 12 - Includes Complementary Shelf 1, single shelf power cables, and interconnecting cables to the System Controller Shelf. It is provided to handle system growth beyond a single System Controller shelf. It is assumed that the system already has a System Controller Shelf installed.

n List 13 - Includes Complementary Shelf 2, a set of single shelf power cables, and interconnecting cables to the System Controller Shelf and Complementary Shelf 1. It is provided to handle system growth beyond a System Controller shelf and Complementary Shelf 1. It is assumed that the system already has a System Controller Shelf and Complementary Shelf 1installed.

OT Circuit Pack/Unit Descriptions

Optical Translator Unit (OTU) Circuit Pack

The 41A Type and 41C Type Optical Translator Unit (OTU) receives an OC-48 optical signal at its input, downconverts the signal to a 2.5 Gb/s electrical signal, strips away stray tones caused by intermodulation products, applies a new tone at a code specific frequency, upconverts to an optical signal, and outputs an OLS compatible OC-48 optical signal at a wavelength specified by its particular code. The input to all OTUs can receive optical signals in the 1310 nm and 1550 nm range. The OLS compatible output wavelength of the unit is specified by its code as shown in Table 2-2 along with the output power range and tone frequency. With such a capability, OTUs may be used to regenerate the optical signal or provide Wavelength Add Drop (WAD) capability. The 41B OTU translates a 1550 nm signal to a 1310 nm signal for WAD capability with 1310 nm equipment.

The faceplate of the OTU is shown in figure 2-14. The OTU is shipped equipped with a Lightwave Build-out (LBO) for ST-Type connectors on the optical input and output. A fault LED is provided with each unit. When there is a loss of incoming signal or it has degraded severely, the LED is flashing. When the LED is on continuously, it indicates circuit pack failure. Each OTU comes equipped with two miscellaneous discrete relay contacts mounted on the board for remote sensing of incoming signal problems and circuit pack failure. Refer to Table 2-3 for more information on the operation of the fault LED and the miscellaneous discretes.

Table 2-2. OTU Code versus Wavelength, Output Power, and Tone Frequency

OTU CODE	Center Wavelength (nm)	Output Power Range (dBm)	Approximate Tone Frequency (KHz)
41A1C, 41C1C	1549.43	-5.0 to -3.0	5
41A2C, 41C2C	1551.03	-6.3 to -4.3	7
41A3C, 41C3C	1552.64	-7.5 to -5.5	9
41A4C, 41C4C	1554.25	-8.2 to -6.2	11
41A5C, 41C5C	1555.86	-8.7 to -6.7	15
41A6C, 41C6C	1557.48	-9.2 to -7.2	17
41A7C, 41C7C	1559.10	-9.0 to -7.0	19
41A8C, 41C8C	1560.72	-7.5 to -5.5	21
41BB	1310.00	0.0 to 2.0	NA

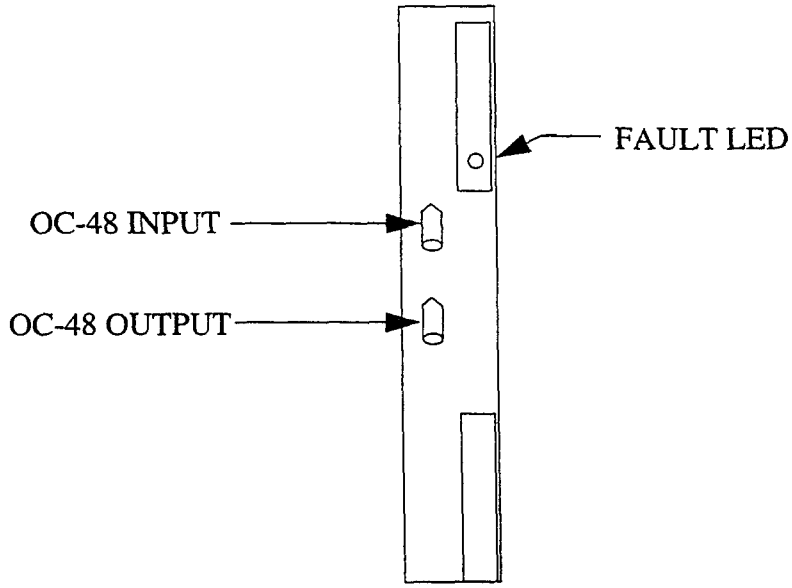


Figure 2-14. OTU Faceplate

OT System Block Diagram

Figure 2-15 shows a block diagram of the Optical Translator fiber connected to two OLS End Terminals. In the majority of all applications, the OT will be schematically located between two OLS End Terminals. The diagram illustrates a four fiber system (two service, two protection) with four OTU circuit packs being required for each wavelength. For an OLS System operating with all eight (8) wavelengths 32 OTUs would be required.

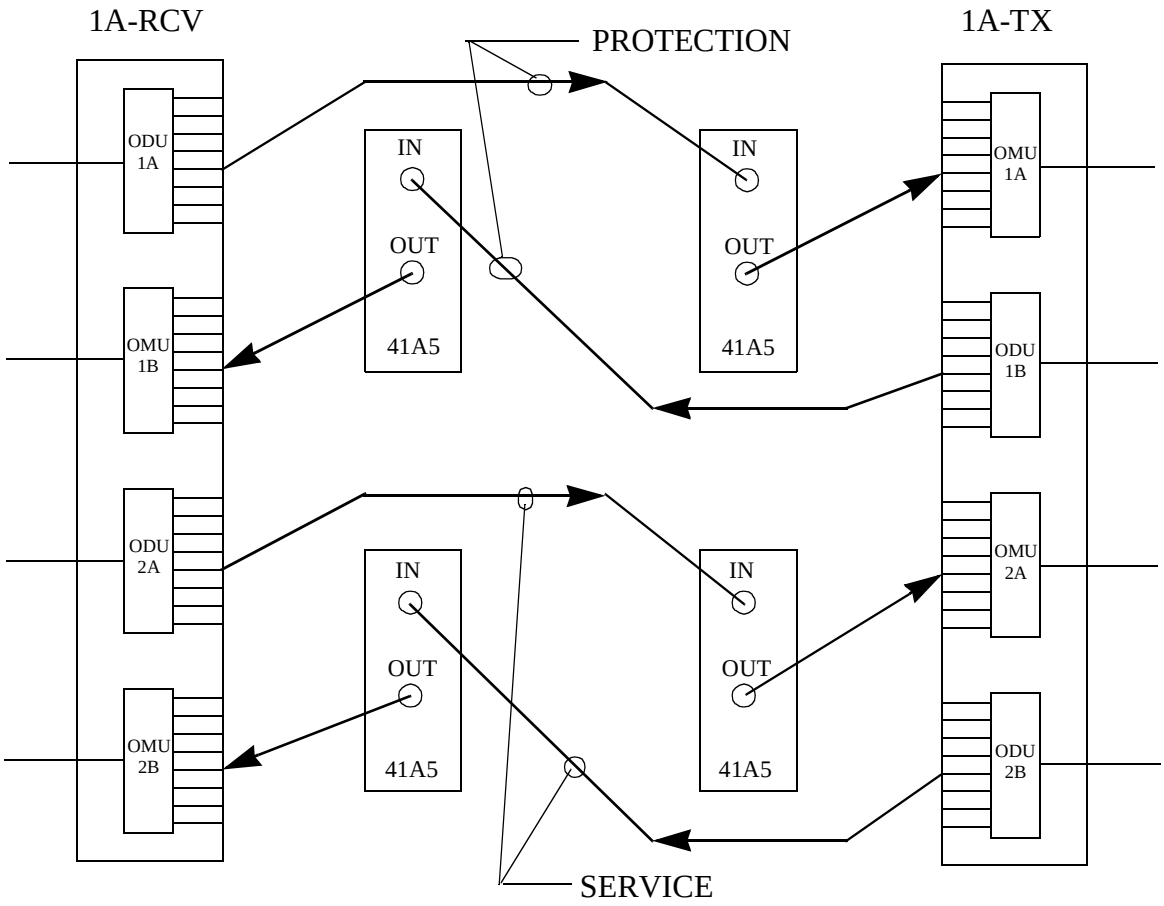


Figure 2-15. OT/OLS System Block Diagram

OT Applications

The OT may be used in a variety of applications such as a low cost replacement for an LCT Smart Repeater. Figure 2-16 shows such an application where three (3) LCT Repeaters have been replaced with OTUs. In this four fiber application, four OTU circuit boards are required at each wavelength (λ_1, λ_2, and λ_3) for a total of 12 OTUs. Besides obtaining a cost reduction, a Sonet node is made available in each of the three rings. A space reduction is achieved in this example going from six LCT Smart Repeaters bays (two bays per wavelength) to one OT cabinet.

.

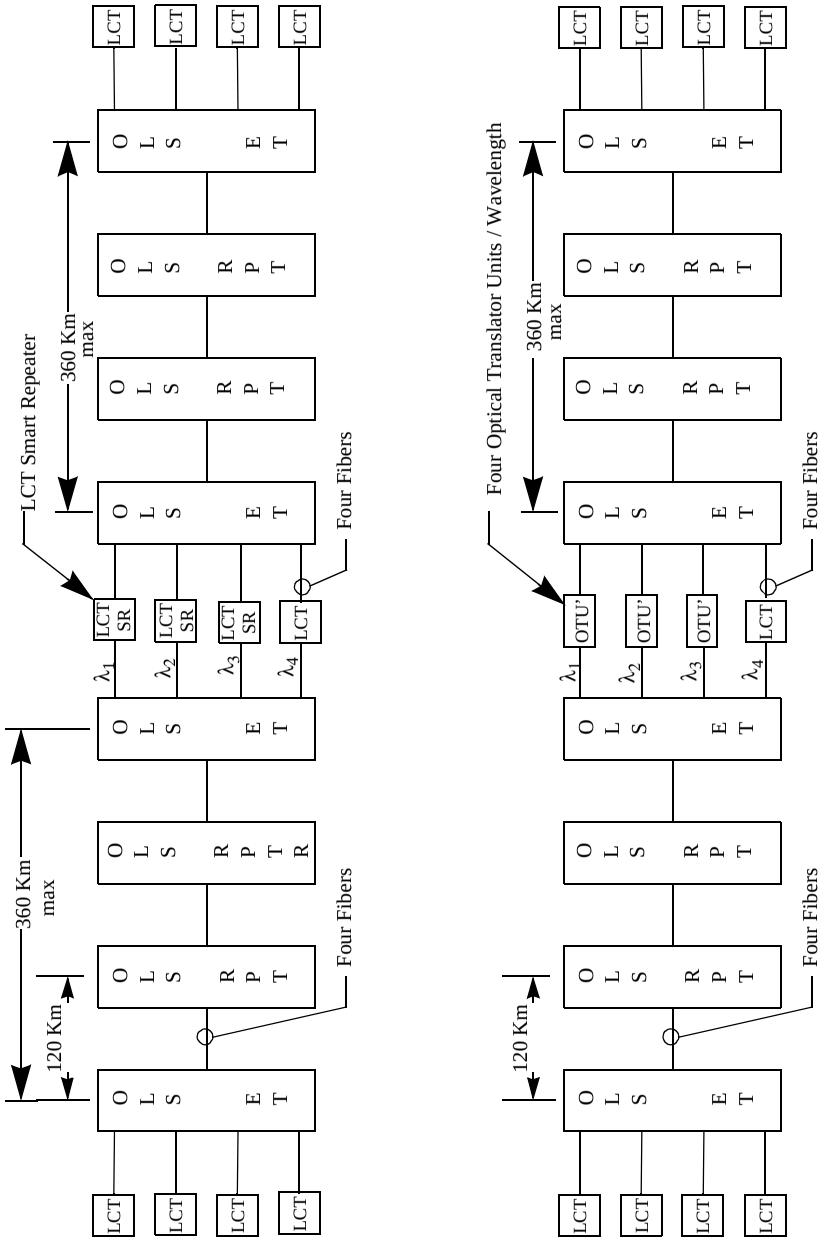
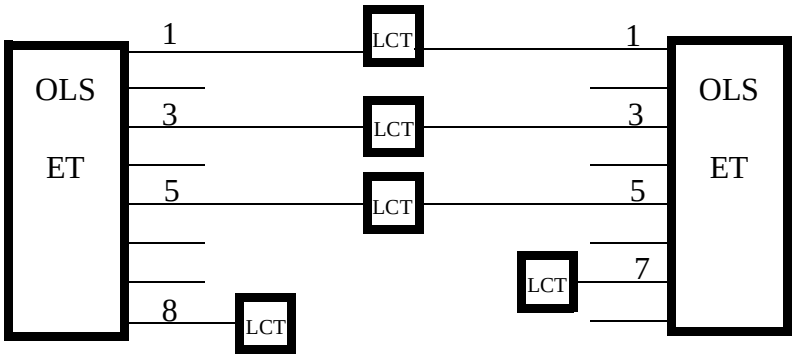
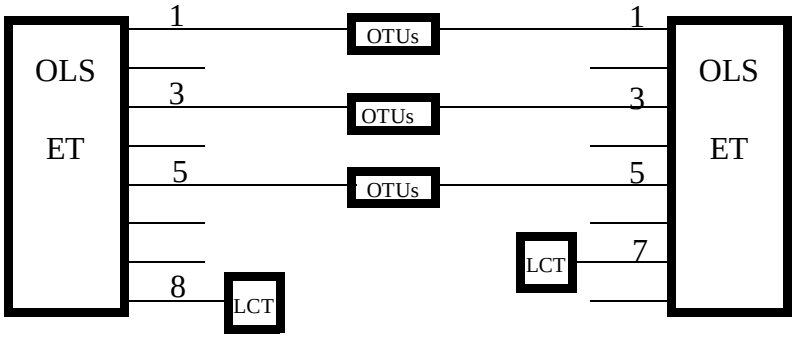


Figure 2-16. OT Replacement of LCT Smart Repeaters

Another application for OT is a low cost replacement for an LCT in Wavelength Add/ Drop (WAD) applications where the LCT is being used to regenerate signals for through traffic. Figure 2-17 shows such an application. The LCTs on wavelengths 1, 3, and 5 are being used to regenerate the signal so that stray tones may be removed. In a four fiber system, four OTUs at each wavelength mounted in one OT cabinet will be required to replace the three LCTs in this example thus saving cost, a Sonet node at each wavelength, and space.



WAD with NGLN R1.0



WAD with OT

Figure 2-17. Wavelength Add/ Drop Applications

Miscellaneous Discrete Alarms

OT Miscellaneous Discrete Alarms

The miscellaneous discrete alarms are the only alarms that can be reported remotely by the OT. There are two miscellaneous discrete alarms per OTU which combine for 64 (2/OTU x 32 OTUs) miscellaneous discrete alarms for a fully populated OT. In addition to the OTU alarms, there are two additional alarms per shelf to report if the A or B source has a loss of power. This power loss may be the result of a fuse failure or a low voltage cutoff. The maximum number of miscellaneous discrete alarms available for a complete OT system would be 70.

OTU Alarm Operation

The alarms are reported by the OTU circuit pack through two relay contacts. The alarms are wired out from the OTU to the backplane and out to the miscellaneous discrete shelf connectors J2 and J3 as a wired pair for each contact(refer to Figure 2-18). The two relay contacts on the OTU board are identified as to as MD1 and MD2. A contact closure signifies an alarm condition.

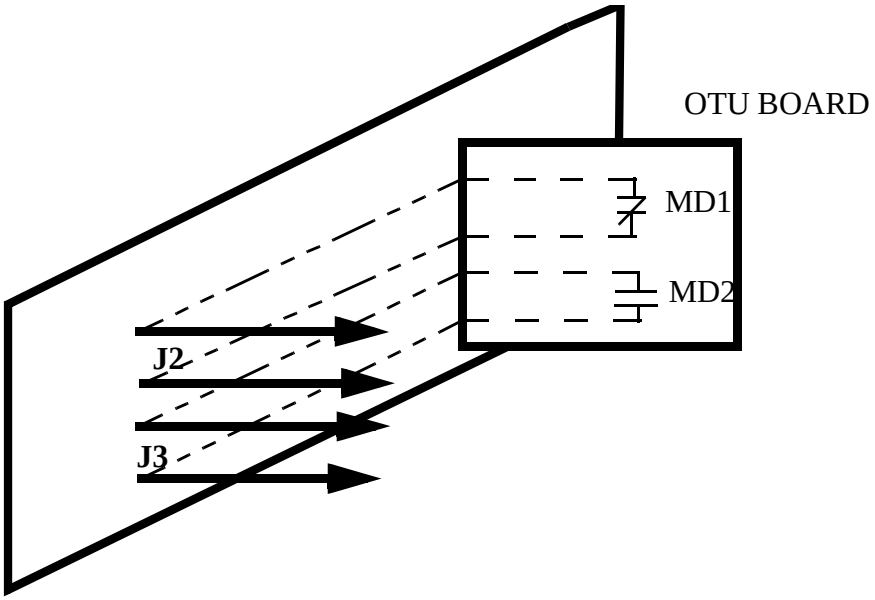


Figure 2-18. Miscellaneous Discrete-Board to Jack Connections

The MD1 relay contact closes whenever there is a circuit pack failure. During initial insertion of the board, the MD-1 being a normally closed contact will cause alarm condition. During initialization of the OTU circuit pack a self check is performed. After completing the self check, which takes 15 to 20 seconds, the OTU will open the MD1 contact if the initialization process has been satisfied. Should the pack fail the self check, the contact will remain closed until the condition is corrected.

Contact MD2 is a normally open contact which closes when there is a loss of incoming signal or it is degraded. The MD2 contact stays open during initialization of the OTU. If after the 15 to 20 second initialization process, the OTU determines that a clean OC-48 signal is present at its input, the MD2 will remain open. If an OC-48 signal is not present or is degraded, the contact will close. Table 2-3 describes the conditions for the operation of MD1 and MD2 and their relation to the fault LED operation.

It should be noted that the removal of an OTU will not cause a miscellaneous discrete alarm. The insertion of an OTU of a different wavelength will not cause a miscellaneous discrete alarm at the OTU but will cause alarms elsewhere within the network.

Table 2-3. OTU Miscellaneous Discrete and Fault LED Conditions

Condition	Fault LED	MD1	MD2	Laser
No Failures	Off	Open	Open	On
Incoming Signal OC-48 LOS/ LOF	Flashing	Open	Closed	Off
Incoming Signal B_1 parity error	On	Open	Closed	On
Out of Range (OOR) on Laser Bias Current (LBC) or Optical Power Transmit (OPT)	On	Closed	Open	On
Internal defect on OTU	On	Closed	Open	Off
Power converter / fuse failure on OTU	On	Closed	Open	Off
OTU reset / initialization	On	Closed	Open	On
OTU pack insertion	On	Closed	Open	Off
A or B Supply Failure	Off	Closed for all OTUs	Open	On

Power Alarm Operation

Each power filter comes equiped with a miscellaneous discrete alarm to indicate when there is a loss of power due to a fuse failure or a voltage cutoff. The alarm does not distinguish between the type of failure but will indicate whether its the A or B power source and which shelf is involved.

The alarm utilizes an opto-isolator to interface with the EMDU unit. An alarm condition is a low impedance (less than 10 ohms) while a normal condition is indicated by a high impedance.

Connecting to the OLS

The OTU miscellaneous alarms are accessed at the J2 and J3 connectors on each shelf of the OT. Connector J2 carries all the Circuit Pack Failure Alarms (MD1) and J3 carries the Incoming Signal Failures (MD2). With three shelves, this results in six cables required to output all the OTU alarms from the OT. Each power filter alarm is connectorized and wired separately from each filter. This results in six additional cables being brought out from the OT. These cables are brought to an External Miscellaneous Discrete Unit (EMDU). The EMDU adds an additional 128 alarm inputs to the original 16 in the OLS to bring its total to 144 alarm inputs. The EMDU adds an additional 32 control outputs to the original four(4) within the OLS to bring its total to 36 outputs.

The EMDU is to be located between one of the OLS End Terminals and the OT. The EMDU is wired back to the OLS End Terminal with a single cable that uses a TBOS protocol to communicate between the two units. The EMDU may be wired to either the OLS 1A-TX or 1A-RCV End Terminal depending upon customer preference. These connections are shown in Figure 2-19. The interface between the OT and the OLS occurs at the EMDU. Wiring of the miscellaneous discretes to the EMDU is specified within this manual while the remaining wiring and physical installation of the EMDU is within the OLS Installation Manual. For additional information on the EMDU and its interface with the OLS or wiring of the EMDU refer to Appendix C and D within this manaul or refer to the Optical Line System (OLS) Installation Manual (365-575-310). A manual is available from DANTEL titled "46220 Alarm and Control Block Installation & Operation Manual". Harris also provides a manual titled "Harris User Guide for C1000 Centurion". Both units are rack mountable. The DANTEL unit may also be wall mounted.

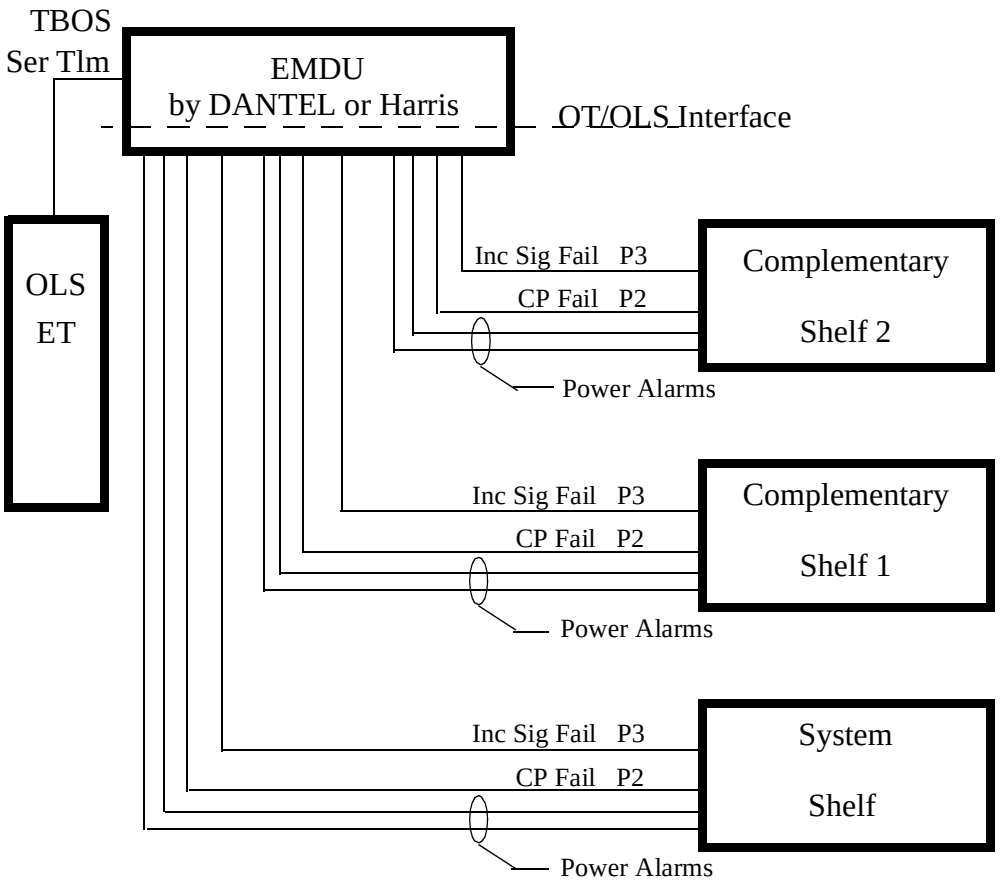


Figure 2-19. Miscellaneous Discrete Cable Connections

Equipment Installation

3

Contents

Equipment Installation

3

Overview

This section covers the general requirements and methods for installing the OT cabinet and and the installation of miscellaneously mounted OT. The OT cabinet uses the same cabinet components as the 5ESS-2000. The 5ESS-2000 Switch Handbook (SIG I WW 100) gives greater detail on physical installation aspects than this IM.

Equipment

The procedure for installing the OT equipment is summarized as follows:

- Check material and tools
- Determine earthquake zone
- Install cabinet
- Install cable rack
- Ground framework
- Install door frame assemblies
- Wire cabinet
- Install door assemblies
- Install end guard assemblies

Check Material and Tools

Ship Loose Material

Material shipped includes:

- The cabinet framework equipped with 3 shelves
- Cabinet front indicator kit (upper door frame, strike, indicator strip and mounting screws)
- Cabinet door kit (air deflector plate with retainers, lower door frames with screws, front doors, and rear doors)
- Cabinet rear (blank) indicator kit (upper door frame, blank indicator strip and mounting screws)
- OT EMC Kit (vertical cable channels with washers and bolts, left and right side cover plates with mounting screws)
- Installation Kit (fiber ID labels, spare shelf grommet, Non-unitized junction kit, fuses, and fiber protection tubing)
- Lightguide buildout kit per the order
- Circuit packs per the order
- OT to OLS fiber jumpers with ID labels per the order
- Alarm circuit module

Tools

The tools required for installation of the OT are listed below in Table 3-1, with the exception of small hand tools normally used.

Table 3-1. Required Tools for Installation

Quantity	Comcode	Description
1	TK-33	Vacuum
1	TK-76B or TK-66B	Drill or Hammer Drill
1	54720	C-Tap Thomas & Betts or equivalent
1	TBM2 or TMB8	Crimping tool Thomas & Betts or equivalent (use 54720)

Table 3-1. Required Tools for Installation

Quantity	Comcode	Description
1	Die code brown or pink	Thomas & Betts (use with 54720)
1	R-3055	Safety goggles
1	406902049	Anchor Setting Tool for drop-in Anchors
1	406899831	Anchor Setting Tool for Heavy-Duty Anchors
1	-	3/4" Torque wrench, 25 ft.-lbs. (for 1/2" bolts)
1	-	19-mm Open End Wrench (or 3/4")

Determine Earthquake Zone

The United States is divided into 5 different earthquake zones. Check which zone your area is classified as before beginning bay installation. In general there are two different floor attachment techniques, one for Zone 0, 1 and 2, and one for Zone 3 and 4.

For stand-alone cabinets in zones 0, 1 and 2 use two 13mm (1/2") anchors on opposite corners of the cabinet baseplate. For stand-alone cabinets in zones 3 and 4 use four 12mm (1/2") heavy duty expansion anchors on opposite corners of the cabinet baseplate.

Cabinet Installation

Uncrating and Hauling Precautions

NOTE:
Please note the following precautions when uncrating equipment:

- Do NOT ship or store containers in any position other than its marked position.

- Do not stack equipment more than two cabinets high when it is being transported over the road or is being held in a warehouse.
- Move containers in the shipping position only. Verify that containers have not been damaged. It is important that all containers be handled with care and that no units are dropped.
- Uncrate all material in quarters separate from the equipment room so as to keep dust and lint away from other equipment.
- Uncrate the cabinet in its shipping position. All cabinets are shipped in a dust-protective, antistatic plastic bag and placed in a wooden container.
- Care should be exercised when uncrating so as not to damage the equipment. The tools required for uncrating position are standard pinch-bar and claw-type hammers. Use a pinch-bar and/or hammer only in areas that have been nailed. Remove the plastic bag and all foreign material.
- Use the cabinet's square tube framework when lifting and moving the cabinet into position.

Install EMC Cover Plates

EMC cover plates are required on both sides of the cabinet. The only exception allowed is for the installation of end guards which is described in the last section of this chapter. End guards may be called out for appearance purposes when one side of the cabinet is exposed at the end of a row or the cabinet is a stand alone with both sides exposed. Review installation instructions to determine which sides will have end guards installed. Do not install EMC side shields and vertical cable channels to these sides.

Mount the EMC side shields as follows:

- Mount the Vertical Cable Channels to both sides of the cabinet frame using the supplied M6 x 12 Hex Bolts with tooth lock washers. Starting from inside the frame, insert bolts with lock washers through predrilled holes at top and bottom of frame. Align bolts with threads on Vertical Cable Channel and secure channel to frame using four bolts per channel as shown in Figure 3-1.
- Align left panel to left side of cabinet with folded edges facing inward towards the cabinet. **Verify that the top center mounting screw hole and coupling bolt holes are in alignment** as shown in Figure 3-1. A hole mismatch indicates that the right panel is being aligned to the left side. Swap panel with other side panel in installation kit and verify hole alignment.
- Install left and right side panels using the eleven (11) Phillips head screws (M5 X .8 X 6MM) per side. Refer to Figure 3-1.

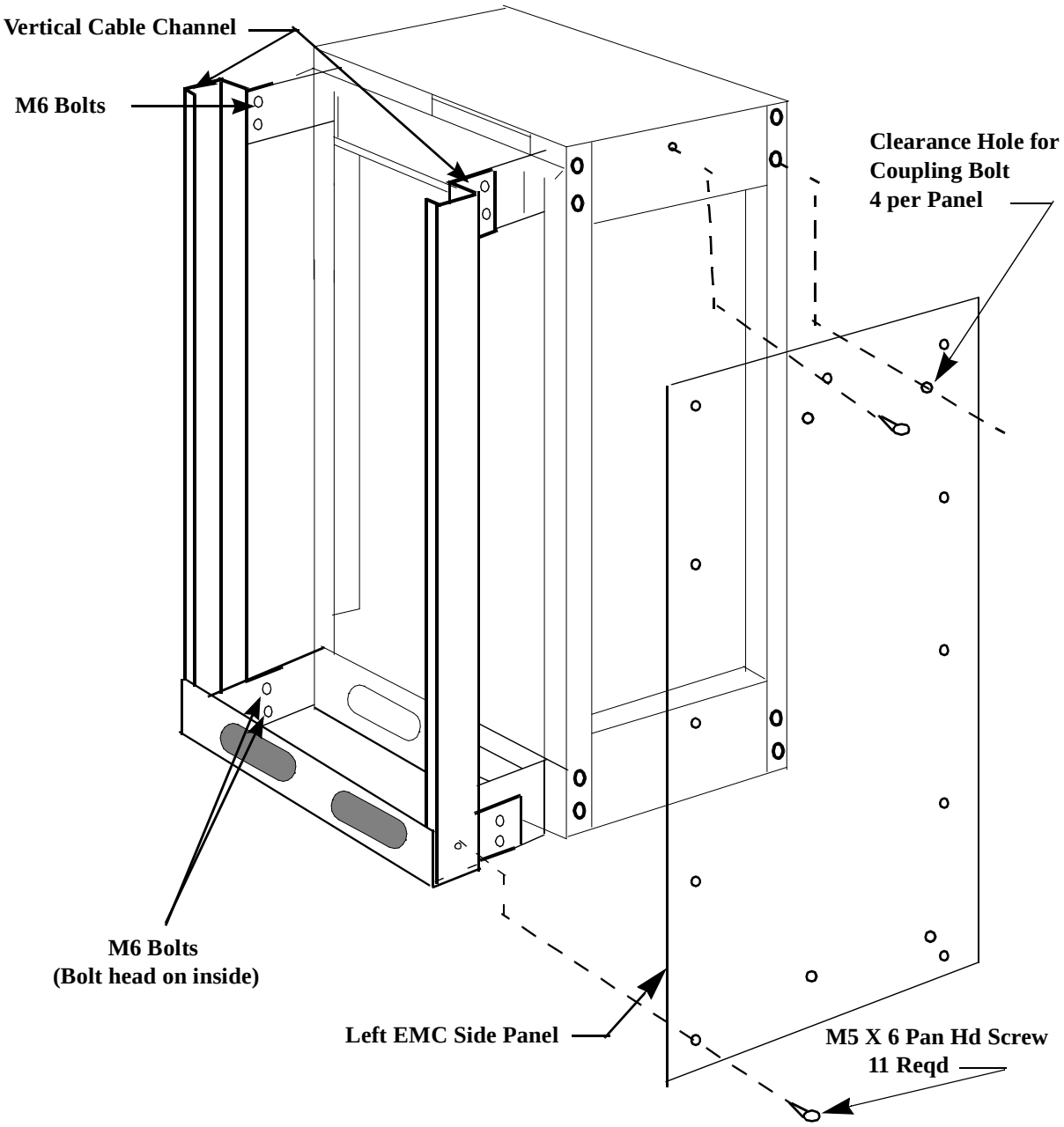


Figure 3-1. EMC Cover Plate Installation

Mark Floor Layout

Refer to Figure 3-2 for cabinet mounting information. Locations 1 are the preferred drilling locations and locations 2 are the secondary. Refer to the job floor plan for cabinet-lineup location, and mark the floor for drilling using a marking pencil or felt pen.

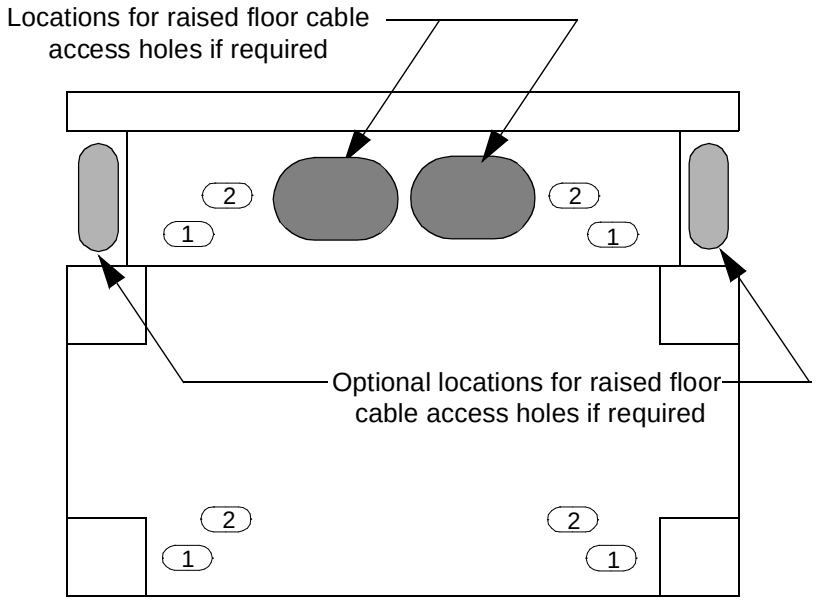


Figure 3-2. Cabinet Framework Footprint

Drill Mounting Holes

⚠ CAUTION:
When drilling holes in concrete (or operating any power tools), always wear safety goggles.

Noting the correct earthquake zone for your area, special attention should be paid to the Anchor Installation for Heavy Duty Anchor or Drop-In Anchor to ensure correct floor drilling.

NOTE:
Refer to ED-5D511-31 "Hardware for anchoring 5ESS switch and 5ESS cabinet and cable rack support stanchions" for details.

Erect and Align Cabinets and Framework

To mount and assemble the cabinet, follow the procedure below:

(1) Move the cabinet to its proper floor location. Exercise care when moving the cabinet and avoid sudden shock or strain to the equipment.

(2) Use two or more technicians to erect the cabinet into position.

(3) Lift the cabinet and place it into its proper location in the lineup. Visually inspect for obvious damage.

(4) Before the cabinet is secured to the floor, verify that it is level so that alignment with adjacent cabinet can occur. The installation kit comes equipped with a Non-unitized Junction Kit for coupling with adjacent cabinets. Refer to SIG I WW 100 5ESS-2000 Switch Handbook Section 4809, Coupling of Cabinets, for details.

(5) Assemble the cabinet to the floor using appropriate hardware. Be sure to note earthquake zone requirements. Refer to ED-5D511-31 "Hardware for anchoring 5ESS switch and 5ESS cabinet and cable rack support stanchions" for details.

Install Cable Rack Top

When a cable rack top assembly is required, assemble per the following:

- Verify the cabinet is not grounded.
- Connect the ED5D779-70, G1B and G2 cable rack to the cabinet using the 4 supplied bolts as shown in Figure 3-3.

NOTE:
Information on ordering and installation of cable racks is included on ED5D742-10 and ED5D742-70 for the 5ESS-2000 system.

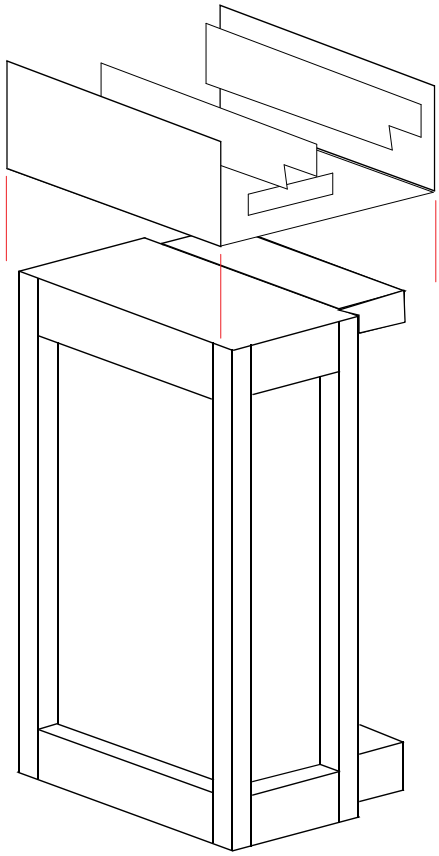


Figure 3-3. Cable Rack Top Installation

Ground Cabinet Framework

Connecting the cabinets to building ground serves two purposes:

(1) A direct earth ground connection for lightning protection, and

(2) A common ground potential for electrostatic discharge (ESD) protection.

When a frame is installed, it should be connected to the building ground as soon as possible after the cable rack is installed.

All OT frames are shipped with ground cable assemblies. It will be necessary to terminate the ground wire in the cable rack.

