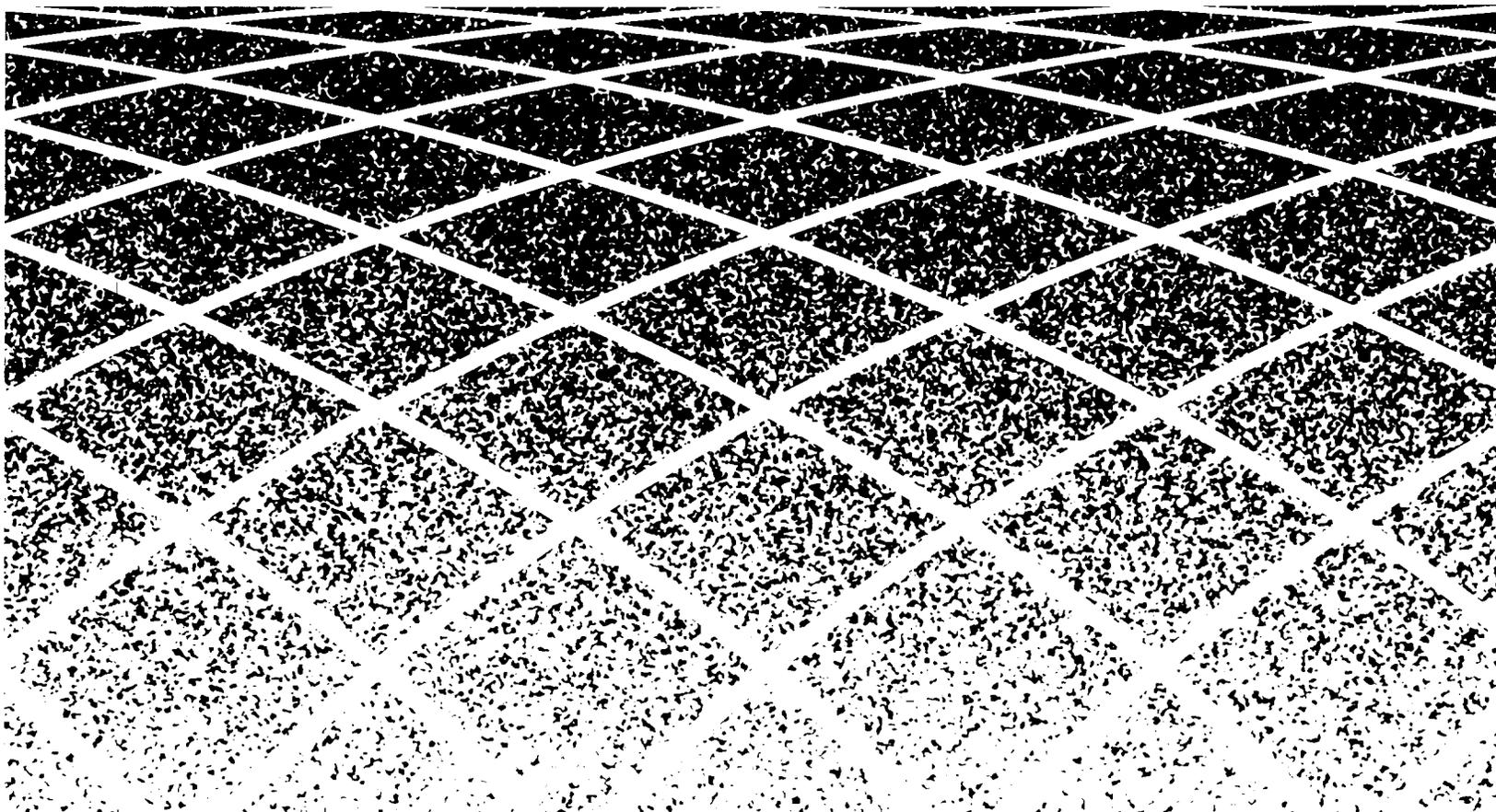




AT&T 363-205-500G
Issue 1 (FPI)
January 1993

SLC[®] Series 5 Carrier System Feature Packages G and I Maintenance and Troubleclearing

Task Oriented Practice (TOP)



Copyright© 1993 AT&T
All Rights Reserved
Printed in U.S.A

Notice

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

Mandatory Customer Information

Trademarks

SLC, *5ESS*, and *SPOTS* are registered trademarks of AT&T.
GTD-5 is a registered trademark used under license from the GTE Corporation.
UL is a registered trademark of Underwriters Laboratories.

Ordering Information

The ordering number for this document is AT&T 363-205-500G. To order this document, call the AT&T Customer Information Center in Indianapolis, Indiana, on 1-800-432-6600.

Support Telephone Number

AT&T has a telephone number to report errors or to ask questions about the information in this document. The support telephone numbers are:

- Outside North Carolina — 1-800-334-0404
- Inside North Carolina — 1-919-727-6681

Developed by the AT&T Document Development Organization.

How Are We Doing?

Document Title: SLC[®] Series 5 Carrier System Feature Packages G and I Maintenance and Troubleshooting Task Oriented Practice (TOP)

Document No.: AT&T 363-205-500G Issue 1 (FPI) Date: January 1993

AT&T welcomes your feedback on this document. Your comments can be of great value in helping us improve our documentation.

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

	Excellent	Good	Fair	Poor	Not Applicable
Ease of Use					////////////////////
Clarity					////////////////////
Completeness					////////////////////
Accuracy					////////////////////
Organization					////////////////////
Appearance					////////////////////
Examples					
Illustrations					
Overall Satisfaction					////////////////////

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

- | | |
|--|---|
| <input type="checkbox"/> Improve the overview/introduction | <input type="checkbox"/> Make it more concise/brief |
| <input type="checkbox"/> Improve the table of contents | <input type="checkbox"/> Add more step-by-step procedures/tutorials |
| <input type="checkbox"/> Improve the organization | <input type="checkbox"/> Add more troubleshooting information |
| <input type="checkbox"/> Include more figures | <input type="checkbox"/> Make it less technical |
| <input type="checkbox"/> Add more examples | <input type="checkbox"/> Add more/better quick reference aids |
| <input type="checkbox"/> Add more detail | <input type="checkbox"/> Improve the index |

Please provide details for the suggested improvement. _____

3. What did you like most about this document?

4. Feel free to write any comments below or on an attached sheet.

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

Name: _____ Telephone Number: (____) _____

Company/Organization: _____ Date: _____

Address: _____

When you have completed this form, please fold, tape, and return to address on back or Fax to: 919-727-3043.

Do Not Cut—Fold Here And Tape



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1999 GREENSBORO, N.C.

POSTAGE WILL BE PAID BY ADDRESSEE

DOCUMENTATION SERVICES
2400 Reynolda Road
Winston-Salem, NC 27199-2029



How Are We Doing?

Document Title: SLC[®] Series 5 Carrier System Feature Packages G and I Maintenance and Troubleshooting Task Oriented Practice (TOP)

Document No.: AT&T 363-205-500G Issue 1 (FPI) Date: January 1993

AT&T welcomes your feedback on this document. Your comments can be of great value in helping us improve our documentation.

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

	Excellent	Good	Fair	Poor	Not Applicable
Ease of Use					////////////////////
Clarity					////////////////////
Completeness					////////////////////
Accuracy					////////////////////
Organization					////////////////////
Appearance					////////////////////
Examples					
Illustrations					
Overall Satisfaction					////////////////////

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

- Improve the overview/introduction
- Improve the table of contents
- Improve the organization
- Include more figures
- Add more examples
- Add more detail
- Make it more concise/brief
- Add more step-by-step procedures/tutorials
- Add more troubleshooting information
- Make it less technical
- Add more/better quick reference aids
- Improve the index

Please provide details for the suggested improvement. _____

3. What did you like most about this document?

4. Feel free to write any comments below or on an attached sheet.

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

Name: _____ Telephone Number: (____) _____

Company/Organization: _____ Date: _____

Address: _____

When you have completed this form, please fold, tape, and return to address on back or Fax to: 919-727-3043.

Do Not Cut—Fold Here And Tape



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1999 GREENSBORO, N.C.

POSTAGE WILL BE PAID BY ADDRESSEE

DOCUMENTATION SERVICES
2400 Reynolda Road
Winston-Salem, NC 27199-2029



About This Task Oriented Practice AT&T 363-205-500G

Purpose

This document provides task oriented procedures to perform system maintenance and trouble clearing activities for the *SLC*[®] Series 5 Carrier System. It contains specific information for Feature Package G (FPG) and Feature Package I (FPI). This document is designed to meet the following objectives:

- Provide all necessary procedures to clear system troubles for a *SLC* Series 5 Carrier System to FPG or FPI* system configuration.
- Separate each specific activity required to support FPG or FPI into individual tab or subtab sections.
- Provide all necessary procedures to perform a task in each tab or subtab section.

* This document does not contain procedures used at the *GTD-5†* EAX switch for trouble clearing. Refer to the *GTD-5 EAX User Guide* set of documents for procedures used at the *GTD-5* EAX switch. Only procedures used at the remote terminal (RT) are included in this document for Feature Package I.

† Registered trademark used under license from the GTE Corporation.

Scope

This document is divided into tabs and subtabs that are used to perform a specific task. The following is a summary of the tab procedures in this document:

- **FPG Maintenance** — This tab is used at the central office terminal (COT) and remote terminal (RT) to clear system troubles for Feature Package G.
- **FPI Maintenance** — This tab is used at the remote terminal (RT) only to clear system troubles for Feature Package I.
- **Fault-Locating Procedures** — This tab is used to perform fault-locating procedures on T1 digital lines. These procedures should be used after the trouble condition has been isolated to the T1 digital line using FPG or FPI Maintenance procedures.
- **SDU Manual** — This tab contains a copy of AT&T 363-205-155, *SDU User's Manual*.

Intended Audience

This document is used at the COT or RT by craftspersons responsible for performing the necessary procedures to clear system trouble for a *SLC Series 5* Feature Package G (FPG) or Feature Package I (FPI) system.

This document assumes a background in telephony and an understanding of basic digital transmission principles. Knowledge of digital loop carrier systems and the *GTD-5 EAX* switch may be assumed in some sections.

How to Use This Document

Find the tab section for performing FPG Maintenance, FPI Maintenance, or Fault-Locating Procedures and read the introduction. Then proceed as follows:

1. Read the **Introduction-000**, then find your task in the TASK INDEX LIST (**IXL-001**).
2. Turn to the desired trouble-clearing or detailed level procedure. All procedures in each section are in numerical order, regardless of type. Procedures in this TOP are of three types:
 - a. **Trouble Analysis Procedure (TAP)** - Detailed step-by-step instructions used to clear system troubles.
 - b. **Detailed Level Procedure (DLP)** - Detailed step-by-step instructions that support TAPs.
 - c. **Trouble Analysis Data (TAD)** - The *TAD element* is used to provide supplemental information when performing a task. This *element* may include information about philosophies, diagrams, and

supporting equipment used with or connected to this system.

3. Perform all the items in the trouble-clearing procedure in the indicated order unless it sends you to another trouble-clearing procedure. When you complete a trouble-clearing procedure, you have finished the task. Where more detailed information is required, you will be sent to a Detailed Level Procedure **DLP-()**. You may also be sent to a DLP by another DLP.
4. **IMPORTANT:** When you complete a DLP, you **MUST** return to the same step in the procedure which sent you there.
5. **IMPORTANT:** In most cases, if one trouble-clearing procedure sends you to another trouble-clearing procedure, you should not return to the first trouble-clearing procedure after you complete the second.
6. Sometimes you will be asked to verify that things have occurred. This may take the form of a formal statement of the expected response. At other times, the instructions will merely state *verify that ...*.
If the expected response is not observed and a specific trouble-clearing reference is not made, you should check to ensure that prior steps were performed correctly and that circuit pack options are correct.
If the expected response is not observed and a specific trouble-clearing reference is made, you should perform the reference trouble-clearing procedure and then return to the point in the procedure that sent you there.
7. If you need assistance after completing all the applicable procedures in this section, call the AT&T Regional Technical Assistance Center (**1-800-225-RTAC**) for FPG. For FPI, customer assistance is provided by the AG Communication Systems (AGCS) Technical Assistance Center (**1-602-582-7805**).

Conventions Used

Trademarks

The trademarks used in this guide are identified on the back of the title page. Trademarks are used as follows: they stand out from the rest of the text by using a different font or capital letters, and they modify a noun. For example, with the trademark, the system name is *SLC* Series 5 Carrier System. Without the trademark, it is referred to as the Series 5 system. The trademark is never used by itself; it always modifies a noun (for example, *SPOTS*[®] channel units). Trademarks are identified on the first use in *each chapter* (in text and headings) with the register mark (®) or with a footnote. Also, they will be identified in each table and figure on the first occurrence.

Product Safety, *UL*[®] Listing, and EMC Compatibility

The Series 5 system is available in a *UL** Listed RT. The *UL* Listed RT is designed to help customers comply with The National Electric Code, state, and local code requirements. The *UL* Listed RT is a 7-foot frame equipped with any combination of *UL* Recognized equipment and apparatus. Nearly all RT equipment and apparatus is *UL* Recognized, and AT&T plans to obtain *UL* Recognition for all new RT equipment introduced in the future. For a list of *UL* Recognized equipment and apparatus, refer to AT&T 363-205-011 (*UL* Listed Remote Terminal Installation) or AT&T 363-205-000G (*SLC Series 5 Information and Pricing Guide for GTE*).