Install Door Frame Assemblies

Assemble the door frames as follows:

- Mount the lower door frame assemblies to the front and rear of the cabinet using 4 supplied screws. Part A on Figure 3-4 and Figure 3-5.
- Pull the alarm cables through the cable access window (shown in Figure 3-4) by clipping any necessary factory tie downs.
- Locate the **OT Indicator Kit (P/N 847814316)** and the Blank Indicator Kit (P/N 847306628).

NOTE:
The OT Indicator Kit is similar to the OLS Indicator Kit. Verify correct kit number before installing.

- Mount the upper door frame assembly (Part of OT Indicator Kit 847814316) to the cabinet front and the rear door frame assembly (Part of Blank Indicator Kit 847306628) to the cabinet rear using 3 supplied screws. Part B on Figure 3-4 and Figure 3-5.

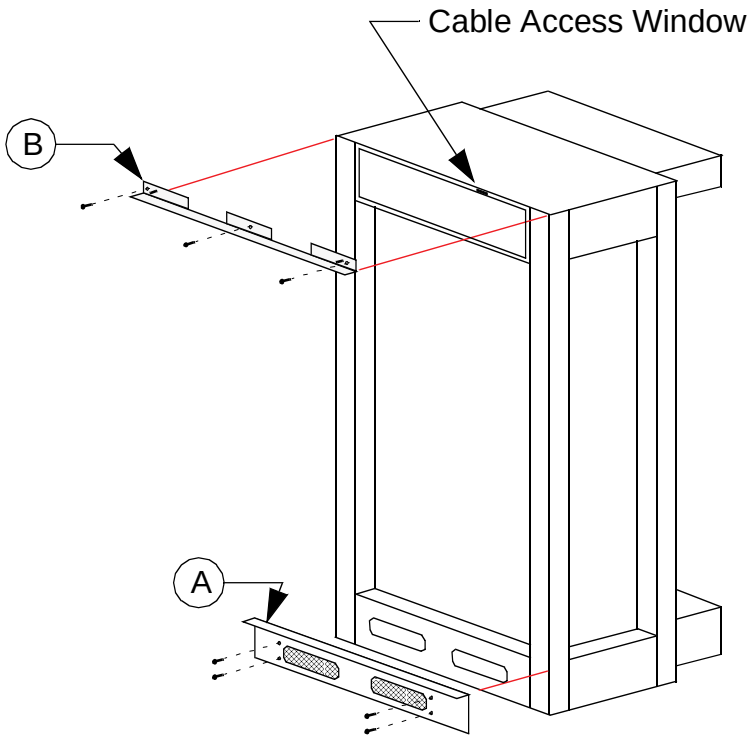


Figure 3-4. Front Door Frame Assembly

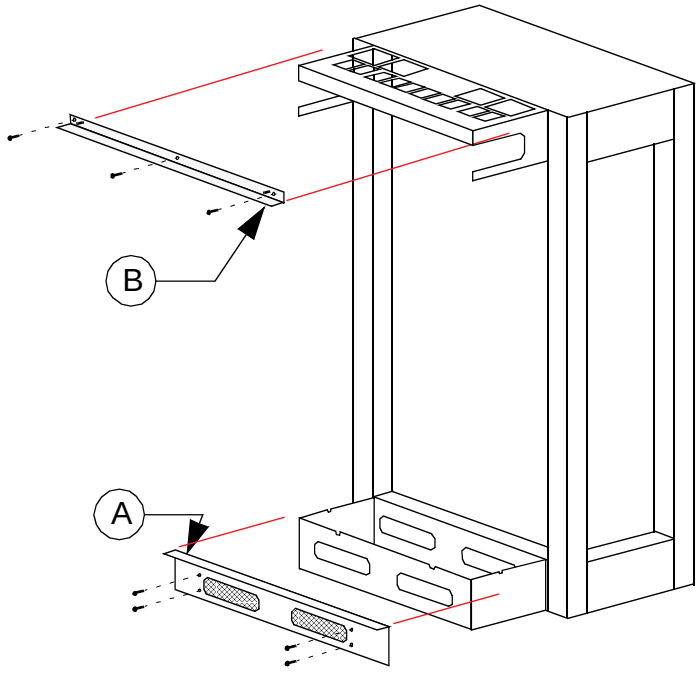


Figure 3-5. Rear Door Frame Assembly

Indicator Strip Wiring

Alarm Circuit Module For OT Cabinet

- Dress the alarm cables through the frame cable window and over the notch in the top of the alarm circuit module.
- Install the 857A alarm circuit module (Part of OT Installation Kit P/N 847814316) using the 3 supplied screws as shown in Figure 3-6.
- Plug the J1B, J2B, and J3B connectors into the 857A alarm circuit module and route cables as shown in Figure 3-7.

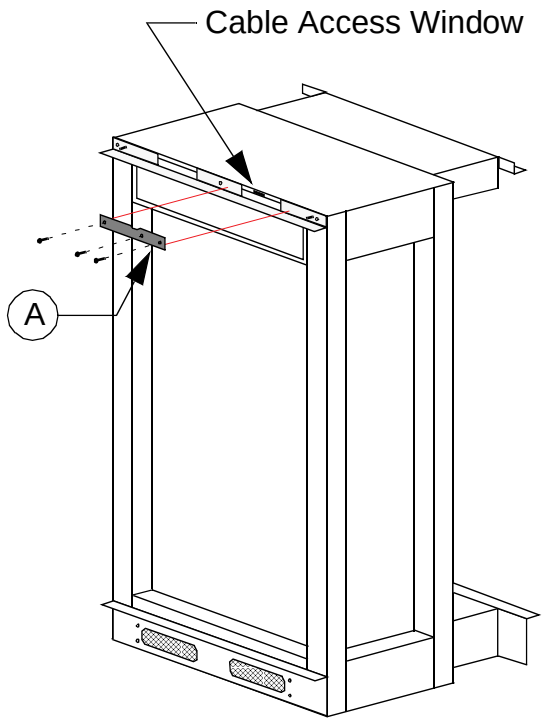


Figure 3-6. Alarm Circuit Module Installation For OT Cabinet

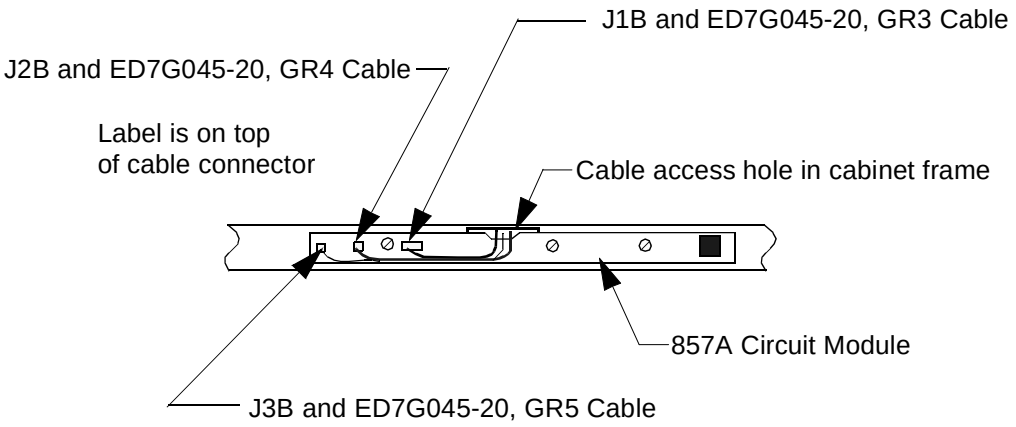


Figure 3-7. Alarm Circuit Module Cable Routing For OT Cabinet

Install Door Assemblies

Assemble the doors as follows:

- Install the OT indicator strip to the top front of the cabinet by snapping the spring catches to the pins on the upper door frame assembly. Part A on Figure 3-8.
- Install the OT blank indicator strip (Part of OT Installation Kit P/N 847814316) to the top rear of the cabinet by snapping the spring catches to the pins on the upper door frame assembly. Part A on Figure 3-9.
- Mount the front door assemblies to the front of the cabinet by aligning the bottom pins then pulling the top pins to engage into the upper door frame. The right front door has the CIT access panel. Part B on Figure 3-8.
- Mount the rear door assemblies to the rear of the cabinet by aligning the bottom pins then pulling the top pins to engage into the upper door frame. Part B on Figure 3-9.
- Mount the air deflector plate to the bottom rear of the cabinet using 2 supplied plastic insertion plugs. Part C on Figure 3-9.

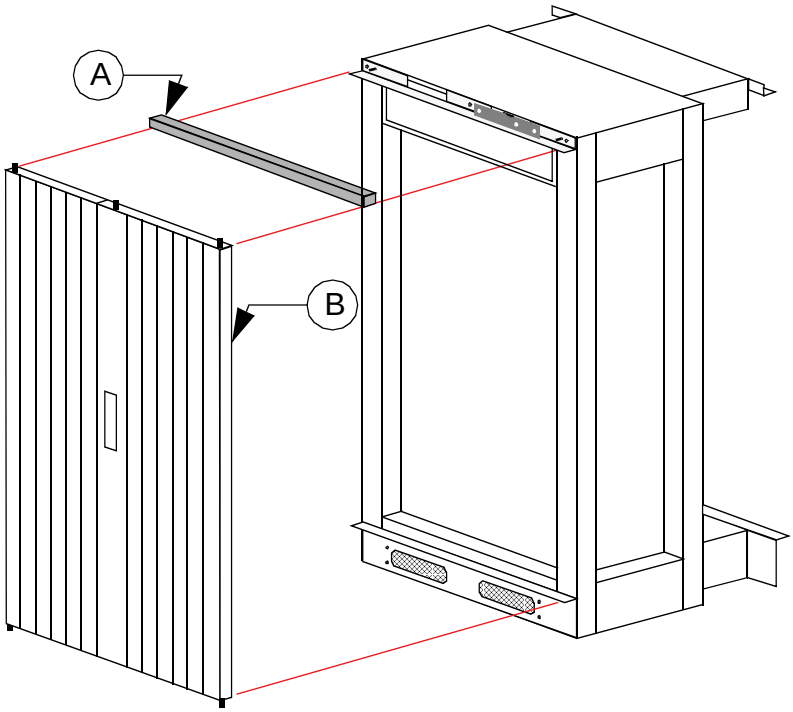


Figure 3-8. Front Door Assembly

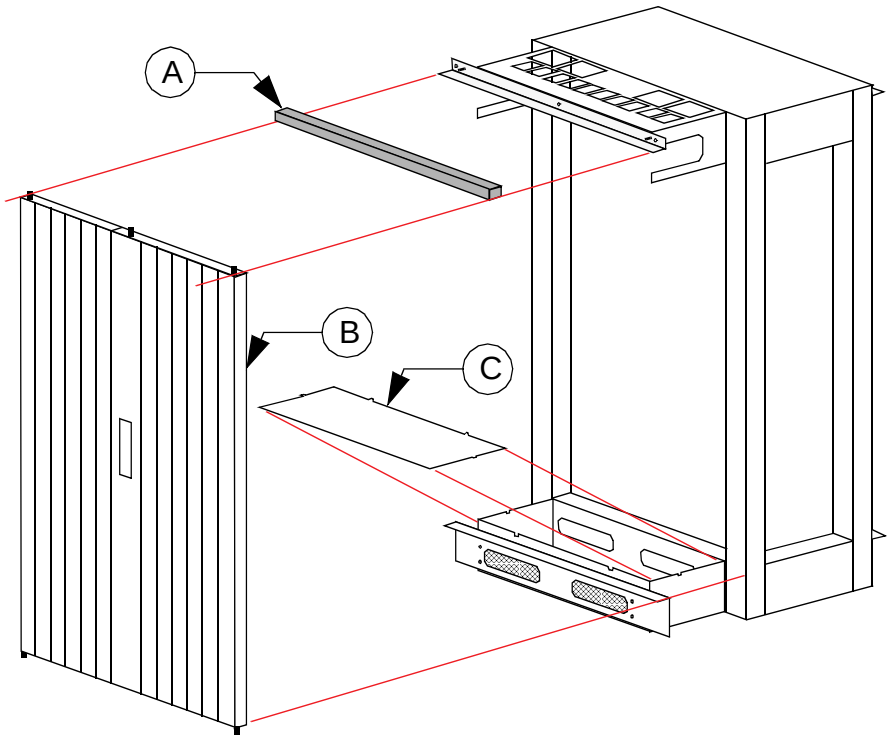


Figure 3-9. Rear Door Assembly

Install Cabinet Door Grounding Cables

Install grounding cable assemblies to door and frame as follows:

- Locate the four(4) grounding cable assemblies (847959970) in installation kit.
- Install cable assembly to the rear door using M4 screw with lock washer locating it 5.32 inches(13.5 cm) down from the top of door (fourth hole down from top of door) as shown in Figure 3-10. Torque screw to 10 inch-lbs(1.13 N.M). Do not overtorque.
- Install other end of cable with M6 screw to the cabinet as show in Figure 3-10. Torque screw to 27.0 inch-lbs(3.1 N.M).
- Repeat the process for the other rear door.

- Install cable assembly to front door using M4 screw with lock washer locating cable 23.3 inches down from top of door(16th hole down from top) as shown in Figure 3-11. Torque screw to 10 inch-lbs(1.13 N.M). Do not overtorque.
- Install other end of cable with M6 screw to the cabinet 46.5 inches(118 cm) up from bottom(two holes up from 45 inch marker on frame) as show in Figure 3-11. Location should be same as vertical center of upper vent. Torque screw to 27.0 inch-lbs(3.1 N.M).
- Repeat the process for the other front door.

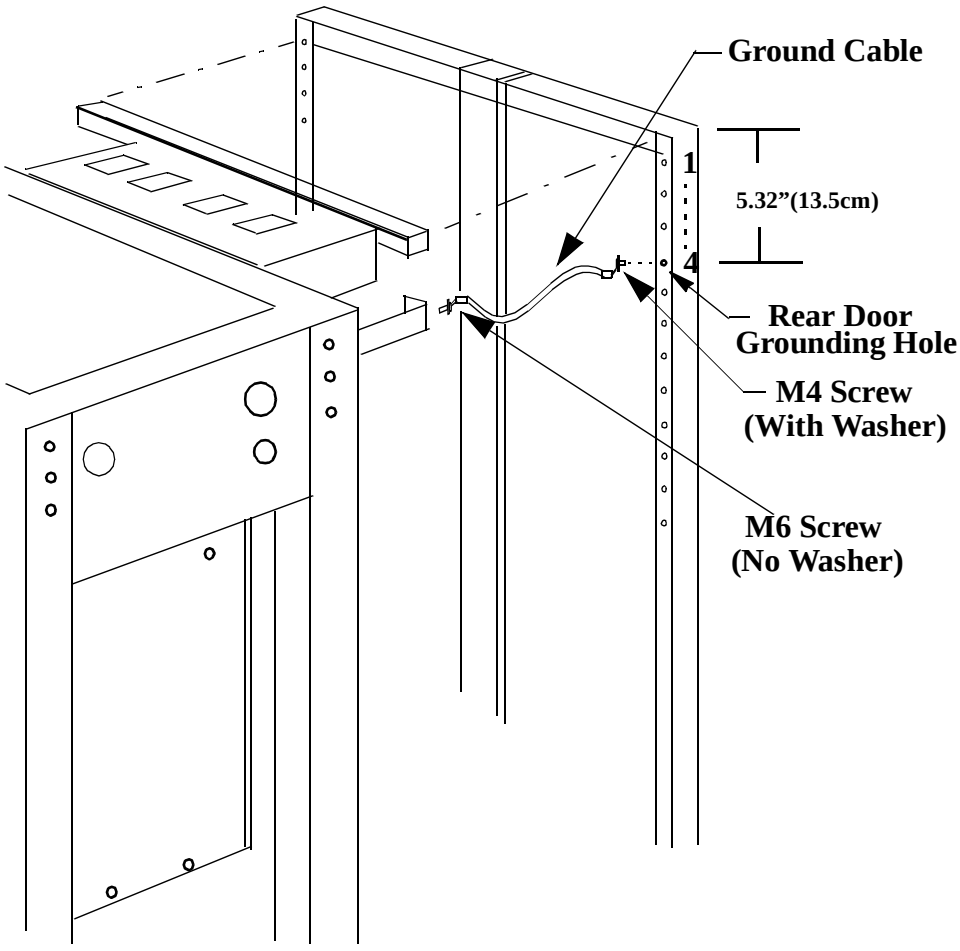


Figure 3-10. Mounting of Rear Door Grounding Cables

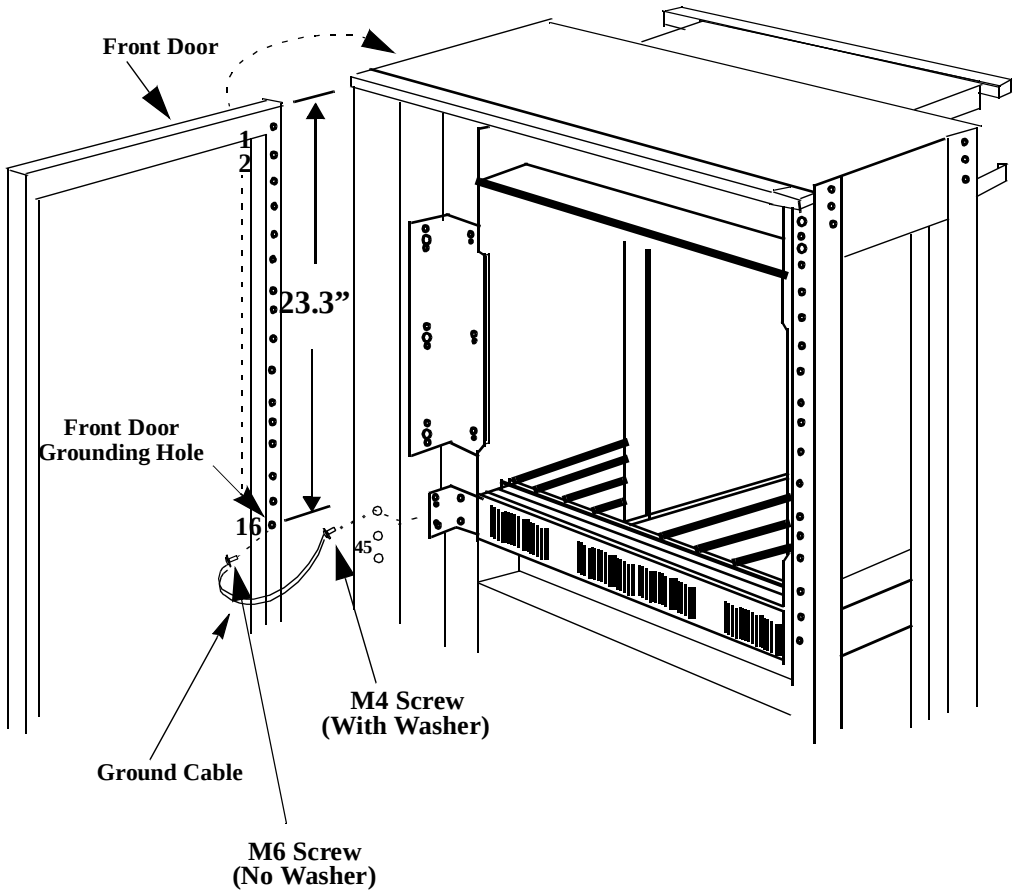


Figure 3-11. Mounting of Front Door Grounding Cables

Install End Guard Assembly

When end guards are required, assemble the ED5D786-70, G1A end guard kit to the sides of the cabinet as shown in Figure 3-12. This end guard kit may be used for both the left or right side. If a Vertical Cable Channel or EMC Side Panel had been previously installed, these items must be removed prior to installing the end guards.

NOTE:
Information on installation of end guards is included on ED5D786-70 and for the 5ESS-2000 system.

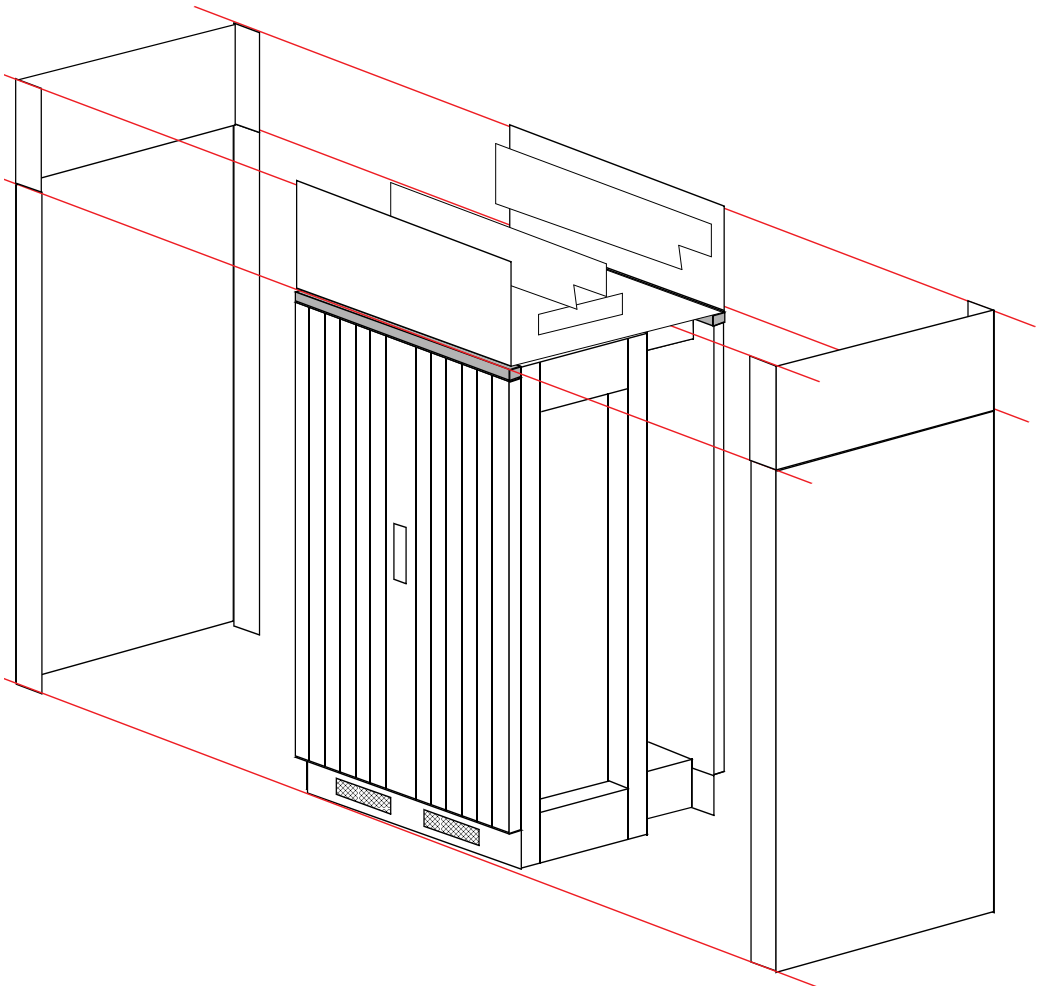


Figure 3-12. End Guard Installation

Miscellaneous Mount Installation

Bay Frame and Mounting Requirements

Miscellaneously mounted OT is designed to mount into customer installed bay frames. It is assumed that the bay frames have been installed properly and meet earthquake zone requirements.

The frames used to mount the miscellanous mount OT must meet the following requirements:

(1) Side to side opening must be 21.5 inches.

(2) Hole to hole spacing must be 22.312 inches.

(3) Vertical mounting hole spacing should be on one (1) inch centers.

Figure 3-13 shows a List 10 Miscellaneously Mounted OT mounted to a Lucent Technologies 800 Type bay frame. When installing shelves in the bay frame, the following mounting requirements must followed.

- The heat baffle that is mounted to the bottom of each shelf must be installed with each shelf. The heat baffles are not to be removed from any shelf.
- The mounting bracket hole separation of 11 inches as shown in Figure 3-13 must be maintained. The supplied interconnecting cables will not be long enough for a larger separation.
- Either an open space of three (3) inches is required for cooling at the top of each installation or another heat baffle.

The total height required for the various List structures is as follows:

Table 3-2. Vertical Space Requirements for List Structures

List Number	Vertical Space Required
List 10	66 Inches
List 11	24 Inches
List 12 with List 11	45 Inches
List 13 with List 11 & 12	66 Inches

The shelves may be mounted at any height ranging from the lower heat baffle touching the base of the bay, to any distance above the base, as long as the top clearance of three (3) inches or greater is maintained.

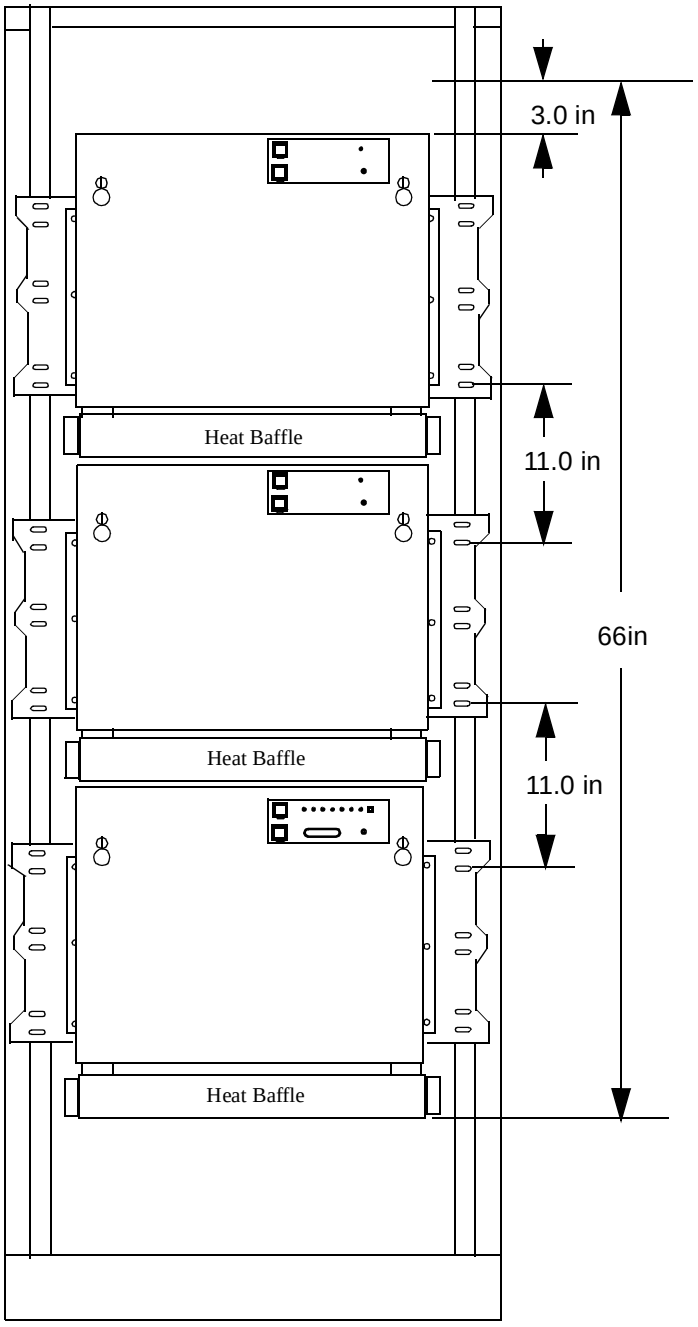


Figure 3-13. Miscellaneous Mount OT

Adjustment of Side Mounting Brackets

The side mounting brackets are factory installed for mounting to the narrow mounting flange of a Lucent Technologies 800 Type bay frame. These brackets are identified by the letters L and R stamped on them. For mounting to the Lucent Technologies 801 Type frame using the wide mounting flange, the bracket needs to be moved forward to another set of mounting holes. For other bay frame types, the bracket should be positioned to provide the best overall results.

If the mounting bracket needs to be moved, remove the three (3) screws holding the bracket and slide the bracket one inch forward towards the front of the shelf. Align the bracket holes with the new set of mounting holes on the chassis side. The bracket should now be parallel with its previous position offset by one inch. Install and tighten mounting screws. Perform the same operation with the mounting bracket on the other side of the shelf. Repeat the process for the brackets on the other two shelves.

Mounting Shelves to Bay Frame

Mount the lowest shelf, the System Shelf, to the bay frame using three (3) mounting screws in each bracket on each side. The Lucent Technologies 800 and 801 type bay frames use a No. 12-24 x 3/4 inch long screw for mounting. If using a different bay frame, check mounting hardware requirements for that particular frame. If this is a List 11, System Controller Shelf only, verify that a three inch space exists above the shelf.

Mount Complementary Shelf 1 above the System Shelf maintaining the 11 inch spacing as shown in Figure 3-13. Complementary Shelf 1 can be identified by the OTU slot label having numbers 9 through 20. Once again use six (6) mounting screws, three on each side, to mount Compementary Shelf 1 to the bay frame. If this is the last shelf to be installed verify that a three (3) inch opening exits above the shelf.

Mount Complementary Shelf 2 above Complementary Shelf 1 maintaining the 11 inch spacing as shown in Figure 3-13. Complementary Shelf 2 can be identified by the OTU slot label having numbers 21 through 32. Once again use six (6) mounting screws, three on each side, to mount Compementary Shelf 2 to the bay frame.

Verify that a three inch open space or greater is available above Complementary Shelf 2.

Wired Cable Installation

4

Contents

Wired Cable Installation

4

Overview

⚠ CAUTION:
Procedures in this installation manual are only to be performed by trained personnel.

This section covers OT cable installation, which includes:

- Miscellaneous Mount OT Intershelf Wiring
- OT Power cable installation (battery A and battery B).
- Miscellaneous discrete cable installation
- Office alarms (for future releases)
- X.25 telemetry cable installation (for future releases)
- Craft interface terminal (CIT) and data terminal equipment (DTE) cable installation (for future releases)
- Final verification.

General Considerations

⚠ CAUTION:
A wrist strap connected to a wrist strap ground jack on the terminal must be worn for ESD protection during the installation process.

CAUTION:
Connectors on the interconnect panel come equipped with protective ESD covers.These covers should be left in place on any connector that is not being immediately cabled so that ESD protections are maintained.

WARNING:
Unterminated optical connectors may emit laser radiation and should not be viewed with optical instruments (other than indirect image-converting devices). Also avoid direct exposure to beam.

Keep the following information under consideration during cable installation:

- This cable information is the latest cable information available at the time of the issue. For up-to-date information, refer to the ED cable drawings listed in the section 1, “Overall Installation and Test Considerations.”
- For ordering information, refer to 365-575-400, Optical Translator (OT) Application, Planning, and Ordering Guide.
- To simplify installation, install cables starting from the sides of the interconnection panel and work towards the center.
- All shielded cable that is less than 25 feet in length must have its shield grounded. If cables are over 25 feet in length, it is strongly advised to ground the cable shield. Ground at the transmit end of the cable.
- Do not remove the backplane cover during the installation process.
- Any bent backplane pins that cannot be straightened or broken pins on the d-sub connectors must be replaced using the AMP 91261-1 tool. Refer to Appendix B "Pin Repair".

Miscellaneously Mounted OT

This section describes the installation of the A and B power cables and shelf intershelf wiring for the four configurations of miscellaneous mounted OT (List 10 through 13).

NOTE:
If wiring an OT cabinet (List 1), bypass this section and proceed to the section titled "OT Cabinet Power Cable Installation".

- Remove EMC covers from shelves by turning the cover retaining screws counterclockwise until screw slot is vertical. Pull the top of the cover out from shelf and rotate downward. Unhook bottom pins from retainer and remove cover from shelf. Leave covers off until installation is complete.

Miscellaneous Mount Power Cable Installation List 10

NOTE:

If installing a List 11, 12, or 13 Miscellaneous Mount Shelf bypass this section and proceed to the next section "Miscellaneous Mount Power Cable Installation List 11, 12, and 13".

The List 10 power cable connections at each shelf are to be installed prior to any other intershelf wiring.

To install the intershelf power cable for the **A supply** perform the following:

- Locate the List 10 power cable for the A supply: **ED9C103-22 GR5** or **GR15**. The supply end of the cable will have a **RED** jacket.
- Take the connector farthest from the supply end and put it through the left access hole of the System Shelf (lowest shelf). Align plug with PWR A connector checking that the locking clip is on the right side and the RED (-48 V) is at the upper end of the connector. Push connector in until locking tab snaps in place.
- Select the connector of the remaining two that is farthest from the supply end and put it through the left access hole of the Complementary Shelf 1 (middle shelf). Align plug with PWR A connector checking that the locking clip is on the right side and the RED (-48 V) is at the upper end of the connector. Push connector in until locking tab snaps in place.
- Take the remaining connector and put it through the left access hole of the Complementary Shelf 2 (top shelf). Align plug with PWR A connector checking that the locking clip is on the right side and the RED (-48 V) is at the upper end of the connector. Push connector in until locking tab snaps in place.
- Route excess cable into bay frame channel on left side and tie to frame.
- Secure cable at entrance to frame.

To install the intershelf power cable for the B supply perform the following:

- Locate B supply power cable **ED9C103-22 GR6** or **GR16**. The supply end of the cable will have a **BLUE** jacket.
- Take the connector farthest from the supply end and put it through the right access hole of the System Shelf (lowest shelf). Align plug with PWR B connector checking that the locking clip is on the left side and the RED (-48 V) wire is at the lower end of the connector. Push connector in until locking tab snaps in place.

- Select the connector of the remaining two that is farthest from the supply end and put it through the right access hole of the Complementary Shelf 1 (middle shelf). Align plug with PWR B connector checking that the locking clip is on the left side and the RED (-48 V) is at the lower end of the connector. Push connector in until locking tab snaps in place.
- Take the remaining connector and put it through the right access hole of the Complementary Shelf 2 (top shelf). Align plug with PWR B connector checking that the locking clip is on the left side and the RED (-48 V) is at the lower end of the connector. Push connector in until locking tab snaps in place.
- Route excess cable into bay frame channel on right side and tie to frame.
- Secure cable at entrance to top of frame.

Miscellaneous Mount Power Cable Installation List 11, 12, and 13.

The power cable connections at each shelf are to be installed prior to any other intershelf wiring. The list 11, 12 , and 13 shelves use the same A and B power cables which has a single power connector at each end. It is assumed that the shelves are being installed as single shelves. Each shelf will require a separate power cable.

To install the intershelf power cable for the **A supply** perform the following:

- Locate the A supply power cable for List 11, 12, and 13. It is the same cable for the three list numbers: **ED9C103-22 GR7**(length=15 ft) or **GR8**(length as specified). The supply end of the cable will have a **RED** jacket.
- Take the connector and put it through the left access hole of the Shelf to be wired. Align plug with PWR A connector on interconnection panel checking that the locking clip is on the right side and the RED (-48 V) wire is at the upper end of the connector. Push connector in until locking tab snaps in place.
- Route excess cable into bay frame channel on left side and tie to frame.
- Secure cable at entrance to frame.

To install the intershelf power cable for the **B supply** perform the following:

- Locate B supply power cable **ED9C103-22 GR9**(length=15 ft) or **GR10**(length as specified**)**. The supply end of the cable will have a **BLUE** jacket.
- Take the connector and put it through the right access hole of the Shelf to be wired. Align plug with PWR B connector on interconnection panel checking that the locking clip is on the left side and the RED (-48 V) wire is at the lower end of the connector. Push connector in until locking tab snaps in place.
- Route excess cable into bay frame channel on right side and tie to frame.

■ Secure cable at entrance to top of frame.

Miscellaneous Mount Power Cable Connection

Install as follows:

(1) Turn the power breakers off, or do not install fuses, at the battery distribution fuse board (BDFB).

(2) Verify the circuit packs are not installed in the shelves.

⚠ WARNING:
Leave the BDFB fuses out or breakers off until performing the steps in section 6, "Powering" of this document.

(3) If power is being fed by an overhead cable rack, route power cable out through top of the bay wiring channel. If power is being fed from a raised floor storage tray, route power cables down bay wiring channel and out through raised floor.

(4) Identify the battery feed connections at the battery distribution fuse board or other protection equipment. They should be labeled BAT A, BAT A RTN, BAT B, and BAT B RTN.

(5) Check that the power feed cables are labeled for battery A (RED) and battery B (BLUE) use.

(6) Splice feeders from the battery distribution fuse board to the OT power cables. The red power lead connects to -48V. The white power lead connects to the power feed return.

(7) Connect equipment ground lead from cabinet or bay to proper ground connection

Miscellaneous Mount Intershelf Wiring

Intershelf wiring is required for list 10, 12, and 13. The List 11 System Controller Shelf does not require intershelf wiring since it is the initial stand alone shelf. Tables 4-1 through 4-3 list the intershelf cables required for the different List structures. Table 4-1 lists the interconnections required for a List 10 configuration which entails all three shelves. List 12 interconnections are given in Table 4-2. These interconnections are based upon the List 11 shelf already installed and requiring the Complementary Shelf 1 be iterconnected to it. Table 4-3 provides information to interconnect Complementary Shelf 2 to the System Controller Shelf and Complimentary Shelf 1. It assumes that the interconnections called out in Table 4-2 are already in place.

When installing cables, match cable plug designation with jack designation such that a P7 cable designation is connected to a J7 connector designation. The jack designations for Complementary Shelf 1 and 2 are shown in Figure 4-3. Figure 4-2 shows the jack designations for the System Shelf interconnection panel.

Install the List 10 intershelf cables as follows:

(1) Install intershelf cables as specified in Table 4-1.

(2) Route cables out the left or right side access holes as specified in Table 4-1. When all the cables have been installed, tie excess cable into left or right bay frame channels.

(3) Upon completion of Table 4-1 interconnections, verify that ED7G045-20 GR2 termination connectors were factory instaled on System Shelf J6 and Complementary Shelf 2 J7.

Table 4-1. Shelf Interconnecting Cables for List 10

Cable Part No.	Connector Pin Size	Side to Run Cable	FROM Shelf / Jack	TO Shelf / Jack
ED7G045-20 GR6	15	Left	System Shelf / J7	Compl. Shelf 1 / J6
ED7G045-20 GR7	15	Left	System Shelf / J9	Compl. Shelf 1 / J8
ED7G045-20 GR8	15	Left	System Shelf / J10	Compl. Shelf 2 / J8
ED7G045-20 GR9	25	Right	System Shelf / J13	Compl. Shelf 1 / J16
ED7G045-20 GR10	25	Right	System Shelf / J14	Compl. Shelf 2 / J16
ED7G045-20 GR11	15	Left	Compl. Shelf 1 / J7	Compl. Shelf 2 / J6

Install List 12 intershelf cables as follows:

(1) Remove the ED7G045-20 GR2 termination from the System Controller Shelf Connector J7 and plug it into Complementary Shelf 1 Connector J7.

(2) Install intershelf cables as specified in Table 4-2.

(3) Route cables out the left or right side access holes as specified in Table 4-2. When all the cables have been installed, tie excess cable into left or right bay frame channels.

(4) Upon completion of Table 4-2 interconnections, verify that ED7G045-20 GR2 termination connectors are on System Shelf J6 and Complementary Shelf 1 J7.

Table 4-2. Shelf Interconnecting Cables for List 12

Cable Part No.	Connector Pin Size	Side to Run Cable	FROM Shelf / Jack	TO Shelf / Jack
ED7G045-20 GR6	15	Left	System Shelf / J7	Compl. Shelf 1 / J6
ED7G045-20 GR7	15	Left	System Shelf / J9	Compl. Shelf 1 / J8
ED7G045-20 GR9	25	Right	System Shelf / J13	Compl. Shelf 1 / J16

Install List 13 intershelf cables as follows:

(1) Remove the ED7G045-20 GR2 termination from the Complementary Shelf 1 Connector J7 and plug it into Complementary Shelf 2 Connector J7.

(2) Install intershelf cables as specified in Table 4-3.

(3) Route cables out the left or right side access holes as specified in Table 4-3. When all the cables have been installed, tie excess cable into left or right bay frame channels.

(4) Upon completion of Table 4-3 interconnections, verify that ED7G045-20 GR2 termination connectors are on System Shelf J6 and Complementary Shelf 2 J7.

Table 4-3. Shelf Interconnecting Cables for List 13

Cable Part No.	Connector Pin Size	Side to Run Cable	FROM Shelf / Jack	TO Shelf / Jack
ED7G045-20 GR11	15	Left	Compl. Shelf 1 / J7	Compl. Shelf 2 / J6
ED7G045-20 GR8	15	Left	System Shelf / J10	Compl. Shelf 2 / J8
ED7G045-20 GR10	25	Right	System Shelf / J14	Compl. Shelf 2 / J16

The shelf interconnecting wiring is complete. Proceed to the section titled "Interconnection Panel Description" and perform the same steps for external wiring as specified for the OT Cabinet.

OT Cabinet Power Cable Installation

Description

The OT is powered by -48 volt direct current. Since redundant power is used to ensure maximum availability of the terminal, two battery power feeds are required for each cabinet or bay (feed A is Red and feed B is Blue).

Power Requirements

The power requirements for OT are as follows:

- Two feeders (A and B) are required for powering the cabinet or bay.
- Each independent feeder must supply -48 volts direct current and a return.
- Each feeder capacity must be 20 amperes at the battery distribution fuse board (BDFB).

The OT uses a power dissipation planning value of 796 watts. Refer to Floor Plan Data Sheet FPD 804-604-162 for complete information on power engineering for the OT.

Available Power Cables

Table 4 - 4 lists power cables available for installing an OT.

Table 4-4. Available Power Cables for OT Cabinet

ED-9C103-22 Cable Group	Cable Length (ft.)	Use With Power Bus	Outer Jacket Cover
5	17	A	Red
6	17	B	Blue
15	As Specified	A	Red
16	As Specified	B	Blue

Power Cable Connection

Install as follows:

(1) Remove EMC covers from shelves by turning the cover retaining screws counterclockwise until screw slot is vertical. Pull the top of the cover out from shelf and rotate downward. Unhook bottom pins from retainer and remove cover from shelf. Leave covers off until installation is complete.

(2) Turn the power breakers off, or do not install fuses, at the battery distribution fuse board (BDFB).

(3) Verify the circuit packs are not installed in the shelves.

⚠ WARNING:
Leave the BDFB fuses out or breakers off until performing the steps in section 6, "Powering" of this document.

(4) If power is being fed by an overhead cable rack, route power cable out through top of bay as shown in Figure 4-1. If power is being fed from a raised floor storage tray, route power cables as show in Figure 4-2.

(5) Identify the battery feed connections at the battery distribution fuse board or other protection equipment. They should be labeled BAT A, BAT A RTN, BAT B, and BAT B RTN.

(6) Check that the supplied ED-9C103-22 power feed cables are labeled for battery A (RED) and battery B (BLUE) use.

(7) Splice feeders from the battery distribution fuse board to the OLS power cables. The red power lead connects to -48V. The white power lead connects to the power feed return.

(8) Connect equipment ground lead from cabinet or bay to proper ground connection

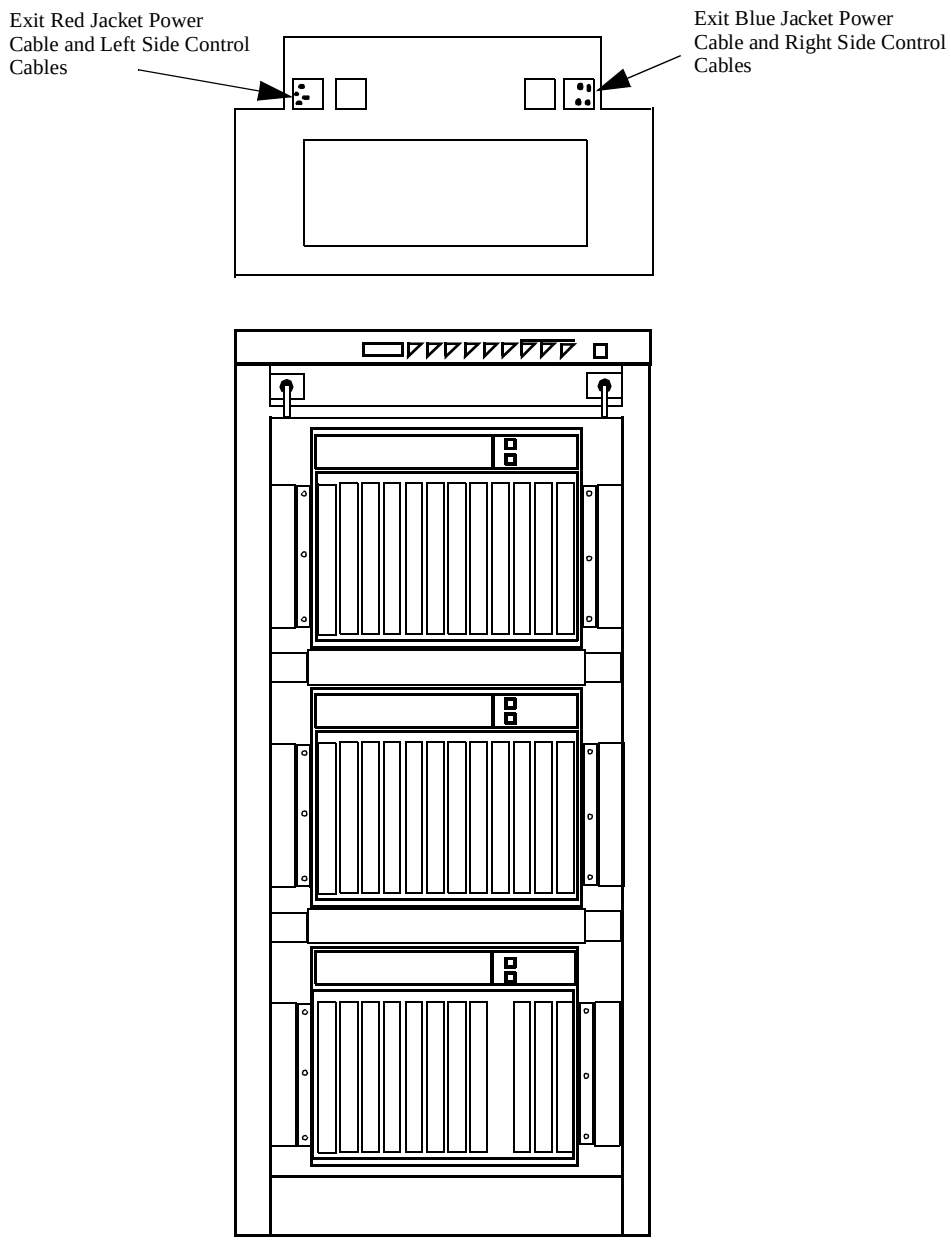


Figure 4-1. Cable Routing for Overhead Rack Installations

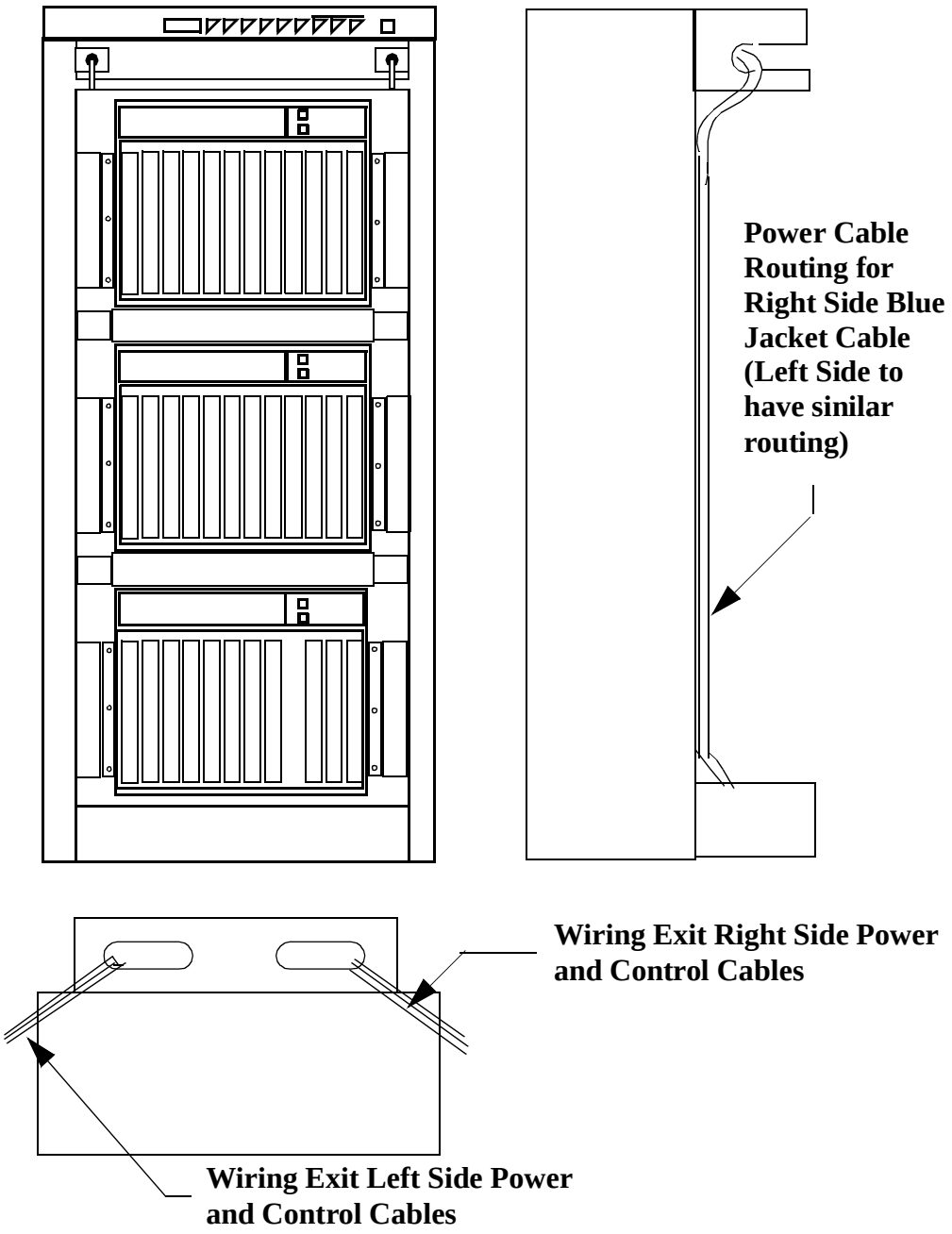


Figure 4-2. Cable Routing for Raised Floor Applications

Interconnection Panel Description

The interconnection panel for the two Complementary Shelves 1 and 2 are identical and all connections are utilized in R!-OT. The System Shelf has a different interconnecting panel with some interfaces active and others available for future releases. Installation instructions will be provided for all interconnections whether being used now or in the future.

Interconnection Panel for Complementary Shelf 1 and 2:

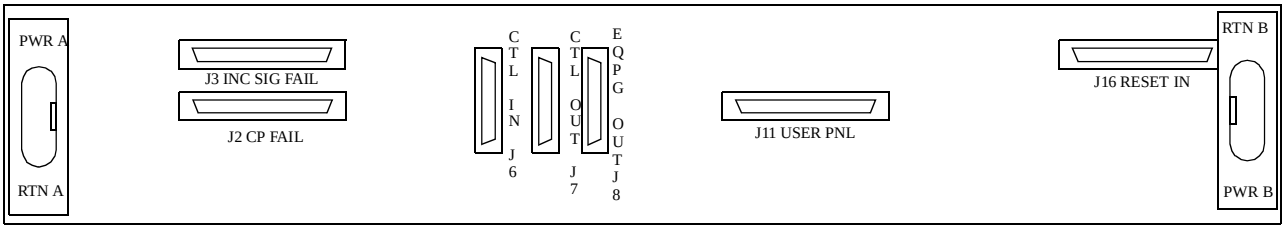


Figure 4-3. Interconnection Panel for Complementary Shelves 1 &2

The external interface connections that are operational for Complementary Shelves 1 and 2 for R1-OT are as follows:

- INC SIG FAIL J3: This connector provides an interface to the Incoming Loss of Signal Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- CP FAIL J2: This connector provides an interface to the Circuit Pack Failure Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- PWR: These connectors provide an interface to the -48V DC power coming from source A and source B. They are installed at the factory.

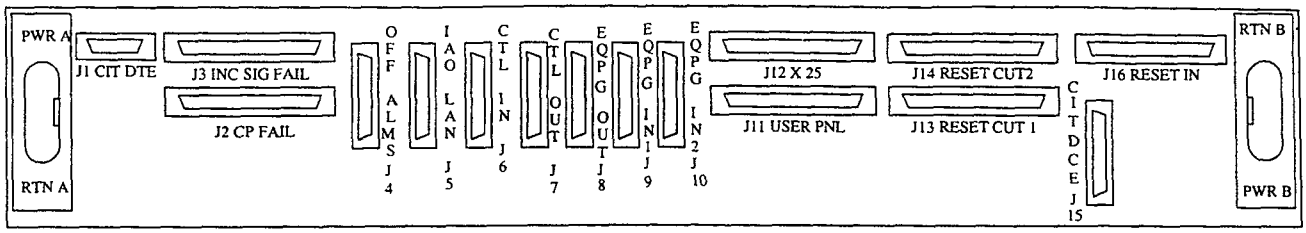


Figure 4-4. Interconnection Panel for System Shelf

Interconnection Panel for System Shelf:

The System Shelf external interface connections operational for R1-OT are as follows:

- INC SIG FAIL J3: This connector provides an interface to the Incoming Loss of Signal Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- CP FAIL J2: This connector provides an interface to the Circuit Pack Failure Miscellaneous Discrete relay contacts located on each OTU within the shelf.
- PWR: These connectors provide an interface to the -48V DC power coming from source A and source B. They are installed at the factory.

The external interface connections available for future releases but not supported in RI-OT are as follows:

- X.25 J12: This connector provides an interface to a message-based operations system that uses X.25 protocol and the Transaction Language 1 (TL1) message language.
- OFF ALMS J4: This connector provides an interface to the local office audible and visible alarms.
- CIT DTE J1: This connector provides an interface to a modem that allows dial-up Craft Interface Terminal access.

A summary of the interconnections for all shelves is given in Table 4 - 5.

Table 4-5. Connections to Shelf Interconnection Panels

Cable Applications	System Shelf	Complementary Shelf 1	Complementary Shelf 1
Misc. Discrete CP Failure	J2	J2	J2
Misc. Discrete Inc. Sig. Fail.	J3	J3	J3
Office Alarms	J4	No Conn.	No Conn
X.25 (TL-1) Telemetry	J12	No Conn	No Conn
CIT DTE	J1	No Conn	No Conn

Miscellaneous Discrete Cable Installation

Description

There are seventy (70) miscellaneous discrete alarms that are to be wired from the OT to the External Miscellaneous Discrete Unit (EMDU). Four cables per OT shelf are required to transport the alarms to the EMDU.

Two EMDUs have been selected for use with OT: DANTEL Model 46220-00 and Harris C-1000 Centurion. The EMDU is located between the OT and one of the OLS end terminals. The wiring of the OT to the EMDU is specified within Section 4 of this manual. The EMDU installation and wiring of the EMDU to the OLS is specified in Appendix C for the DANTEL unit and Appendix D for the Harris unit. A manual is available from DANTEL titled "46220 Alarm and Control Block Installation & Operation Manual". Harris also provides a manual titled "Harris User Guide for C1000 Centurion. Both units are rack mountable. The DANTEL unit may also be wall mounted. A block diagram of the cabling to the EMDU is shown in Figure 4-5.

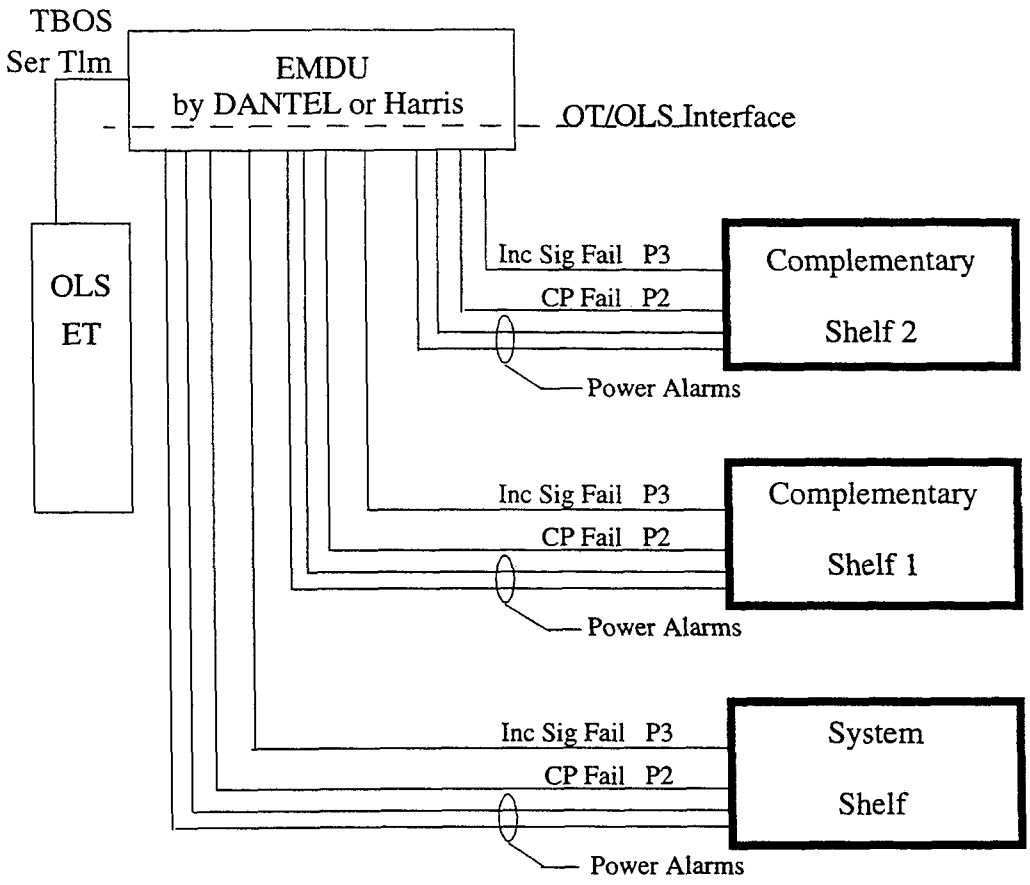


Figure 4-5. Miscellaneous Discrete Cable Connections

Available Miscellaneous Discrete Cables

Table 4-6 lists cables available for office miscellaneous discrete cables.

Table 4-6. Miscellaneous Discrete Cables

ED-7G045-22 Cable Group	Cable Length (ft.)	Cable Type
3	As Specified	12 pair / 26 Gauge / Solid
4	150	12 pair / 26 Gauge / Solid
16	As Specified	1 pair / 26 Gauge / Solid
17	150	1 pair / 26 Gauge / Solid

Miscellaneous Discrete Cable Connections

Connections to the DANTEL EMDU

Figure 4-6 shows the DANTEL terminal strip to which the miscellaneous discrete cables will be wired. The miscellaneous discrete cable wiring tables (Tables 4-7 though 4-13) will reference the wire wrap pin designations on this terminal strip.

⚠ CAUTION:
The DANTEL EMDU must have power removed prior to performing any wiring or DIP switch settings.
Do **NOT** remove Connector P1 on the DANTEL EMDU with the power ON. This may damage the unit. Remove source power to the P1 connector or remove Fuse F1 (1 Amp GMT Type fuse) as a method to remove power from the DANTEL . Refer to Appendix C for additional information.

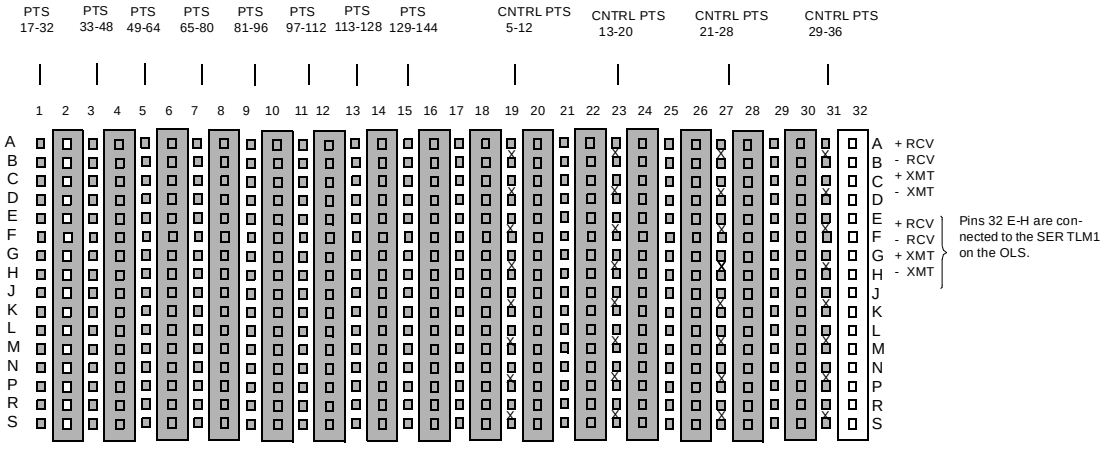


Figure 4-6. DANTEL Wire Wrap Pin Designations

Tables 4-7 through 4-13 provide detail information to wire each cable shown in Figure 4-5. If the OT is a List 1 or List 10 which has all three shelves, wire cables in the same sequence as the tables starting with Table 4-7 and ending with Table 4-13. The System Controller Shelf (bottom shelf) cable P2 should be wired first followed by the Complementary Shelf 1 (middle shelf) cable P2 and then the Complementary Shelf 2 (upper shelf) cable P2. Repeat the sequence again starting at the System Shelf with cable P3.

Before wiring the power alarm cables detailed in Table 4-13, review the instructions for providing cable slack within the bay and connecting to the power filter. These instructions precede Table 4-13.

If the shelf is an individual miscellaneous mount shelf (List 11 through 13), wire only those miscellaneous discrete cables associated with that shelf.

In each table the second column provides the pin locations on the DANTEL wire wrap terminals. The third column provides the color code for the two wires to be wired for each alarm.

The OLS alarm numbers for the miscellaneous discrete alarms start with alarm number 17 in Table 4-7. The initial 16 miscellaneous discrete alarms are located with the OLS.

Table 4-7. OT System Shelf Cable P2 Wiring to DANTEL EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
C P Fail OTU 1	1 (A1 & A2)	W-BL / BL-W	12 & 25(RTN)	17
C P Fail OTU 2	2 (B1 & B2)	W-O / O-W	11 & 24(RTN)	18
C P Fail OTU 3	3 (C1 & C2)	W-G / G-W	10 & 23(RTN)	19
C P Fail OTU 4	4 (D1 & D2)	W-BR / BR-W	9 & 22(RTN)	20
C P Fail OTU 5	5 (E1 & E2)	W-S / S-W	8 & 21(RTN)	21
C P Fail OTU 6	6 (F1 & F2)	R-BL / BL-R	7 & 20(RTN)	22
C P Fail OTU 7	7 (G1 & G2)	R-O / O-R	6 & 19(RTN)	23
C P Fail OTU 8	8 (H1 & H2)	R-G / G-R	5 & 18(RTN)	24
	No Connection		1, 2, 3, 4 ,13, 14, 15, 16, 17,	

Table 4-8. OT Complementary Shelf 1 Cable P2 Wiring to DANTEL EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
C P Fail OTU 9	9 (J1 & J2)	W-BL / BL-W	12 & 25(RTN)	25
C P Fail OTU 10	10 (K1 & K2)	W-O / O-W	11 & 24(RTN)	26
C P Fail OTU 11	11 (L1 & L2)	W-G / G-W	10 & 23(RTN)	27
C P Fail OTU 12	12 (M1 & M2)	W-BR / BR-W	9 & 22(RTN)	28
C P Fail OTU 13	13 (N1 & N2)	W-S / S-W	8 & 21(RTN)	29
C P Fail OTU 14	14 (P1 & P2)	R-BL / BL-R	7 & 20(RTN)	30
C P Fail OTU 15	15 (R1 & R2)	R-O / O-R	6 & 19(RTN)	31
C P Fail OTU 16	16 (S1 & S2)	R-G / G-R	5 & 18(RTN)	32
C P Fail OTU 17	17 (A3 & A4)	R-BR / BR-R	4 & 17(RTN)	33
C P Fail OTU 18	18 (B3 & B4)	R-S / S-R	3 & 16(RTN)	34
C P Fail OTU 19	19 (C3 & C4)	BK-BL / BL-BK	2 & 15(RTN)	35
C P Fail OTU 20	20 (D3 & D4)	BK-O / O-BK	1 & 14(RTN)	36
	No Connection		13	

Table 4-9. OT Complemetary Shelf 2 Cable P2 Wiring to DANTEL EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
C P Fail OTU 21	21 (E3 & E4)	W-BL / BL-W	12 & 25(RTN)	37
C P Fail OTU 22	22 (F3 & F4)	W-O / O-W	11 & 24(RTN)	38
C P Fail OTU 23	23 (G3 & G4)	W-G / G-W	10 & 23(RTN)	39
C P Fail OTU 24	24 (H3 & H4)	W-BR / BR-W	9 & 22(RTN)	40
C P Fail OTU 25	25 (J3 & J4)	W-S / S-W	8 & 21(RTN)	41
C P Fail OTU 26	26 (K3 & K4)	R-BL / BL-R	7 & 20(RTN)	42
C P Fail OTU 27	27 (L3 & L4)	R-O / O-R	6 & 19(RTN)	43
C P Fail OTU 28	28 (M3 & M4)	R-G / G-R	5 & 18(RTN)	44
C P Fail OTU 29	29 (N3 & N4)	R-BR / BR-R	4 & 17(RTN)	45
C P Fail OTU 30	30 (P3 & P4)	R-S / S-R	3 & 16(RTN)	46
C P Fail OTU 31	31 (R3 & R4)	BK-BL / BL-BK	2 & 15(RTN)	47
C P Fail OTU 32	32 (S3 & S4)	BK-O / O-BK	1 & 14(RTN)	48
	No Connection		13	

Table 4-10. OT System Shelf Cable P3 Wiring to Dantel EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
I S Fail OTU 1	33 (A5 & A6)	W-BL / BL-W	12 & 25(RTN)	49
I S Fail OTU 2	34 (B5 & B6)	W-O / O-W	11 & 24(RTN)	50
I S Fail OTU 3	35 (C5 & C6)	W-G / G-W	10 & 23(RTN)	51
I S Fail OTU 4	36 (D5 & D6)	W-BR / BR-W	9 & 22(RTN)	52
I S Fail OTU 5	37 (E5 & E6)	W-S / S-W	8 & 21(RTN)	53
I S Fail OTU 6	38 (F5 & F6)	R-BL / BL-R	7 & 20(RTN)	54
I S Fail OTU 7	39 (G5 & G6)	R-O / O-R	6 & 19(RTN)	55
I S Fail OTU 8	40 (H5 & H6)	R-G / G-R	5 & 18(RTN)	56
	No Connection		1, 2, 3, 4 ,13, 14, 15, 16, 17,	

Table 4-11. OT Complementary Shelf 1 Cable P3 Wiring to DANTEL EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
I S Fail OTU 9	41 (J5 &J6)	W-BL / BL-W	12 & 25(RTN)	57
I S Fail OTU 10	42 (K5 & K6)	W-O / O-W	11 & 24(RTN)	58
I S Fail OTU 11	43 (L5 & L6)	W-G / G-W	10 & 23(RTN)	59
I S Fail OTU 12	44 (M5 & M6)	W-BR / BR-W	9 & 22(RTN)	60
I S Fail OTU 13	45 (N5 & N6)	W-S / S-W	8 & 21(RTN)	61
I S Fail OTU 14	46 (P5 & P6)	R-BL / BL-R	7 & 20(RTN)	62
I S Fail OTU 15	47 (R5 & R6)	R-O / O-R	6 & 19(RTN)	63
I S Fail OTU 16	48 (S5 & S6)	R-G / G-R	5 & 18(RTN)	64
I S Fail OTU 17	49 (A7 & A8)	R-BR / BR-R	4 & 17(RTN)	65
I S Fail OTU 18	50 (B7 & B8)	R-S / S-R	3 & 16(RTN)	66
I S Fail OTU 19	51 (C7 & C8)	BK-BL / BL-BK	2 & 15(RTN)	67
I S Fail OTU 20	52 (D7 & D8)	BK-O / O-BK	1 & 14(RTN)	68
	No Connection		13	

Table 4-12. OT Complementary Shelf 2 Cable P3 Wiring to DANTEL EMDU

OTU ALARM NAME	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
I S Fail OTU 21	53 (E7 & E8)	W-BL / BL-W	12 & 25(RTN)	69
I S Fail OTU 22	54 (F7 & F8)	W-O / O-W	11 & 24(RTN)	70
I S Fail OTU 23	55 (G7 & G8)	W-G / G-W	10 & 23(RTN)	71
I S Fail OTU 24	56 (H7 & H8)	W-BR / BR-W	9 & 22(RTN)	72
I S Fail OTU 25	57 (J7 & J8)	W-S / S-W	8 & 21(RTN)	73
I S Fail OTU 26	58 (K7 & K8)	R-BL / BL-R	7 & 20(RTN)	74
I S Fail OTU 270	59 (L7 & L8)	R-O / O-R	6 & 19(RTN)	75
I S Fail OTU 28	60 (M7 & M8)	R-G / G-R	5 & 18(RTN)	76
I S Fail OTU 29	61 (N7 & N8)	R-BR / BR-R	4 & 17(RTN)	77

I S Fail OTU 30	62 (P7 & P8)	R-S / S-R	3 & 16(RTN)	78
I S Fail OTU 31	63 (R7 & R8)	BK-BL / BL-BK	2 & 15(RTN)	79
I S Fail OTU 32	64 (S7 & S8)	BK-O / O-BK	1 & 14(RTN)	80
	No Connection		13	

Power Failure Miscellaneous Discrete

Each power fail alarm is cabled individually from the A and B power filter on each shelf. This results in six (6) cables for a three (3) shelf OT system. Figure 4-7 shows the location of the miscellaneous discrete connector at the rear of the power filter.

NOTE:
When wiring the miscellaneous discrete cable to the power filter at the OT shelf, provide ten (10) inches of slack cable between the cable entrance to the shelf and the cable connector (refer to Figure 4-8). This added length of cable is required to allow access to the connector release tab during filter removal.

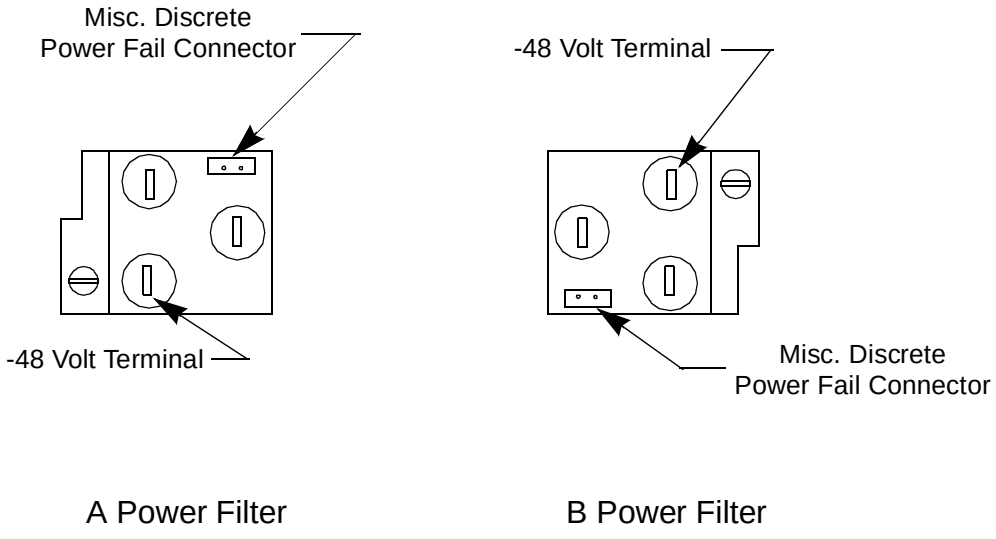


Figure 4-7. Miscellaneous Discrete Power Filter Connections

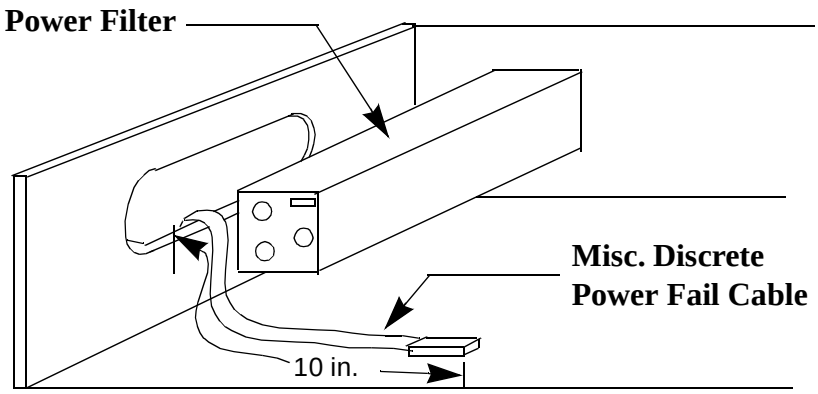


Figure 4-8. Required Length for Misc. Discrete Power Fail Cables

Table 4-13. OT Power Alarm Wiring to DANTEL EMDU

ALARM NAME & LOCATION	DANTEL ALARM No.(Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers	OLS ALARM No.
A Pwr Fail - Sys. Shelf	65 (A9 & A10)	W-BL / BL-W	1 & 2(RTN)	81
B Pwr Fail - Sys. Shelf	66 (B9 & B10)	W-BL / BL-W	1 & 2(RTN)	82
A Pwr Fail - Compl 1 Shelf	67 (C9 & C10)	W-BL / BL-W	1 & 2(RTN)	83
B Pwr Fail - Compl 1 Shelf	68 (D9 & D10)	W-BL / BL-W	1 & 2(RTN)	84
A Pwr Fail - Compl 2 Shelf	69 (E9 & E10)	W-BL / BL-W	1 & 2(RTN)	85
B Pwr Fail - Compl 2 Shelf	70 (F9 & F10)	W-BL / BL-W	1 & 2(RTN)	86

Connections to the Harris Centurion EMDU.

The Harris Centurion EMDU utilizes fifty (50) pin connectors for its inputs. Each 50 pin connector on the Harris unit provides for 32 alarm inputs, 4 control outputs using wired pair, and ten ground connections. The OT uses 25 pin D-Subminiature connectors and two pin connectors with all alarms requiring a pair of wires(two connections). With these incompatabilities, a connectorized cable connection is not possible.

Refer to Figures 4-7 and 4-8 when wiring power fail miscellaneous discretes from power filter to the Harris EMDU.