The Series 5 system meets requirements for electromagnetic compliance (EMC) as defined in Federal Communications Commission (FCC) Part 15A and/or 15B.

Safety Labels

Safety labels in this document have the following definitions:



DANGER:

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



WARNING:

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



CAUTION:

*This indicates the presence of a hazard that **will** or can cause minor personal injury or property damage if the hazard is not avoided. This includes equipment damage, loss of software, or service interruption.*

System Features Supported

This document supports a *SLC* Series 5 Carrier System configured for Feature Package G Mode 1 or Mode 2 (concentrated) and Feature Package I Mode 1, Mode 2, or Mode 4 (Mode 2 and Mode 4 provide concentration).

* Registered trademark of Underwriters Laboratories Inc

Feature Package G is a *universal* system configuration [a central office terminal (COT) connected to a remote terminal (RT)] while Feature Package I is an *integrated* system configuration (a *GTD-5* EAX digital switch connected to an RT).

Related Documentation/Training

The following is an abbreviated list of documents associated with the *SLC Series 5* Carrier System. See AT&T 363-205-010, *SLC Series 5 Carrier System Applications and Planning Guide* for more information on documents, drawings, and training.

SLC Series 5 Documentation Plan

SLC Series 5 Carrier System Planning

363-205-010 *SLC Series 5 Carrier System Applications and Planning Guide*
363-205-100 *SLC Series 5 Carrier System General Description*
363-205-100G *SLC Series 5 Carrier System General Description
Feature Package G and I*

SLC Series 5 Carrier System Engineering and Circuit Design

363-005-101
thru -302 *SLC Series 5 Carrier System Data Sheets*
915-710-115G *SLC Series 5 Carrier System Feature Package G and I
Application Engineering*
915-710-116 *SLC Series 5 Carrier System Channel Unit Applications*
FPD 801-450-106-x *SLC Series 5 Carrier System Floor Plan Data Sheets*

SLC Series 5 Carrier System Ordering

363-205-000G *SLC Series 5 Carrier System Information and Pricing Guide
for GTE*

SLC Series 5 Carrier System Remote Terminal (RT) Installation and Splicing

631-600-240 *80-Type Cabinets*
631-600-241 *80-Type Cabinet Feeder Distribution Interface (FDI)*
640-250-217
thru -327 *Outside Plant Documentation*

T1 Metallic Facility

363-200-001 *T-Carrier Digital Line and Support Pairs
Preservice Testing*

Channel Testing

363-202-300 *Pair Gain Test Controller and Test Bust Control Unit
Description and Installation*

363-205-300 *Extended Test Controller
 Description, Turnup, and Maintenance*

Channel Unit Installation

363-205-402 *SLC Series 5 Carrier System Channel Unit Installation Tests (for
 FPG systems only)*

Feature Package G and I, Acceptance, Turnup, and Conversion

363-205-600G *SLC Series 5 Carrier System Maintenance*

This document provides all procedures used at the COT or RT to establish a
 FPG or FPI system or the change FPG or FPI system configurations.

GTD-5 EAX Documentation for Feature Package I

GTD-5 EAX User Guide

This document provides all procedures used at the *GTD-5 EAX* switch.

How to Order Documentation

To order additional copies of this document and/or to request placement on the
 standing order list, send or call in an order as follows:

Customer	Mail Order	Telephone Order (Monday thru Friday)
Commercial Customers*	AT&T Customer Information Center Attention: Order Entry Center 2855 N. Franklin Road P.O. Box 19901 Indianapolis, IN 46219	Within USA: 1-800-432-6600 7:30 a.m to 6:30 p.m. EST Fax: 1-317-322-6484 From Canada: 1-800-255-1242 Worldwide: Toll: 1-317-322-6557 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 AT&T.
 AT&T entities should use Form IND 1-80.80 FA, available through the Customer
 Information Center.

One-time orders include a binder (if applicable) and the document contents for
 the current issue in effect at the time of order. Also, you may request placement
 on the standing order list for all later 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.

How to Comment on This Document

Feedback forms are located immediately after the title page of this document. If the feedback forms are missing, please send your comments and suggestions to:

AT&T Documentation Services
2400 Reynolda Road
Winston-Salem, NC 27106

You may also report errors or request changes to this document by calling the toll-free number: **1-800-334-0404** and giving the document identifier number (**AT&T 363-205-500G**).

Customer Assistance and Technical Support

For FPG, AT&T will provide customer assistance on the *SLC Series 5 Carrier System* including, but not limited to, troubleshooting assistance, technical consultation, operational problem consultation, procedural advice, and emergency recovery assistance from a qualified system support professional from the Regional Technical Assistance Center (RTAC). For FPI, customer assistance is provided by the AG Communication Systems (AGCS) Technical Assistance Center (TAC).

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

Service is provided from the AGCS TAC at 1-602-582-7305. This telephone number is monitored 24 hours a day, 7 days a week. During regular business hours, your call will be answered by TAC personnel. Outside of normal hours, all calls will be answered at a centralized answering center. All calls will be dispatched immediately to TAC personnel.

FPI Maintenance Introduction SLC® Series 5 Carrier System Maintenance Procedures tab

Overview

This tab section is used at the remote terminal (RT) to clear system troubles for a SLC® Series 5 Carrier System Feature Package I (FPI) system configuration. The *GTD-5* EAX User Manual* documentation is used at the central office end of the system. This document assumes that the system has been turned up end-to-end and that at a previous time all system alarms were normal (clear).

At the top of each page the document number and issue information are on the inside of the page, and the tab Section: TOP Element and page count are on the outside top of the page.

This tab provides all the procedures necessary to perform the type of activity being done. This tab is stand-alone and can be removed from the binder if desired.

How to Use This Document

To find the instructions for performing FPI Maintenance tasks proceed as follows:

1. Read the **Introduction-000**, then find your task in the TASK INDEX LIST (**IXL-001**). Trouble clearing of all system level alarms begins by executing **TAP-101**.
2. Turn to the desired trouble-clearing or detailed level procedure. All procedures in each section are in numerical order, regardless of type. Procedures in this TOP are of three types:

* Registered trademark used under license from the GTE Corporation.

- a. Trouble Analysis Procedure (**TAP**) - Detailed step-by-step instructions used to clear system troubles.
 - b. Detailed Level Procedure (**DLP**) - Detailed step-by-step instructions that support **TAPs**.
 - c. Trouble Analysis Data (**TAD**) - The *TAD element* is used to provide supplemental information when performing a task. This *element* may include information about philosophies, diagrams, and supporting equipment used with or connected to this system.
3. Perform all the items in the trouble-clearing procedure in the indicated order unless it sends you to another trouble-clearing procedure. When you complete a trouble-clearing procedure, continue with trouble-clearing procedures until all alarms are cleared. For system alarms, TAP-101 should be re-executed if multiple problems exist. Where more detailed information is required, you will be sent to a Detailed Level Procedure **DLP-()**. You may also be sent to a DLP by another DLP.
 4. **IMPORTANT:** When you complete a DLP, you **MUST** return to the same step in the procedure which sent you there.
 5. **IMPORTANT:** In most cases, if one trouble-clearing procedure sends you to another trouble-clearing procedure, you should not return to the first trouble-clearing procedure after you complete the second.
 6. Sometimes you will be asked to verify that things have occurred. This may take the form of a formal statement of the expected response. At other times, the instructions will merely state *verify that ...*. If the expected response is not observed and a specific trouble-clearing reference is not made, you should check to ensure that prior steps were performed correctly and that circuit pack options are correct. If the expected response is not observed and a specific trouble-clearing reference is made, you should perform the reference trouble-clearing procedure and then return to the point in the procedure that sent you there.
 7. If you need assistance after completing all the applicable procedures in this section, call the AGCS Technical Assistance Center (TAC). The telephone number is **1-602-582-7305**.

Circuit packs being returned for repair should be sent, along with your company's repair and return form, to the following address:

AT&T Network Systems
Carolinas Service Center
6701-A North Park Blvd.
Charlotte, NC 28216

Safety Lables

Safety lables in this document have the following definitions:

 **DANGER:**
This indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.

 **WARNING:**
This indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.

 **CAUTION:**
This indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. This includes equipment damage, loss of software, or service interruption.

Equipment and Craft Personnel Considerations

 **CAUTION:**
*An electrostatic discharge wrist strap with a minimum resistance of 250K Ohms should be worn when handling Series 5 circuit packs to prevent possible damage to the circuit packs. Before using the wrist strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks it should not be used. To avoid possible personal injury while using the wrist strap, do not connect it to the power shelf or adjacent portions of the RT frame. Connect the wrist strap to **ESD GRD** jack on the fan unit, if present. If grounding jack is not present, connect wrist strap to bare-metal section of the frame well away from the power shelf.*

The Series 5 channel bank assembly and associated equipment provide high voltage ringing current and high amperage power distribution. You should remove any metal jewelry before working on this equipment, particularly around the backplane. *Follow local personel safety procedures when working on any AT&T product.*

Checklist

The following tab Index table provides a means to verify that all elements are present. This information should not be used for direct access to a particular element because *most elements are not stand-alone procedures*.

FPI Maintenance Tab Index	
Element	Title
Introduction-000	FPI System Maintenance Introduction
IXL-001	Task Index List
TAD-100	FPI Maintenance Philosophy
TAP-101	Clear System Alarms at FPI RT
TAP-102	Clear Major (MJ) Alarms at FPI RT (Suspect Shelf Alarms)
TAP-103	Clear ADU and BCU FAIL Alarm at FPI RT- MJ or MN, BCU FAIL and ADU FAIL LEDs Lighted
TAP-104	Clear ADU FAIL Alarm at FPI RT- MJ or MN, and ADU FAIL LEDs Lighted
TAP-105	Clear Fuse Alarms at FPI RT- MJ, MN, NE, and Any Digroup LED Lighted
TAP-106	Clear CLF Alarm at FPI RT- MJ, Digroups A, B, C, or D, and CLF LEDs Lighted
TAP-107	Clear Minor Alarm at FPI RT- MN and NE LEDs Lighted, ON PROT LED Not Lighted
TAP-108	Clear Power Minor Alarm at RT - PMN LED Lighted
TAP-109	Clear MISC Alarm - MJ or MN & MISC1
TAP-110	Clear Minor Alarm - MN and NE LEDs Lighted at RT - No Digroup LEDs Lighted
TAP-111	Clear Major Alarm at RT - MJ and All Digroup Indicators Lighted
TAP-112	Clear Power Trouble at RT - No RT Alarms All Span OOS.SYS.LOCAL at CO
TAP-113	Clear ACTU White or Blue Alarm- Single Channel Trouble in FPI RT
TAP-114	Clear Channel Failure - Multiple Channel- Trouble in FPI RT
TAP-115	Clear Power Minor Alarm at 80E Cabinet (Bulk Power Plant) RT - PMN LED Lighted
TAP-116	Clear Minor Alarm - MN and NE LEDs Lighted at 80E Cabinet RT - No Digroup LEDs Lighted
TAP-117	Clear Flashing CLF Alarm at FPI RT
TAP-118	Clear NE/MJ, TRU AB, LIU-A or LIU-B FAIL LEDs Lighted (Suspect TRU AB, LIU-A or LIU-B Failure)
TAP-119	Clear NE/MJ, TRU CD, LIU-C, LIU-D, or EMU FAIL LEDs Lighted (Suspect TRU CD, LIU-C, LIU-D, or EMU Failure)
TAP-120	Clear ADU FE Alarm at FPI RT - MJ, FE, and Digroup LEDs Lighted