The Harris unit is shipped equipped with adapters that connect the fifty (50) pin connector on the Harris unit to a 50 pin wire wrap terminal. This allows the Harris unit to be connectorized for easy replacement without requiring any rewiring. The pin numbers for the wire wrap terminals are given in Figure 4-9. The pin numbers are not provided on the back of the adapter.

Since the Harris unit has limited wire wrap connections to ground, some wire wrap terminals will be required to handle two wire wraps per terminal. When wire wrapping the first connections to pins 5 through 9 and 30 through 34, install the first connection at the bottom of the pin to allow space for the second wire wrap. When these terminals are filled, the wiring table will call out ground connections to be used on J3 and J4 connectors which are located directly above connectors J1 and J2.

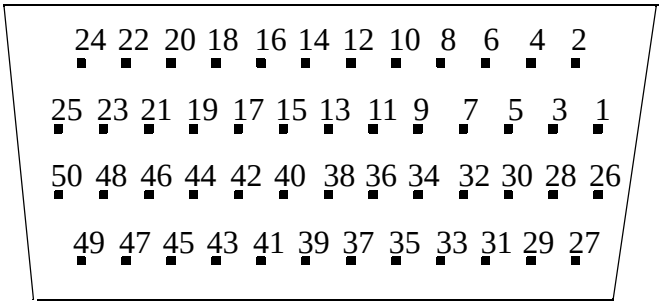


Figure 4-9. Connector Adapter Viewed from Wirewrap Side

Table 4-14. Misc. Disc. Cable Wiring / OT to Harris EMDU

OLS Alrm No.	OTU ALRM NAME	CABLE CONN/ SHELF	HARRIS ALARM NO. (Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers
17	CP Fail OTU 1	P2 / System	1 (J1-10 & J1-5-RTN)	W-BL/BL-W	12 & 25(RTN)
18	C P Fail OTU 2	P2 / System	2 (J1-35 & J1-5-RTN)	W-O / O-W	11 & 24(RTN)
19	C P Fail OTU 3	P2 / System	3 (J1-11 & J1-6-RTN)	W-G / G-W	10 & 23(RTN)
20	C P Fail OTU 4	P2 / System	4 (J1-36 & J1-6-RTN)	W-BR / BR-W	9 & 22(RTN)
21	C P Fail OTU 5	P2 / System	5 (J1-12 & J1-7-RTN)	W-S / S-W	8 & 21(RTN)
22	C P Fail OTU 6	P2 / System	6 (J1-37 & J1-7-RTN)	R-BL / BL-R	7 & 20(RTN)
23	C P Fail OTU 7	P2 / System	7 (J1-13 & J1-8-RTN)	R-O / O-R	6 & 19(RTN)

Table 4-14. Misc. Disc. Cable Wiring / OT to Harris EMDU

OLS Alrm No.	OTU ALRM NAME	CABLE CONN/ SHELF	HARRIS ALARM NO. (Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers
24	C P Fail OTU 8	P2 / System	8 (J1-38 & J1-8-RTN)	R-G / G-R	5 & 18(RTN)
		P2 / System	No Connection		1, 2, 3, 4, 13, 14, 15, 16, 17
25	C P Fail OTU 9	P2 / Compl S1	9 (J1-14 & J1-9-RTN)	W-BL / BL-W	12 & 25(RTN)
26	C P Fail OTU 10	P2 / Compl S1	10 (J1-39 & J1-9-RTN)	W-O / O-W	11 & 24(RTN)
27	C P Fail OTU 11	P2 / Compl S1	11 (J1-15 & J1-30-RTN)	W-G / G-W	10 & 23(RTN)
28	C P Fail OTU 12	P2 / Compl S1	12 (J1-40 & J1-30-RTN)	W-BR / BR-W	9 & 22(RTN)
29	C P Fail OTU 13	P2 / Compl S1	13 (J1-16 & J1-31-RTN)	W-S / S-W	8 & 21(RTN)
30	C P Fail OTU 14	P2 / Compl S1	14 (J1-41 & J1-31-RTN)	R-BL / BL-R	7 & 20(RTN)
31	C P Fail OTU 15	P2 / Compl S1	15 (J1-17 & J1-32-RTN)	R-O / O-R	6 & 19(RTN)
32	C P Fail OTU 16	P2 / Compl S1	16 (J1-42 & J1-32-RTN)	R-G / G-R	5 & 18(RTN)
33	C P Fail OTU 17	P2 / Compl S1	17 (J1-18 & J1-33-RTN)	R-BR / BR-R	4 & 17(RTN)
34	C P Fail OTU 18	P2 / Compl S1	18 (J1-43 & J1-33-RTN)	R-S / S-R	3 & 16(RTN)
35	C P Fail OTU 19	P2 / Compl S1	19 (J1-19 & J1-34-RTN)	BK-BL / BL-BK	2 & 15(RTN)
36	C P Fail OTU 20	P2 / Compl S1	20 (J1-44 & J1-34-RTN)	BK-O / O-BK	1 & 14(RTN)
		P2 / Compl S1	No Connection		13
37	C P Fail OTU 21	P2 / Compl S2	21 (J1-20 & J3-5-RTN)	W-BL / BL-W	12 & 25(RTN)
38	C P Fail OTU 22	P2 / Compl S2	22 (J1-45 & J3-5-RTN)	W-O / O-W	11 & 24(RTN)
39	C P Fail OTU 23	P2 / Compl S2	23 (J1-21 & J3-6-RTN)	W-G / G-W	10 & 23(RTN)
40	C P Fail OTU 24	P2 / Compl S2	24 (J1-46 & J3-6-RTN)	W-BR / BR-W	9 & 22(RTN)
41	C P Fail OTU 25	P2 / Compl S2	25 (J1-22 & J3-7-RTN)	W-S / S-W	8 & 21(RTN)
42	C P Fail OTU 26	P2 / Compl S2	26 (J1-47 & J3-7-RTN)	R-BL / BL-R	7 & 20(RTN)
43	C P Fail OTU 27	P2 / Compl S2	27 (J1-23 & J3-8-RTN)	R-O / O-R	6 & 19(RTN)
44	C P Fail OTU 28	P2 / Compl S2	28 (J1-48 & J3-8-RTN)	R-G / G-R	5 & 18(RTN)
45	C P Fail OTU 29	P2 / Compl S2	29 (J1-24 & J3-9-RTN)	R-BR / BR-R	4 & 17(RTN)
46	C P Fail OTU 30	P2 / Compl S2	30 (J1-49 & J3-9-RTN)	R-S / S-R	3 & 16(RTN)
47	C P Fail OTU 31	P2 / Compl S2	31 (J1-25 & J3-30-RTN)	BK-BL / BL-BK	2 & 15(RTN)

Table 4-14. Misc. Disc. Cable Wiring / OT to Harris EMDU

OLS Alrm No.	OTU ALRM NAME	CABLE CONN/ SHELF	HARRIS ALARM NO. (Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers
48	C P Fail OTU 32	P2 / Compl S2	32 (J1-50 & J3-30-RTN)	BK-O / O-BK	1 & 14(RTN)
		P2 / Compl S2	No Connection		13
49	I S Fail OTU 1	P3 / Compl S2	33 (J2-10 & J2-5-RTN)	W-BL / BL-W	12 & 25(RTN)
50	I S Fail OTU 2	P3 / System	34 (J2-35 & J2-5-RTN)	W-O / O-W	11 & 24(RTN)
51	I S Fail OTU 3	P3 / System	35 (J2-11 & J2-6-RTN)	W-G / G-W	10 & 23(RTN)
52	I S Fail OTU 4	P3 / System	36 (J2-36 & J2-6-RTN)	W-BR / BR-W	9 & 22(RTN)
53	I S Fail OTU 5	P3 / System	37 (J2-12 & J2-7-RTN)	W-S / S-W	8 & 21(RTN)
54	I S Fail OTU 6	P3 / System	38 (J2-37 & J2-7-RTN)	R-BL / BL-R	7 & 20(RTN)
55	I S Fail OTU 7	P3 / System	39 (J2-13 & J2-8-RTN)	R-O / O-R	6 & 19(RTN)
56	I S Fail OTU 8	P3 / System	40 (J2-38 & J2-8-RTN)	R-G / G-R	5 & 18(RTN)
		P3 / System	No Connection		1, 2, 3, 4 ,13, 14, 15, 16, 17,
57	I S Fail OTU 9	P3 / System	41 (J2-14 & J2-9-RTN)	W-BL / BL-W	12 & 25(RTN)
58	I S Fail OTU 10	P3 / Compl S1	42 (J2-39 & J2-9-RTN)	W-O / O-W	11 & 24(RTN)
59	I S Fail OTU 11	P3 / Compl S1	43 (J2-15 & J2-30-RTN)	W-G / G-W	10 & 23(RTN)
60	I S Fail OTU 12	P3 / Compl S1	44 (J2-40 & J2-30-RTN)	W-BR / BR-W	9 & 22(RTN)
61	I S Fail OTU 13	P3 / Compl S1	45 (J2-16 & J2-31-RTN)	W-S / S-W	8 & 21(RTN)
62	I S Fail OTU 14	P3 / Compl S1	46 (J2-41 & J2-31-RTN)	R-BL / BL-R	7 & 20(RTN)
63	I S Fail OTU 15	P3 / Compl S1	47 (J2-17 & J2-32-RTN)	R-O / O-R	6 & 19(RTN)
64	I S Fail OTU 16	P3 / Compl S1	48 (J2-42 & J2-32-RTN)	R-G / G-R	5 & 18(RTN)
65	I S Fail OTU 17	P3 / Compl S1	49 (J2-18 & J2-33-RTN)	R-BR / BR-R	4 & 17(RTN)
66	I S Fail OTU 18	P3 / Compl S1	50 (J2-43 & J2-33-RTN)	R-S / S-R	3 & 16(RTN)
67	I S Fail OTU 19	P3 / Compl S1	51 (J2-19 & J2-34-RTN)	BK-BL / BL-BK	2 & 15(RTN)
68	I S Fail OTU 20	P3 / Compl S1	52 (J2-44 & J2-34RTN)	BK-O / O-BK	1 & 14(RTN)
		P3 / Compl S1			13
69	I S Fail OTU 21	P3 / Compl S2	53 (J2-20 & J4-5-RTN)	W-BL / BL-W	12 & 25(RTN)
70	I S Fail OTU 22	P3 / Compl S2	54 (J2-45 & J4-5-RTN)	W-O / O-W	11 & 24(RTN)
71	I S Fail OTU 23	P3 / Compl S2	55 (J2-21 & J4-6-RTN)	W-G / G-W	10 & 23(RTN)

Table 4-14. Misc. Disc. Cable Wiring / OT to Harris EMDU

OLS Alrm No.	OTU ALRM NAME	CABLE CONN/ SHELF	HARRIS ALARM NO. (Pin Desg)	WIRE COLORS	OT CABLE PIN Numbers
72	I S Fail OTU 24	P3 / Compl S2	56 (J2-46 & J4-6-RTN)	W-BR / BR-W	9 & 22(RTN)
73	I S Fail OTU 25	P3 / Compl S2	57 (J2-22 & J4-7-RTN)	W-S / S-W	8 & 21(RTN)
74	I S Fail OTU 26	P3 / Compl S2	58 (J2-47 & J4-7-RTN)	R-BL / BL-R	7 & 20(RTN)
75	I S Fail OTU 270	P3 / Compl S2	59 (J2-23 & J4-8-RTN)	R-O / O-R	6 & 19(RTN)
76	I S Fail OTU 28	P3 / Compl S2	60 (J2-48 & J4-8-RTN)	R-G / G-R	5 & 18(RTN)
77	I S Fail OTU 29	P3 / Compl S2	61 (J2-24 & J4-9-RTN)	R-BR / BR-R	4 & 17(RTN)
78	I S Fail OTU 30	P3 / Compl S2	62 (J2-49 & J4-9-RTN)	R-S / S-R	3 & 16(RTN)
79	I S Fail OTU 31	P3 / Compl S2	63 (J2-25 & J4-30-RTN)	BK-BL / BL-BK	2 & 15(RTN)
80	I S Fail OTU 32	P3 / Compl S2	64 (J2-50 & J4-30-RTN)	BK-O / O-BK	1 & 14(RTN)
		P3 / Compl S2	No connection		13
81	A Pwr Fail - Sys. Shelf	A Pwr / System	65 (J3-10 & J3-31-RTN)	W-BL / BL-W	1 & 2(RTN)
82	B Pwr Fail - Sys. Shelf	B Pwr / System	66 (J3-35 & J3-31-RTN)	W-BL / BL-W	1 & 2(RTN)
83	A Pwr Fail - Compl 1 Shelf	A Pwr / Compl S1	67 (J3-11 & J3-32-RTN)	W-BL / BL-W	1 & 2(RTN)
84	B Pwr Fail - Compl 1 Shelf	B Pwr / Compl S1	68 (J3-36 & J3-32-RTN)	W-BL / BL-W	1 & 2(RTN)
85	A Pwr Fail - Compl 2 Shelf	A Pwr / Compl S2	69 (J3-12 & J3-33-RTN)	W-BL / BL-W	1 & 2(RTN)
86	B Pwr Fail - Compl 2 Shelf	B Pwr / Compl S2	70 (J3-37 & J3-33-RTN)	W-BL / BL-W	1 & 2(RTN)

Miscellaneous Discrete Cable Installation Procedure

Perform the following steps to install miscellaneous discrete cables:

(1) Verify power is off at the EMDUs (DANTEL or Harris).

(2) Route both twenty-five pin connector cables and one two pin connector cable through the left opening in the OT system shelf. Route one two pin connector cable through the right opening.

(3) Connect the twenty five pin miscellaneous discrete cables to J2 (CP Fail) and J3 (Inc Sig Fail) on the interconnection panel.

(4) Connect the two pin miscellaneous discrete cables to the A & B power filter connections. Allow extra length in cables as specified in Figure 4-8.

(5) Route cables along the cable rack to the input wiring points on DANTEL or Harris EMDU.

(6) Repeat steps 2, 3, and 4 for Complementary Shelf 1 and 2.

(7) Connect the miscellaneous discrete cables to the external miscellaneous discrete unit(EMDU) input terminal strip by cutting the cables to length and wire-wrapping the loose ends onto the terminal strip. The DANTEL or Harris EMDU are not to be located within the OT cabinet.

(8) Dress and tie cables.

Office Alarms Cable Installation

Description

■ Office alarms are commonly used by central office maintenance personnel to quickly identify a failed system. In R1-OT the operation of office alarms is not supported. The connector is provided on the interconnection panel for future releases. Wiring information is provided should the cable be wired at this time.

Available Office Alarms Cables

Table 4-15 lists cables that are available for the office alarms application.

Table 4-15. Office Alarms, Parallel Telemetry, and Miscellaneous Discrete Cables

ED-7G045-22 Cable Group	Cable Length (ft.)	Cable Type
1	As Specified	816AS 6/26
2	150	

Office Alarm Cable Connection

Table 4-16 lists office alarm cable connections and designations.

NOTE:
The designations and their associated pin numbers on this office alarm cable are different than the other alarm cables used for LCT and OLS. Follow wiring designations carefully.

Table 4-16. Office Alarm Cable Connection

Alarm Name	Designation	Pin	Wire Color
Office Alarm Major Audible	OAMJAUD	1	BL-W
Office Alarm Major Visual	OAMJVIS	2	O-W
Office Alarm Minor Visual	OAMNVIS	3	G-W
Office Alarm Minor Audible	OAMNAUD	4	BR-W
Office Alarm Critical Visual	OACRVIS	5	S-W
Office Alarm Critical Audible	OACRAUD	6	BL-R
No Connection	none	7	none
No Connection	none	8	none
Office Alarm Major Audible Return	OAMJAUDR	9	W-BL
Office Alarm Major Visual Return	OAMJVISR	10	W-O
Office Alarm Minor Visual Return	OAMNVISR	11	W-GR

Table 4-16. Office Alarm Cable Connection

Alarm Name	Designation	Pin	Wire Color
Office Alarm Minor Audible Return	OAMNAUDR	12	W-BR
Office Alarm Critical Visual Return	OACRVISR	13	W-S
Office Alarm Critical Audible Return	OACRAUDR	14	R-BL
No Connection	none	15	none

Office Alarm Cable Installation Procedure

During office alarm cable installation, note the following transient current considerations:

- Steady-state current for office alarm connections shall not exceed 0.9 amps at 60 volts or 1.8 amps at 30 volts. The maximum transient currents (20 msec. duration) during initial contact closure shall not exceed 9 amps at 60 volts or 18 amps at 30 volts.
- Use transient noise-suppressing devices to keep within the limits specified above. These devices may include diodes or contact suppression networks. If the protection devices are not adequate, use an external buffer relay.
- Use suppression devices across any external relay coil being driven by the OT. Selection of transient suppression devices shall be made according to the specific office alarm circuit arrangement.

Perform the following steps to install the office alarm (optional) cable:

(1) Route the office alarm cable through the left opening in the side of the OT system shelf.

(2) Connect the office alarm cable to J4 on the interconnection panel.

(3) Inspect the office alarm panel. Use a contact suppression network (refer to transient current considerations information above) if required.

(4) Connect the office alarm cable to the office alarm panel by cutting the cable to length and wire-wrapping the loose ends onto the panel.

(5) Label the connections that are wire-wrapped.

(6) Dress and tie the cable.

X.25 (TL-1) Telemetry Cable Installation

Description

X.25 is a synchronous network communication protocol commonly used with operations systems. It utilizes transaction language 1 (TL1) for the message language.

Available X.25 Telemetry Cables

Table 4-17 lists cables available for X.25 applications.

Table 4-17. X.25 Telemetry Cable

ED-7G045-22 Cable Group	Cable Length (ft.)	Cable Type
6	As Specified	321 46
7	150’	321 46

X.25 Telemetry Cable Connection

The X.25 telemetry cable connects to J12 on the interconnection panel.

Table 4-18 lists pin connections for the X.25 cable (EIA-232D). For more information about the TL1 interface refer to AT&T 824-102-176 Optical Line System (OLS) Operations Systems Engineering Guide.

Table 4-18. TL1/X.25 Interface - EIA-232D Pin Connections

Pin	Description
1	Protective Ground (Shield)
2	Transmitted Data
3	Received Data
4	Request to Send (RTS)

Table 4-18. TL1/X.25 Interface - EIA-232D Pin Connections

Pin	Description
5	Clear to Send (CTS)
6	DSR Data Set Ready
7	Signal Ground
8	Received Line Signal Detector
15	Transmitter Signal Element Timing (DCE to DTE)
17	Receiver Signal Element Timing (DCE to DTE)
20	DTR Data Terminal Ready*

.

Table 4-19 lists X.25 cable connections and designations for ED-7G045-22 Group 6 and 7 cables.

Table 4-19. X.25 Telemetry Cable Connection, G6 and G7

Name	Designation	P12 Terminal	Wire Color	Datakit End
Protective Ground	GRD	1	BK	1 GRD
MSR Transmit Data	MSRTDX	2	BL	2 TDX
MSR Receive Data	MSRRXD	3	O	3 RXD
MSR Request To Send	MSRRTS	4	G	No Connect
MSR Clear To Send	MSRCTS MSRDTR	5 20	BR W/G	4 RTS 20 DTR **
MSR Data Set Ready	MSRDSR	6	S	6 DSR
Signal Ground	GRD	7	W	7 GRD
MSR Receive Line Signal Detected	MSRRLSD	8	R	8 RLSD
No Connection	none	9	none	
No Connection	none	10	none	
No Connection	none	11	none	
No Connection	none	12	none	
No Connection	none	13	none	

Table 4-19. X.25 Telemetry Cable Connection, G6 and G7

Name	Designation	P12 Terminal	Wire Color	Datakit End
No Connection	none	14	none	
MSR Transmitter Signal Element Timing	MSRTSET	15	W/BL	15 TSET
No Connection	none	16	none	
MSR Receiver Signal Element Timing	MSRRSET	17	W/O	17 RSET
No Connection	none	18	none	
No Connection	none	19	none	
MSR Data Terminal Ready	MSRDTR MSRCTS	20 5	W/G BR	20 DTR 4 RTS **
No Connection	none	21	none	
MSR Ring Indicator	MSRRI	22	W/BR	22 RRI
No Connection	none	23	none	
No Connection	none	24	none	
No Connection	none	25	none	

** At the Datakit end of cable, Pin 4 is shorted to Pin 20 internally within the cable connector. Pin 4 at the Datakit end is wired to Pin 5 at the OT end (P12). Thus Pin 5 at the OT connector is also shorted to Pin 20.

X.25 Telemetry Cable Installation Procedure

Perform the following steps to install the X.25 telemetry cable:

NOTE:
Group 6 and 7 cables have a female (jack) connector with a blank label at one end and a male (plug) connector labeled P12 at the other end. The cable plug labeled P12 mates with the J12 socket on the OT. The jack (female) end is intended to mate with the X.25 network equipment.

(1) Mark the blank label at the female (socket) end of the cable with the appropriate jack number for the X.25 port on the operation support system.

(2) Making sure the plug (male) end(P12) of the cable is at the OT cabinet or the miscellaneously mounted shelf, route the X.25 cable out the right side of the OT System Shelf to the X.25 port of the operation support system.

(3) Connect the X.25 telemetry cable to J12 on the System Shelf interconnection panel.

(4) Connect the other end of the X.25 telemetry cable to the X.25 port of the operation support system.

(5) Dress and tie the cables.

CIT DTE Cables Installation

Description

The OT supplies access to remote CIT PCs through a local area network or modem connection to the CIT DTE port for future applications.

Available CIT DTE Cables

Table 4-20 lists cables available for CIT DTE applications.

Table 4-20. CIT DTE Cable

ED-7G045-22 Cable Group	Cable Length (ft.)	Cable Type
14	150’	321 46
15	As Req’d.	321 46

CIT DTE Cable Connection

The nine(9) pin connector of the CIT DTE telemetry cable connects to J1 on the OT interconnection panel. The twenty five(25) pin connector located at the other end of the cable is designed to connect to the local area network or modem .

The local area network or modem must meet the following requirements:

- Must be able to transmit at 300, 1200, 2400, 4800, or 9600 baud rate
- Must have an RS-232 DCE interface port
- Must be configured for 8 bit data bytes with 1 start bit and 1 stop bit
- Must not use the DSR lead.

Table 4-21 lists CIT DTE cable connections and designations.

Table 4-21. CIT DTE Cable Connection

Name	Designation	Modem 25 Pin	OT 9 Pin	Wire Color
Protective Ground	GRD	1	not present	BK ground wire
CT Transmit Data	CTTXD	2	3	BL
CT Receive Data	CTRXD	3	2	O
CT Request To Send	CTRTS	4	7	G
CT Clear To Send	CTCTS	5	8	BR
CT Data Set Ready	CTDSR	6	6	S
Signal Ground	GRD	7	5	W
CT Receive Line Signal Detected	CTRLSD	8	1	R
No Connection	none	9		none
No Connection	none	10		none
No Connection	none	11		none
No Connection	none	12		none
No Connection	none	13		none
No Connection	none	14		none
No Connection	none	15		none
No Connection	none	16		none
No Connection	none	17		none
No Connection	none	18		none
No Connection	none	19		none
CT Data Terminal Ready	CTDTR	20	4	W/G
No Connection	none	21		none
No Connection	none	22		none
No Connection	none	23		none
No Connection	none	24		none
No Connection	none	25		none

CIT DTE Cable Installation Procedure

Perform the following steps to install the CIT DTE cable:

(1) Both ends of the cable are connectorized. Making sure the socket end of the cable(P1) is at the OT equipment, route the CIT DTE cable out the left side of the OT shelf to the 25-pin D-type connector on the local area network or modem.

(2) Connect the CIT DTE cable to J1 on the interconnection panel.

(3) Connect the CIT DTE cable to the RS232 DCE port on the local area network or modem.

(4) Dress and tie the cables.

Final Verification

Perform the following steps to ensure that cables are properly installed:

(1) Verify that cables are properly secured and dressed.

(2) Verify that all cables are properly labeled.

Fiber Installation

5

Contents

Fiber Installation

5

Overview

⚠ CAUTION:
Procedures in this installation manual are only to be performed by trained personnel.

This section covers OT fiber installation.

General Considerations

⚠ CAUTION:
A wrist strap connected to a wrist strap ground jack on the terminal must be worn for ESD protection during the installation process.

⚠ CAUTION:
Connectors on the interconnect panel come equipped with protective ESD covers.These covers should be left in place on any connector that is not being immediately cabled so that ESD protections are maintained.

⚠ WARNING:
Unterminated optical connectors may emit laser radiation and should not be viewed with optical instruments (other than indirect image-converting devices). Also avoid direct exposure to beam.

Keep the following information under consideration during cable installation:

- This cable information is the latest cable information available at the time of the issue. For up-to-date information, refer to the ED cable drawings listed in the section 1, “Overall Installation and Test Considerations.”
- For ordering information, refer to Optical Translator (OT) Application, Planning, and Ordering Guide (365-575-400).
- Do not use cable ties with the optical fiber.
- Place optical fiber jumpers in protective tube or channel, such as polyvinyl chloride (PVC) tubing, when running the cable from the OLS to the cable rack.
- Place optical fiber jumpers in the cable rack in a protective channel with nothing on top of them.
- Maintain a minimum of 1.5 inches of optical fiber bend radius.
- Optical fiber jumpers require ST, FC/PC, or SC type connectors for connection to the OT.
- Do not remove the backplane cover during the installation process.

Fiber Jumper And Label Installation

Description

The Optical Translator (OT) cabinet can accommodate up to 32 Optical Translator Units (OTUs). Each one of these circuit packs requires two fibers, one input and one output. Connections are made to removable Optical Line Build-Outs (LBO). The input fibers originate from an external source and the output fibers exit the cabinet to an external location. In most instances this will be an OLS End Terminal. The cabinet will not have any internal fiber connections.

Available Fiber Jumpers

Table 5-1 lists some of the available jumpers for high speed fiber connection.

Table 5-1. Lightwave Jumpers

Code	Comcode	Length	Description
FS1EP-EP-02	107 149 494	2 ft.	ST II+ - ST II+
FS1EP-EP-10	107 149 536	10 ft.	ST II+ - ST II+
FS1EP-EP-25	107 149 569	25 ft.	ST II+ - ST II+
FS1EP-EP-50	107 149 601	50 ft.	ST II+ - ST II+
FS1EP-EP-100	107 149 627	100 ft.	ST II+ - ST II+

Fiber Routing and Installation

The following guidelines should be followed when installing fibers in the OT cabinet.

(1) Fibers are to enter and exit from the **left side of each shelf if the OTU to which they terminate is left of center.**

(2) Fibers are to enter and exit from the **right side of each shelf if the OTU to which they terminate is right of center.**

(3) After exiting each shelf, run fibers into split polyethylene tubes provided with the OT installation kit. Run tubes to the side of cabinet in the space between the shelves and the frame using cable ties to fasten them. If exiting at the top of cabinet run tubing through innermost rectangular hole at top of cabinet (Refer to Figure 5-1). For raised floor applications run out through the bottom of the cabinet exiting through large holes in cabinet frame.

(4) When routing fibers, do not remove protective covers at end of connector.

(5) Before routing fibers verify which OTU locations are to be used for the initial installation. The OTU locations selected by the customer may be anywhere within the three shelves. Install fibers only at slot locations that are to be used for this installation. If the OTU codes being used are known refer to Table 5-2 and Figure 5-2 for their location within the bay.

(6) To determine the approximate length of fiber required from the bottom of the shelf to the OTU input and OTU output, slide an OTU circuit pack into a shelf without inserting it and use it as gauge to determine fiber length. After determining the lengths for the input and output, remove OTU circuit pack.

⚠ CAUTION:
Do not connect fibers to OTU circuit packs at this time. Fibers may have power levels that could damage OTU receiver.

(7) All fibers are to be dressed from the OTU connectors down to the shelf's bottom edge, through the notched cutouts, and into the fiber channel just under the notches. Route fibers horizontally in fiber channel and exit at either end of shelf.

Table 5-2. OTU Codes and Their Assigned Slots

OTU CODE	SERVICE SLOTS	PROTECTION SLOTS
41A1, 41C1	OTU 1 & OTU 2	OTU 17 & OTU 18
41A2, 41C2	OTU 3 & OTU 4	OTU 19 & OTU 20
41A3, 41C3	OTU 5 & OTU 6	OTU 21 & OTU 22
41A4, 41C4	OTU 7 & OTU 8	OTU 23 & OTU 24
41A5, 41C5	OTU 9 & OTU 10	OTU 25 & OTU 26
41A6, 41C6	OTU 11 & OTU 12	OTU 27 & OTU 28
41A7, 41C7	OTU 13 & OTU 14	OTU 29 & OTU 30
41A8, 41C8	OTU 15 & OTU 16	OTU 31 & OTU 32

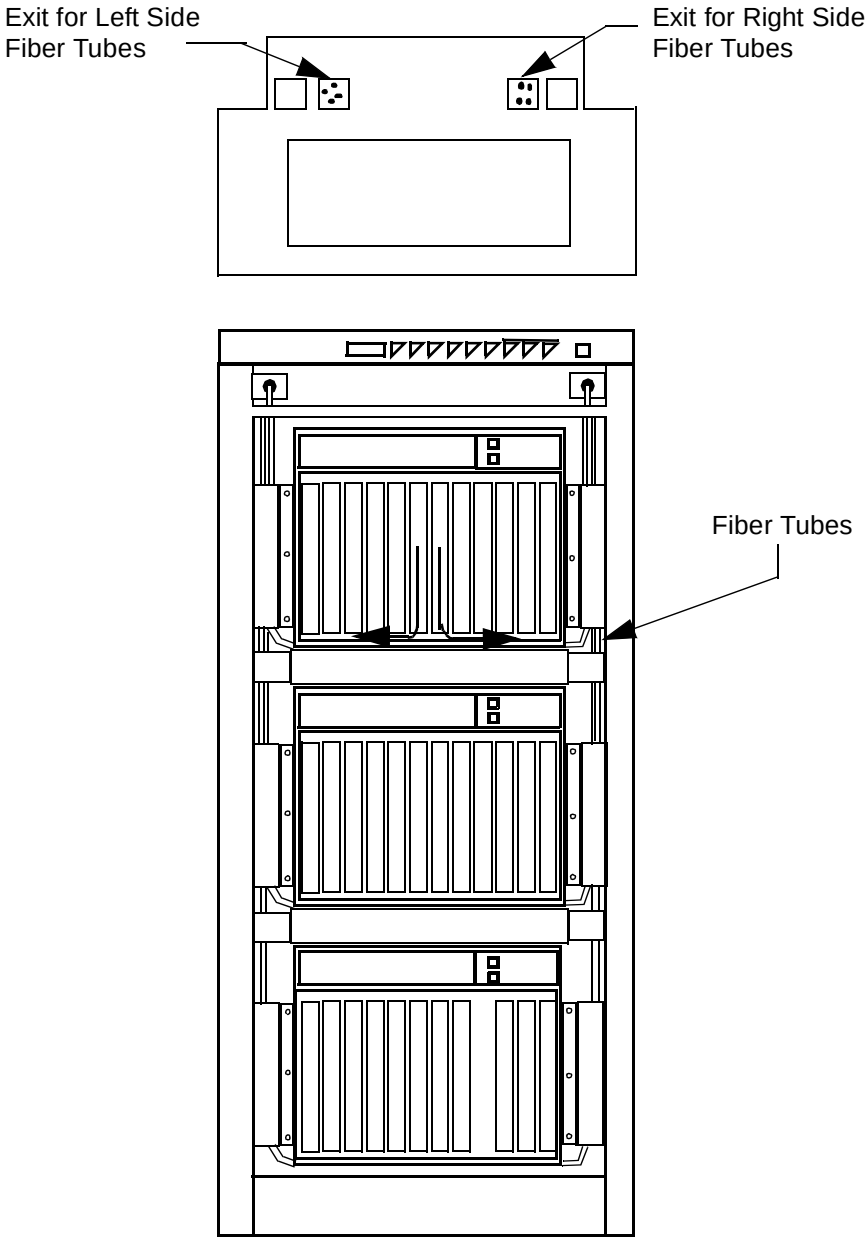


Figure 5-1. Fiber Routing for Overhead Rack Installations

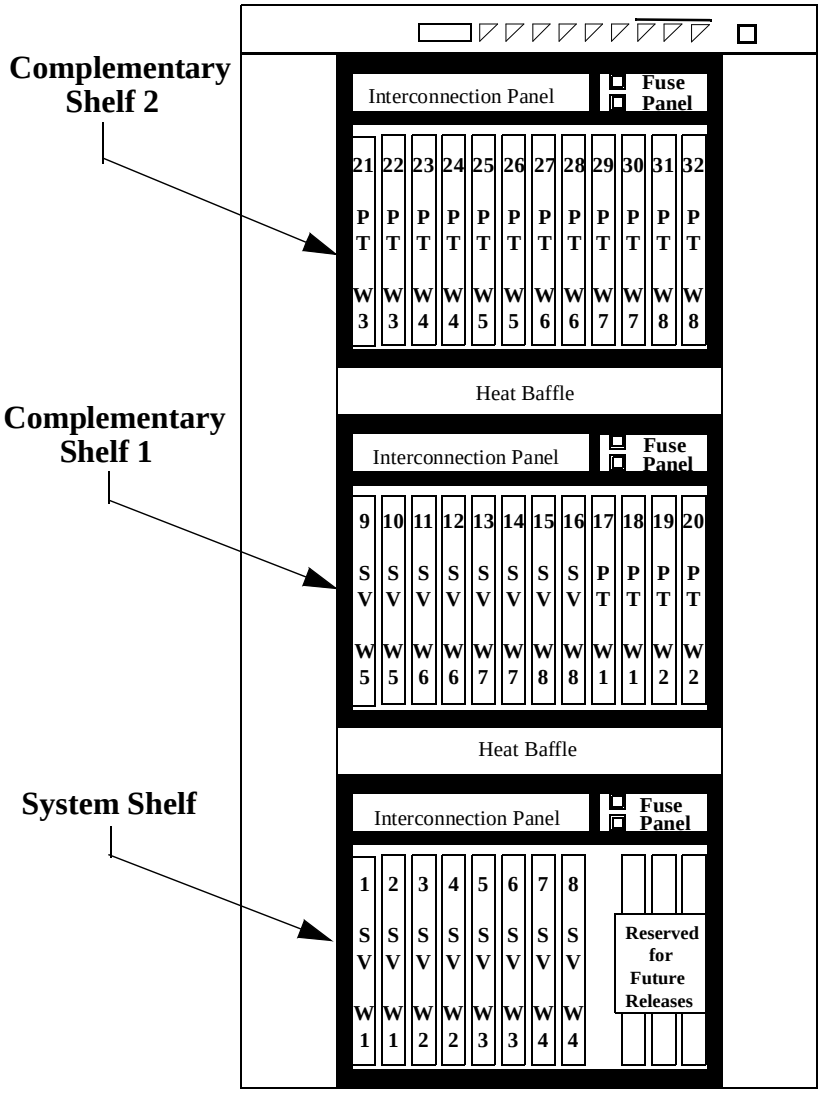


Figure 5-2. OT Cabinet Showing Assigned Slots.

Fiber Labelling

The fibers are to be labelled by the numbered OTU slot where they reside. The input fiber will have the OTU number followed by IN and the output fiber will have the OTU number followed by out. For Example: Two fibers are connected to an OTU at slot 26 in Complementary Shelf 2. The input fiber, which should be the longest fiber, will be labelled **OTU 26 IN** while the output fiber will be labelled **OTU 26 OUT.**

Follow the instructions on the label card for location on fiber connector and avoid running the label over embossed lettering on the connector.

Final Verification

Perform the following steps to ensure that cables are properly installed:

(1) Verify that fibers are properly secured and dressed.

(2) Verify that optical fiber is protected properly.

(3) Verify that all fibers are properly labeled.

(4) Verify that fibers are not connected to OTU circuit packs at the OT cabinet.

Powering

6

Contents

Powering

6

Overview

This section describes procedures to:

- Power OT Equipment

General Considerations

Note the following before starting:

- Disconnect the office alarms from the OT Network Element before performing any tests. Reconnect the office alarms after completing the testing.

Tools, Test Sets, and Accessories

The following equipment is required to complete the procedures in this section:

- Multimeter capable of measuring resistance (ohms) and DC volts from -40 to -60 volts.
- Wrist strap connected to the wrist strap ground jack of the user panel for ESD protection.

OT Cabinet Powering

Description

Two -48V DC power feeders connect to the OT shelf fuses. From the fuses, power is channeled through a filter to the backplane of the shelf and to the circuit packs.

NOTE:
The red power lead connects to -48V DC source. The white power lead connects to battery return.

Powering Procedure

Perform the following steps to power the OT shelves:

☐ (1) Verify that all packing material has been removed from the cabinet and shelf.

☐ (2) Verify the following:

- Breakers at the Battery Distribution and Fuse Bay (BDFB) are in the OFF position, or
- Fuses on the BDFB are not yet installed.

☐ (3) Verify that there are no circuit packs in any of the three shelves.

☐ (4) Remove the fuses from the fuse holders on all three shelves by opening the retainer, lifting up on the bottom edge, and pressing lightly down on the top edge of the fuse cap until it pops out.

Check Battery Cable Not Grounded

☐ (5) Using an ohmmeter, measure the resistance from the top terminal inside each fuse holder to frame ground. Refer Figure 6-1 which shows where to take the measurement from the front of the shelf.

Requirement: The resistance should show an open circuit (more than a megohm reading) for each fuse. If the resistance measurement requirement is not met, check the battery cables.

Check Battery Return Cable Connected

☐ (6) Locate the Supply A Power Filter at the left side of the interconnection panel on Complementary Shelf 2 (Top Shelf). Remove the spade lug terminal from the **top** terminal of the filter. The wire color is BLACK and the terminal is labeled -48VR. Using an ohmmeter, measure the resistance from the wire end to cabinet frame ground.

Requirement: The resistance shall measure less than one (1) ohm. After completing the measurement, restore connection to power filter.

☐ (7) .At the top right side of Complementary Shelf 2, remove the screw that holds the fuse panel cover in place and swing out the fuse panel door. Locate the Supply B Power Filter at the right side of the interconnection panel. Remove the spade lug terminal from the **bottom** terminal of the filter. The wire color is SLATE/BLACK and the terminal is labeled -48VR. Using an ohmmeter, measure the resistance from the wire end to cabinet frame ground.

Requirement: The resistance shall measure less than one (1) ohm. After completing the measurement, restore connection to power filter. Close fuse panel door and tighten panel holding screw.

NOTE: Since the power cable is tied together for all three shelves, the battery return measurement need only to be done at one of the three shelves.

Power Cabinet/Check Voltage

☐ (8) Insert 20 amp fuses into the OT power feeds at the BDFB. If breakers are being used, put them in the ON position.

☐ (9) Using the voltmeter, measure the voltage from the top terminal of each fuse holder on all three shelves to the terminal grounding cable or an unpainted frame ground surface. Refer to Figure 6-1 which shows where to take the measurement from a front view of the terminal.

Requirement: The voltage should be -48 volts (between -41.75 and -60.0 VDC) at each fuse holder.

NOTE:
Measure the voltage at the top of the fuse holder, not at the rear.

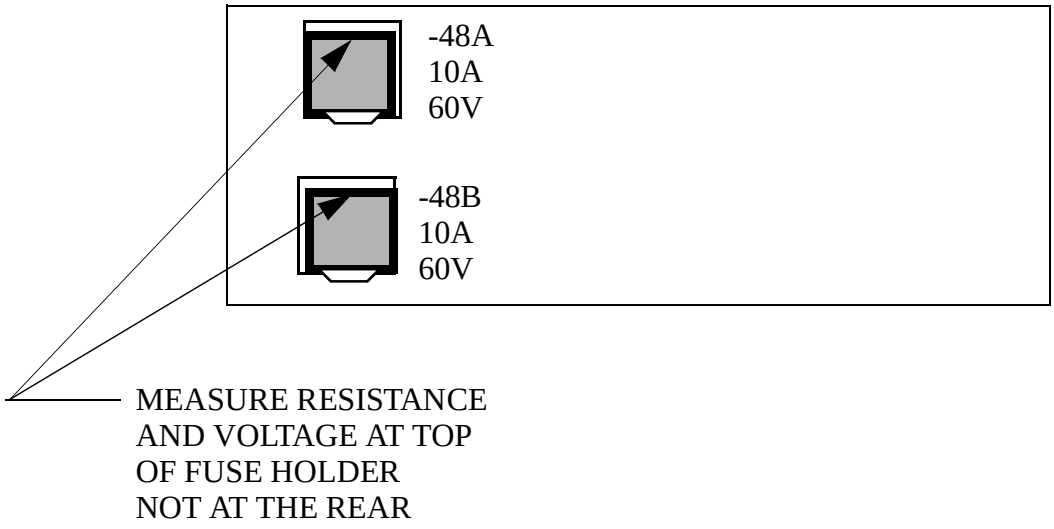


Figure 6-1. Fuse Panel Measurement Point

Power Shelves

NOTE:
The fuse cap lamp is a fuse status indicator. The cap lamp works correctly when it is fully engaged and the fuse retainer is locked in place. If the lamp lights in any other position, it may incorrectly indicate a fuse failure.

☐ (10) Insert two 10 amp fuses into the fuse holders of the lower shelf per the following:

a. Open the retainer from the bottom edge and swing it up and out of the way.

b. Put the fuse in the fuse cap, and the entire assembly in the fuse holder on the fuse panel. Be sure to put the lettering right-side-up.

c. Push up and in gently on the bottom edge of the fuse. The fuse will secure in place.

d. Close the retainer over the fuse cap and snap it in place.

Requirement: The PWR ON LED is illuminated on the indicator strip for the lower shelf.

☐ (11) Insert two 10 amp fuses into the fuse holders of the middle shelf per the following:

a. Open the retainer from the bottom edge and swing it up and out of the way.

b. Put the fuse in the fuse cap, and the entire assembly in the fuse holder on the fuse panel. Be sure to put the lettering right-side-up.

c. Push up and in gently on the bottom edge of the fuse. The fuse will secure in place.

d. Close the retainer over the fuse cap and snap it in place.

Requirement: The PWR ON LED is illuminated on the indicator strip for the middle shelf.

☐ (12) Insert two 10 amp fuses into the fuse holders of the upper shelf per the following:

a. Open the retainer from the bottom edge and swing it up and out of the way.

b. Put the fuse in the fuse cap, and the entire assembly in the fuse holder on the fuse panel. Be sure to put the lettering right-side-up.

c. Push up and in gently on the bottom edge of the fuse. The fuse will secure in place.

d. Close the retainer over the fuse cap and snap it in place.

Requirement: The PWR ON LED is illuminated on the indicator strip for the upper shelf.

Verify A Feed

☐ (13) Disconnect the B power feed by turning the breaker off or removing the fuse for the B power feed at the BDFB.

Requirement: The PWR ON LED for all three shelves should remain illuminated.

☐ (14) Remove the B fuse from the lower shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the lower shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing power when it should still be available from battery A. Correct the error as needed and re-test.

☐ (15) Remove the B fuse from the middle shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the middle shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing power when it should still be available from battery A. Correct the error as needed and re-test.

☐ (16) Remove the B fuse from the upper shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the upper shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing power when it should still be available from battery A. Correct the error as needed and re-test.

☐ (17) Reinsert the B fuse into the fuse panel for all three shelves.

☐ (18) Turn the breaker on or replace the fuse for the B power feed at the BDFB.

Verify B Feed

☐ (19) Disconnect the A power feed by turning the breaker off or removing the fuse for the A power feed at the BDFB.

Requirement: The PWR ON LED for both shelves should remain illuminated.

☐ (20) Remove the A fuse from the lower shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the lower shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing power when it should still be available from battery B. Correct the error as needed and re-test.

☐ (21) Remove the A fuse from the middle shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the middle shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing power when it should still be available from battery B. Correct the error as needed and re-test.

☐ (22) Remove the A fuse from the upper shelf fuse panel.

Requirement: Verify that the PWR ON LED is still on for the upper shelf.

If the LED is not on, then the A and B power feeders to the OT are swapped, indicated by the shelf losing when it should still be available from battery B. Correct the error as needed and re-test.

☐ (23) Reinsert the A fuse into the fuse panel for all three shelves.

☐ (24) Turn the breaker on or replace the fuse for the A power feed at the BDFB.

Start Up and Local Installation Testing

7

Contents

Start Up and Local Installation Testing

7

Overview

This section describes testing of the Optical Translator Cabinet(OT) and miscellaneous mount OT, the miscellaneous discretes on each OTU, the associated wiring to the EMDU, and the optical output of each OTU. Tests described in this section must be performed on each OTU and OT cabinet or miscellaneous mount shelf.

General Considerations

⚠ WARNING:
Unterminated optical connectors may emit laser radiation. Do not view beam with optical instruments. Avoid direct exposure to beam.

Note the following before starting installation tests:

- Disconnect the office alarm cable from the OT before performing any tests. Reconnect the office alarm cable after completing testing.

Tools, Test Sets and Accessories

The following equipment is required for performing installation tests:

- One wrist strap connected to the wrist strap ground jack on the user panel for ESD protection.
- Two single mode optical cables with appropriate connectors (ST) on each end. (recommended length of 2 to 4 feet)

- Optical Power meter
- Single Mode 33 dB attenuated fiber jumper with ST connectors (not required if power meter rating +16 dBm or greater)
- A Sonet frame OC-48 optical signal from an LCT transmitter at any wavelength or any OLS channel operating with an OC-48 signal. If not available, a test set that generates an OC-48 optical signal will be required such as the Lucent Technologies OC-48 Optical Signal Source (**ITE Number 7089**) or Tektronix ST2400 Test Set with opt 12.
- Optical connector cleaning accessories as described in Appendix A.

General Circuit Pack Installation Considerations

- A wrist strap, connected to the wrist strap ground jack on the user panel or filter panel, must be worn when handling circuit packs or touching the terminal.
- Before installing any circuit packs, inspect the **circuit pack side** of the backplane for any bent or broken backplane pins. If any pins are found to be bent, straighten the pin if possible.
- Any bent pins that cannot be straightened or broken pins must be replaced using the BERG MT370 pin kit for the METRAL pins. Refer to Appendix B "Pin Repair".
- When installing circuit packs, use care to insert them straight to avoid damaging the circuit packs or the backplane pins.
- Fiber connectors on optical circuit packs should always be either connected to fiber or covered by protective covers. Verify the OTU code to be installed with the slot number.
- Check that the input and output fibers are clear as the OTU circuit pack is inserted into the slot.

⚠ CAUTION:
Do not connect fibers to OTU circuit packs at this time. Do not connect the fiber until instructed to do so.

OTU Miscellaneous Discrete Tests

The testing of the miscellaneous discrete contacts will be performed as a combined OT/OLS test using a fully tested OLS. This test will verify the operation of the miscellaneous discretes on each OTU circuit board and at each OTU slot connector. It will verify the wiring to the EMDU, the operation of the EMDU, the TBOS link to the OLS, and the OLS software with each alarm.

To start testing of miscellaneous discretes the following steps must have been completed:

- The OLS must be installed and tested through Section 14 of the OLS IM (365-575-310 Issue 2).
- The OLS must be loaded with release 2.0 software.
- Wiring to the EMDU from the OT must be complete as described in Tables 4-5 through 4-10 or Table 4-11.
- Wiring to the EMDU from the OLS and the -48 Volt supply voltage must be complete as specified in Appendix C or D.
- Switch and strap settings on the EMDU must be completed as described in Appendix C or D. If switch settings must be changed, the DANTEL EMDU must be powered down for the new settings to be activated.

Testing OTU Miscellaneous Discrete Alarms

The procedure for testing miscellaneous discrete alarms is as follows:

1. Enable the Serial Telemetry Port by entering the following command through the CIT at the OLS.

   Security_Set_Security_Port_SER-TLM_Enable

   If a SER-TLM alarm comes on after enabling the port, communications is not being made with the EMDU (DANTEL or Harris). Check that the serial telemetry cable from the EMDU is connected to the SER TLM 1 port of the OLS. Check that the OLS end terminal that is receiving the Serial Telemetry cable has been activated. Verify wiring and switch settings at the EMDU. Check that the EMDU is powered.

2. Verify that the OLS is free of environmental alarms using the command:

   FAULT_Retrieve_Alarms(All)

3. If environmental alarms exist, clear the environmental alarms before proceeding. Use Table 7-1 to identify the OTU slot associated with each alarm. The presence of an environmental alarm indicates that the alarm wiring has a short. Locate and repair short.

Table 7-1. OLS Alarm Numbers versus OTU Slot Number

OTU SLOT Number	CP FAIL Circuit Pack Failure OLS Environmental Alarm Number	LOS Loss of Incoming Signal OLS Environmental Alarm Number	Wavelength	Protection or Service
1	17	49	1	Service
2	18	50	1	Service
3	19	51	2	Service
4	20	52	2	Service
5	21	53	3	Service
6	22	54	3	Service
7	23	55	4	Service
8	24	56	4	Service
9	25	57	5	Service
10	26	58	5	Service
11	27	59	6	Service
12	28	60	6	Service
13	29	61	7	Service
14	30	62	7	Service
15	31	63	8	Service
16	32	64	8	Service
17	33	65	1	Protection
18	34	66	1	Protection
19	35	67	2	Protection
20	36	68	2	Protection
21	37	69	3	Protection
22	38	70	3	Protection
23	39	71	4	Protection
24	40	72	4	Protection
25	41	73	5	Protection
26	42	74	5	Protection

OTU SLOT Number	CP FAIL Circuit Pack Failure OLS Environmental Alarm Number	LOS Loss of Incoming Signal OLS Environmental Alarm Number	Wavelength	Protection or Service
27	43	75	6	Protection
28	44	76	6	Protection
29	45	77	7	Protection
30	46	78	7	Protection
31	47	79	8	Protection
32	48	80	8	Protection

4. Remove any fibers connected to OTU cirvuit packs
5. Install, but do not seat OTU circuit packs into the Complementary Shelf 2 (top shelf) starting with OTU Slot 32 continuing in a decreasing numerical sequence. If the Complementary Shelf 2 becomes full, continue loading into Complementary Shelf 1 starting with OTU slot 20 and continuing to the next lowest slot number until all the OTUs have been installed. The slot location of the OTU codes is not important at this time. Do not connect any fibers to OTUs at this time.
6. Following the general circuit pack installation considerations given at the beginning of this section, seat the OTU mounted in slot 32.

   Requirement: The fault LED is on continuously at initial circuit pack installation. Less than one minute after insertion, the fault LED will change to flashing and remain flashing.
7. Apply an OC-48 signal **(-11 to -27 dBm)** to the input of the OTU in slot 32. This signal may be obtained from an LCT transmitter operating at any wavelength, or from any OLS OMU input or ODU output having an OC-48 signal, or a test set with an OC-48 source as recommended in the Tools, Test Sets, and Accessories of this section.
   If the ITE Number 7089 Test Set is to be used for the OC-48 source, the output must be fiber connected to the input prior to plugging in the AC power cord. Once powered the fiber may be disconnected from the input while maintaining the output connection and connected to the OTU input.

   Requirement: Less than one minute after applying an OC-48 signal to the input of the OTU, the flashing LED will turn OFF.

8. Wait for one minute after the LED turns OFF and **unseat the OTU while keeping the OC-48 fiber connected** to the input of the OTU. The fiber with the OC-48 signal on it is to be disconnected from the input ounce the pack has become unseated.
9. Verify the operation of the miscellaneous discrete alarms by reviewing the Alarm History report using the command:

   FAULT_Retrieve_History_Retrieve-History

   Requirement: The history report must show environment 48 ON and environment 80 ON. They must be followed by a environment 48 Cleared and environment 80 Cleared. The order in which the alarms clear is not a requirement. All other alarms must be OFF. If another environment alarm is ON, it may be shorted to one of the OTU Slot 32 alarms (env 48 or env 80). Compare the alarm history report to the one shown in Table 7-2.

Table 7-2. Alarm History Report for Alarms 38 and 70

```
M Retrieve-History: COMPLD
   /* Maintenance History Report

================================================================
=========
   Date  Time      System  Source        Event
   of Event        Alarm   Address       Description

================================================================
=========
   01-30 03:18:40 -        env-80        environment 80-cleared
   01-30 03:18:25 MN       env-48        environment 48-cleared
   01-30 03:17:43 MN       env-80        environment 80
   01-30 03:17:28 MN       env-48        environment 48
```

(5). Repeat steps 5 through 7 at the next lowest OTU slot until all the OTUs that were installed have been tested. After testing the last OTU, remove this OTU from its slot and move it down to the next lowest numbered slot. Repeat steps 5 through 7. Repeat this sequence until all 32 slots have been tested.

(6). Request a history report using the command:

FAULT_Retrieve_History_Retrieve-History

(7). **CRITICAL** - Verify proper operation of all the alarms. Report to be similar to an abbreviated report shown in Table 7-3.

Table 7-3. Alarm History Report for Miscellaneous Discretes Test

```
M Retrieve-History: COMPLD
   /* Maintenance History Report

=================================================================
   Date Time      System Source        Event
   of Event        Alarm   Address       Description

=================================================================
   04-04 11:34:59-         env-49        environment 49-cleared
   04-04 11:34:45 MN       env-17        environment 17-cleared
   04-04 11:34:02 MN       env-49        environment 49
   04-04 11:33:47 MN       env-17        environment 17
   04-04 11:33:10 -        env-18        environment 18-cleared
   04-04 11:33:01 MN       env-50        environment 50-cleared
   04-04 11:32:28 MN       env-50        environment 50
   04-04 11:32:13 MN       env-18        environment 18
   04-04 11:31:38 -        env-51        environment 51-cleared
   04-04 11:31:36 MN       env-19        environment 19-cleared
   04-04 11:30:53 MN       env-51        environment 51
   04-04 11:30:38 MN       env-19        environment 19


   Date Time      System Source        Event
   of Event        Alarm   Address       Description

=================================================================
   04-04 11:30:04 -        env-52        environment 52-cleared
   04-04 11:30:01 MN       env-20        environment 20-cleared
   04-04 11:29:18 MN       env-52        environment 52
   04-04 11:29:04 MN       env-20        environment 20
   04-04 11:28:41 -        env-53        environment 53-cleared
   04-04 11:28:38 MN       env-21        environment 21-cleared
   04-04 11:27:55 MN       env-53        environment 53
   04-04 11:27:41 MN       env-21        environment 21
   04-04 11:27:18 -        env-54        environment 54-cleared
   04-04 11:27:15 MN       env-22        environment 22-cleared
   04-04 11:26:32 MN       env-54        environment 54
   04-04 11:26:17 MN       env-22        environment 22
   04-04 11:25:43 -        env-55        environment 55-cleared
   04-04 11:25:40 MN       env-23        environment 23-cleared
   04-04 11:24:57 MN       env-55        environment 55
   04-04 11:24:43 MN       env-23        environment 23
   04-04 11:23:56 -        env-56        environment 56-cleared
```

```
================================================================

   Date Time      System Source        Event
   of Event        Alarm   Address       Description

================================================================
   04-04 11:23:53 MN      env-24        environment 24-cleared
   04-04 11:23:10 MN      env-56        environment 56
   04-04 11:22:55 MN      env-24        environment 24
    ..     ..    ..        ..            ..         ..
    ..     ..    ..        ..            ..         ..
    ..     ..    ..        ..            ..         ..
   04-04 11:18:45 -       env-42        environment 42-cleared
   04-04 11:18:37 MN      env-74        environment 74-cleared
   04-04 11:18:03 MN      env-74        environment 74
   04-04 11:17:36 MN      env-42        environment 42
   04-04 11:16:50 -       env-75        environment 75-cleared
   04-04 11:16:23 MN      env-43        environment 43-cleared
   04-04 11:16:04 MN      env-75        environment 75
   04-04 11:15:26 MN      env-43        environment 43
   04-04 11:14:16 -       env-76        environment 76-cleared
   04-04 11:14:13 MN      env-44        environment 44-cleared

================================================================
   Date Time      System Source        Event
   of Event        Alarm   Address       Description

================================================================
   04-04 11:13:31 MN      env-76        environment 76
   04-04 11:13:16 MN      env-44        environment 44
   04-04 11:12:39 -       env-45        environment 45-cleared
   04-04 11:12:30 MN      env-77        environment 77-cleared
   04-04 11:11:56 MN      env-77        environment 77
   04-04 11:11:41 MN      env-45        environment 45
   04-04 11:10:31 -       env-78        environment 78-cleared
   04-04 11:10:28 MN      env-46        environment 46-cleared
   04-04 11:09:46 MN      env-78        environment 78
   04-04 11:09:31 MN      env-46        environment 46
   04-04 11:08:08 -       env-79        environment 79-cleared
   04-04 11:08:06 MN      env-47        environment 47-cleared
   04-04 11:07:23 MN      env-79        environment 79

================================================================
   Date Time      System Source        Event
   of Event        Alarm   Address       Description

================================================================
   04-04 11:07:08 MN      env-47        environment 47
```

```
   04-04 10:53:57 -        env-80          environment 80-cleared
   04-04 10:52:31 MN       env-48          environment 48-cleared
   04-04 10:51:48 MN       env-80          environment 80
   04-04 10:51:34 MN       env-48          environment 48
================================================================================
```

Installing OTUs into Final Positions

The installation instructions will specify the location of each OTU circuit pack. A system has been developed which specifies the slots to be assigned to each OTU code. In addition, slots have been assigned positions for providing Service or Protection. These assigned locations are shown in Table 7-4 and Figure 7-1.

Following the precautions previously listed at the beginning of this Section, install and seat all OTU circuit packs into their final positions. Refer to Table 7-4 and Figure 7-1 to verify location. All OTUs at this time should have their faceplate LED flashing.

Table 7-4. OTU Codes and Their Assigned Slots

OTU CODE	SERVICE SLOTS	PROTECTION SLOTS
41A1C, 41C1C	OTU 1 & OTU 2	OTU 17 & OTU 18
41A2C, 41C2C	OTU 3 & OTU 4	OTU 19 & OTU 20
41A3C, 41C3C	OTU 5 & OTU 6	OTU 21 & OTU 22
41A4C, 41C4C	OTU 7 & OTU 8	OTU 23 & OTU 24
41A5C, 41C5C	OTU 9 & OTU 10	OTU 25 & OTU 26
41A6C, 41C6C	OTU 11 & OTU 12	OTU 27 & OTU 28
41A7C, 41C7C	OTU 13 & OTU 14	OTU 29 & OTU 30
41A8C, 41C8C	OTU 15 & OTU 16	OTU 31 & OTU 32

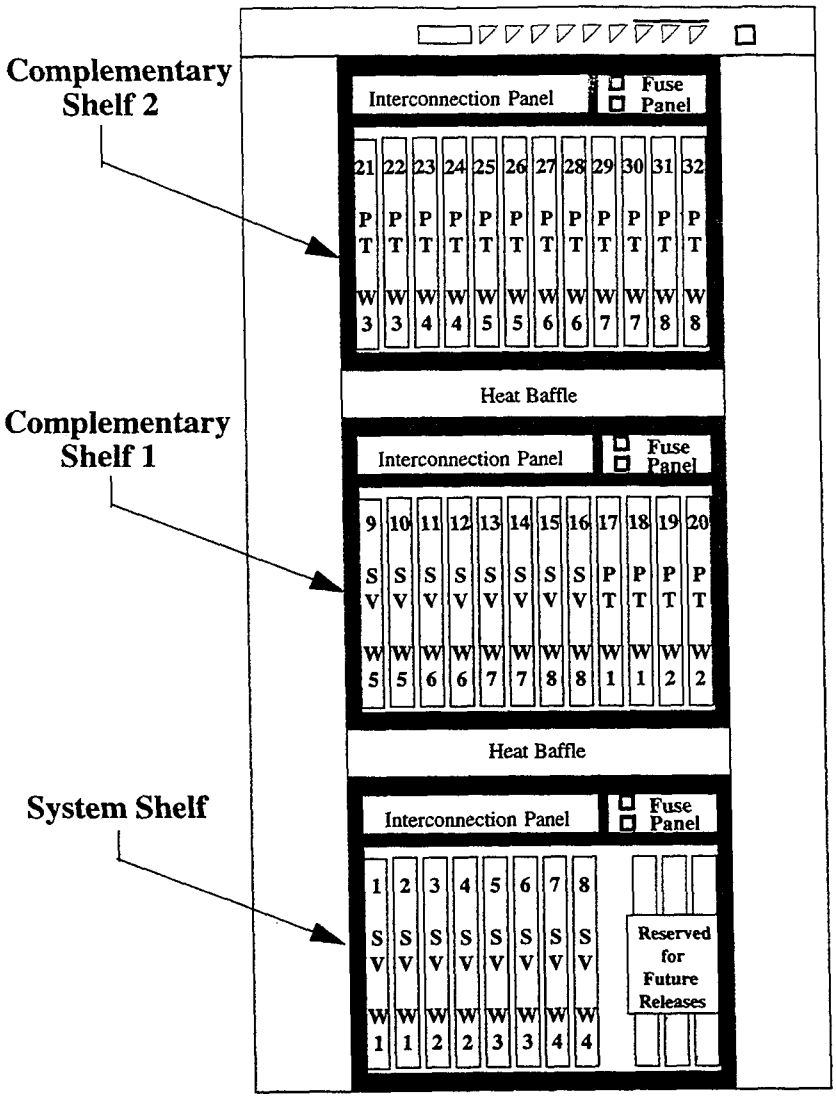


Figure 7-1. OT Cabinet Showing Assigned Slots.

Provisioning of Miscellaneous Discretes

The miscellaneous discrete alarms, which have been identified as environmental alarms with an assigned number, will be provided with descriptions that define their function. The description for environmental alarms 17 through 48 will be CP FAIL OTU "N". Environmental alarms 49 through 80 will be identified as LOS OTU "N" where "N" is the OTU slot number associated with that alarm. At this time only the slots with OTUs in them need to be provisioned with these descriptions. Refer to Table 7-1 to obtain the alarms associated with each OTU Slot and their function.

In addition to the OTU miscellaneous discrete alarms, each shelf has two alarms to indicate an A or B power failure for a total of six alarms. The power fail alarms are environmental alarms 81 through 86. They are listed in Table 7-5 along with their descriptions for provisioning.

Table 7-5. Power Fail Miscellaneous Discrete Alarms

Environmental Alarm No.	Alarm Description	Provisioned Description
81	A Power Fail - System Shelf	A PWR FAIL SYS
82	B Power Fail - System Shelf	B PWR FAIL SYS
83	A Power Fail - Complementary Shelf 1	A PWR FAIL CMP 1
84	B Power Fail - Complementary Shelf 1	B PWR FAIL CMP 1
85	A Power Fail - Complementary Shelf 2	A PWR FAIL CMP 2
86	B Power Fail - Complementary Shelf 2	B PWR FAIL CMP 2

To explain the provisioning process an example is presented.

Example: Provision an OTU mounted in slot 12.

Go to Table 7-1 and look up the alarms associated with OTU Slot 12. They are environmental alarm 28 (CP Fail) and 60 (LOS).

To provision each alarm enter the following command through the CIT:

CONFIGURATION_Set _Attribute_ Environment_28_<Enter>

The CIT screen will respond with the following:

ALARM LEVEL: MN

DESCRIPTION: environment 28

Press the <Enter> key.

The CIT screen will respond with the following:

ALARM LEVEL: MN

DESCRIPTION: environment 28

In place of environment 28 type in capital letters CP FAIL OTU 12.

The CIT screen should appear as follows:

ALARM LEVEL: MN

DESCRIPTION: CP FAIL OTU 12

Press the <enter> key and the <F9> to execute the change. Environmental alarm 28 is now provisioned as CP FAIL OTU 12.

Repeat the process for environmental alarm 60 so that it will be provisioned LOS OTU 12.

Repeat the process until the alarms for all installed OTUs have been provisioned. OTU slots that are without OTU circuit packs need not to be provisioned at this time.

To save time during the entry process follow the procedure given below:

(1) Press the <F9> Key to repeat the previous screen.

(2) Press the <ESC> key to return to the alarm number.

(3) Type in the next alarm number and press the <Enter> key.

(4) The CIT screen describes the default alarm level as MN. Press the <Enter> key.

(5) The CIT screen will now allow the entry of the new description.

(6) Enter the new description and Press <Enter> followed by the <F9> key.

(7) Repeat the process until all the alarms have been entered.

When the alarm provisioning has been completed, request a listing of the provisioned alarms using the following command:

CONFIGURATION_Retrieve_Attribute_Environment_All

Table 7-6 shows a complete listing of all the provisioned alarms. Compare the provisioned alarm descriptions on the CIT screen with those given in Table 7-6. Make the appropriate corrections if required until alarm descriptions are in agreement with Table 7-6.

Table 7-6. Provisioned Alarm Descriptions

```
   M Retrieve-Attribute-Environment:All: COMPLD
   /* Environmental Alarm Provisioning Report

==========================================================================
   Address Alarm Description
           Level
```

```
=================================================================
   env-1      MN     environment 1
   env-2      MN     environment 2
   env-3      MN     environment 3
   env-4      MN     environment 4
   env-5      MN     environment 5
   env-6      MN     environment 6
   env-7      MN     environment 7
   env-8      MN     environment 8
   env-9      MN     environment 9
   env-10     MN     environment 10
   env-11     MN     environment 11
   env-12     MN     environment 12

=================================================================
   Address Alarm Description
           Level

=================================================================
   env-13     MN     environment 13
   env-14     MN     environment 14
   env-15     MN     environment 15
   env-16     MN     environment 16
   env-17     MN     CP FAIL OTU 1
   env-18     MN     CP FAIL OTU 2
   env-19     MN     CP FAIL OTU 3
   env-20     MN     CP FAIL OTU 4
   env-21     MN     CP FAIL OTU 5
   env-22     MN     CP FAIL OTU 6
   env-23     MN     CP FAIL OTU 7
   env-24     MN     CP FAIL OTU 8
   env-25     MN     CP FAIL OTU 9
   env-26     MN     CP FAIL OTU 10
   env-27     MN     CP FAIL OTU 11
   env-28     MN     CP FAIL OTU 12
   env-29     MN     CP FAIL OTU 13

=================================================================
   Address Alarm Description
           Level

=================================================================
   env-30     MN     CP FAIL OTU 14
   env-31     MN     CP FAIL OTU 15
   env-32     MN     CP FAIL OTU 16
   env-33     MN     CP FAIL OTU 17
   env-34     MN     CP FAIL OTU 18
   env-35     MN     CP FAIL OTU 19
```

```
   env-36     MN     CP FAIL OTU 20
   env-37     MN     CP FAIL OTU 21
   env-38     MN     CP FAIL OTU 22
   env-39     MN     CP FAIL OTU 23
   env-40     MN     CP FAIL OTU 24
   env-41     MN     CP FAIL OTU 25
   env-42     MN     CP FAIL OTU 26
   env-43     MN     CP FAIL OTU 27
   env-44     MN     CP FAIL OTU 28
   env-45     MN     CP FAIL OTU 29
   env-46     MN     CP FAIL OTU 30

==========================================================================
   Address Alarm Description
           Level

==========================================================================
   env-47     MN     CP FAIL OTU 31
   env-48     MN     CP FAIL OTU 32
   env-49     MN     LOS OTU 1
   env-50     MN     LOS OTU 2
   env-51     MN     LOS OTU 3
   env-52     MN     LOS OTU 4
   env-53     MN     LOS OTU 5
   env-54     MN     LOS OTU 6
   env-55     MN     LOS OTU 7
   env-56     MN     LOS OTU 8
   env-57     MN     LOS OTU 9
   env-58     MN     LOS OTU 10
   env-59     MN     LOS OTU 11
   env-60     MN     LOS OTU 12
   env-61     MN     LOS OTU 13
   env-62     MN     LOS OTU 14
   env-63     MN     LOS OTU 15

==========================================================================
   Address Alarm Description
           Level

==========================================================================
   env-64     MN     LOS OTU 16
   env-65     MN     LOS OTU 17
   env-66     MN     LOS OTU 18
   env-67     MN     LOS OTU 19
   env-68     MN     LOS OTU 20
   env-69     MN     LOS OTU 21
   env-70     MN     LOS OTU 22
   env-71     MN     LOS OTU 23
```

```
   env-72     MN     LOS OTU 24
   env-73     MN     LOS OTU 25
   env-74     MN     LOS OTU 26
   env-75     MN     LOS OTU 27
   env-76     MN     LOS OTU 28
   env-77     MN     LOS OTU 29
   env-78     MN     LOS OTU 30
   env-79     MN     LOS OTU 31
   env-80     MN     LOS OTU 32

=================================================================
   Address Alarm Description
           Level

=================================================================
   env-81     MN     A PWR FAIL SYS
   env-82     MN     B PWR FAIL SYS
   env-83     MN     A PWR FAIL CMP 1
   env-84     MN     B PWR FAIL CMP 1
   env-85     MN     A PWR FAIL CMP 2
   env-86     MN     B PWR FAIL CMP 2
     ..       ..          ..      ..
     ..       ..          ..      ..
     ..       ..          ..      ..
   env-143    MN     environment 143
   env-144    MN     environment 144
```

Final Testing of OTU Circuit Packs

Test Description

The purpose of this test will be to determine that the OTU receiver is operational, and the transmitter output power is within specification. An OC-48 signal is required to perform this task. The OTU transmitter will not turn ON unless it is receiving an OC-48 signal at its input.

Test Procedure

Perform the following steps to test the OTUs:

⚠ CAUTION:
High power optical signal levels may be present during the following testing. If using an optical power meter that is not rated for +16 dBm, use a 33 dB attenuator cable between the optical source and the meter.

(1) Obtain an OC-48 Signal from an LCT, an OLS ODU with an OC-48 signal, or a test set with an OC-48 source. Verify with an optical power meter that the OC-48 source is within the input specification of the OTU **(-11 to -27 dBm)**.

(2) Remove the ESD covers from one of the OTUs and connect the OC-48 signal to the input. Connect an optical power meter to the OTU output using an optical fiber with ST connectors.

Requirement: The output power from the OTU Code shall be between the minimum and maximum power specified in Table 7-7 and the fault LED shall be OFF.

(3) If the OTU meets requirement, remove the fibers used for testing and replace the protective ESD covers. Do not install the input or output fibers.

(4) Repeat steps one through three until all the OTUs have been tested.

Table 7-7. OTU Code versus Wavelength, Output Power, and Tone Frequency

OTU CODE	Center Wavelength (nm)	Output Power Range (dBm)	Approximate Tone Frequency (KHz)
41A1C, 41C1C	1549.43	-5.0 to -3.0	5
41A2C, 41C2C	1551.03	-6.3 to -4.3	7
41A3C, 41C3C	1552.64	-7.5 to -5.5	9
41A4C, 41C4C	1554.25	-8.2 to -6.2	11
41A5C, 41C5C	1555.86	-8.7 to -6.7	15
41A6C, 41C6C	1557.48	-9.2 to -7.2	17
41A7C, 41C7C	1559.10	-9.0 to -7.0	19
41A8C, 41C8C	1560.72	-7.5 to -5.5	21
41BB	1310.00	0.0 to 2.0	NA

Miscellaneous Discrete Power Fail Test

When the A or B shelf supply fails due to a fuse failure or a low voltage cutoff, the miscellaneous discrete Circuit Pack Fail Alarm is activated for every OTU installed within the shelf. In addition, each shelf will have two miscellaneous discrete Power Fail alarms. One for the A power source and the other for the B power source. The alarm is located within the power filter and activates when there is a low voltage cutoff or a fuse failure.

NOTE:
The fuse cap lamp is a fuse status indicator. The cap lamp works correctly when it is fully engaged and the fuse retainer is locked in place. If the lamp lights in any other position, it may incorrectly indicate a fuse failure.

The procedure for testing the operation of these alarms is as follows:

(1) Verify that all OTUs are seated in their slots and are powered. All OTUs should have their faceplate LED flashing.

(2) Verify by using the CIT command **FAULT_Retrieve_Alarm(all)** that the slots with OTUs have only Incoming Signal Fail (LOS) Alarm (alarms 49 through 72). Alarm numbers 17 through 48 (CP FAIL) are to be OFF. Power Fail alarms, 81 through 86, are to be OFF.

(3) Remove the A fuse from the System Shelf.

(4) Verify using the CIT that the correct Power Fail Alarm has turned ON (refer to Table 7-5). All other Power Fail alarms are to be OFF.

(5) Verify using the CIT that the circuit pack fail alarms (CP FAIL) turn ON for all the OTUs plugged into the System Shelf. These circuit pack fail alarms will only appear on the CIT terminal. The circuit pack faceplate LEDs will remain flashing during this test.

(6) Replace the A fuse and **WAIT** one minute.

(7) Using the CIT command **FAULT_Retrieve_Alarm(all)**, verify that the CP FAIL and Power Fail alarms have cleared.

(8) Remove the B fuse from the System Shelf.

(9) Verify using the CIT that the correct Power Fail Alarm has turned ON (refer to Table 7-5). All other Power Fail alarms are to be OFF

(10) Verify using the CIT that the circuit pack fail alarms (CP FAIL) turn ON for all the OTUs plugged into the System Shelf. These circuit pack fail alarms will only appear on the CIT terminal. The circuit pack faceplate LEDs will remain flashing during this test.

(11) Replace the B fuse and **WAIT** one minute.

(12) Using the CIT command **FAULT_Retrieve_Alarm(all)**, verify that the CP FAIL and Power Fail alarms have cleared.

(13) Repeat steps 3 through 12 for Complementary Shelves 1 and 2.

(14) When completed, unplug circuit packs and leave in slots.

(15) Replace shelf EMC covers by hooking hinge pins in place and pushing up on cover until top of cover is tight against shelf. Tighten retaining screws by turning them clockwise until they stop.

Final Operations

Complete the following checks before proceeding to integration testing.

- Verify that the OTUs are mounted in the correct slots
- Verify that the correct codes are in these slots.
- All OTUs should be unseated in their slots.
- All fibers shall be disconnected from the OTUs.
- Dust covers are to be on the input and output ports of each OTU.
- OTU fibers shall have protective covers on them.
- Verify that EMC covers have been installed and are locked in place.

Proceed to Section 7 in the FT-2000 OC-48 Large Capacity Terminal Integration Manual (365-575-211).

Fiber Cleaning

A

Contents

Fiber Cleaning

A

Description

It is critical that optical connectors be kept clean to avoid connector damage.

The presence of hydrocarbons and other contaminates on optical connectors has been related to catastrophic damage at high optical power levels such as those encountered in the OLS system.

The conventional method of cleaning the optical ferrule end face requires the use of isopropyl (reagent grade) alcohol, wiping tissues, and canned air. While it is possible to achieve good results with the conventional method, this document presents a new recommended procedure for cleaning connectors on systems with high optical power levels.

WARNING:
Disconnected or separated optical connectors may emit invisible laser radiation. Do not view the lightwave beam with an optical instrument. Avoid direct exposure to the beam.