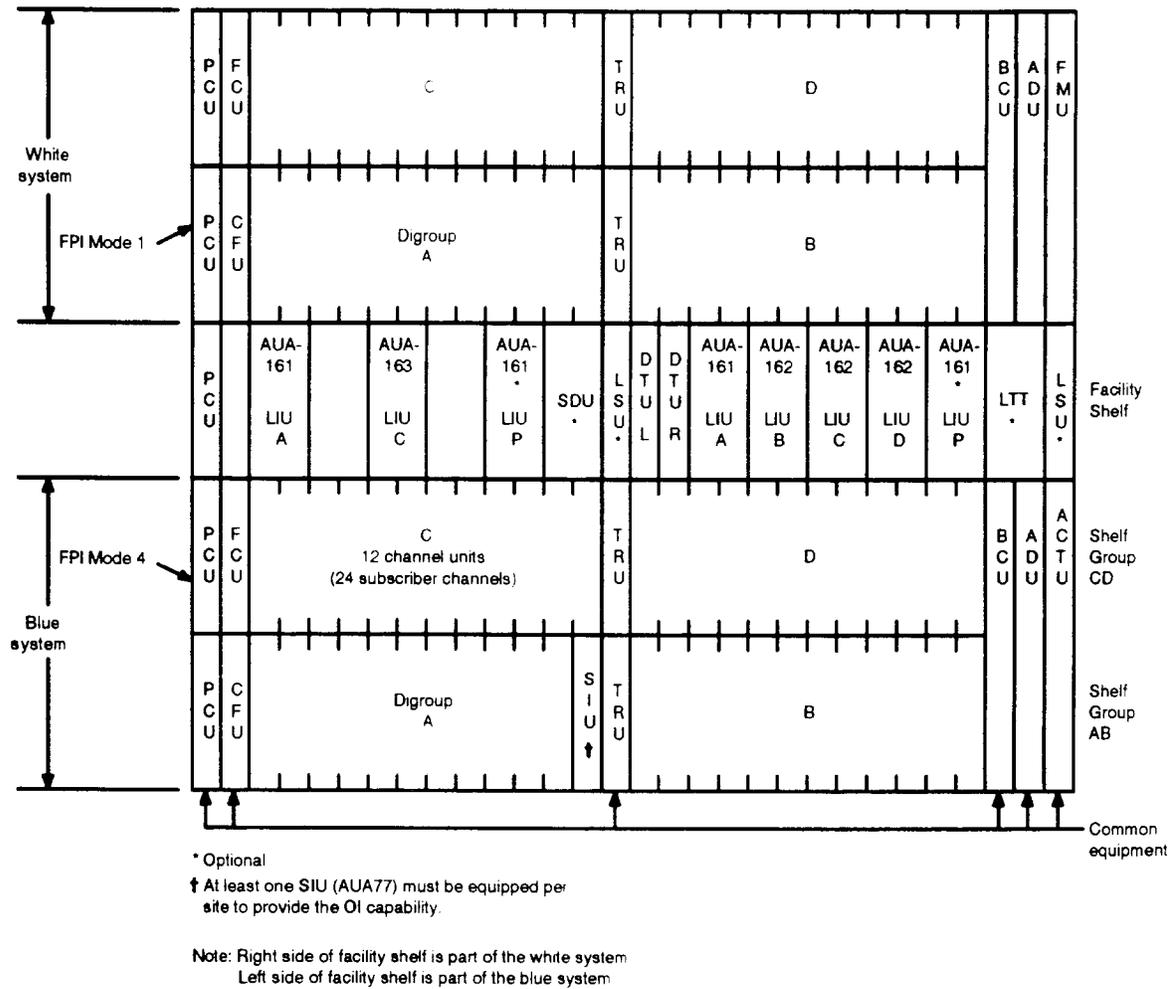
FPI Maintenance Tab Index (Continued)	
Element	Title
DLP-500	Abbreviated System Maintenance and Alarm Summary Tables
DLP-501	Use System Display Unit (SDU) to Examine System Alarms or Check Channel Unit Test Results
DLP-502	Set Line Switch Unit (LSU) Option Switch Settings
DLP-503	Set Alarm Display Unit (ADU) Option Switch Settings
DLP-504	Install the Flash Memory Unit (FMU)
DLP-505	Install and Bringup Feature Package I LIU
DLP-506	Perform Test of RT Batteries Using 197A Battery Load Test Set
DLP-507	Check 197A Battery Load Test Set for Proper Operation
DLP-508	Set Option Switches and Install the SIU

FPI System Maintenance

Introduction

This Tab provides procedures to clear Feature Package I (FPI) system troubles for the blue, white, or both systems of the *SLC*® Series 5 Carrier System remote terminal (RT) (Figure 1). The procedures are based on analyzing system alarm LED indicators and replacing faulty common circuit packs. These procedures assume the system alarms were all clear after the system was turned up end-to-end and that one failure condition caused the new system trouble condition.

These procedures require proper option setting and compatible version circuit packs are used when a circuit pack replacement is done.



pe 813795/01

Figure 1 — Feature Package I Mode 1 (White) and Mode 4 (Blue) RT Channel Bank

Task Index List

FIND YOUR JOB IN THE LIST BELOW **THEN GO TO**

FPI Maintenance Philosophy	TAD-100
System Alarms at FPI RT — Clear.....	TAP-101
Channel Failure — Multiple Channels — Signaling Trouble — Clear	TAP-114
ACTU White or Blue Alarm — Single Channel Signaling Trouble — Clear	TAP-113
Power Trouble at RT - All Spans OOS.SYS.LOCAL at CO — Clear.....	TAP-112
System Display Unit (SDU) to Examine System Alarms or Check Channel Unit Test Results — Use.....	DLP-501
Abbreviated System Maintenance and Alarm Summary Tables	DLP-500

▲ CAUTION:
In dusty areas (for example, near construction sites), AT&T recommends tenting the RT cabinet to protect electronic equipment whenever the cabinet doors are opened for extended periods.

FPI Maintenance Philosophy

System Overview

The *SLC*® Series 5 Carrier System (Series 5) equipped with Feature Package I (FPI) interfaces with a *GTD-5** EAX digital switch. The basic building block for a Series 5 is a 96-line system, which is referred to as an MXU Subtype S at the *GTD-5* EAX. The Series 5 uses two independent 96-line systems that are physically packaged into one 5-shelf dual bank assembly. The FPI system provides three configurations, which are designated by Mode of operation. Mode 1 offers no concentration (24 circuits per DS1 span); Mode 2 offers 2-to-1 concentration (48 circuits per DS1 span); and Mode 4 offers 4-to-1 concentration (96 circuits per DS1 span). Refer to AT&T 363-205-100G, General Description, for a description of these configurations.

The FPI remote terminal (RT) provides a direct digital interface at the DS1 rate with the *GTD-5* EAX. The RT is connected directly to the *GTD-5* EAX digital trunk facility interface unit (DT-FIU) in Mode 1, 2, or 4. The system communicates with the *GTD-5* EAX through the remote data link control (RDLC) link connected to the *GTD-5* EAX by the first DS0 of the A DS1 span. Optional line interface unit (LIU)-protection switching provides backup termination for the *GTD-5* EAX RDLC datalink LIU. This provides equipment protection for the master LIU (MLIU) that communicates with the central office (CO).

The MLIU is loaded with its software generic before it becomes operational. The software generic resides on the FMU (flash memory unit). The FMU must be loaded through either direct or dial-up connection to a PC operating the DTFIO software package. These maintenance procedures assume that the correct software generic resides on the installed FMU. If the FMU has failed and needs to be replaced, the craftsman will need to reload the FMU.

If trouble isolation is being performed, the craftsman located at the CO terminal opposite the RT should use the *GTD-5* EAX User Guide for the Series 5 FPI MXU. This document should be used when the trouble has been isolated to the RT or when trouble clearing begins at the RT. When a CLF alarm is reported

* Registered trademark used under license from the GTE Corporation.

at the RT and the *GTD-5* EAX diagnostics do not report a faulty circuit pack, the office repeater should be replaced (or trouble isolated to multiplexer facility equipment).

Alarms

The BCU, ADU, and MLIU monitor failure conditions within the system and monitor external conditions that may affect operation of the system. The MLIU reports alarm conditions to the *GTD-5* EAX which are displayed as alarm messages and/or system malfunction syndromes (SMAs) at the system terminal. DLP-500 lists major alarm conditions that can occur and the corresponding alarm messages that will be seen. Alarm conditions are also reflected at the RT by the lighting of LEDs on the common circuit packs. When trouble has been determined to be with the Series 5 RT, trouble analysis begins with an examination of alarm and status indicators on the system plug-ins or customer trouble reports.



CAUTION:

Fan operation is essential to prevent system failures in those Series 5 RTs engineered and installed with fans. At the conclusion of all installation and maintenance activities, check that the FCUs (fan control units) for both systems in the dual channel bank are installed and that the fans operate properly. Press the FAN TEST pushbutton on each FCU to ensure proper operation.

Trouble Analysis Procedures

A general knowledge of how the Series 5 system functions and what alarm LED indications mean will aid in performing TAPs (trouble analysis procedures). TAPs in this volume generally assume the following:

- The system is equipped with the plug-ins required to make an operating system.
- There may be a single cause for multiple trouble indications
- Only a single trouble is assumed to exist.

When an alarm is indicated at the *GTD-5* EAX system terminal, the craftsperson should first use local procedures to verify that problems do not exist at the DT-FIU and that the *GTD-5* EAX is not transmitting any yellow alarms. After the CO side has been verified, a craftsperson should be dispatched to the RT for fault isolation. At the RT, the craftsperson determines if the system alarm is MJ

(major) or MN (minor) by examining MJ and MN indicators on the ADU. A further analysis of bank indicators results in the craftsperson accessing a particular TAP to begin trouble clearing. The IXL-001 will indicate the proper TAP for trouble clearing. TAP-101 should be used first when trouble clearing system alarms because it is designed to quickly find a single trouble that may cause multiple alarm indications. Refer to Figure 1 for an overview of the logic flow followed by the TAP Procedures.

Trouble-clearing procedures should be followed in the order specified in the TAPs. Erroneous LED conditions could be detected if the procedures are not followed in the order specified. When following the procedures, wait for alarms to settle before proceeding with trouble clearing. Alarms may take up to 10 minutes to settle when circuit packs are replaced.

If a CLF alarm at the RT indicates trouble on a digital line, fault-locating procedures should be followed to isolate the transmission facility problem.

Trouble-clearing is based on replacement of plug-ins. Any options on replacement plug-ins must be set per the appropriate facility record. Whenever replacement of a plug-in does not cure the trouble, the original plug-in should be returned to operation.

The time interval between when a trouble is cleared and when the alarm LEDs go off depends on the circuit packs being replaced. When any combination of the BCU and the ADU is removed, the time for alarms to clear may be up to ten minutes. If LIU-A is replaced, one to two minutes is required for the LIU-A generic to be loaded from the FMU. If protection switching is provided through LIU-P, two minutes will normally be required to load the LIU-P generic from LIU-A. The LIU-P load time is dependent on the call processing traffic. The craftsperson should follow the time intervals in the TAPs before proceeding with subsequent steps.

Fiber Facilities and T1 Extensions

When a lightguide multiplexer, such as the DDM-1000 or DDM-2000, or DDM-Plus transport facility is used with a SLC Carrier System, digital line trouble (CLF on Series 5 LIU circuit packs) may be caused by the carrier facility. When there are digital line failures, first check the multiplexer circuit packs for alarm conditions. A flashing LED on a low-speed circuit pack (ALM on DDM-1000, FAULT on DDM-2000, or DS1 on DDM-Plus) indicates a loss of received DS1 signal from connecting equipment. The LED will stay on if the circuit pack fails and MJ, MN, NE, FE, or ABN indicators will light. Trouble clearing the

multiplexer equipment should begin at the end with the NE indicator. Series 5 LIU CLF alarms could be caused by a multiplexer loopback. This would light the ABN indicator. Use documentation for the type of multiplexer used to clear multiplexer system troubles.

When T1 extension lines are used, the repeater shelf or the T1 extension line could cause digital line failures. If there is digital line trouble on a system with T1 extension lines, first check the multiplexer low-speed packs for flashing or steady LED indicators. If the indicator is flashing, trouble clearing should start at the repeater shelf as done at a central office repeater bay. First look for blown fuses on the power shelf or repeater shelf. Then measure simplex current (-V to -L) and voltage (-V to ground). If the current is present, fault locating can be done from the 800 or 900 series DSX, or protector blocks between the multiplexer and the repeater shelf when TIE BLOCK/307 DSX is used. DLP-522 gives procedures for connecting fault locate test equipment for an 80D or 80E cabinet with an SXSS repeater shelf and IT BLOCK/307 DSX. If you have a different equipment arrangement, find the protectors for the transmit side of the digital line and Fault Locate pair and make test set connections as indicated in Fault-Locating Tab procedures.

Circuit Pack Replacement

In the FPI system, the *GTD-5* EAX data base maintains the state of the system mode, grooming setting, and protection equipage. These settings must correspond to the LIU and ADU switch settings as described in the installation procedures. These procedures assume that the system has been previously running without alarms, implying that no compatibility problems exist at the time of the alarm. It is imperative that maintenance personnel use care when making settings on replacement of CPs (circuit packs) and ensure that the correct codes of replacement CPs are installed into the proper bay position at the system. Failure to observe these cautions may result in immediate or future loss of service or may introduce errors into the digital bit stream.

There are several indications that the craftsman may use to determine whether an error has been made during system maintenance as follows:

- When a new CP (except LIU) is installed at turnup or during maintenance, the CP's FAIL indicator (LED) should be observed to ensure that it comes on momentarily, then goes off. The absence of this JPU (just powered up) indication should cause the craftsman to check for proper CP type, option settings, and location. The FAIL indicator on the LIU will remain while it is initializing (up to 2 minutes) and then go out.

- A misplaced or misset CP should always cause the associated digroup indicator (on the BCU) to light.
- If the FAIL LED stays on following the replacement of a common unit, the CP is probably failed, is installed in the wrong position, or contains incorrectly set options. When the ADU LED TEST switch is depressed, if the FAIL LED on the unit goes off and the CMP LED on the ADU lights, the unit has been optioned incorrectly. If the FAIL LED on the unit does not go off then the unit is installed in the wrong position or is failed.