NOTE:
All optical fiber connectors (ST, FC/PC, and SC types), lightguide buildouts, and buildout blocks or equivalents should be cleaned before making initial connections or reconnections per the following instructions. Only the components being assembled at this particular time should be cleaned.

Keep all dust caps and plugs in place until time to make connections

Equipment Required

Recommended Procedure:

Recommended Procedure:

- CLETOP Reel Type A[1]
- CLETOP Reel Type B[2]
- CLETOP Stick Type
- Optical quality tissue
- Isopropyl (Reagent Grade) alcohol

Conventional Procedure:

- Optical quality tissue
- Isopropyl (Reagent Grade) alcohol
- Pipe cleaner
- Canned air or nontoxic gas

Fiber Cleaning Procedure

Disassemble

(1) Remove (if necessary) lightguide jumper from buildout, or remove dustcap (if necessary) from the optical connector.

(2) Remove (if necessary) lightguide buildout from buildout block. Unlock the tab by depressing the locking beam on the buildout and pushing in and rotate in counterclockwise direction and separate from the buildout block by sliding apart.

1. Available from Speer Fiber Optics, 18 Pierson Drive, Belle Mead, NJ 08502, Phone (908) 359-1173
2. CLETOP TYPE B - The use of is not approved by Lucent Technologies for cleaning ST, FC/PC, and SC type connectors.

CAUTION:
Locking beam must only be pushed along a line perpendicular to buildout body in direction towards the buildout in order to avoid damage to the locking beam.

Clean (Recommended new procedure)

Optical jumpers and pigtails

NOTE:
All disconnected fiber optic connectors should be capped. All optical connectors should be cleaned before each use and before being assembled in the line build-out.

(1) Remove (if necessary) lightguide jumper from buildout, or remove dustcap (if necessary) from the optical connector.

(2) Remove (if necessary) lightguide buildout from buildout block. Unlock the tab by depressing the locking beam on the buildout and pushing in and rotate in counterclockwise direction and separate from the buildout block by sliding apart.

CAUTION:
Locking beam must only be pushed along a line perpendicular to buildout body in direction towards the buildout in order to avoid damage to the locking beam.

(3) Clean (if necessary) the cylindrical surface of the connector ferrule with a tissue dampened with isopropyl (reagent grade) alcohol.

(4) Hold CLETOP Reel Type A cleaner in the palm of your left hand and rotate the lever with your thumb. This opens the shutter and winds the cleaning cloth.

(5) While holding the lever down, press the optical ferrule endface against the cleaning cloth and drag the plug towards you.

(6) Rotate the connector 90°, press the optical ferrule endface against the cleaning cloth in the right slot and drag it toward you.

(7) Be sure the optical plug is pressed firmly against the cleaning tape surface while dragging the plug. Insufficient cleaning may result from not enough pressure.

(8) Release the lever, allowing it to return to its initial position. The shutter will close when this is done.

Optical connectors inside the faceplate and other receptacled devices

NOTE:
To prevent contamination, the optical ports should be covered with a dust cap when not in use.

(1) Removing (if necessary) the Line Buildout.

(2) Use the stick type CLETOP cleaners to clean connector ferrule endfaces in hard to reach places such as inside of LBOs by first wiping the cleaning cloth on the tip of the CLETOP stick against the ferrule end face.

(3) Replace the line buildout.

Clean (conventional cleaning procedure) if required

Optical jumpers and pigtails

NOTE:
All disconnected fiber optic connectors should be capped. All optical connectors should be cleaned before each use and before being assembled in the line build-out.

(1) Remove (if necessary) lightguide jumper from buildout, or remove dustcap (if necessary) from the optical connector.

(2) Remove (if necessary) lightguide buildout from buildout block. Unlock the tab by depressing the locking beam on the buildout and pushing in and rotate in counterclockwise direction and separate from the buildout block by sliding apart.

CAUTION:
Locking beam must only be pushed along a line perpendicular to buildout body in direction towards the buildout in order to avoid damage to the locking beam.

(3) Clean the end and the sides of the connectors, buildouts, and blocks with a lint-free, optical quality tissue dampened with isopropyl (Reagent Grade) alcohol.

(4) Carefully wipe the connector, buildouts, and blocks again with a clean, dry, lint-free optical quality tissue.

(5) Blow any lint or dust from the connectors, buildouts, and blocks using canned air or a nontoxic gas held 3 inches away.

(6) Clean the inside of the block (and 0 dB buildout only) using a pipe cleaner moistened with isopropyl (Reagent Grade) alcohol.

CAUTION:
Do not use a pipe cleaner on attenuated buildouts (3, 5, 7, 10, 15, and 20 dB) as the lens can be damaged.

(7) Blow any lint or dust from inside the block, using canned air or a nontoxic gas held 3 inches away.

Assemble

(1) Assemble by inserting the buildout into the block by aligning the buildout with the slot in the block.

(2) Align the buildout with the slot in the buildout block, push in, and rotate clockwise until locked into position.

(3) Slide the connector onto the buildout and rotate it clockwise until locked into position.

Pin Repair

B

Contents

Pin Repair

B

General

This section describes the procedures for terminal repair in FASTECH and METRAL technology using the KS-22876, L6 Pin Repair Kit for the FASTECH technology and the BERG MT370-01 Tool Kit for the METRAL technology. The tools were designed to remove and replace pins in MLPWB (Multilayer Printed Wiring Board) backplane areas equipped with or without spacer aligners.

Tool Kit Descriptions

KS-22876 L6 Pin Replacement Kit - Comcode 406984641

- L101 Handle Assembly
- L102 Extension Rod
- L103 Head No. 1 (inserts pins in spacer aligner areas from circuit pack side)
- L104 Head No. 2W (inserts pins in areas without spacer aligners from circuit pack side)
- L105 Head No. 3 (removes pins from wiring side)
- L106 Head No. 4 (removes stub of broken pins from wiring side)
- L107 Head No. 5 ((removes pins from circuit pack side)
- L110 Pin Gauge
- L112 Case

- L113 Instructions
- L114 Deburring Head
- L115 Drill Bit
- L116 Pin Vise
- AT-7860 D Long Nose Pliers (Insulated)

METRAL Press-Fit Repair Kit

- Repair Tool Kit: BERG MT370-01
- Individual Pins: See Table B-1 on page B-3
- Ordering Information: See Step 7 on page B-7

Pin Designations

Table B-1. FASTECH Pin Codes

PIN ID	Comcode	Pin Type or Commercial Code	FASTECH/ METRAL
B	106918477	1B32SG	FASTECH
E	105672729	1B27SG	FASTECH
H	103624987	1B14SG	FASTECH
I	106918485	1B33SG	FASTECH
J	407423524	1B34SG	FASTECH
O	103180287	1D1SG	FASTECH
Q	106918493	1C5SG	FASTECH
U	105424238	1D4SG	FASTECH
V	105396436	1B21SG	FASTECH
W	105396444	1B22SG	FASTECH
Y	408675594	1C6SG	FASTECH
3	103055943	1B3SG	FASTECH
6	105672711	1B26SG	FASTECH

Table B-2. METRAL Pin Codes

A		88929-102	METRAL
C		88929-119	METRAL
D		88930-101	METRAL
F		88929-106	METRAL
X		88929-120	METRAL

LCT Circuit Pack and Equipment Location

Table B-3. LCT Equipment Location (Switch Fabric Shelf)

Circuit Pack	Backplane Location	
SYSMEM	20-554	Controller Shelf Only
SYSCTL	20-534	Controller Shelf Only
TG1/2	20-504	Backplane Designation Only
USER PNL	43-505	Backplane Designation Only
SWICO (1-8)	20-123, 173, 223,273,323, 377,427, 477	
PWR A	44-551	Backplane Designation Only
PWR B	39-551	Backplane Designation Only
MCTL	20-554	Complimentary Shelf Only

Table B-4. LCT Equipment Location (Low Speed Shelf)

Circuit Pack	Backplane Location	
LSINTFC 1A-8B	07-026, 032, 038, 044, 050, 056, 062, 068, 122, 128, 134, 140, 146, 152, 158, 164	
LSSWIN	07-086	
LSSWOUT	07-092	
TG1	07-108	
TG2	07-116	
LS INTFC P1	07-074	
LS INTFC P2	07-080	
SYSCTL	07-172	Backplane Designation Only
SYSMEM	07-178	Backplane Designation Only
TOHCTL	07-100	
PWR A	17-173	Backplane Designation Only
PWR B	15-173	Backplane Designation Only
USER PNL	16-159	Backplane Designation Only

Table B-5. LCT Equipment Location (Enhanced High Speed Shelf)

Circuit Pack	Backplane Location	
SWX	07-126	Backplane Designation Only
TS1	07-041	Backplane Designation Only
TRMTRX	07-062	
TS2	07-072	Backplane Designation Only
RCVRX	07-080	
SWY	07-088	Backplane Designation Only
TS3	07-105	Backplane Designation Only
TRMTRY	07-126	
TS4	07-132	Backplane Designation Only
TS5	07-137	Backplane Designation Only
RCVRY	07-144	
LNCTLX	07-150	
LNCTLY	07-156	
OHCTLX	07-162	
OHCTLY	07-168	
LOHCTL	07-174	Backplane Designation Only
EQL	07-180	Backplane Designation Only
PWR A	17-173	Backplane Designation Only
PWR B	15-173	Backplane Designation Only
USER PNL	16-159	Backplane Designation Only

OLS Circuit Pack and Equipment Location

Table B-6. OLS Equipment Location

Circuit Pack	Backplane Location	
SYSMEM (LEA2)	20-604	
SYSCTL (LEA1)	20-584	
TOHCTL (LEA5)	20-554	
OA (LEA6/LEA6B)	20-534, 20-434, 20-330,20-230	
TLM (LDA1)	52-180, 52-230 52-280, 52-330	
OMU/ODU (505A/605A)	52-382, 52-430 52-478, 52-526	
USER PNL	45-557	Backplane Designation Only
PWR A	50-597	
PWR B	44-597	

OT Circuit Pack and Equipment Location

Table B-7. OT Equipment Location

Circuit Pack	Backplane Location	
SYSMEM	20-605	
SYSCTL	20-565	
TOHCTL	20-525	
OTU (System Shelf)	20-163 20-203 20-243 20-283 20-323 20-363 20-405 20-445 20-485	Note: Location 20-485 is not populated with any circut pack at this time Its inclusion is for accuracy

Table B-7. OT Equipment Location

Circuit Pack	Backplane Location	
OTU (Complimentary Shelves 1&2)	20-163 20-203 20-243 20-283 20-323 20-363 20-405 20-445 20-485 20-525 20-565 20-605	
PWR A	39-184	
PWR B	39-570	

Procedures for Pin Replacement

CAUTION:
This procedure must been done with the shelf out of service and powered down to insure no further damage to the equipment or to the person doing the pin replacement.

CAUTION:
Proper ESD precautions must be used.

(1) Determine if the bent or broken pin is in an OLS, OT or an LCT Bay.

(2) Determine the shelf in which the bent or broken pin resides (ex. Switch Fabric Shelf).

(3) Determine the circuit pack slot in which the pin resides.

(4) Determine the number and column location of the pin.

(5) Refer to the correct figure (Figures B-1 through B-19 on pages B-8 through B -26) to determine the letter pin code associated with the pin.

(6) Using Table 1, "FASTECH Pin Codes," on page 3, determine the type of pin (either METRAL or FASTECH) and the correct comcode for the replacement pin.

(7) Obtain the correct replacement pin (See the Applications, Planning, and Ordering Guide for ordering information).

(8) If the pin to be replaced is a METRAL type pin, refer to "METRAL Press-Fit Repair Kit MT370-01" documentation for proper procedures to remove and replace the bent or broken pin.

(9) If the pin to be replaced is a FASTECH type pin, refer to "KS-22876 L513 Instruction Pin replacement for FASTECH Technology Using the KS-22876 L6 Pin Kit" documentation for proper procedures to remove and replace the bent or broken pin.

Reference Notes:

(1) 1-Type contacts shall be press fit from the component side.

(2) 1D1 contacts shall be broken off on the component side after insertion.

(3) 1B32, 1B33, 1B34, and 1C6 contacts shall be broken off on the noncomponent side after insertion.

High Speed Shelf notes:

(4) The C847324282 backplane assembly is shown on pages 18 and 19. This was discontinued approximately 12-96. The current backplane assembly is C847779808. It is similar in all respects except that some pin fields are not populated. The List tag on the top of the bay will call out which backplane is used when correlated with the respective J-drawing.

(5) Pin substitutions (for High Speed Shelf only):

The 1B32SG may be used for the 1B26SG.

The 1B34SG may be used for the 1B27SG.

The 1B33SG may be used for the 1B28SG.

Large Capacity Terminal (LCT) - Pin Type Location

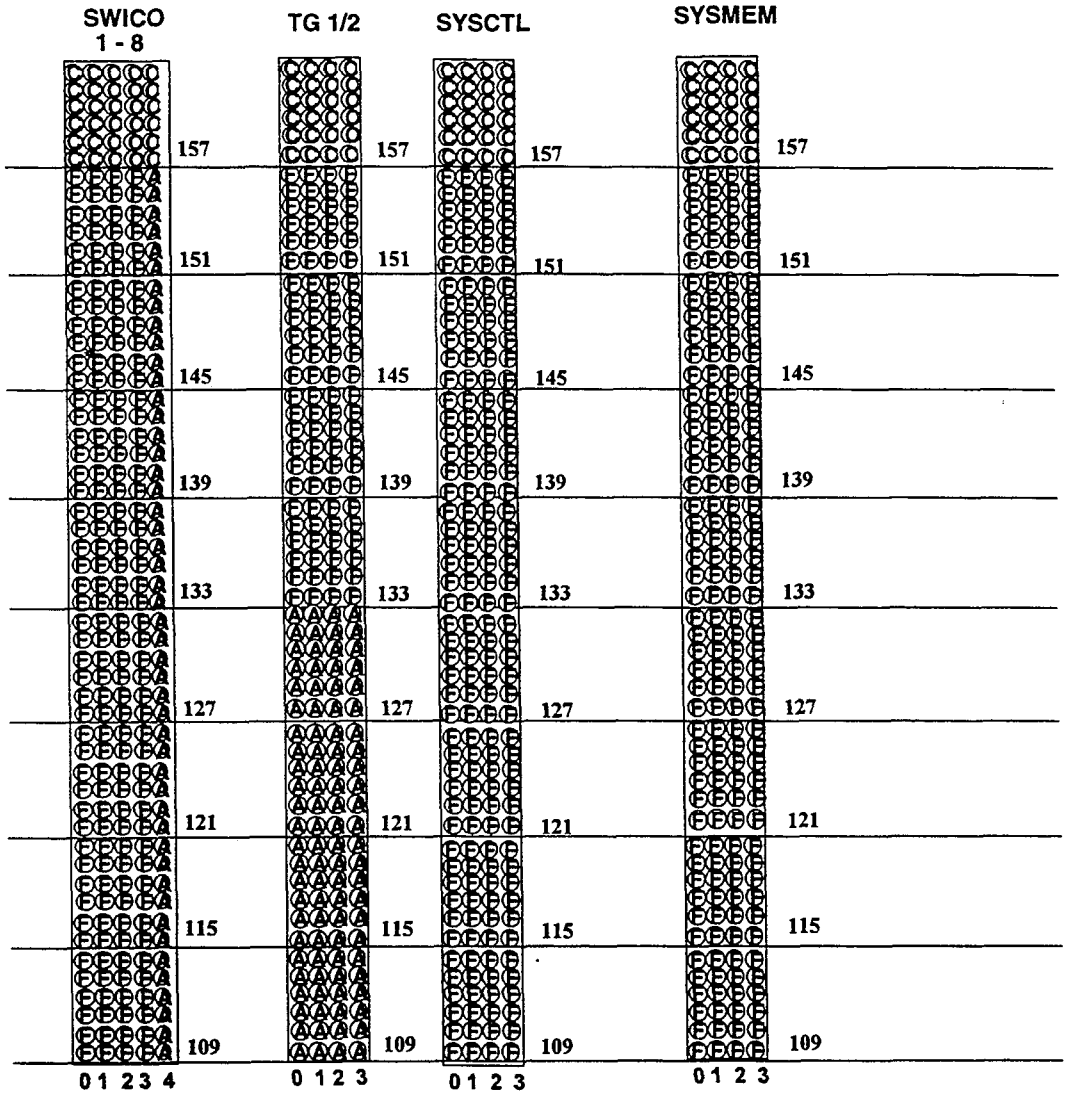


Figure B-1. LCT Switch Fabric Shelf - System Controller (Upper) - Compon Side View

Large Capacity Terminal (LCT) - Pin Type Location

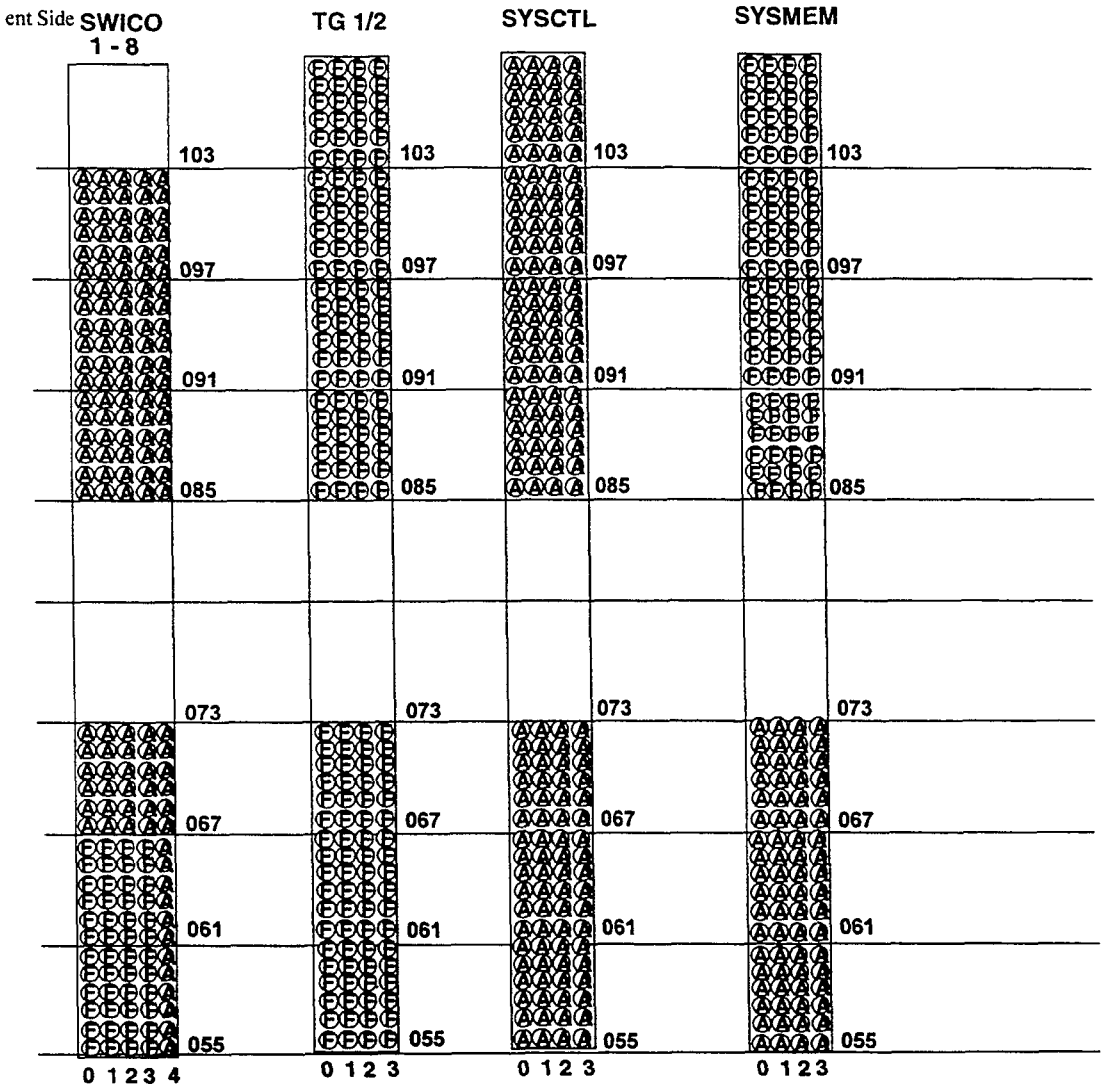


Figure B-2. LCT Switch Fabric Shelf System Controller (Middle) - Compone Side View

Large Capacity Terminal (LCT) - Pin Type Location

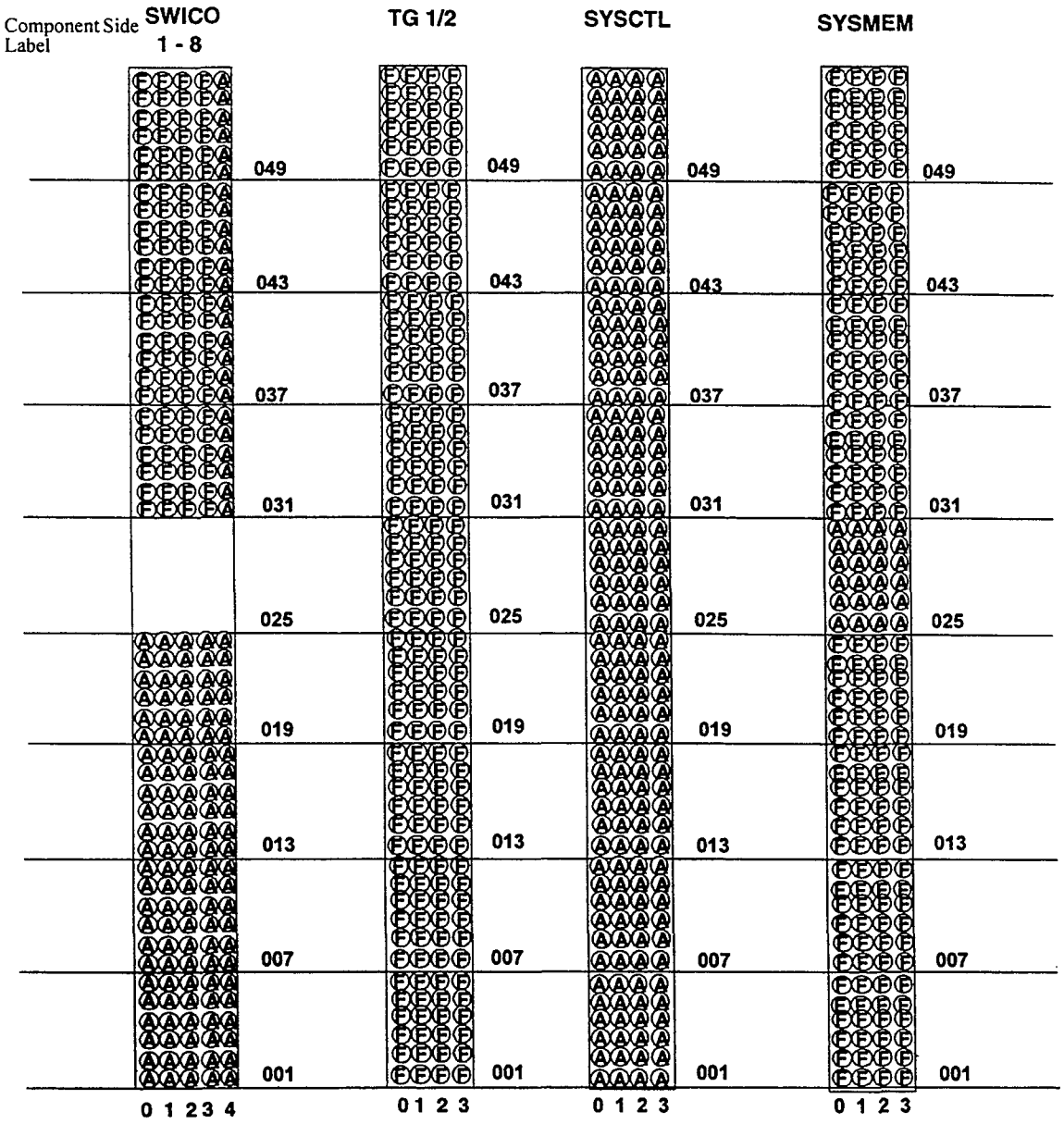


Figure B-3. LCT Switch Fabric Shelf System Controller (Lower) - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

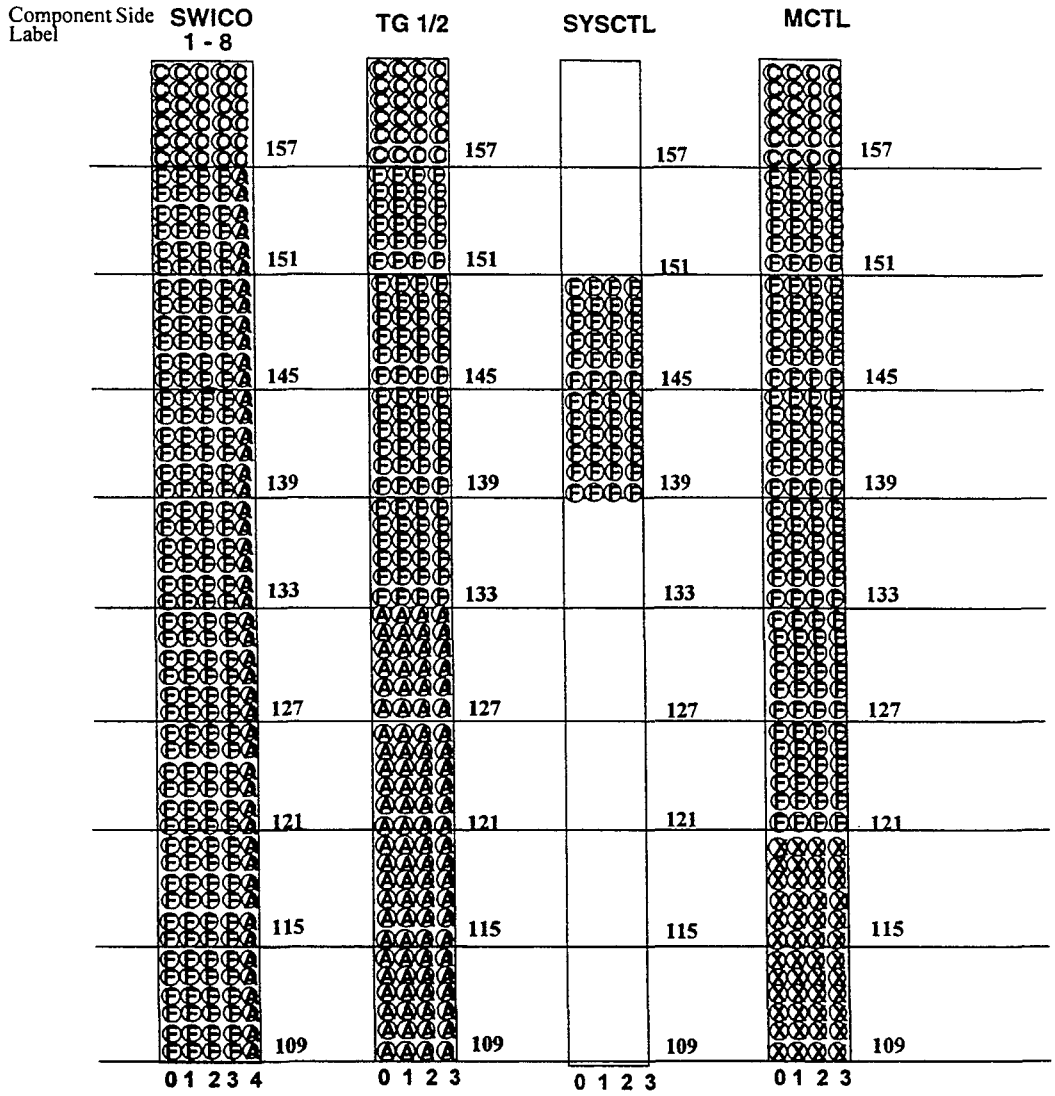


Figure B-4. LCT Switch Fabric Shelf Complementary (Upper) - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

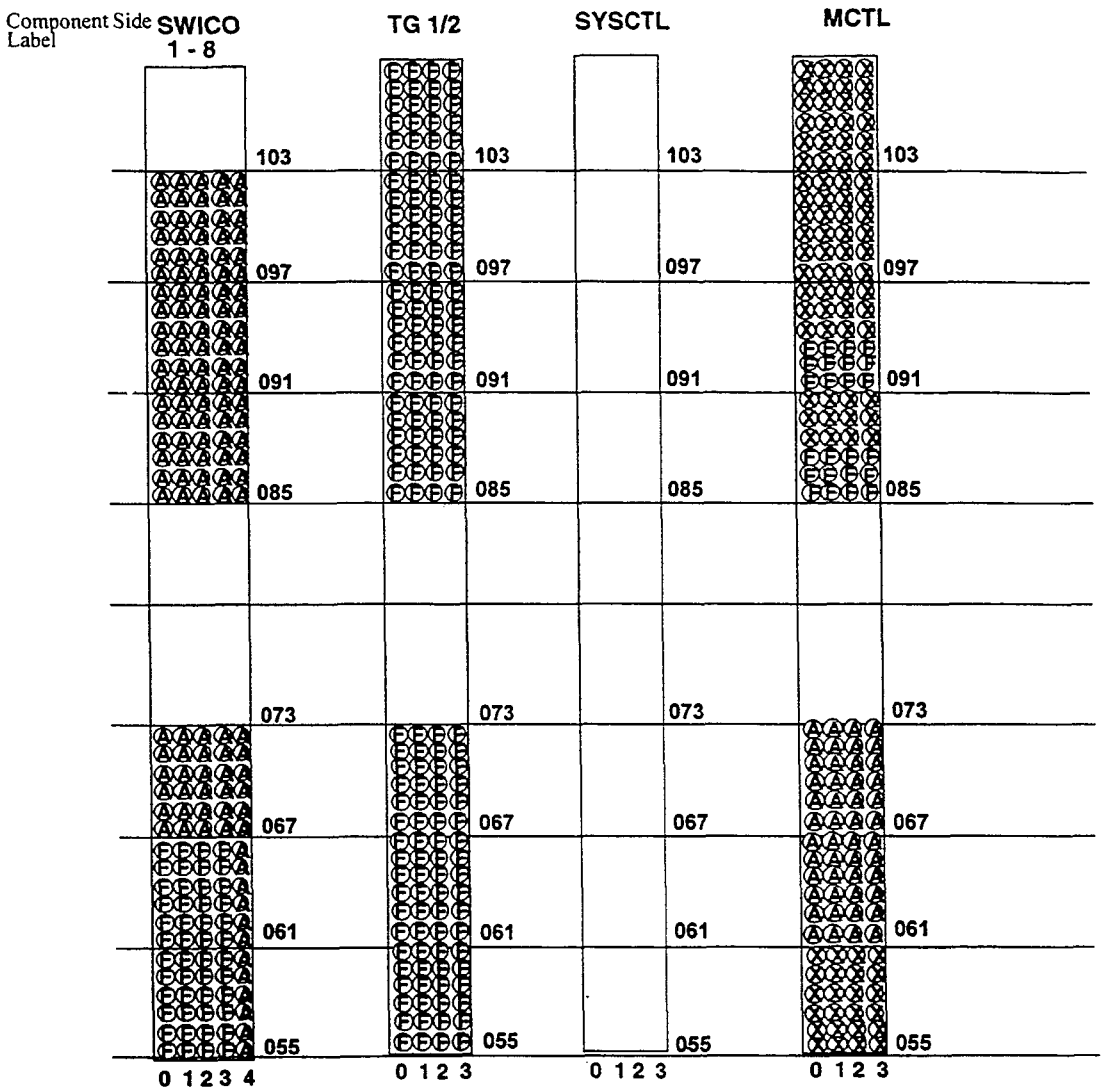


Figure B-5. LCT Switch Fabric Shelf Complementary (Middle) - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

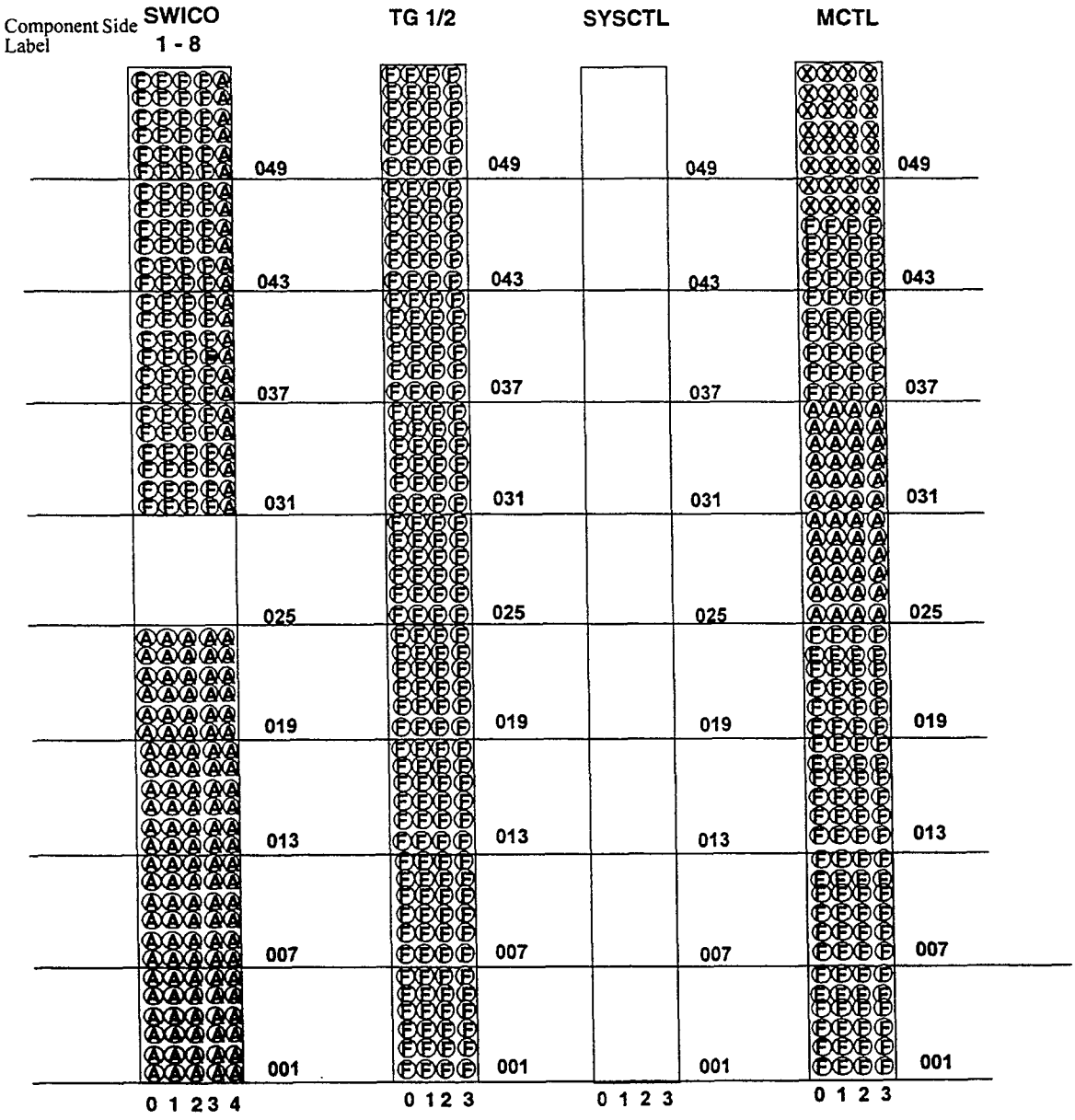


Figure B-6. LCT Switch Fabric Shelf Complementary (Lower) - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

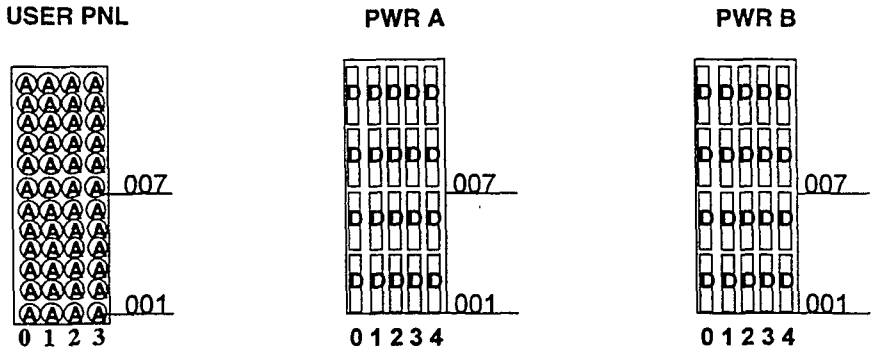


Figure B-7. LCT User and Power Panel - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