The following procedure may be used when a problem is indicated (as above) following replacement of a unit. A simple verification of craftsperson error may be made as follows: While observing the FAIL LED on the unit just replaced, depress the ADU LED TEST switch. With the exception of the FMU, if the FAIL LED on the replaced CP does not light, a craftsperson error of the type listed above is indicated. The CMP LED on the ADU will light if an incompatibility is detected. With the exception of the FMU, and misset ADU option switch, the FAIL LED on the CP that is misset will be off.

If however, the ADU has just been replaced and a switch is misset so that the GTD-5 EAX data base and RT ADUs are not in agreement, the FAIL LED on CPs other than the ADU may go off when the ADU LED TEST switch is depressed. This is because the ADU establishes the configuration for the local controller, so the local bank controller must take the ADU setting as correct. In any event, an extinguished FAIL LED tells the craftsperson to recheck the last CP replaced for CP code, option switch settings, and for location.



CAUTION:

*An electrostatic discharge wrist strap with a minimum resistance of 250K Ohms should be worn when handling Series 5 circuit packs to prevent possible damage to the circuit packs. Before using the wrist strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks it should not be used. To avoid possible personal injury while using the wrist strap, do not connect it to the power shelf or adjacent portions of the RT frame. Connect the wrist strap to **ESD GRD** jack on the fan unit, if present. If grounding jack is not present, connect wrist strap to bare-metal section of the frame well away from the power shelf.*

Maintenance Tools

The FPI system can be equipped with a system display unit (SDU). The SDU provides status data for several types of information including system alarms and channel unit test results. The SDU CATEGORY button is used to select the type of information to be displayed when the DATA button is pressed. DLP-501 provides a summary of alarms and channel test data that is displayed by the SDU. Refer to the AT&T 363-005-155 AUA8 SDU data sheet/user's manual (See SDU Manual Tab) for more details.

If a remote terminal local area network (RT-LAN) is used, the Operations Interface (OI) software can access each RT system connected to the RT-LAN to perform maintenance functions such as alarm retrieval, channel unit testing, channel unit provision, and traffic and performance monitoring. DLP-500 provides a summary of the primary alarm messages displayed by the OI for FPI alarm conditions. The OI Retrieve-Summary command should be used to obtain a list of all outstanding alarms. Refer to AT&T 363-205-111G, *Operations Interface User's Guide*, for more details.

Customer Trouble Reports

A customer trouble report is generally an unalarmed trouble and usually indicates a channel unit problem or distribution facility (drop) problem. The system can be optioned to activate a MN alarm if an RT channel unit fails. Single-party, multiparty, and coin service trouble reports are first received at the maintenance center. The maintenance center utilizes the ACCESS/DIAG tests and the facility test unit (FTU) of the GTD-5 EAX to perform IN-testing of the channel unit. An remote measurement unit (RMU) must be used to test the out pair to the subscriber. If a channel unit problem is found, a channel unit trouble report is initiated to the proper repair force and trouble analysis procedures begin at the RT. A replacement of the RT channel unit is performed first. If the problem is still present, the outside plant must be verified.

The SDU can display channel unit test results. If the RT-LAN is used, the OI can perform channel tests or review channel test results from a centralized location.

AT&T 363-205-402, **SLC Series 5 Carrier System Channel Unit Installation AT&T TOP** contains procedures to install and test channel units. These procedures can be used to clear in-service special service troubles by performing the tasks to add channel service for the type of channel unit that has trouble. These procedures will clear the trouble conditions if the SLC Series 5 Carrier System is causing the problem. Customer equipment, drop pairs, or central office (or

network) equipment can also cause the trouble condition.

Further Assistance

When procedures of this volume do not locate the trouble, multiple troubles or obscure troubles are assumed to exist. The necessary SDs, CDs, etc., should be available to assist in locating an obscure wiring problem. If fault isolation fails to identify and correct the problem, the craftsperson should remove all circuit packs and follow the initial turnup procedures described in AT&T 363-205-600G to reinstall the system.

The AG Communication System Technical Assistance Center (TAC) can be contacted at 1-602-582-7305 to assist with FPI problems that cannot be resolved.

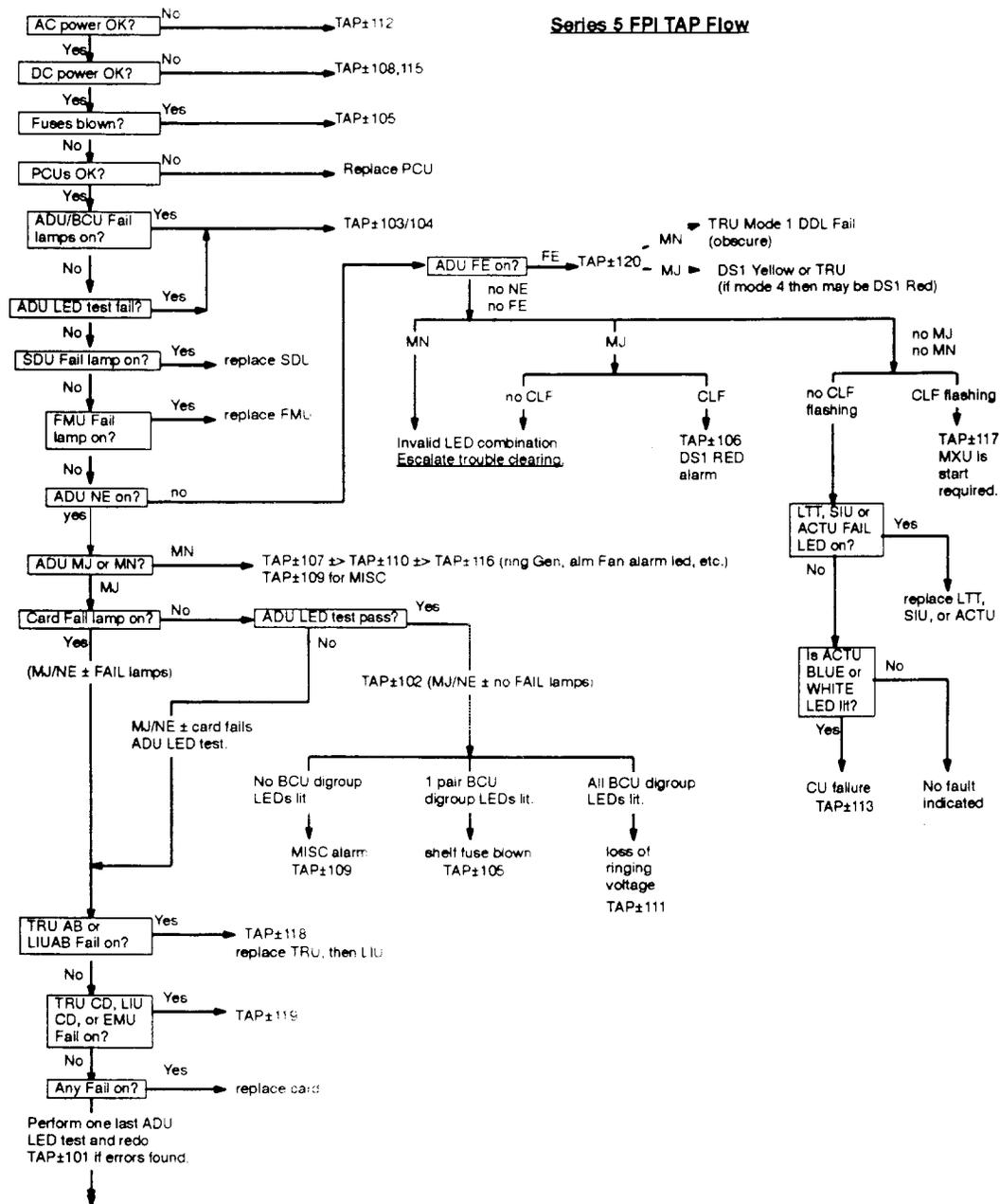


Figure 1 — Feature Package I Maintenance Flowchart

Clear System Alarms at FPI RT

1.



NOTE:

This procedure assumes all required common unit circuit packs are fully seated in the channel bank or power shelf and none are missing or have been removed. This procedure also assumes the system has been running in an integrated configuration with the *GTD-5** EAX and that the system alarms (at a previous time) were clear. Thus, the **ADU CMP** indicator should not be lighted (this indicator is used when there is an option switch/common unit compatibility conflict). If the **CMP** indicator is lighted, a *GTD-5* EAX data base change may have been made that does not match the hardware configuration. This could indicate that the mode, grooming, equalization, circuit pack type[†], or protection settings are incorrect. The compatibility problem should be corrected before continuing with alarm isolation.

First, determine whether or not power is being supplied to the RT.

Complete loss of power at the RT is indicated by the following conditions:

RT in outage at CO.

Host/Remote span status OOS.SYS.LOCAL at CO.

No lamps lighted at RT.

No lamps lighted at RT when **LED TEST** button on ADU is depressed.

Is power being supplied to the RT?

If **YES** then continue with Step 2.

If **NO** then do **TAP-112**.

* Registered trademark used under license from the GTE Corporation.

† For example, LIU installed in LIU-B slot for a Mode 2 system, or a FPG type LIU installed in a FPI system.

2. Is **BCU PMN** LED lighted?

If **YES** then do **TAP-108**.
If **NO** then proceed to Step 3.

3. At **CFU**, RT **BFU** (**ALM** on the unit), RT **BAT** shelf, or RT ringing generator units (in the power shelf at the RT) are any fuses blown?

If **YES** then do **TAP-105**.
If **NO** then continue with Step 4.

4. Is the **FAIL** LED lighted on any of the units in the power or battery shelf?

If **YES** then continue with Step 5.
If **NO** then go to Step 6.

5. Replace any circuit packs in the power and battery shelf with the **FAIL** LED lighted.

Did system alarms clear?

If **YES** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE**.
If **NO** then continue with Step 6.

- 6.



CAUTION:

Before removing a PCU from an RT shelf, locate the CFU that is housed in the same system (blue or white) as the PCU and remove either the -20 HZ/AB (if PCU is in the AB shelf) or -20 HZ/CD (if PCU is in the CD shelf) fuse. Replace the fuse after the PCU has been replaced.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the facility shelf **PCU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

Is the FAIL lamp lighted for any PCU?

If **YES** then replace **PCU** and continue with Step 7.
If **NO** then continue with Step 7.

7. Are both the **ADU** and **BCU FAIL** LEDs lighted?

If **YES** then do **TAP-103**.
If **NO** then continue with Step 8.

8. Is the **ADU FAIL** LED lighted?

If **YES** then do **TAP-104**.
If **NO** then continue with Step 9.

9. Verify the general operation of the **ADU** and **BCU** by performing an LED test. At **ADU** depress the **LED TEST** push button. Are the **FAIL** LEDs on the **ADU** and **BCU** lighted, and did one or more of the **FAIL** LEDs on the **LIUs**, or **TRUs** light?

If **NO** then do **TAP-103**.
If **YES** then continue with Step 10.

10. If the system is equipped with an **SDU**, use the **CATEGORY** and **DATA** buttons to access additional data describing the fault.

Reference: DLP-501

Is the **SDU FAIL** LED lighted?

If **YES** then replace **SDU**.
If **NO** then continue with Step 11.

11. Is **FMU FAIL** LED lighted?

If **YES** then replace **FMU**.

Reference: DLP-504

If **NO** then continue with Step 12.

12. Is the **ADU NE** LED lighted?

If **YES** then proceed to Step 15.

If **NO** then continue with Step 13.

13. Is the **ADU FE** LED lighted?

If **YES** then do **TAP-120**.

If **NO** then continue with Step 14.

14. If neither **NE** or **FE ADU** LEDs are lighted, what other alarm indicator(s) are present?

If **CLF** LEDs flashing on all nongroomed **LIUs** and no **ADU MJ** or **MN** LEDs lighted, do **TAP-117**.

If **ADU MJ**, and **CLF** on steady on any **LIU**, do **TAP-106**.

If **LTT**, **SIU**, or **ACTU FAIL** LED lighted, replace **LTT**, **SIU**, or **ACTU**.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the **ACTU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

If **ACTU WHITE** or **BLUE** LED lighted, do **TAP-113**.

If **ADU MN** or **ADU MJ** and no **LIU CLF** lighted, this is an invalid alarm combination, indicating that multiple problems exist and/or that the **ADU/BCU** is faulty. Request technical assistance.

15. Is the **ADU MJ** LED lighted?

If **YES** then proceed to Step **19**.
If **NO** then continue with Step **16**.

16. Is the **ADU MN** LED lighted?

If **NO** then proceed to Step **18**.
If **YES** then continue with Step **17**.

17. Is the **MISC 1** lamp lighted?

If **YES** then do **TAP-109**.
If **NO** then do **TAP-107**.

18. All alarms should be accompanied with either a **ADU MJ** or **MN**. Since neither **MJ** or **MN** is lighted, request technical assistance.

19. Is the **FAIL** indicator lighted on any of the common units in the dual channel bank assembly?

If **YES** then go to Step **23**.
If **NO** then continue with Step **20**.

20. Perform a LED test by depressing the **LED TEST** push button on the **ADU**.

Did **FAIL** LEDs on all circuit packs (excluding **FMU**) light?

If **YES** then continue with **TAP-102**.
If **NO** then continue with Step **21**.

21. Replace any circuit packs whose **FAIL** LED did not light during the **ADU** LED test.

22. Repeat the LED test.

Did **FAIL** LEDs on all circuit packs (excluding **FMU**) light?

If **YES** then go to Step **28**.

If **NO** then multiple problems exist. Request technical assistance.

23. Is the **FAIL** indicator lighted on **TRU AB**, or **LIU A** or **B**?

If **YES** then continue with **TAP-118**.

If **NO** then continue with Step **24**.

24. Is the **FAIL** indicator lighted on **TRU CD**, **LIU C** or **D**, or **EMU** (mode 4)?

If **YES** then continue with **TAP-119**.

If **NO** then continue with Step **25**.

25. On any other common unit in the dual channel bank assembly, replace the circuit pack with the **FAIL LED** lighted. Note that one circuit pack may cause another to fail. Therefore, replacing a failing circuit pack may clear the **FAIL LED** on one or more other circuit packs. Continue with Step **26**.

Reference: DLP-502 (LSU), DLP-508 (SIU)

Comment: The **PCU**, **TRU**, **SDU**, **FMU**, **DTU-L**, **DTU-R**, or **ACTU** do not require option switch settings and can simply be replaced.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the **ACTU** or replace the **PCU** in the facility shelf. Wait for the **FAIL LED** on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

26. At this point the **FAIL** LEDs on all common unit circuit packs in the channel bank assembly, and on all circuit packs in the power and battery shelves should be off. If any of **FAIL** LEDs are lighted then multiple problems exist, and trouble clearing procedures must be repeated. If the **FAIL** LEDs cannot be cleared then call for technical assistance.

Is the **FAIL** LED lighted on any of the common unit circuit packs in the channel bank assembly, or on any of the circuit packs in the power or battery shelf?

If **YES** then repeat **TAP-101**.
If **NO** then continue with Step 27.

27. At **ADU**, depress **LED TEST** push button.

Did **FAIL** LEDs on all circuit packs (excluding **FMU**) light?

If **YES** then continue with Step 28.
If **NO** then multiple problems exist. Repeat **TAP-101**.

28. If necessary, request CO personnel to configure, load, and start the system.
Did system alarms clear?

If **NO** then continue with Step 29.
If **YES** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

29. Multiple problems exist. Repeat **TAP-101**. If problems persist then request technical assistance.

Clear Major (MJ) Alarms at FPI RT (Suspect Shelf Alarms)

1.  **NOTE:**
This TAP assumes that failure conditions on common circuit packs have been cleared. If fail conditions exist, execute **TAP-101** before proceeding.

Are NE and all DIGROUP LEDs lighted?

If **YES**, then do **TAP-111**.
If **NO**, then continue with Step 2.

2. Is **DIGROUP A, B, C, or D** lighted?

If **YES**, then do **TAP-105**.
If **NO**, then continue with Step 3.

3. Is **MISC 1** LED lighted?

If **YES**, then do **TAP-109**.
If **NO**, then continue with Step 4.

4. Call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear ADU and BCU FAIL Alarm at FPI RT MJ or MN, BCU FAIL and ADU FAIL LEDs Lighted

1.



CAUTION:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.



NOTE 1:

For FPI configurations, the CU provisioning memory resides in the ADU and BCU, with a check sum stored in each TRU for use if the main data in either plug-in must be restored. If the BCU or ADU is replaced, **up to 10 minutes** may be required for fail and status indicators to return to normal, depending on the amount of provisioning data downloaded to the new unit. If both ADU and BCU plug-ins fail and are replaced at the RT, the provisioning parameters must be reinitialized using the CIU (craft interface unit) or OI (operations interface); all special service channel units in the single affected bank (blue or white) must be reprovisioned.



NOTE 2:

Service will not be interrupted when the ADU or BCU is reseated in an FPI system, but the FAIL and PRV indicators will be lighted for up to 60 seconds.

Remove **BCU** and install replacement **BCU**.

2. Did **BCU FAIL** LED extinguish?

If **YES**, then continue with Step 3.

If **NO**, then proceed to Step 4.

3. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 4.

4. Remove **ADU** and install a replacement **ADU**.

Reference: **DLP-503**

5. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 6.

6.



NOTE:

If alarms remain, multiple troubles exist and trouble analysis must be extended using other TAPs.

If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear ADU FAIL Alarm at FPI RT MJ or MN, and ADU FAIL LEDs Lighted

1.  **NOTE:**
Service will not be interrupted when the **ADU** is reseated in an FPI system, but the **FAIL** and **PRV** indicators will be lighted for up to **2 minutes**.

Remove **ADU** and check position of option switches.

Reference: **DLP-503**

2.  **NOTE 1:**
For FPI configurations, the CU provisioning memory resides in the **ADU** and **BCU**, with a check sum stored in each **TRU** for use if the main data in either plug-in must be restored. If the **BCU** or **ADU** is replaced, **up to 10 minutes** may be required for fail and status indicators to return to normal, depending on the amount of provisioning data downloaded to the new unit. If both **ADU** and **BCU** plug-ins fail and are replaced at the RT, the provisioning parameters must be reinitialized using the CIU (craft interface unit) or OI (operations interface); all special service channel units in the single affected bank (blue or white) must be reprovisioned.

-  **NOTE 2:**
Service will not be interrupted when the **ADU** or **BCU** is reseated in an FPI system, but the **FAIL** and **PRV** indicators will be lighted for up to 60 seconds.

Did trouble indicators extinguish within 35 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 3.

3. Remove **ADU** and install a replacement **ADU**.
4. Replace blown fuse, if necessary.

Comment Remove the **LTT** ribbon cable connector from the **ACTU** before installing the fuse for the facility shelf **PCU** (common fuse). Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

5. Did trouble indicators extinguish within 10 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 6.

6. If alarms remain, multiple troubles exist and trouble analysis must be repeated.
7. If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear Fuse Alarms at FPI RT MJ, MN, NE, and Any Digroup LED Lighted

1. At **CFU**, or in RT power shelf **BFU**, etc., are any fuses blown?

If **YES**, then continue with Step 2.
If **NO**, then proceed to Step 4.

- 2.



CAUTION:

Removal of CFU or BFU fuse can cause loss of service. When the blown fuse is removed, replace with a good fuse within 20 seconds or alarms will be indicated again.

Replace blown fuse.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the fuse for the facility shelf **PCU**. Wait for the **FAIL LED** on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

3. Did alarm clear within 5 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 4.

4.



CAUTION 1:

Before removing a PCU from an RT shelf, locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.

Replace **PCU** associated with failed digroup(s).

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the facility shelf **PCU**. Wait for the **FAIL LED** on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

5. Replace fuse if blown again.

6. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 7.

7. If alarms remain, multiple troubles exist and trouble analysis must be repeated.

8. If replacement fuse blows, unseat all channel units and reset them, one at a time, until channel unit that causes fuse to blow is found. If trouble was not with a channel unit, use SD-7C117 and SD-7C118 to locate trouble. If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear CLF Alarm at FPI RT MJ, Digroups A, B, C, or D, and CLF LEDs Lighted

1. Using **DLP-505**, replace **LIU** with **CLF** indicator lighted.

2. Did **CLF** indicator on **LIU** go off?

If **YES**, then proceed to Step 10. (**LIU** was bad or incoming T-line is intermittent)
If **NO**, continue with Step 3.

3. Is **LIU-A CLF** lighted and **LIU-P** equipped?

If **YES**, continue with Step 4.
If **NO**, proceed to Step 8.

4. Remove **LIU-P**. If **CLF** alarm clears, replace **LIU-P**. Otherwise, reinstall **LIU-P** just removed.

5. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 6.

6. Verify that Y-cable, ED-7C717-30, is operational and installed correctly. Correct any problems.

7. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 8.

8. Alarm indicator pattern indicates a failed carrier line. Is transmission facility T1 line or other carrier facility?

If **T1 LINE**, then use local procedures or the Fault-Locating tab of this practice to perform fault-locating procedures from a DSX cross-connect panel. Then proceed to Step 10.

If **OTHER CARRIER FACILITY**, then continue with Step 9.

9. Refer to trouble-clearing documentation for that facility.

10. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 11.

- 11.



NOTE:

If alarms remain, multiple troubles exist and trouble analysis must be repeated.

Use SD-7C117, SD-7C118, and SD-7C119 to help locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear Minor Alarm at FPI RT MN and NE LEDs Lighted, ON PROT LED Not Lighted

1. What type of RT configuration do you have?

If **DISTRIBUTED POWER SHELF** (J1C182BA), then continue with Step 2.

If **80E CABINET WITH BULK POWER PLANT**, then proceed to Step 3.

If **FRAME TYPE BULK POWER SHELF** (J1C182BB), then proceed to Step 4.

- 2.



NOTE:

OPEN BATT, main **RINGING GENERATOR FAIL**, **RECTIFIER** failure, and **FAN ALARM** are the only items from RT power plant that can cause a minor alarm.

Is **OPEN BATT** LED on the **337A BATTERY CHARGER**, **FAIL** LED on the main **3C** or **3A RINGING GENERATOR**, or **FAN ALARM** LED on the fan assembly lighted?

If **YES**, then do **TAP-110**.

If **NO**, then proceed to Step 5.

3. Is **RMN** LED on the **AUG3 RINGING CONTROL UNIT**, **FAIL** LED on either **3C** or **3A RINGING GENERATOR**, or **FAN ALARM** LED on the fan unit lighted or is **NORMAL** LED on control and distribution panel off?

If **YES**, then do **TAP-116**.

If **NO**, then proceed to Step 5.

4. Is **FAIL** LED on either **3C** or **3A RINGING GENERATORS** or **FAN ALARM** LED on the fan unit lighted?

If **YES**, then do **TAP-110**.
If **NO**, then continue with Step 5.

5. Are **FAIL** LEDs lighted on **LIU-P**, **LSU**, or the facility shelf **PCU**?

If **YES**, then continue with Step 6.
If **NO**, then proceed to Step 8.

- 6.



CAUTION 1:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.



CAUTION 2:

If it is necessary to replace a PCU at an RT location, the PCU should not be removed from the shelf until the correct CFU fuse has been removed. Locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.

Replace circuit pack(s) that has **FAIL** LED lighted.

Reference: **DLP-502 (LSU), DLP-505 (LIU)**

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the facility shelf **PCU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

7.



NOTE:

If protection **LIU FAIL** LED is lighted, and replacing **LIU** does not clear the alarm, reinstall original **LIU** and replace the **LSU**.

Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 8.

8. Is **BCU FAIL** LED lighted?

If **YES**, then continue with Step 9.

If **NO**, then proceed to Step 11.

9.



CAUTION:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.



NOTE 1:

For FPI configurations, the CU provisioning memory resides in the **ADU** and **BCU**, with a check sum stored in each **TRU** for use if the main data in either plug-in must be restored. If the **BCU** or **ADU** is replaced, **up to 10 minutes** may be required for fail and status indicators to return to normal, depending on the amount of provisioning data downloaded to the new unit. If both **ADU** and **BCU** plug-ins fail and are replaced at the RT, the provisioning parameters must be reinitialized using the CIU (craft interface unit); all special service channel units in the single affected bank (blue or white) must be reprovisioned.



NOTE 2:

Service will not be interrupted when the **ADU** or **BCU** is reseated in an FPI system, but the **FAIL** and **PRV** indicators will be lighted for up to 60 seconds.

Replace **BCU**.

10. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 11.

11.



CAUTION:

When a TRU is removed, even momentarily, service will be interrupted on all 48 circuits served by the TRU. All calls in progress will be torn down.

Reinsert original **BCU** (if removed) and replace **TRU** circuit pack.

12. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 13.

13. If **LIU-P** is not equipped, proceed to Step 16. Is the force (f) or deny (d) switch for digroup **A** set to **ON** (left) position on **LSU**?

If **YES**, then continue with Step 14.

If **NO**, then proceed to Step 16.

14.



CAUTION:

Changing position of force and deny switch can cause service interruption on a digroup. Make sure that force or deny is no longer needed before returning switch to the normal position.

Return digroup option switch to its **OFF** (right) position.

15. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 16.

16. Depress **ADU LED TEST** push button.

17. Are **FAIL** LEDs on all **LIUs** lighted?

If **YES**, then proceed to Step 23.

If **NO**, then continue with Step 18.

18. Is **ADU CMP** LED lighted?

If **YES**, then continue with Step 19.

If **NO**, then proceed to Step 20.

19. An incompatibility problem exists in the FPI system. Check the mode, grooming, and protection settings on the **ADU** and the equalization settings and grooming switch on the **LIU** to ensure correct settings. Also verify that *GTD-5** EAX data base settings are compatible with **ADU/LIU** settings. Resolve incompatibility problem and return to Step 16.

* Registered trademark used under license from the GTE Corporation.

20. Using **DLP-505**, replace **LIU** with **FAIL** indicator that did not light and repeat from Step 16.

21. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 22.