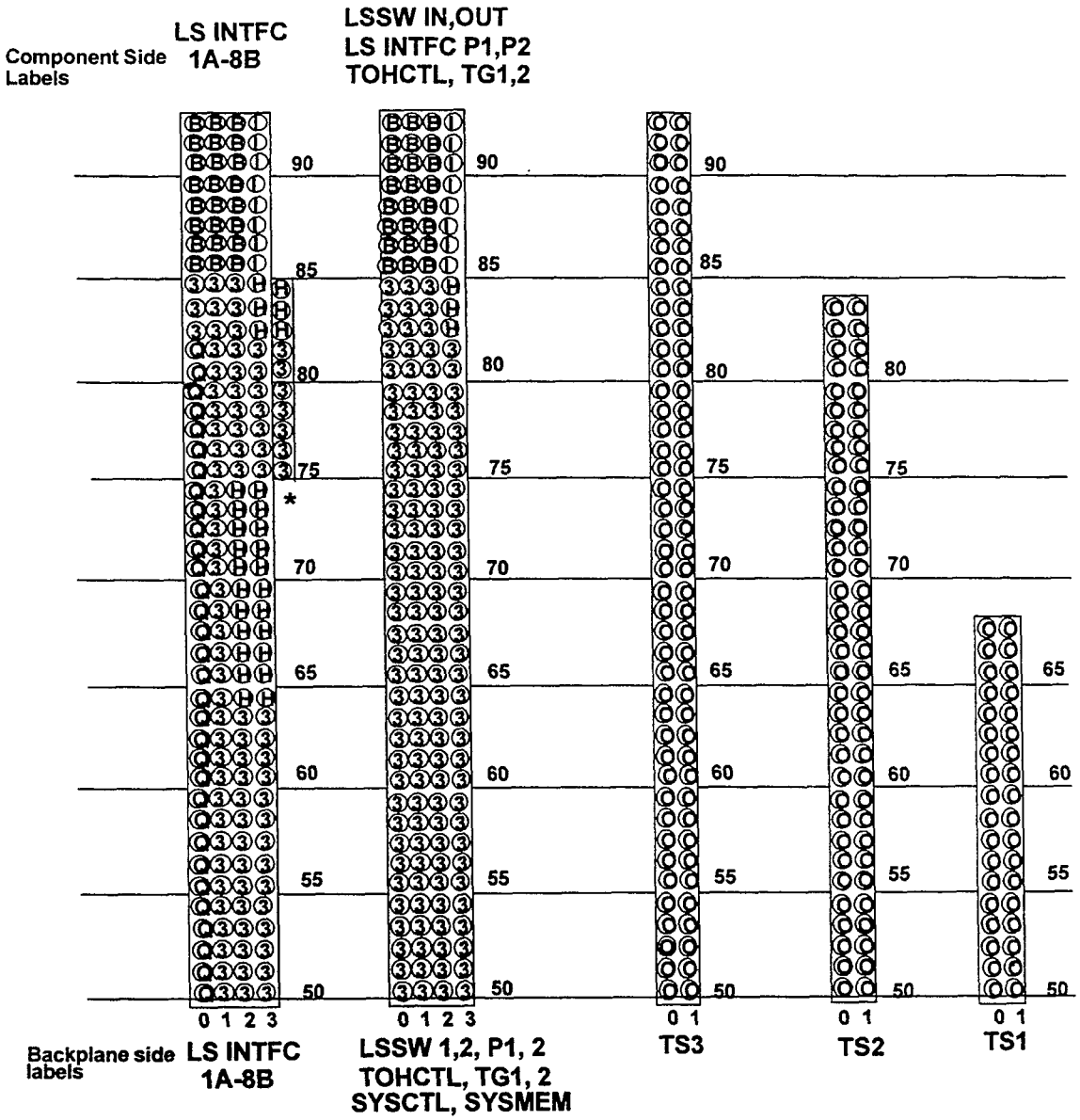


Figure B-8. Low Speed Shelf (Complementary) - Component Side

Large Capacity Terminal (LCT) - Pin Type Location

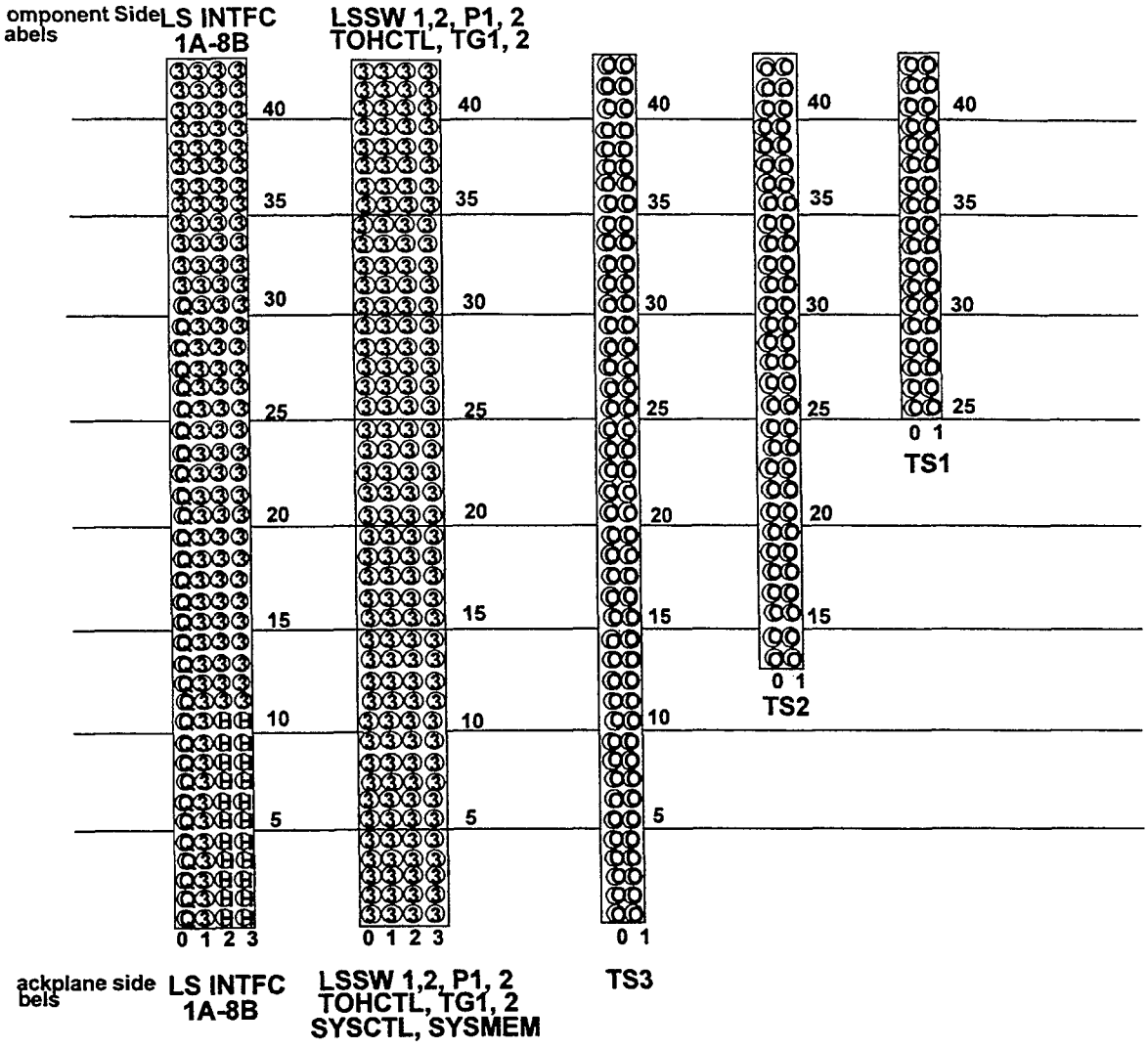


Figure B-9. Low Speed Shelf (Complementary) - Component Side View

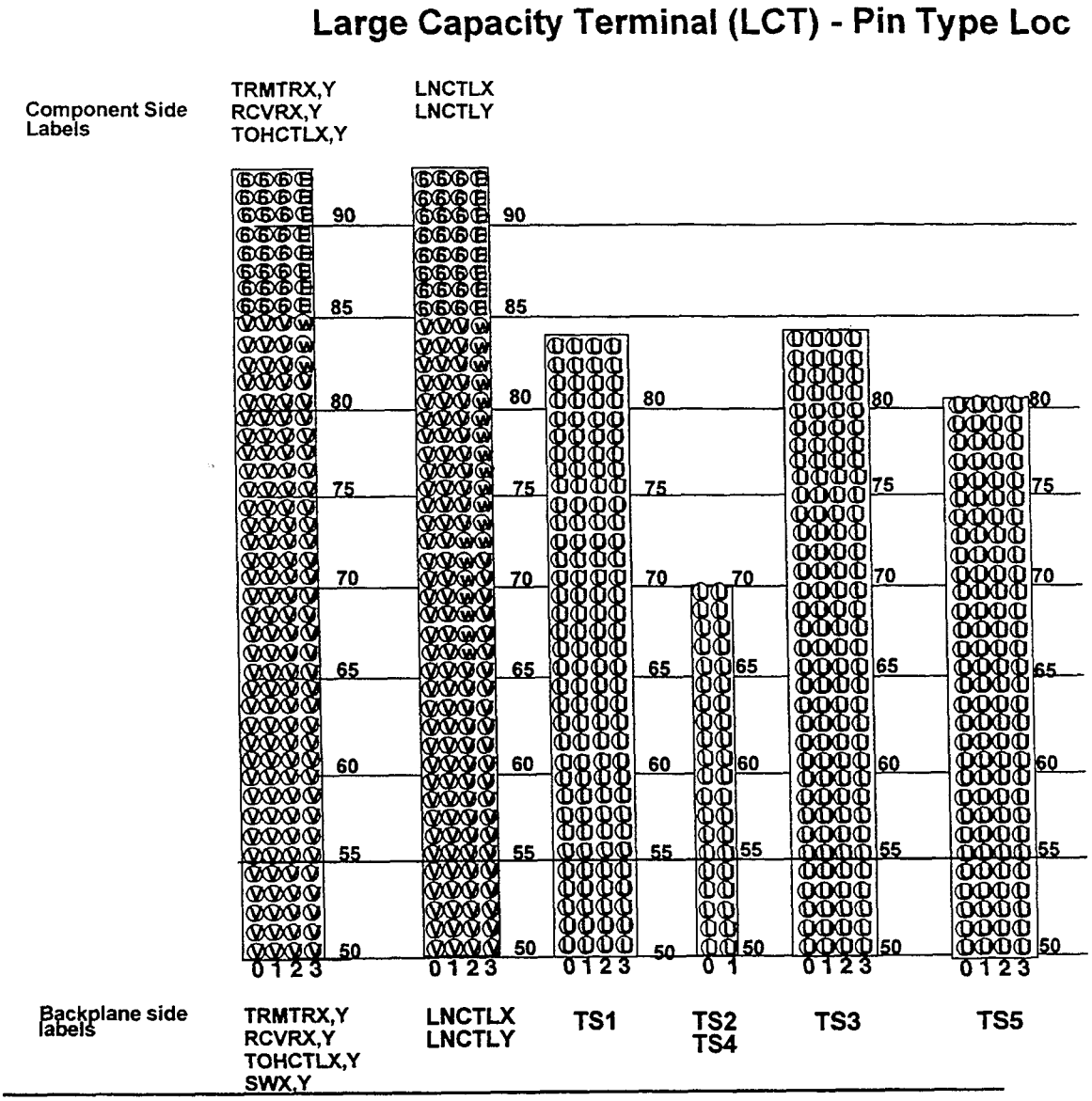


Figure B-10. LCT High Speed Shelf (Upper) - Component Side View

Large Capacity Terminal (LCT) - Pin Type Location

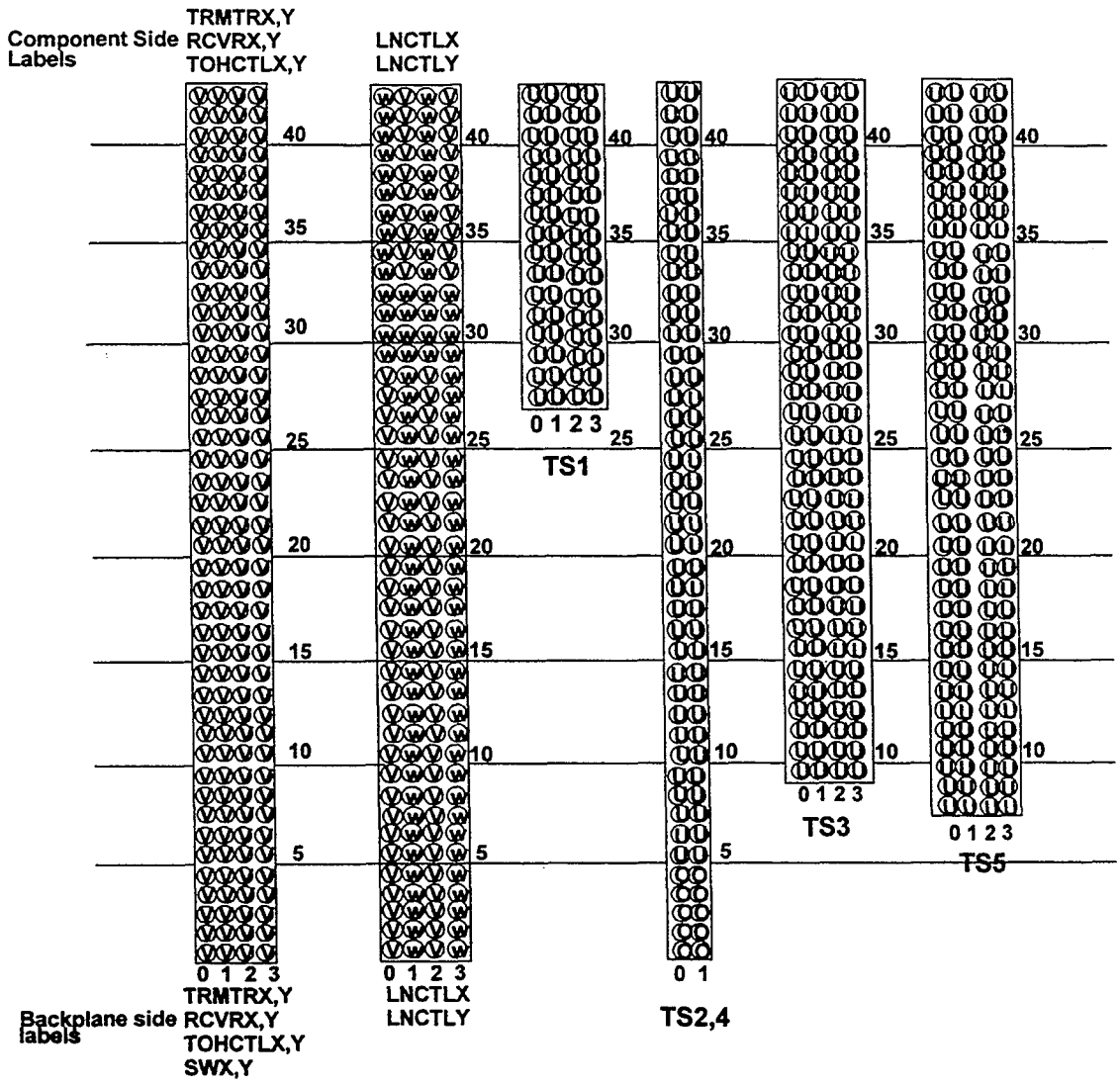


Figure B-11. LCT High Speed Shelf (Lower) - Component Side View

Optical Line System (OLS) - Pin Type Location

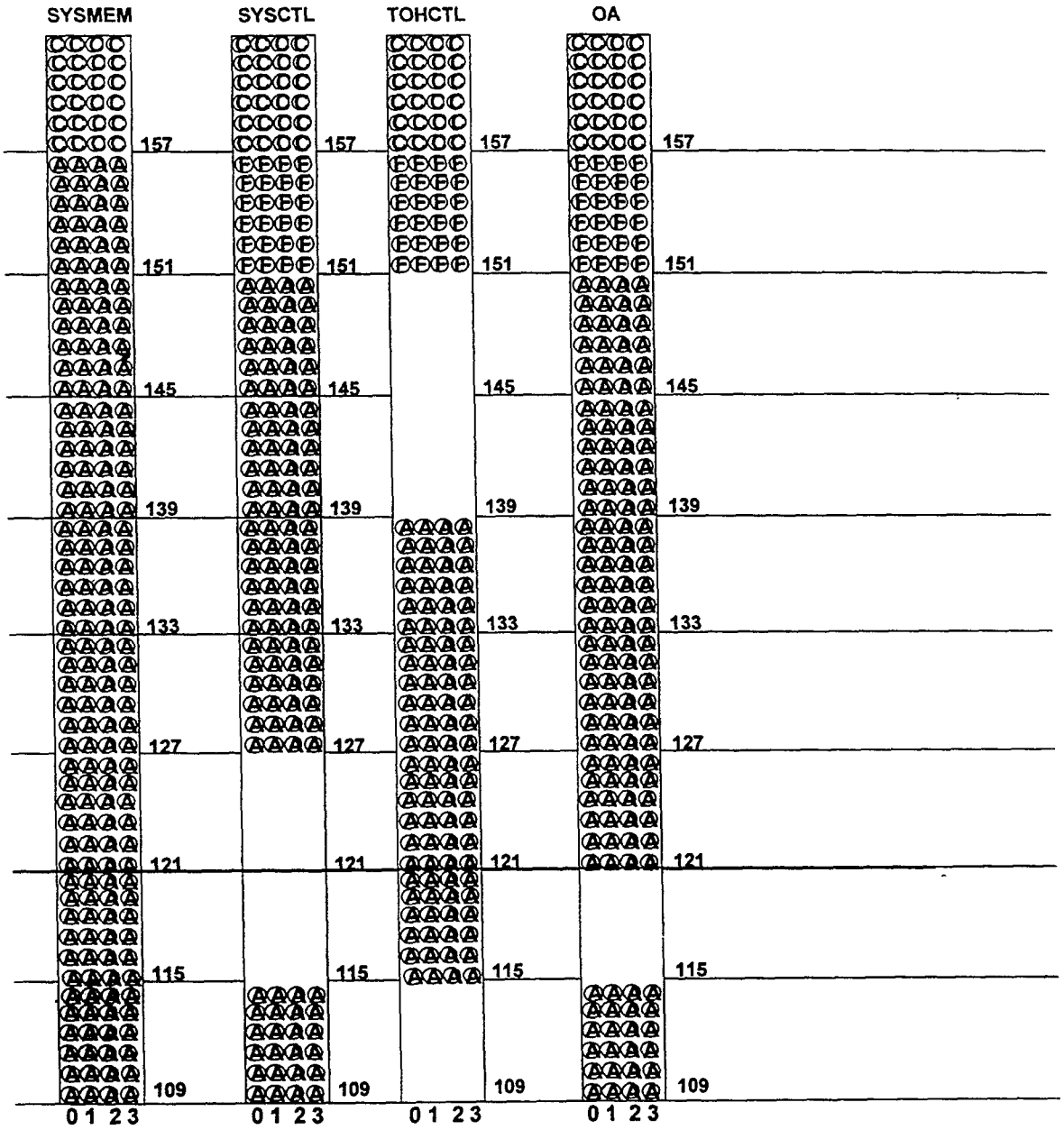


Figure B-12. Optical Line System All Shelves - Component Side View

Optical Line System (OLS)- Pin Type Location

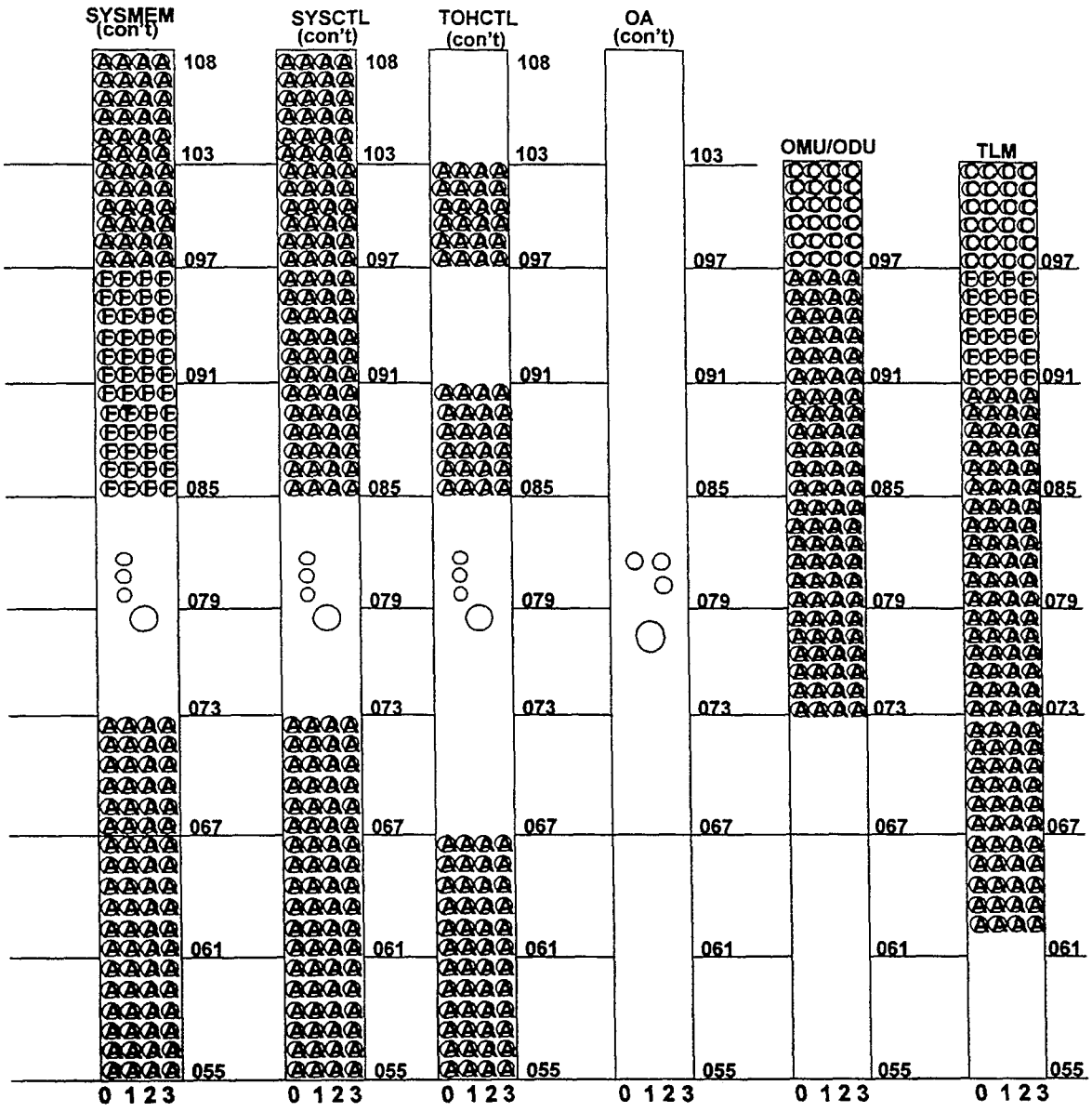


Figure B-13. Optical Line System (Middle) - Component Side View

Optical Line System (OLS) - Pin Type Location

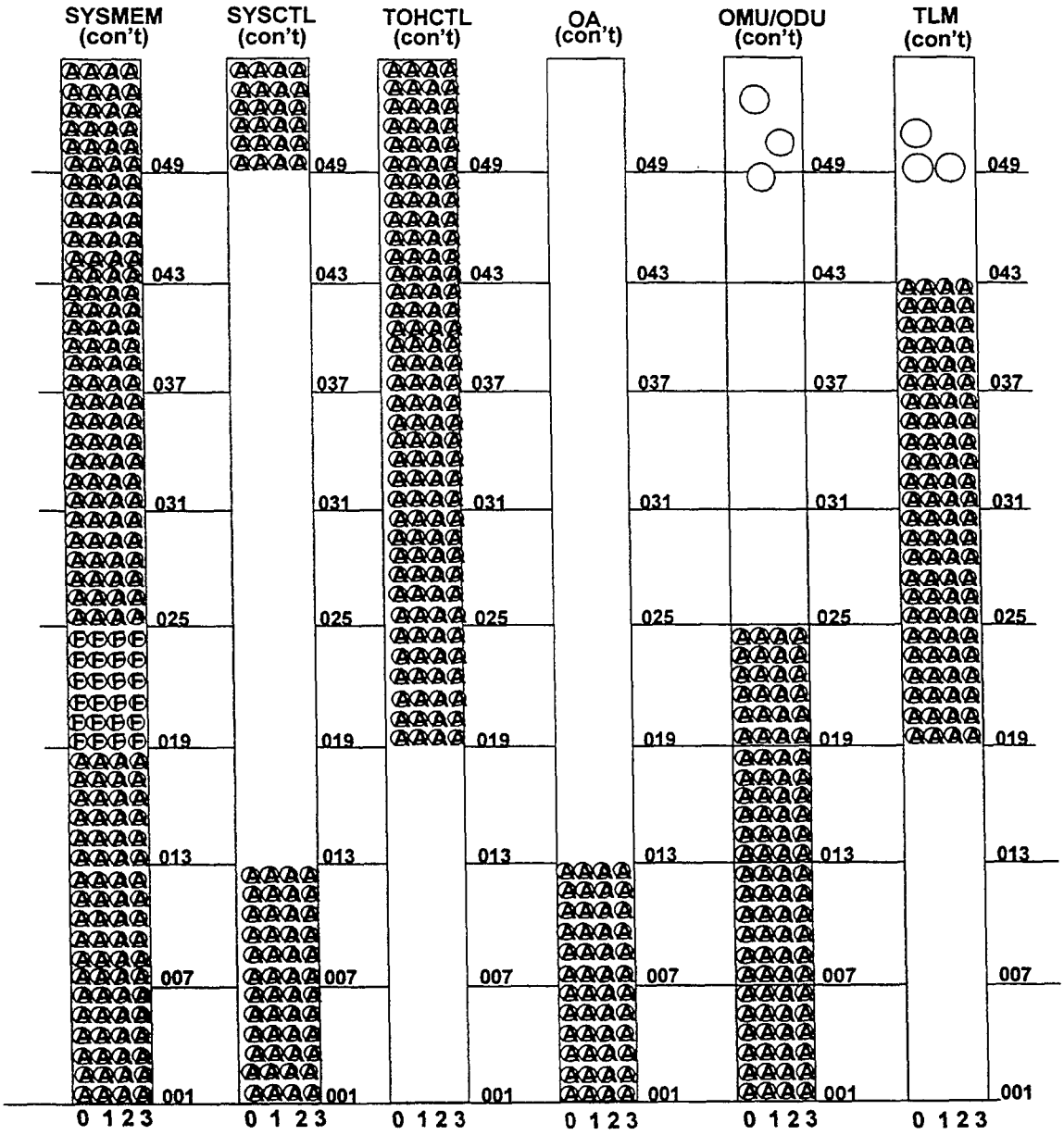


Figure B-14. Optical Line System (Lower) - Component Side View

Optical Line System (OLS) - Pin Type Location

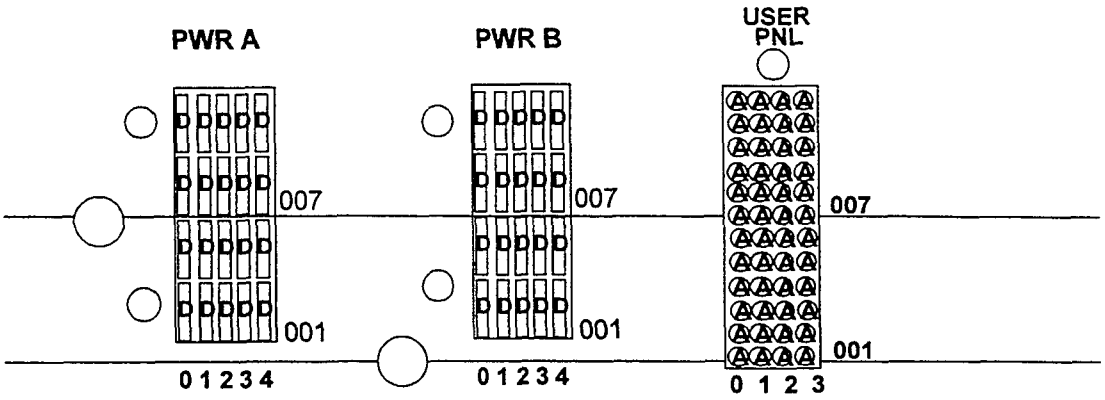


Figure B-15. OLS - Power and User Panel - Component Side View

Optical Translator (OT) - Pin Type Location

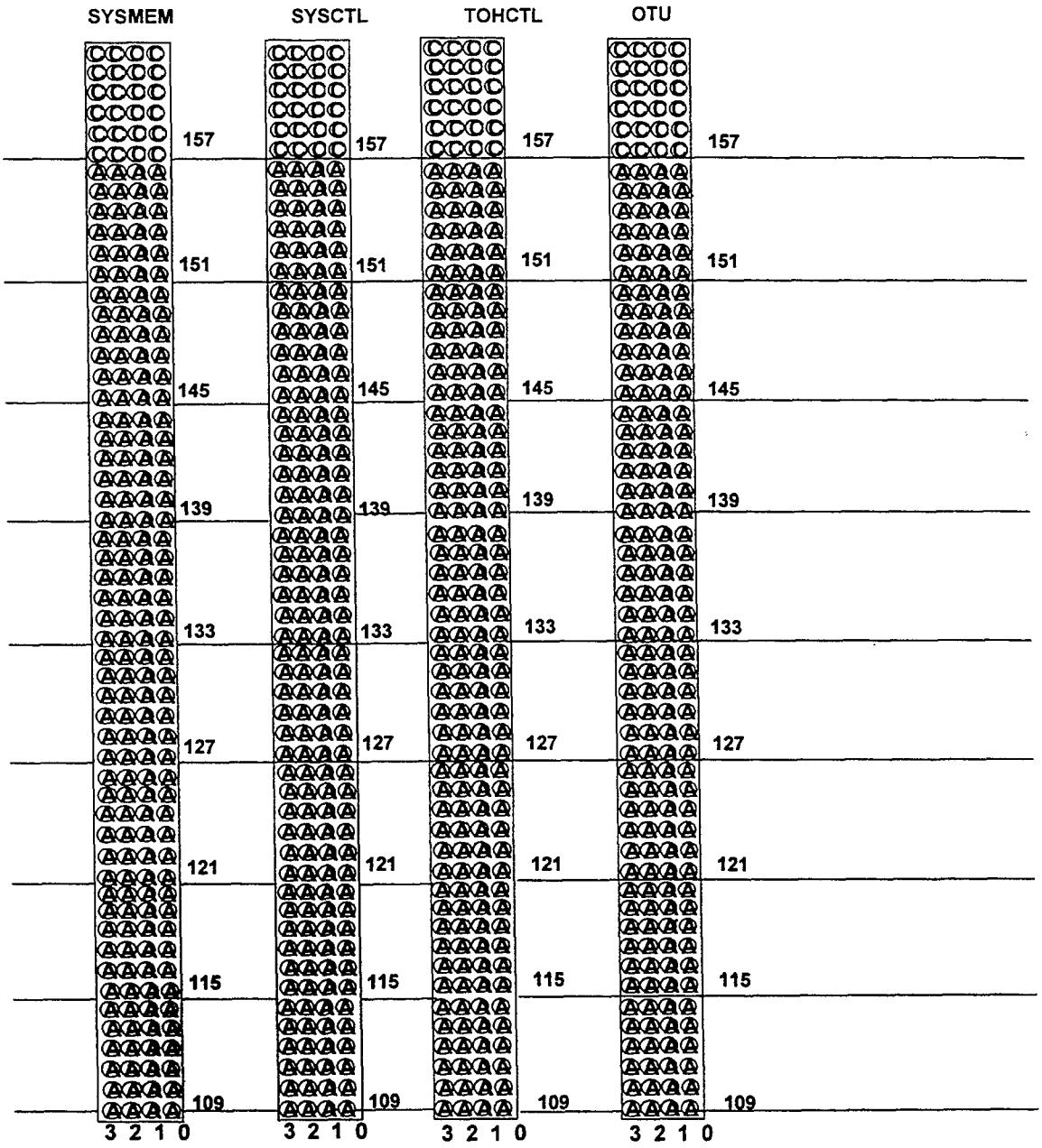


Figure B-16. Optical Translator (Upper) - Component Side View

Optical Translator (OT) - Pin Type Location

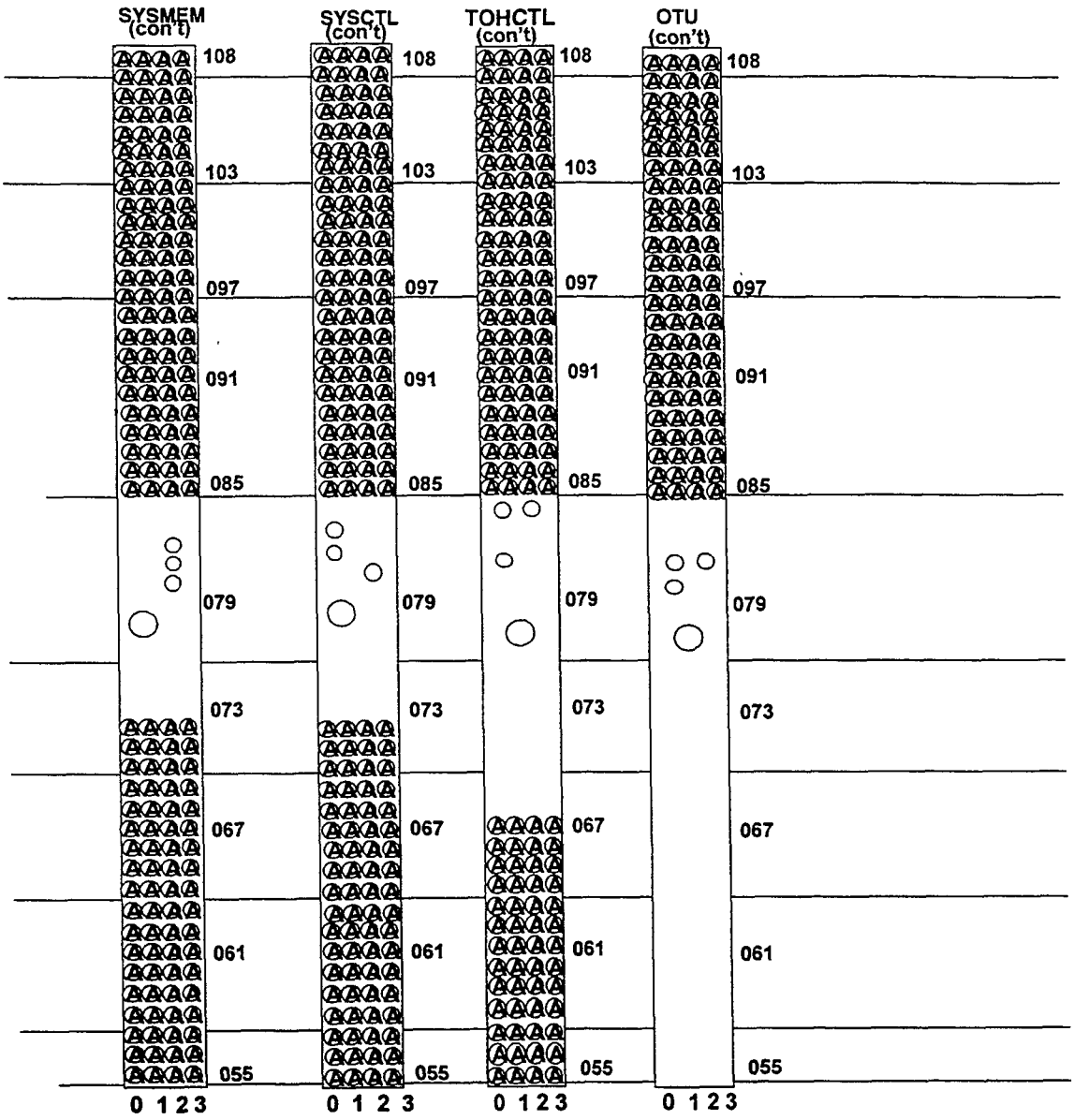


Figure B-17. Optical Translator (Middle) - Component Side View

OPTICAL TRANSLATOR (OT) - Pin Type Location

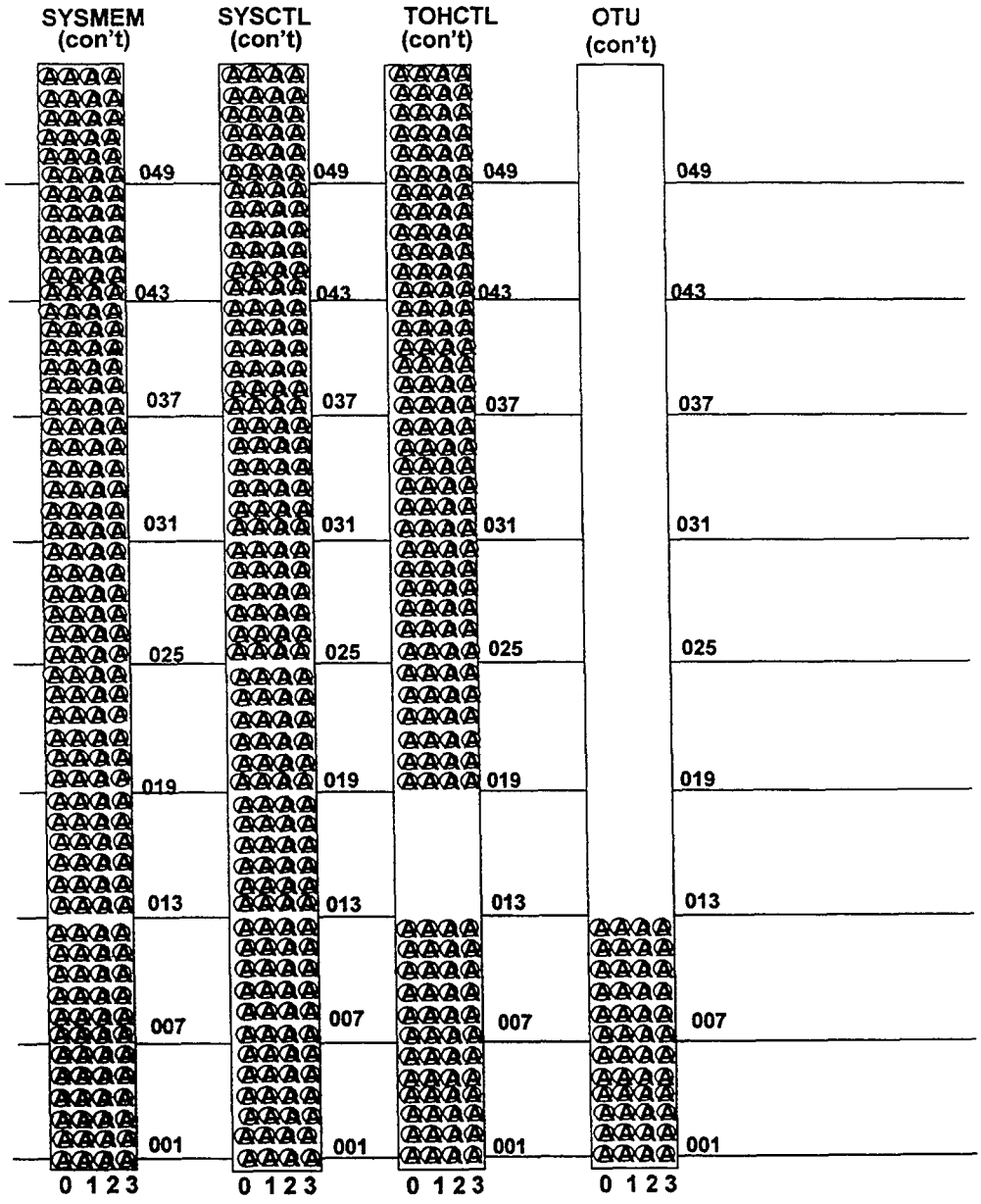


Figure B-18. Optical Translator (Lower) - Component Side View

OPTICAL TRANSLATOR SYSTEM (OT) - Pin Type Location

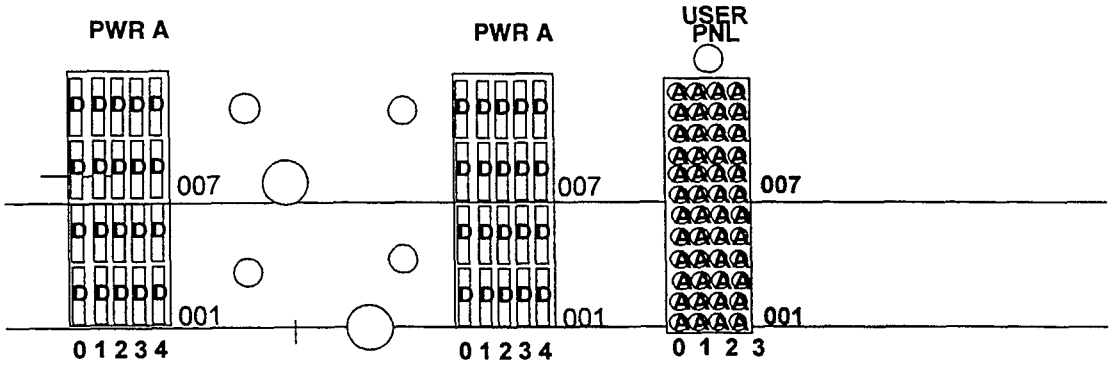


Figure B-19. Optical Translator - Power and User Panel - Component Side View

Dantel Alarm and Control Block Installation - Extended Miscellaneous Discretes

C

Contents

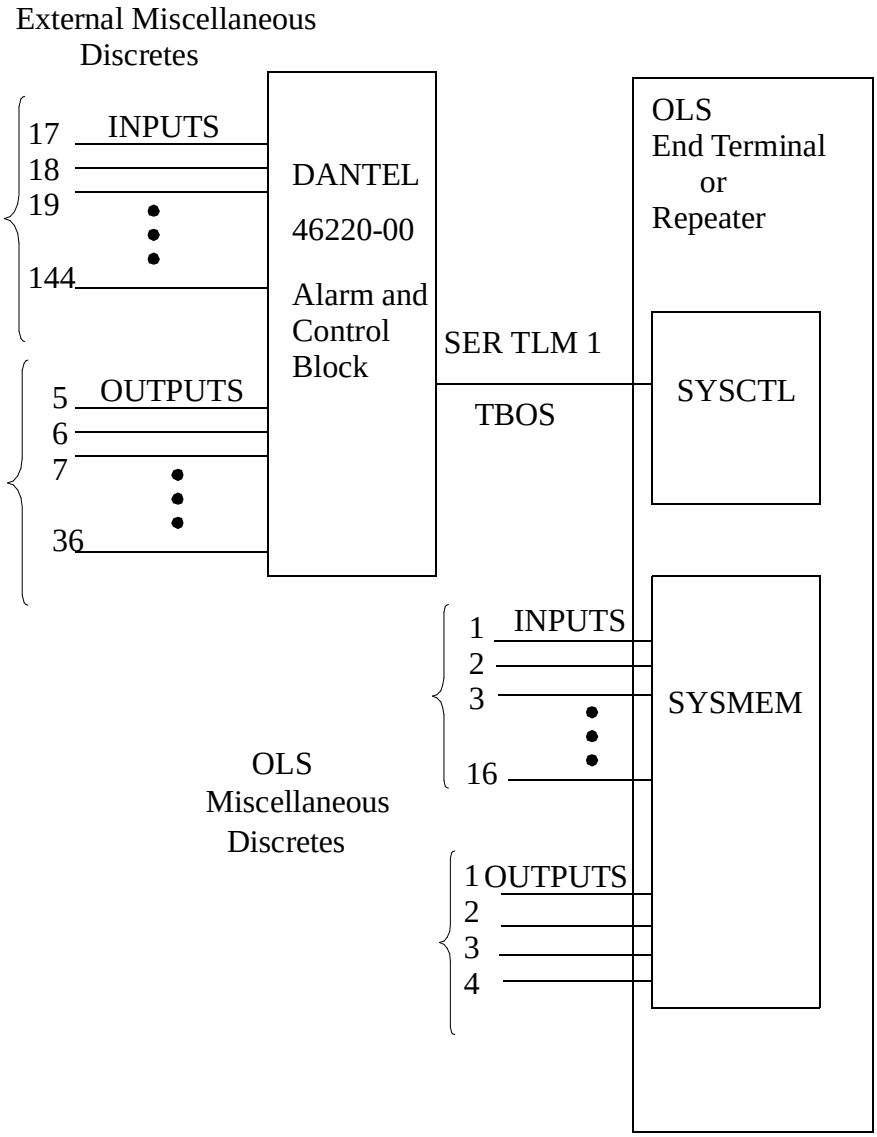
Dantel Alarm and Control Block Installation - Extended Miscellaneous Discretes

C

Description

The Extended Miscellaneous Discretes feature for the Optical Line System Release 2.0 - OLS provides additional miscellaneous discrete inputs and outputs to supplement the OLS Release 1.0 miscellaneous discretes feature. It consists of an additional 128 alarm and status input points and an additional 32 control output points, bringing the total number of miscellaneous discrete inputs for the network element to 144 inputs and 36 outputs.

Figure C-1. Miscellaneous Discretes Applications



Ordering Information

Table C-1.

Description	Order Number	Commcode Number
Alarm Control Block	Model No. 46220-00	407567924
Mounting Bar	A25-00508-01	406863621
SER TLM1 Cable	ED7G028-22 G201 - 4000 ft. max G251 - 150 ft. G261 - 250 ft.	

Tools Required

- Phillips Screwdriver
- Small standard screwdriver
- 11/32-inch wrench

Equipment Required

- Alarm Control Block
- 23" Mounting Bar
- Standard WECO Distribution Frame
- ED7G028-22 Cable

Installation Procedure

A complete and detailed installation procedure is provided in the DANTEL Installation & Operation Manual provided with the 46220-00 Alarm and Control Block. The following procedure is provided to facilitate its use with Lucent's Release 2.0 Optical Line System.

Assemble

(1) Attach the Alarm and Control Block to the Mounting Bar.

(2) Attach the mounting bar to the distribution frame. The mounting bar is rear mounted to the distribution frame.

(3) Run the ED7G028-22 cable from the SER TLM1 port of the OLS to the Alarm Control Block.

(4) The SER TLM1 Cable needs to be wired to the Alarm and Control block.

Wiring

(1) In order to access the power supply board of the Dantel Alarm Block the unit must be opened by placing your thumbs under the sides of the unit and gently-pushing outwards as in Figure 2.

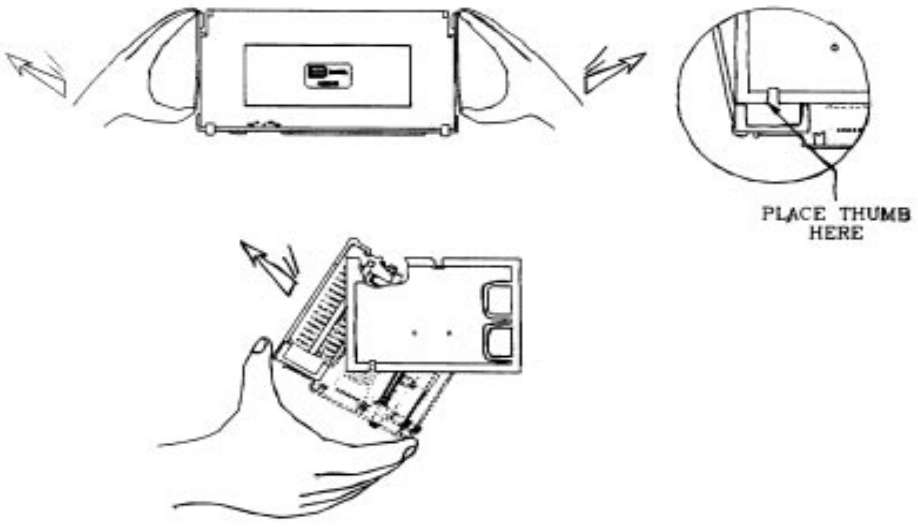


Figure C-2. Opening the Dantel Alarm Block

(2) Pull the Power Supply board and CPU board down. Refer to Figure 3.

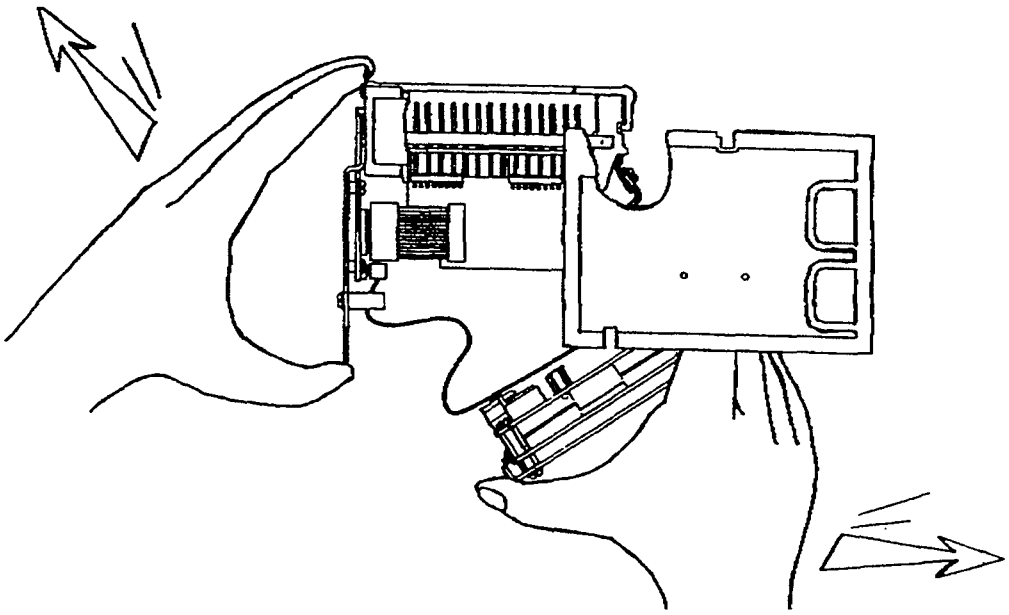


Figure C-3. Pulling Down Power Supply and CPU

(3) On the power supply board , wire negative battery (-21 to -56 VDC) and ground connector to connector TB1 (Refer to Figure 4). Provide appropriate slack on the wires so that the unit may be closed and opened.

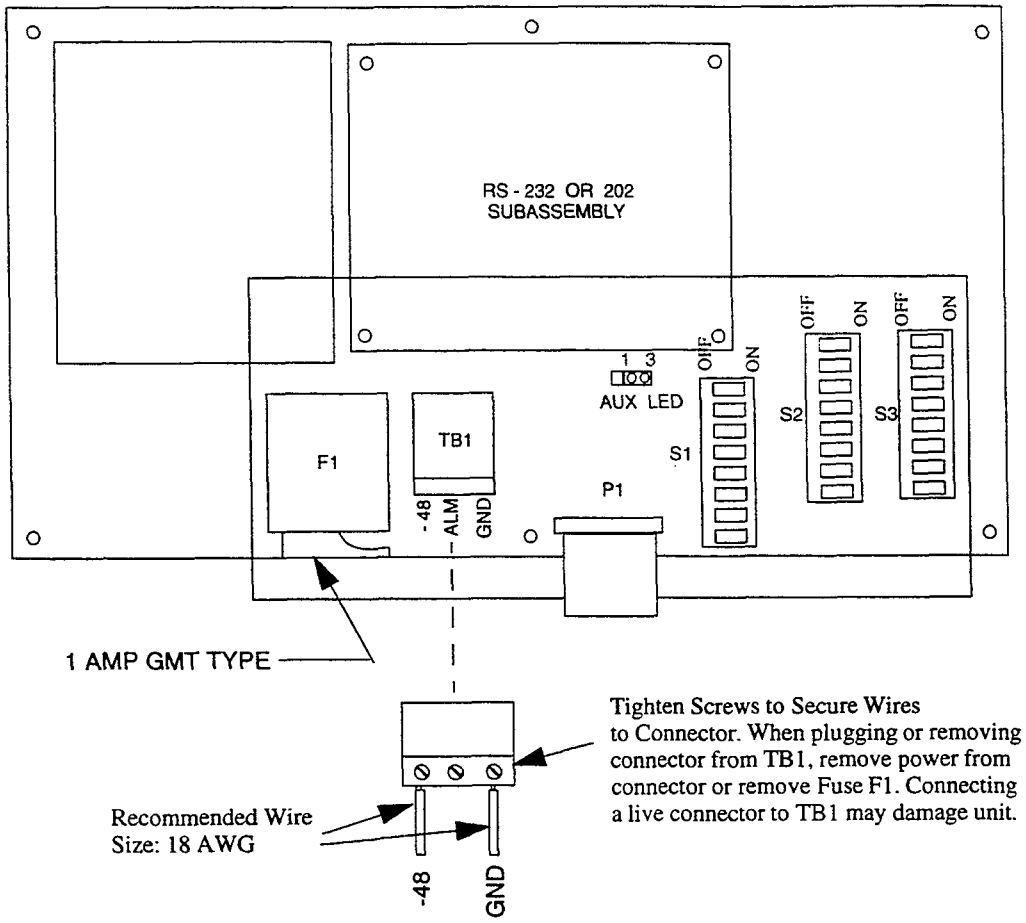
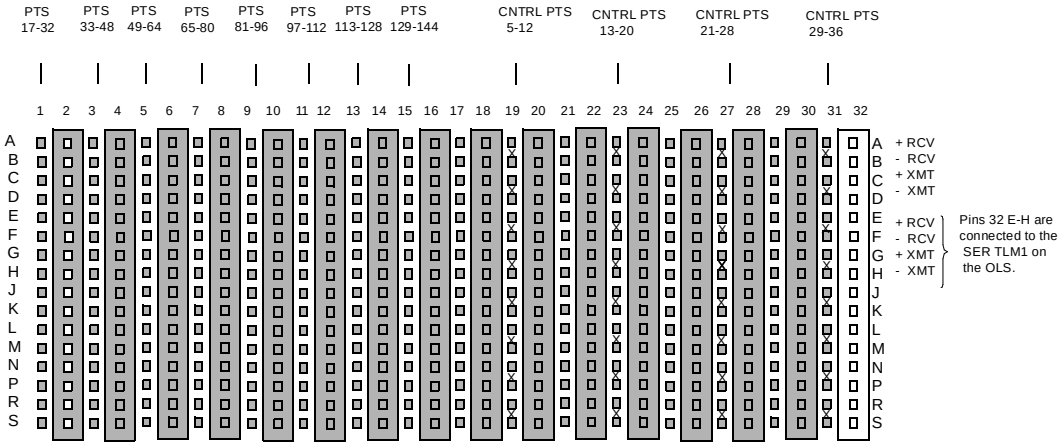


Figure C-4. Power Supply Board Component Location

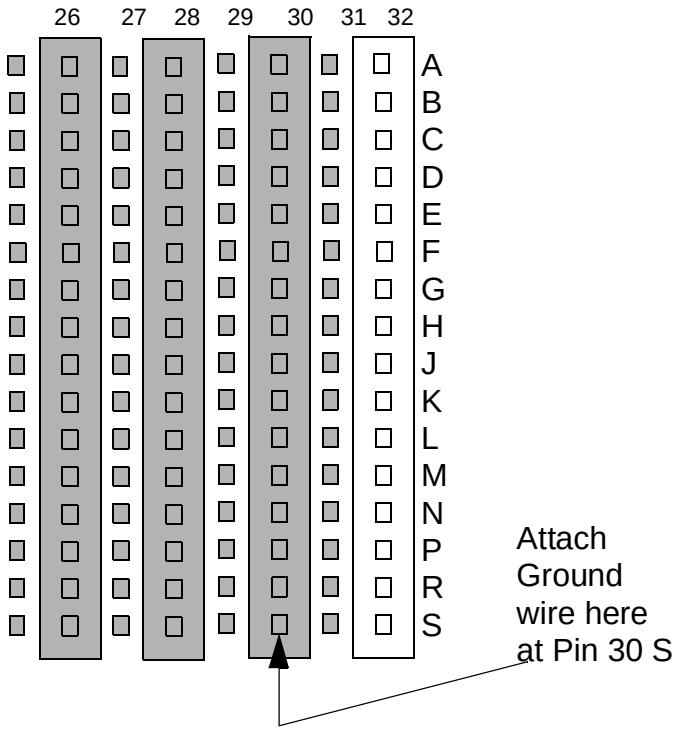
(4) Wire the alarm inputs (refer to Figure 5). There are two pins for each alarm input. One is for ground and the other is for alarm input. The dark-colored columns are grounds and are wired together. Pin 1 will begin with Input Point 17 (See Figure 5 below).

Figure C-5. Dantel Wire Wrap Pin Designations



(5) Wire Pin 30 S back to the Battery return ground terminal (GND) on TB-1 (refer to Figure 6-6). Provide appropriate slack on this wire so that the Alarm Block can be opened and closed.

Figure C-6. Ground Pin on Dantel Alarm Block



(6) The following table lists the SER TLM1 cable connections (P19 on the OLS) and designations:

.

Table C-2. TBOS Cable Connections

Name	Designation	Pin	Wire Color
TBOS TRM Transmit N	TBASTXN	1	BL (CA1)
No Connection	none	2	none
TBOS TRM Receive N	TBASRXN	3	O (CA2)
No Connection	none	4	none

Table C-2. TBOS Cable Connections

Name	Designation	Pin	Wire Color
No Connection	none	5	none
TBOS TRM Transmit P	TBASTXP	6	W (CA1)
No Connection	none	7	none
TBOS TRM Receive P	TBASRXP	8	W (CA2)
No Connection	none	9	none

(7) The SER TLM1 port is located at P19 on the OLS Interconnection Panel. See Figure 6 below.

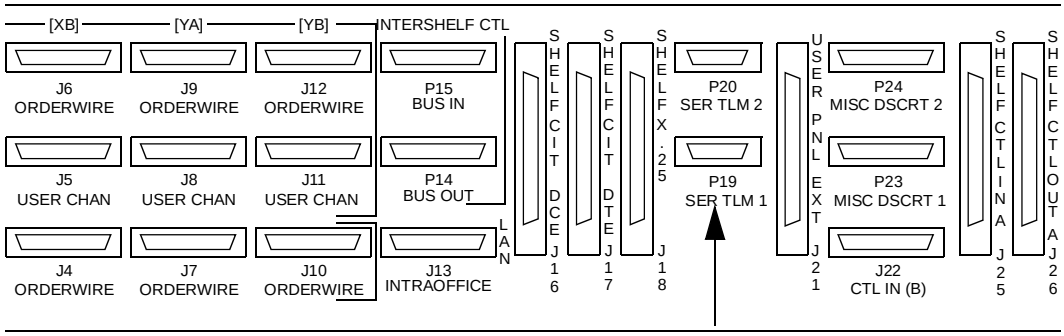


Figure C-7. OLS Interconnection Panel (SER TLM1 at arrow)

(8) The TBOS Transmit and Receive Positive and Negative (see Table 2 above) need to be wire-wrapped to pins 32 E-H on the Alarm and Control Block (See Figure 5 above).

1. TBASTXP (W) to 32-E
2. TBASTXN (BL) to 32-F
3. TBASRXP (W) to 32-G
4. TBASRXN (O) to 32-H
5.

Switch and Strap Settings

1.1 Before making these settings remove Power by removing fuse F1 (See figure 6-4) Power Supply Board Component Location).

On the Dantel 46220-00 Alarm and Control Block there are three (3) switches located on the Power Supply Board (See Figure 4 above). For use with Lucent's Optical Line System the following switch settings must be made:

1.2 S1 Switch

1. OFF
2. OFF
3. OFF
4. ON
5. OFF
6. OFF
7. OFF
8. OFF

1.3 S2 Switch Settings:

1. OFF
2. ON
3. OFF
4. OFF
5. OFF
6. OFF
7. OFF
8. ON

1.4 S3 Switch Settings:

1. OFF
2. ON
3. OFF

4. ON
5. ON
6. OFF
7. OFF
8. OFF

1.5 After the Switch settings have been made apply power by replacing F1.

NOTE:
If the Switch settings are made after the Dantel Alarm Block has been powered up, it will be necessary to turn the unit off and then turn it back on again in order for the new settings to be recognized.

Provisioning Extended Miscellaneous Discretes

Enabling SER TLM 1 Port

The SER TLM Port must first be enabled through the CIT by using the following Command:

SECURITY_Set_Security_Port_SER-TLM1_Enable

Extended Miscellaneous Discrete Assignments

The Miscellaneous Discrete Assignments are provisioned by using the following command through the CIT:
CONFIGURATION_Set_Attribute_Enviroment_

This input sets the Descriptions and Alarm Levels for the miscellaneous discrete inputs.

— The Point parameter selects the miscellaneous discrete input point to provision

NOTE:
The miscellaneous discrete points 1-16 are assigned to the original miscellaneous discrete ports. Therefore the extended miscellaneous discretes will begin their assignment with point number 17 and continue through point number 144.

— The Alarm Level Parameter provisions the severity of the condition associated with the closing of the selected miscellaneous discrete input point. The choices are:

  - "CR": critical
  - "MJ": major
  - "MN": minor
  - "NA": status not alarmed
  - "NR": status not alarmed and not reported to the OS.

- The Description parameter is the text string associated with the selected miscellaneous discrete environmental input point. It is character string of up to 26 characters, where the characters are letters, digits, or spaces. It is used to identify the point in the `Retrieve_History` and `Retrieve_Alarm (and Status)` reports.

Extended Miscellaneous Discrete Assignments used to Monitor the Optical Translator