22. At **ADU**, depress the **LED TEST** push button.

23. Are all **FAIL** LEDs on **ADU**, **BCU**, **TRU**, and **LSU** lighted?

If **YES**, then proceed to Step 26.

If **NO**, then continue with Step 24.

24. Replace circuit pack(s) that has **FAIL** LED that does not light (excluding the **FMU** circuit pack).

Reference: **DLP-502 (LSU), DLP-503 (ADU)**

25. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 26.

26.



CAUTION:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Replace **LSU**.

Reference: **DLP-502**

27. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 28.

28.



CAUTION:

If it is necessary to replace a PCU at an RT location, the PCU should not be removed from the shelf until the correct CFU fuse has been removed. Locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.

Replace facility shelf **PCU**.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the facility shelf **PCU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

29. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 30.

30. Is RT located in an 80E cabinet with bulk power plant?

If **YES**, then do **TAP-116**.

If **NO**, then continue with Step 31.

31. Perform Clear Minor Alarm procedure using **TAP-110**.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear Power Minor Alarm at RT - PMN LED Lighted

1. What type of RT configuration do you have?

If **80E CABINET WITH BULK POWER PLANT**, then do TAP-115.
If **BULK POWER SHELF (J1C182BB)**, then continue with Step 2.
If **DISTRIBUTED POWER SHELF (J1C182BA)**, then proceed to Step 3.

2. Use documentation for your bulk power to clear trouble. Check AC circuit breakers, and verify that AC power is present at the RT enclosure.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

3. Using DMM (digital multimeter), measure incoming AC voltage by using **AC** and **GND** jacks on **LDU** faceplate.

4. Is measured AC voltage between 105 and 129 volts?

If **YES**, then continue with Step 5.
If **NO**, then proceed to Step 13.

5. Is **FAIL** LED lighted on any **336A RECTIFIERS** at RT?

If **YES**, then continue with Step 6.
If **NO**, then proceed to Step 8.

6. Replace **336A RECTIFIERS** that have **FAIL** LED lighted.

7. Did alarm clear within 20 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then proceed to Step 20.

8. Is **BAT DISCHG** LED lighted on any **337A BATTERY CHARGER(s)**?

If **YES**, then continue with Step 9.

If **NO**, then proceed to Step 20.

9. Replace one **336A RECTIFIER**.

10. Did alarm clear within 20 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 11.

11. Replace another **336A RECTIFIER**.

12. Did alarm clear within 20 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then proceed to Step 20.

13. Is fuse blown or circuit breaker tripped at RT main AC circuit breaker box?

If **YES**, then continue with Step 14.

If **NO**, then proceed to Step 17.

14. Replace blown fuse or reset circuit breaker.

15. Does fuse blow or circuit breaker trip again?

If **YES**, then proceed to Step 20.
If **NO**, then continue with Step 16.

16. Did alarm clear within 20 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then proceed to Step 20.

17. Contact local power company if loss of AC power has occurred or if there is overvoltage or undervoltage condition.

18. Does local power company verify abnormal power condition?

If **YES**, then continue with Step 19.
If **NO**, then proceed to Step 20.

19. Estimate restoration time for AC power. If necessary, equip RT with fully charged batteries or other power source to maintain power until AC power is restored.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

- 20.



NOTE:

If alarms remain, multiple troubles exist and trouble analysis must be extended. Other TAPs in this practice may apply. Use of SD-7C117 and SD-7C118 may assist in locating trouble.

If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

Clear MISC Alarm - MJ or MN & MISC1

1. From system records, determine what types of alarms light the **MISC 1** LED at the RT.
2. Use local procedures to clear condition(s) that caused alarm to activate at RT.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear Minor Alarm - MN and NE LEDs Lighted at RT - No Digroup LEDs Lighted

1. Are there any blown fuses on battery shelf or **BFU** on power shelf?

If **YES**, then continue with Step 2.
If **NO**, then proceed to Step 4.

2. Replace blown fuse(s).

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the fuse (common) for the facility shelf **PCU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

3. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 4.

4. Is bulk power (J1C182BB bulk power shelf) being used?

If **YES**, then proceed to Step 25.
If **NO**, then continue with Step 5.

5. Is **OPEN BATT** LED on **337A BATTERY CHARGER** lighted at RT battery shelf?

If **YES**, then continue with Step 6.
If **NO**, then proceed to Step 25.

6. Condition DMM (digital multimeter) to measure voltage.

7. Measure voltage at **-48B** and **GND** and **-48L** and **GND** jacks on the **LDU** faceplate.
8. Does voltage measure between **-42** and **-58** volts?

If **YES**, then continue with Step **9**.
If **NO**, then proceed to Step **18**.
9. Use **SD-7C119** to check wiring between **337A BATTERY CHARGER** and batteries.
10. Was a problem found in wiring?

If **YES**, then continue with Step **11**.
If **NO**, then proceed to Step **12**.
11. Correct wiring problem and proceed to Step **17**.
12. Is fuse blown on **337A BATTERY CHARGER**?

If **YES**, then continue with Step **13**.
If **NO**, then proceed to Step **14**.
13. Replace **337A BATTERY CHARGER** and proceed to Step **17**.
14. Is **BAT DISCHG** LED on **337A BATTERY CHARGER** lighted?

If **YES**, then continue with Step **15**.
If **NO**, then proceed to Step **13**.
15. Depress and hold **HIGH RATE CHG ACTIVATE** push button on **337A BATTERY CHARGER**. Is **BAT DISCHG** LED lighted?

If **YES**, then continue with Step **16**.

If **NO**, then repeat from Step 13.

16.



NOTE:

HIGH RATE CHG ON LED will remain lighted until batteries reach approximately -58 volts. If batteries are completely discharged, it may take approximately one day for **HIGH RATE CHG ON** LED to go out.

Release **HIGH RATE CHG ACTIVATE** push button. Does **BAT DISCHG** LED go off and is **HIGH RATE CHG ON** LED lighted?

If **YES**, then continue with Step 17.

If **NO**, then proceed to Step 13.

17. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then proceed to Step 23.

18. Use DMM to measure voltage at battery shelf jacks **J5 (+BAT)** and **J6 (-BAT)**.

19. Does voltage measure between -42 and -58 volts?

If **YES**, then proceed to Step 9.

If **NO**, then continue with Step 20.

20. Is **197A BATTERY LOAD TEST SET** available for use in testing batteries?

If **YES**, then continue with Step 21.

If **NO**, then proceed to Step 23.

21. Test batteries using **197A** test set

Reference: **DLP-506**

22. Replace any failed battery pack(s) and reconnect battery leads to battery shelf and proceed to Step 24.
23. Replace battery packs one at a time until -48 volts is present at output jacks on battery shelf.
24. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 25.
25. Is **FAN ALARM** LED lighted on a fan assembly?

If **YES**, then continue with Step 26.
If **NO**, then proceed to Step 39.
26. Remove **FAN H** and **FAN L** fuses on corresponding **BFU** on power shelf.
Are fuses blown?

If **YES**, then continue with Step 27.
If **NO**, then proceed to Step 30.
27. Replace **FAN H** and **FAN L** fuses on corresponding **BFU**.
28. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 29.
29. Is **FAN ALARM** LED lighted on fan assembly?

If **YES**, then continue with Step 30.
If **NO**, then proceed to Step 39.

30.



CAUTION:

To avoid possible damage, do not over extend fan assembly power cable.

Remove fan assembly from bay.

31. Examine fan assembly for anything that will prevent fan from operating properly.

32. Remove any blockages and reinstall fan assembly and fuses.

33. Operate corresponding **FAN TEST** push button on **FCU**.

34. Are fans on and is fan assembly **FAN ALARM LED** off?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 35.

35. Remove **FAN H** and **FAN L** fuses on corresponding **BFU**.

36. Replace fan assembly with new fan assembly.

37. Reinstall fuses and depress **FAN TEST** push button on **FCU**.

38. Are fans on and is fan assembly **FAN ALARM LED** off?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 39.

39. Is **FAIL LED** lighted on either **3A** or **3C RINGING GENERATOR** on power shelf?

If **YES**, then continue with Step 40.

If **NO**, then proceed to Step 43.

40. Replace failed **3A** or **3C RINGING GENERATOR**.

41. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 42.

42. Reinstall original **3A** or **3C RINGING GENERATOR**.

43. Replace one of the **336 RECTIFIERS**.

44. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 45.

45. Reinstall original **336A RECTIFIER**.

46. Replace second **336A RECTIFIER**.

47. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 48.

48. Reinstall original **336A RECTIFIER**.

49. Is bulk power being used?

If **YES**, then continue with Step 50.

If **NO**, then do **TAP-116**.

50. Use SD-7C130 (J1C182BB bulk power shelf) to check wiring and repeat from Step 10.

Clear Major Alarm at RT - MJ and All Digroup Indicators Lighted

1. Is RT located in an 80E cabinet with bulk power plant?

If **YES**, then continue with Step 2.
If **NO**, then proceed to Step 10.
2. At ring shelf, is **FAIL LED** lighted on both **3C** or **3A RINGING GENERATORS** on either **GROUP 1**, **GROUP 2**, or both?

If **YES**, then continue with Step 3.
If **NO**, then proceed to Step 6.
3. Replace both **RINGING GENERATORS**.
4. Does alarm clear within 5 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 5.
5. At ring shelf, is **FAIL LED** lighted on both **3C** or **3A RINGING GENERATORS** on either **GROUP 1**, **GROUP 2**, or both?

If **YES**, then proceed to Step 9.
If **NO**, then continue with Step 6.
6. Is **RMJ** indicator on **RING CONTROL UNIT(s)** lighted?

If **YES**, then continue with Step 7.
If **NO**, then go to Step 13.
7. Replace **RING CONTROL UNIT(s)** with **RMJ** indicator lighted.

8. Does alarm clear within 5 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 9.

9. Use SD-7C155-01 to locate and clear trouble.

10. Is **FAIL** indicator lighted on both **3C** or **3A RINGING GENERATORS** at the RT power shelf?

If **YES**, then continue with Step 11.

If **NO**, then proceed to Step 13.

11. Replace both **3C** or **3A RINGING GENERATORS**.

12. Did the alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 13.

- 13.



NOTE:

If alarms remain, trouble analysis must be extended. Multiple troubles may exist; other TAPs in this practice may apply. Use of SD-7C117 and SD-7C118 may assist in locating trouble.

14. If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

Clear Power Trouble at RT - No RT Alarms All Span OOS.SYS.LOCAL at CO

1. Are any fuses blown on **BFU** at RT power shelf?

If **YES**, then continue with Step 2.
If **NO**, then proceed to Step 7.

2. Replace any blown fuses.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the fuse (common) for the facility shelf **PCU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

- 3.



NOTE:

When primary power is restored to the system, the FAIL LEDs on all circuit packs are lighted while power-up routines are run. When the power-up routines are completed (within 10 minutes), the FAIL LEDs are turned off and the spans at the CO are returned to service.

Do alarms clear after 10 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 4.

4. Does fuse blow again?

If **YES**, then continue with Step 5.

If **NO**, then proceed to Step 7.

5. Is bulk powering (J1C182BB bulk power shelf) being used?

If **YES**, then continue with Step 6.
If **NO**, then proceed to Step 7.

6. Use SD-7C130 (J1C182BB bulk power shelf) to check wiring and proceed to Step 13.

7. Is -48 V DC present at -48B and GND pin jacks on the LDU?

If **YES**, then continue with Step 8.
If **NO**, then proceed to Step 11.

8. Is -48 V DC present at -48L and GND pin jacks on the LDU?

If **YES**, then proceed to Step 21.
If **NO**, then continue with Step 9.

9. Replace LDU.

10. Did alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then proceed to Step 21.

11. Using DMM (digital multimeter), measure incoming AC voltage by using AC and GND jacks on LDU faceplate.

12. Is measured AC voltage between 105 and 129 volts?

If **YES**, then proceed to Step 21.
If **NO**, then proceed to Step 15.

13. Was problem found?

If **YES**, then continue with Step 14.
If **NO**, then proceed to Step 15.

14. Correct problem.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

15. Is fuse blown or circuit breaker tripped at RT main AC circuit breaker box?

If **YES**, then continue with Step 16.
If **NO**, then proceed to Step 19.

16. Replace blown fuse or reset circuit breaker.

17. Does fuse blow or circuit breaker trip again?

If **YES**, then proceed to Step 20.
If **NO**, then continue with Step 18.

18. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then proceed to Step 21.

19. Contact local power company if loss of power has occurred or if there is overvoltage or undervoltage condition.

20. Does local power company verify abnormal power condition?

If **YES**, then proceed to Step 22.
If **NO**, then continue with Step 21.

21. Use SD-7C119 (RT power shelf) and SD-7C118 (RT enclosure) to examine AC wiring for shorts, opens, or incorrectly terminated wiring.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

22. Estimate restoration time for AC power. If necessary, equip RT with fully charged batteries or other power source to maintain power until AC power is restored.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

Clear ACTU White or Blue Alarm- Single Channel Trouble in FPI RT

1. Was the failure reported by the Operations Interface (OI) operator following routine maintenance performed by the **ACTU** (automated channel test unit)?

If **YES**, replace the remote terminal (RT) channel unit (CU) and continue with Step 2.
If **NO**, proceed to Step 3.
2. Did the trouble clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, continue with Step 3.
3. Request the maintenance center or test desk to perform tests on the circuit with trouble.
4. Can maintenance center or test desk access failed channel for testing?

If **YES**, then continue with Step 5.
If **NO**, then proceed to Step 11.
5. Was trouble isolated to RT CU?

If **YES**, then continue with Step 6.
If **NO**, then **STOP**. Verify outside plant facility and correct any problems.
6. Replace the CU on the circuit with trouble.

7. Did the trouble clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, reinstall original CU, then continue with Step 8.

8. Verify proper circuit operation in accordance with **NTP-004** of AT&T 363-205-402, *Channel Unit Installation* and correct any problems.

9. Did the trouble clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, continue with Step 10.

10. Request the maintenance center or test desk to test several other in-service circuits.

Did any of these other circuits test bad?

If **YES**, proceed to **TAP-114**.

If **NO**, contact technical assistance.

11. Can maintenance center or test desk access circuits in other RTs at the same location?

If **YES**, continue with Step 12.

If **NO**, proceed to Step 37.

12.



NOTE 1:

Verify that the maintenance center or test desk is not using **ACTU** to perform tests on any CU in dual bank assembly containing failed CU, and that a CIU is not accessed to any circuit in the single bank (white or blue) containing the circuit under test.



NOTE 2:

If the maintenance center or test desk cannot access failed channel, check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

Replace **ACTU** (automatic channel test unit).

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the **ACTU**. Wait for the **FAIL** LED on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

Can the maintenance center or test desk now access the circuit in trouble?

If **YES**, proceed to Step 4.
If **NO**, continue with Step 13.

13.



NOTE:

Verify that the maintenance center or test desk is not using **ACTU** to perform tests on any CU in dual bank assembly containing failed CU, and that a CIU is not accessed to any circuit in the single bank (white or blue) containing the circuit under test.

Obtain a **SLC**® Series 5 craft interface unit (CIU).

14. Condition CIU for testing. Refer to CIU User's Guide if necessary.

15. Insert connector on end of CIU cable into **TEST ACC** jack on automatic channel test unit (**ACTU**).

16. The CIU will perform a 15-second self-test when first powered up and then will display the following OPERATIONS MENU:
 1. **CKT ACTIVITIES**
 2. **SYSTEM TURN-UP**
 3. **TEST BUS ACCESS COMMAND [CKT ACTIVITIES] =**
17. At the CIU keyboard, enter **3** or **T**.
18. The CIU display will show: **SYSTEM ID =**
19. At the CIU keyboard, enter system identification (SYSTEM ID) number for system. The CIU display will show: **CLEAR TEST BUS ACCESS**
20. Get DMM (digital multimeter) and condition to measure DC volts.
21. Connect DMM test leads to **LINE T/R** jack on CIU.
22. Does meter indicate 0 volts DC?
 - If **YES**, then proceed to Step **26**.
 - If **NO**, then continue with Step **23**.
23. At the CIU keyboard, press **BREAK** key.
24. Remove DMM test leads from CIU.
25. Replace CU associated with channel experiencing trouble and repeat from Step **22**.
26. Condition DMM to measure ohms.
27. With DMM test leads connected to **LINE T/R** jack on CIU, does DMM indicate infinite resistance (open circuit)?

If **YES**, then proceed to Step **31**.
If **NO**, then continue with Step **28**.

28. At the CIU keyboard, press **BREAK** key.
29. Remove DMM test leads from CIU.
30. Replace CU associated with channel experiencing trouble and repeat from Step **27**.
31. Remove DMM test leads from CIU.
32. Repeat Steps **22** through **31** with DMM leads connected to **LINE T1/R1** jack on CIU. Then continue with Step **33**.
33. At the CIU keyboard, enter YES to CLEAR TEST BUS ACCESS.
34. Remove CIU cable from **TEST ACC** on **ACTU**.
35. Was the **ACTU** test bus fouled?

If **YES**, continue with Step **36**.
If **NO**, proceed to Step **37**.
36. Request the maintenance center or test desk to perform tests on the circuit with trouble, then return to Step **4**.

37. Replace the **LTT**.

Can the maintenance center or test desk now access the failed circuit?

If **YES**, return to Step **36**.
If **NO**, continue with Step **38**.

38. Consult FORTEL maintenance practices to resolve problems in remote measurement unit (RMU).
39. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

Clear Channel Failure - Multiple Channel- Trouble in FPI RT

1.



CAUTION:

When a TRU is removed, even momentarily, service will be interrupted on all 48 circuits served by the TRU. All calls in progress will be torn down.

Verify that the trouble on multiple channels is so widespread that removing service from remaining channels on the affected shelf is necessary.

2.



CAUTION:

On this TAP and all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record.

Replace **TRU** associated with channel units (CUs) with trouble.

3.



NOTE:

If maintenance center or test desk cannot access failed channel via **ACTU**, check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

Request maintenance center or test desk to perform tests.

4. Did trouble clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 5.

5. Replace **TRU** associated with shelf being tested.

6. Request maintenance center or test desk to repeat tests.

7. Did trouble clear?

If **YES**, then proceed to Step 14.

If **NO**, then continue with Step 8.

8. Unplug all CUs on shelf being tested. (The CUs do not need to be removed from shelf.)

9. Reinsert on CU and have maintenance center or test desk perform tests on that channel.

10. Did trouble clear?

If **YES**, then proceed to Step 12.

If **NO**, then select a second test channel, and return to Step 9 or, if the second channel has already been tested, continue with Step 11.

11. If troubles have not cleared, call for technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

12. Reinsert CUs one at a time and have maintenance center or test desk repeat tests after each insertion.

13. Replace CU that causes test to fail.
14. Reinsert remaining CUs.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear Power Minor Alarm at 80E Cabinet (Bulk Power Plant) RT - PMN LED Lighted

1. At control and distribution panel, is **BAT2** or **VS** circuit breaker on AYK2 circuit pack tripped or is **FRB** fuse blown?

If **YES**, then continue with Step 2.

If **NO**, then proceed to Step 8.

2. Reset tripped circuit breaker or replace blown fuse.

3. Does circuit breaker trip or fuse blow again?

If **YES**, then continue with Step 4.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

4. Is **FRB** fuse blown?

If **YES**, then continue with Step 5.

If **NO**, then proceed to Step 6.

5. Wiring problem present on control and distribution panel. Use SD-83109-01 to locate and clear trouble.

6. Replace AYK2 circuit pack.

7. Does circuit breaker trip again?

If **YES**, then proceed to Step 5.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

8. On OLS rectifier shelf, is **FAIL** indicator on either CS787B540 power unit (rectifier) lighted?

If **YES**, then continue with Step 9.
If **NO**, then proceed to Step 14.

9. At AC power panel, locate circuit breaker (**CB6**, **CB7**, or **CB8**) providing AC power to rectifier with **FAIL** indicator lighted.

10. Operate circuit breaker **OFF** and then back **ON**.

11. Does **FAIL** indicator on rectifier remain lighted?

If **YES**, then continue with Step 12.
If **NO**, then proceed to Step 13.

12. Replace CS787B540 rectifier.

13. After 5 minutes, is **PMN** or **P/M** indicator on **BCU** lighted?

If **YES**, then continue with Step 14.
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

14. Use a millivoltmeter to measure output current of each rectifier at test points on control and distribution panel (refer to Table A for test point locations).

Rectifier	Test Points
1	RR - RC1
2	RR - RC2
3	RR - RC3

15. Is output current absent from all rectifiers?

If **YES**, then continue with Step 16.
If **NO**, then proceed to Step 23.

16. At control and distribution panel, operate **UTILITY** circuit breaker **OFF** then back **ON** again.

17. Is output current still absent from all rectifiers?

If **YES**, then continue with Step 18.
If **NO**, then proceed to Step 22.

18. Contact local power company if loss of AC power has occurred.

19. Does power company verify loss of AC power?

If **YES**, then continue with Step 20.
If **NO**, then proceed to Step 21.

20. Estimate restoration time for AC power. If necessary, provide auxiliary source of AC power until AC power is restored.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

21. Check wiring at control and distribution panel using SD-83109-01.

22. Is output current present from all rectifiers?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 23.

23. Check wiring and appropriate circuit breakers on control and distribution panel using SD-83109-01.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

**Clear Minor Alarm - MN and NE LEDs Lighted at
80E Cabinet RT - No Digroup LEDs Lighted**

1. At ring shelf, is **RMN** indicator on **AUG3 RING CONTROL UNIT** and/or **FAIL** indicator on **3C** or **3A RINGING GENERATOR** lighted?

If **YES**, then continue with Step 2.
If **NO**, then proceed to Step 9.

2. Is **FAIL** indicator on **RINGING GENERATOR** lighted?

If **YES**, then continue with Step 3.
If **NO**, then proceed to Step 7.

3. Replace **RINGING GENERATOR**.

4. Is **FAIL** indicator on **RINGING GENERATOR** lighted?

If **YES**, then continue with Step 5.
If **NO**, then proceed to Step 6.

5. Use SD-7C155-01 to locate and clear trouble.

6. Does alarm clear within 5 minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then proceed to Step 1.

7. Replace **RING CONTROL UNIT** with lighted **RMN** indicator.

8. Is **RMN** indicator on **RING CONTROL UNIT** lighted?

If **YES**, then proceed to Step 5.
If **NO**, then proceed to Step 6.

9. Is **FAN ALARM** LED lighted on any 2B fan unit?

If **YES**, then continue with Step 10.
If **NO**, then proceed to Step 16.

- 10.



CAUTION:

To avoid possible damage, do not over extend fan assembly power cable.

Disconnect **J114** from **P114** on fan assembly and remove fan assembly from bay.

11. Examine fan assembly for any mechanical blockage that will prevent fan from operating properly.

12. Is any mechanical blockage present?

If **YES**, then continue with Step 13.
If **NO**, then proceed to Step 15.

13. Remove any blockages, reconnect **J114** to **P114** on fan unit, and reinstall fan unit in bay.

14. Is **FAN ALARM** indicator on 2B fan unit off?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO**, then continue with Step 15.

15. Replace 2B fan unit with new fan unit.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

16. Remove cover from control and distribution panel. Is circuit breaker **RB1**, **RB2**, **RB3**, or **BAT1** on **AYK1** circuit pack tripped or **FBAT** fuse blown?

If **YES**, then continue with Step 17.

If **NO**, then proceed to Step 32.

17. Reset tripped circuit breaker or replace blown fuse.

18. Does circuit breaker trip or fuse blow again?

If **YES**, then continue with Step 19.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

19. Is **FBAT** fuse blown?

If **YES**, then proceed to Step 23.

If **NO**, then continue with Step 20.

20. Is **BAT1** breaker tripped?

If **YES**, then continue with Step 21.

If **NO**, then proceed to Step 24.

21. Replace **AYK1** circuit pack.

22. Does breaker trip again?

If **YES**, then continue with Step 23.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

23. Wiring problem present on control and distribution panel. Use SD-83109-01 to locate and clear trouble.
24. At **AYK1** circuit pack, disconnect plug **P1 (RB1)**, **P2 (RB2)**, or **P3 (RB3)** associated with tripped breaker (Figure 1).

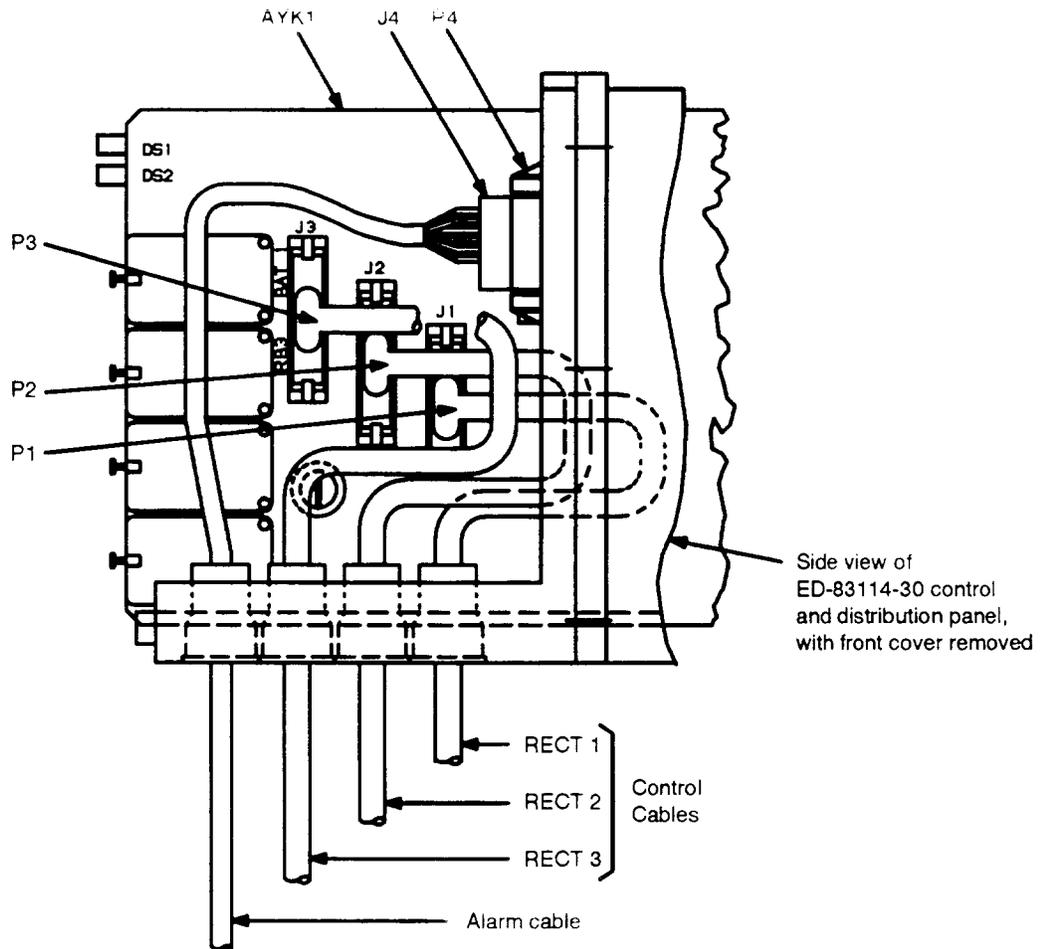


Figure 1 — Location of Rectifier Cable Plugs at AYK1 Circuit Pack

25. Reset tripped circuit breaker.

26. Does breaker trip again?

If **YES**, then repeat from Step 21.
If **NO**, then continue with Step 27.