When used to monitor the Optical Translator (OT), Miscellaneous Discrete Points 17-86 (1-70 on the DANTEL Alarm an Control Block) will be provisioned with the description parameters assigned in the following Table.

Table C-3. Miscellaneous Discrete Assignments - Monitoring OT

Point No.	Description	Point No.	Description	Point No.	Description
17.	CP Fail OTU 1	40.	CP Fail OTU 24	63.	I S Fail OTU 15
18.	CP Fail OTU 2	41.	CP Fail OTU 25	64.	I S Fail OTU 16
19.	CP Fail OTU 3	42.	CP Fail OTU 26	65.	I S Fail OTU 17
20.	CP Fail OTU 4	43.	CP Fail OTU 27	66.	I S Fail OTU 18
21.	CP Fail OTU 5	44.	CP Fail OTU 28	67.	I S Fail OTU 19
22.	CP Fail OTU 6	45.	CP Fail OTU 29	68.	I S Fail OTU 20
23.	CP Fail OTU 7	46.	CP Fail OTU 30	69.	I S Fail OTU 21
24.	CP Fail OTU 8	47.	CP Fail OTU 31	70.	I S Fail OTU 22
25.	CP Fail OTU 19	48.	CP Fail OTU 32	71.	I S Fail OTU 23
26.	CP Fail OTU 10	49.	I S Fail OTU 1	72.	I S Fail OTU 24
27.	CP Fail OTU 11	50.	I S Fail OTU 2	73.	I S Fail OTU 25
28.	CP Fail OTU 12	51.	I S Fail OTU 3	74.	I S Fail OTU 26
29.	CP Fail OTU 13	52.	I S Fail OTU 4	75.	I S Fail OTU 27
30.	CP Fail OTU 14	53	I S Fail OTU 5	76.	I S Fail OTU 28
31.	CP Fail OTU 15	54.	I S Fail OTU 6	77.	I S Fail OTU 29
32.	CP Fail OTU 16	55.	I S Fail OTU 7	78.	I S Fail OTU 30
33.	CP Fail OTU 17	56.	I S Fail OTU 8	79.	I S Fail OTU 31
34.	CP Fail OTU 18	57.	I S Fail OTU 9	80.	I S Fail OTU 32
35.	CP Fail OTU 19	58.	I S Fail OTU 10	81	A pwr fail sys shelf
36.	CP Fail OTU 20	59.	I S Fail OTU 11	82	B pwr fail sys shelf
37.	CP Fail OTU 21	60.	I S Fail OTU 12	83	A pwr fail comp shelf 1
38.	CP Fail OTU 22	61.	I S Fail OTU 13	84	B pwr fail comp shelf 1
39.	CP Fail OTU 23	62.	I S Fail OTU 14	85	A pwr fail comp shelf 2
				86	B pwr fail comp shelf 2

Harris C-1000 Centurion Installation - Extended Miscellaneous Discretes

D

Contents

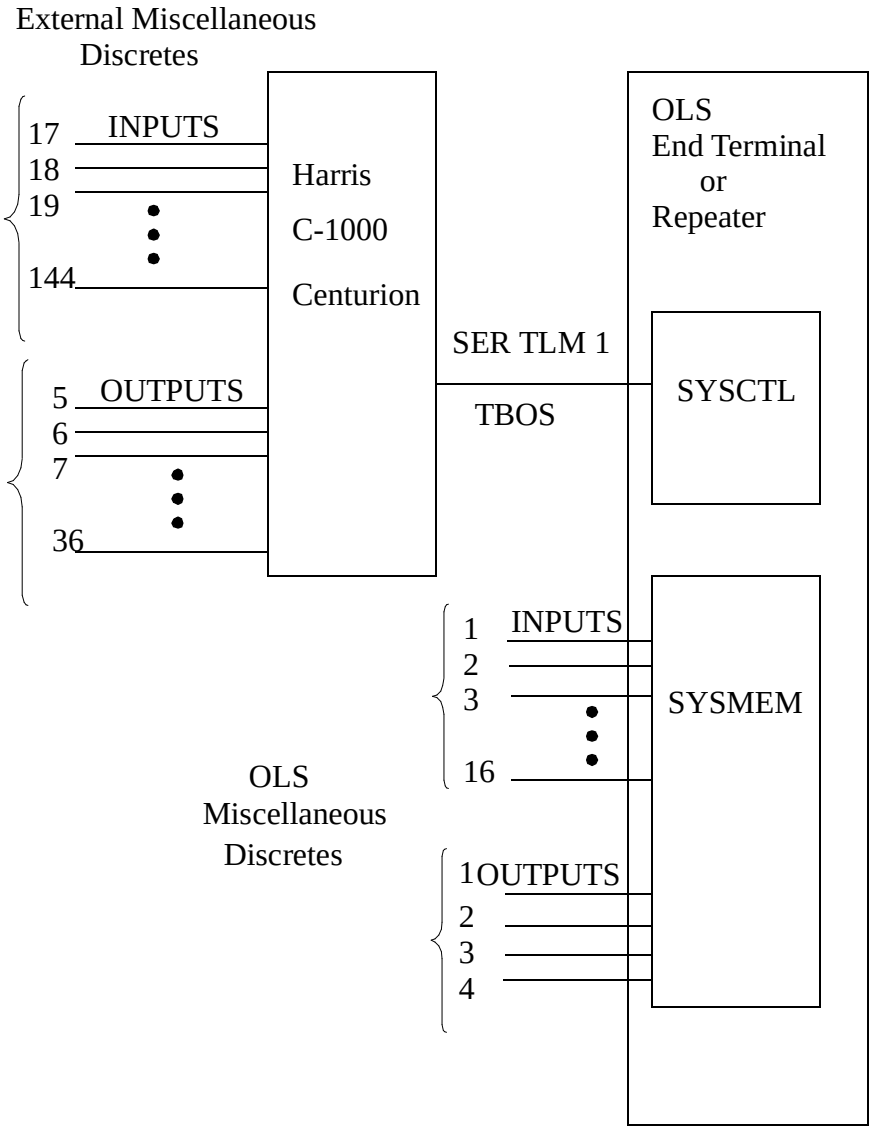
Harris C-1000 Centurion Installation - Extended Miscellaneous Discretes

D

Description

The Extended Miscellaneous Discretes feature for the Optical Line System Release 2.0 - OLS provides additional miscellaneous discrete inputs and outputs to supplement the OLS Release 1.0 miscellaneous discretes feature. It consists of an additional 128 alarm and status input points and an additional 32 control output points (See Figure 1. below). This will bring the total number of miscellaneous discrete inputs for the network element to 144 inputs and 36 outputs.

Figure D-1. Miscellaneous Discrete Applications



Ordering Information

Table D-1. Ordering Information

Description	Part Number	Comcode Number
C-1000 Centurion	594-T043	407567932
Rer Access Wire Wrap Connector	620-T030	407532217
SER TLM1 Cable	ED7G028-22 G201 - 4000 ft. max G251 - 150 ft. G261 - 250 ft.	

Tools Required

- Phillips Screwdriver
- Small standard screwdriver
- 11/32-inch wrench

Equipment Required

- C-1000 Centurion
- Mounting Brackets
- Standard WECO Distribution Frame
- ED7G028-22 Cable

Installation Procedure

A complete and detailed installation procedure is provided in the Harris C1000 User Guide provided with the Centurion C-1000. The following procedure is provided to facilitate its use with Lucent's Release 2.0 Optical Line System.

Assembly

(1) Attach the Mounting Brackets to the Harris C-1000 Centurion.The Mounting Brackets are then front mounted to the distribution frame.

(2) Run the ED7G028-22 cable (see Table C-1) from J19 on the OLS, SER TLM1 port, to J9 on the rear of the C-1000 Centurion (See Figure 2-1 of the C-1000 Centurion User Guide). Note that this cable is made up of two cables, each having two wires. The connector provided by Harris must be wired to the cable per Table D-2. **It is recommended that the connection at the Harris C-1000 Centurion end (J9) be soldered.** Do not rely upon the mechanical connection.
Table D-2 lists the cable connections and designations for this cable.

Table D-2. TBOS Cable Connection

OLS Pin	OLS Designation	Cable & Wire Color	Harris Designation	Harris Pin
1	TX -	CABLE 1 / BLUE	RX -	**1**
6	TX +	CABLE 1 / WHITE	RX +	**2**
8	RX +	CABLE 2 / WHITE	TX +	**3**
3	RX -	CABLE 2 / ORANGE	TX -	**7**

(3) J1 - J8 are the ports to be used for inputs and control outputs (See Table 2-1 of the C-1000 Centurion User Guide and Table 4-14 of this manual).

Powering the Unit

(1) Power must be provided from a fuse panel using #14 to #24 (#20 is optimum) AWG power and ground wire. The input voltage range is -20 to -60 VDC. Fuse protection should be removed before inserting or removing power wires. The recommended fuse for a -48 Vdc System is 0.5 A slow blow (maximum).

(2)

(3) Power connections are located at J11 on the rear panel of the C1000 Centurion (See Figure 2-1 in the C-1000 Centurion User Guide). The Positive and Negative connections are marked at J11 (See also Figure 2-2 in the C-1000 Centurion User Guide).

Switch Settings

(1) Each C1000 unit is configured by using Configuration DIP switches on the front of the unit (See Figure 1-1 in the C-1000 Centurion User Guide). Units, such as the OLS, that can handle 128 or less discrete points use the 10-switch block on the Left (S1). The 10-switch block on the right (S2) is not used. The settings should be as follows:

1. S1-1 to S1-8 OFF (down)
2. S1-9 to S1-10 ON (up)

3. S2-1 to S1-10 OFF (down

Provisioning Extended Miscellaneous Discretes

Enabling SER TLM 1 Port

The SER TLM Port must first be enabled through the CIT by using the following Command:

SECURITY_Set_Security_Port_SER-TLM1_Enable

Extended Miscellaneous Discrete Assignments

The Miscellaneous Discrete Assignments are provisioned by using the following command through the CIT:
`CONFIGURATION_Set_Attribute_Enviroment_`

This input sets the Descriptions and Alarm Levels for the miscellaneous discrete inputs.

- The Point parameter selects the miscellaneous discrete input point to provision

NOTE:
The miscellaneous discrete points 1-16 are assigned to the original miscellaneous discrete ports. Therefore the extended miscellaneous discretes will begin their assignment with point number 17 and continue through point number 144.

- The Alarm Level Parameter provisions the severity of the condition associated with the closing of the selected miscellaneous discrete input point. The choices are:
  - "CR": critical
  - "MJ": major
  - "MN": minor
  - "NA": status not alarmed
  - "NR": status not alarmed and not reported to the OS.
- The Description parameter is the text string associated with the selected miscellaneous discrete environmental input point. It is character string of up to 26 characters, where the characters are letters, digits, or spaces. It is used to identify the point in the `Retrieve_History` and `Retrieve_Alarm (and Status)` reports

Extended Miscellaneous Discrete Assignments used to Monitor the Optical Translator

When used to monitor the Optical Translator (OT), Miscellaneous Discrete Points 17-86 (1-70 on the Harris C-1000 Centurion) will be assigned with the description parameter provisioned in the following Table.

Table D-3. Miscellaneous Discrete Assignments - Monitoring OT

Point No.	Description	Point No.	Description	Point No.	Description
17.	CP Fail OTU 1	40.	CP Fail OTU 24	63.	I S Fail OTU 15
18.	CP Fail OTU 2	41.	CP Fail OTU 25	64.	I S Fail OTU 16
19.	CP Fail OTU 3	42.	CP Fail OTU 26	65.	I S Fail OTU 17
20.	CP Fail OTU 4	43.	CP Fail OTU 27	66.	I S Fail OTU 18
21.	CP Fail OTU 5	44.	CP Fail OTU 28	67.	I S Fail OTU 19
22.	CP Fail OTU 6	45.	CP Fail OTU 29	68.	I S Fail OTU 20
23.	CP Fail OTU 7	46.	CP Fail OTU 30	69.	I S Fail OTU 21
24.	CP Fail OTU 8	47.	CP Fail OTU 31	70.	I S Fail OTU 22
25.	CP Fail OTU 19	48.	CP Fail OTU 32	71.	I S Fail OTU 23
26.	CP Fail OTU 10	49.	I S Fail OTU 1	72.	I S Fail OTU 24
27.	CP Fail OTU 11	50.	I S Fail OTU 2	73.	I S Fail OTU 25
28.	CP Fail OTU 12	51.	I S Fail OTU 3	74.	I S Fail OTU 26
29.	CP Fail OTU 13	52.	I S Fail OTU 4	75.	I S Fail OTU 27
30.	CP Fail OTU 14	53	I S Fail OTU 5	76.	I S Fail OTU 28
31.	CP Fail OTU 15	54.	I S Fail OTU 6	77.	I S Fail OTU 29
32.	CP Fail OTU 16	55.	I S Fail OTU 7	78.	I S Fail OTU 30
33.	CP Fail OTU 17	56.	I S Fail OTU 8	79.	I S Fail OTU 31
34.	CP Fail OTU 18	57.	I S Fail OTU 9	80.	I S Fail OTU 32
35.	CP Fail OTU 19	58.	I S Fail OTU 10	81	A pwr fail sys shelf
36.	CP Fail OTU 20	59.	I S Fail OTU 11	82	B pwr fail sys shelf
37.	CP Fail OTU 21	60.	I S Fail OTU 12	83	A pwr fail comp shelf 1
38.	CP Fail OTU 22	61.	I S Fail OTU 13	84	B pwr fail comp shelf 1
39.	CP Fail OTU 23	62.	I S Fail OTU 14	85	A pwr fail comp shelf 2
				86	B pwr fail comp shelf 2

Index

I

L

M

N

O

P

R

S

T

U

W