27. At OLS rectifier shelf, locate and disconnect appropriate **P906-** connector that is attached to end of cable that was disconnected in Step 24.

28. Reconnect plug **P1**, **P2**, or **P3** that was disconnected in Step 24 and reset tripped circuit breaker.

29. Does breaker trip again?

If **YES**, then proceed to Step 31.
If **NO**, then continue with Step 30.

30. Replace appropriate CS787B540 power unit (rectifier), reconnect **906-** connector, and proceed to Step 22.

31. Defective control cable between circuit breaker and rectifier. Replace control cable and proceed to Step 22.

32. At control and distribution panel, is **LOW VOLT DISCONNECT** indicator lighted?

If **YES**, then continue with Step 33.
If **NO**, then proceed to Step 44.

33. Use DMM (digital multimeter) to measure voltage between test points **PVR** and **PV** on control and distribution panel.

34. Is voltage reading greater than 42.5 V DC?

If **YES**, then continue with Step **35**.

If **NO**, then proceed to Step **39**.

35. At control and distribution panel, remove **AYK1** circuit pack and measure voltage between test points **BATC** and **RR**.

36. Is voltage reading greater than 0.2 V DC?

If **YES**, then continue with Step **37**.

If **NO**, then proceed to Step **38**.

37. Replace control and distribution panel.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

38. Replace **AYK1** circuit pack.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

39. Output of rectifiers is low, check wiring at OLS rectifier shelf and wiring between rectifier shelf and AC control panel.

40. Is wiring correct and connectors securely attached?

If **YES**, then proceed to Step **43**.

If **NO**, then continue with Step **41**.

41. Correct wiring problem.

42. Does alarm clear?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 43.

43. Trouble in wiring at control and distribution panel or rectifier shelf. Use SD-83109-01 and SD-7C118 to clear trouble.

44. Is **FBAT** fuse on control and distribution panel blown?

If **YES**, then continue with Step 45.

If **NO**, then proceed to Step 43.

45. Replace blown fuse and proceed to Step 42.

Clear Flashing CLF Alarm at FPI RT

1. Are all nongroomed **CLF** LEDs flashing on **LIUs**?

If **YES**, then continue with Step 2.

If **NO**, then other alarms are present. Return to **TAP-101** and clear these remaining alarms before proceeding. If **NO**, proceed to Step 3.

2. RT has been stopped at CO. Request CO personnel to configure and start system. If the system does not start then request technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear NE/MJ, TRU AB, LIU-A or LIU-B FAIL LEDs Lighted (Suspect TRU AB, LIU-A or LIU-B Failure)

1. Is **TRU AB FAIL** indicator lighted?

If **YES**, continue with Step 2.
If **NO**, proceed to Step 5.

- 2.



CAUTION:

When a TRU is removed, even momentarily, service will be interrupted on all 48 circuits served by the TRU. All calls in progress will be torn down.

Replace **TRU AB**.

3. After 2 minutes, is **FAIL** indicator on **TRU AB, LIU-A** or **LIU-B** still lighted?

If **YES**, continue with Step 4.
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

4. Is **LIU-A FAIL** LED lighted?

If **YES**, continue with Step 5.
If **NO**, proceed to Step 7.

- 5.



CAUTION:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LIU, or LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Using **DLP-505**, replace **LIU-A**.

6. After 30 seconds, is **FAIL** indicator on **TRU AB, LIU-A** or **LIU-B** still lighted?

If **YES**, continue with Step 7.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

7. Using **DLP-505**, replace **LIU-B**.

8. After 30 seconds, is **FAIL** indicator on **TRU AB, LIU-A** or **LIU-B** still lighted?

If **YES**, continue with Step 9.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

9. Was **LIU-A** replaced in Step 5?

If **YES**, proceed to Step 12.

If **NO**, continue with Step 10.

10. Using **DLP-505**, replace **LIU-A**

11. After 30 seconds, is **FAIL** indicator on **TRU AB, LIU-A** or **LIU-B** still lighted?

If **YES**, continue with Step 12.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

- 12.



NOTE:

There are certain cases where the **TRU** can become initialized improperly if multiple circuit packs are replaced during trouble clearing procedures. When this problem occurs, the **TRU FAIL LED** will be off but the **FAIL LEDs** of the **LIUs** associated with the **TRU** will be lighted. The problem can be cleared simply by removing and reinstalling the **TRU**.

Remove and reinstall **TRU CD**

13. After 30 seconds, is the **FAIL** indicator on **LIU-C** (or **EMU**) or **LIU-B** still lighted?

If **YES**, then continue with Step 14.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

14. Use SD-7C117, SD-7C118, and SD-7C119 at the RT to locate trouble. If troubles have not cleared, call technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear NE/MJ, TRU CD, LIU-C, LIU-D, or EMU FAIL LEDs Lighted (Suspect TRU CD, LIU-C, LIU-D, or EMU Failure)

1. Is **TRU CD FAIL** indicator lighted?

If **YES**, continue with Step 2.
If **NO**, proceed to Step 5.

- 2.



CAUTION:

When a TRU is removed, even momentarily, service will be interrupted on all 48 circuits served by the TRU. All calls in progress will be torn down.

Replace **TRU CD**.

3. After 30 seconds, is **FAIL** indicator on **TRU CD**, **LIU-C** (or **EMU**), or **LIU-D** still lighted?

If **YES**, continue with Step 4.
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

4. Is **LIU-C FAIL** (or **EMU**) LED lighted?

If **YES**, continue with Step 5.
If **NO**, proceed to Step 7.

- 5.



CAUTION:

On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, ensure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LIU, or LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Using **DLP-505**, replace **LIU-C** (or **EMU**).

6. After 30 seconds, is **FAIL** indicator on **TRU CD**, **LIU-C** (or **EMU**), or **LIU-D** still lighted?

If **YES**, continue with Step 7.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

7. Using **DLP-505**, replace **LIU-D**.

8. After 30 seconds, is **FAIL** indicator on **TRU CD**, **LIU-C** (or **EMU**), or **LIU-D** still lighted?

If **YES**, continue with Step 9.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

9. Was **LIU-C** (or **EMU**) replaced in Step 5?

If **YES**, proceed to Step 12.

If **NO**, continue with Step 10.

10. Using **DLP-505**, replace **LIU-C** (or **EMU**).

11. After 30 seconds, is **FAIL** indicator on **TRU CD**, **LIU-C** (or **EMU**), or **LIU-D** still lighted?

If **YES**, continue with Step 12.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

- 12.



NOTE:

There are certain cases where the **TRU** can become initialized improperly if multiple circuit packs are replaced during trouble clearing procedures. When this problem occurs, the **TRU FAIL LED** will be off but the **FAIL** LEDs of the **LIUs** associated with the **TRU** will be lighted. The problem can be cleared simply by removing and reinstalling the **TRU**.

Remove and reinstall **TRU CD**.

13. After 30 seconds, is the **FAIL** indicator on **LIU-C** (or **EMU**) or **LIU-B** still lighted?

If **YES**, then continue with Step 14.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

14. Use SD-7C117, SD-7C118, and SD-7C119 at the RT to locate trouble. If troubles have not cleared, call technical assistance.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

Clear ADU FE Alarm at FPI RT - MJ, FE, and Digroup LEDs Lighted

1.



NOTE:

This TAP distinguishes between Yellow alarms generated by the *GTD-5** and **TRU** protocol failures, using alarms displayed at the *GTD-5* EAX to determine the error condition.

Is the alarm "SERIES 5 TRU AB (CD) ALARM" asserted at the *GTD-5* EAX?

If **YES**, proceed to Step 4
If **NO**, continue with Step 2.

2.



NOTE:

DS1 alarms are not displayed consistently in all modes. In modes 1 and 2 the **ADU FE** LED is lighted for DS1 Yellow alarms, and off for DS1 Red alarms. In mode 4, the **ADU FE** LED is lighted for both DS1 Red and Yellow alarms.

Is Yellow alarm (all modes) or Red alarm (Mode 4) being received on any of the spans? (As determined by special test equipment or the **SDU**.)

If **YES**, continue with Step 3.
If **NO**, proceed to Step 4.

3. The *GTD-5* EAX has detected an alarm condition on the DS1 Span . Use *GTD-5* repair procedures to clear alarm condition.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

* Registered trademark used under license from the GTE Corporation.

4.



CAUTION:

When a TRU is removed, even momentarily, service will be interrupted on all 48 circuits served by the TRU. All calls in progress will be torn down.

Replace **TRU** associated with the lighted digroup LEDs (**TRU A/B** if A and B digroups are lighted; **TRU C/D** if C and D digroups are lighted).

5. Did alarm clear within 20 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then request technical assistance.

Abbreviated System Maintenance and Alarm Summary Tables

General

This procedure is intended for craft personnel familiar with *SLC*® Series 5 Carrier System maintenance. It is assumed that the craft personnel are familiar with the system architecture and understand the functions of the plug-in circuit packs. The basis of this procedure is that one failure condition can cause multiple alarm indications. Detailed steps are not provided. If a circuit pack is replaced, all options must be set correctly on the replacement pack.

The following list provides the order that should be followed when clearing system trouble. Alarm symptoms are given for a failure that can cause multiple alarm indicators to light. The NE/FE LED indicates the probable location of this procedure assumes you are at the RT with NE lighted (if indicator is lighted). An FE alarm requires switching personnel to correct the trouble. Reinstall original packs if trouble does not clear.

If the guidelines on the following page do not clear/find the trouble, refer to **IXL-001** or **TAP-101** for detailed procedures.

Comment: Remove the **LTT** ribbon cable connector from the **ACTU** before installing the **ACTU**, replacing the facility shelf **PCU**, or the fuse for the facility shelf (common fuse). Wait for the **FAIL LED** on the **ACTU** to go out before reconnecting the cable. Not doing this can result in improper initialization of the **ACTU**.

I. POWER; symptoms MJ,MN,CLF,PMN,DIGROUPS

A.) Replace Fuse

1.) If fuse blows,

a.) Replace PCU.

b.) Unseat all associated packs and replace fuse.

1.) If fuse blows use SDs to correct wiring trouble.

2.) Install, one at a time, until pack that blows fuse is found.

Start with PCU, Common Units, then Channel units.

B.) RT AC power.

II. FAIL on circuit pack; symptoms MJ,MN,CLF,DIGROUPS

A.) Replace circuit pack.

B.) If MJ and all DIGROUPS (no CLFs), replace RT ringing generators.

C.) Wait for LIU-A to load from the FMU.

III. CLF on LIU; MJ/MN,DIGROUPS

A.) On AB or CD LIUs, replace TRUs and PCUs.

B.) Single digroup.

1.) Replace LIUs.

a.) Measure line voltage and current, compare with office records.

b.) Fault locate (NE or FE not lighted fault locate first).

C.) Flashing indicates RT stopped by *GTD-5** EAX.

IV. MN: symptom only MN is lighted

A.) RT fan.

B.) LSU f/d switch set.

V. Channel Trouble; No alarms

A.) Single channel, replace RT CUs. Check wiring, reset CTU/ACTU, then do B.

B.) Multiple Channel, replace TRUs, LIUs, DTU-L and DTU-R

* Registered trademark used under license from the GTE Corporation.

Alarm Indicator Summary

The following is a list of LED indicators and what condition caused the alarm indicator to light:

- **FAIL** – the circuit pack has failed a self-diagnostic test. May be caused by wrong options switch settings, or the pack may not be compatible with the system configuration (FAIL will go off during an LED test if optioned wrong or incompatible). The **ALARM** or **ALM** are used on power circuit packs to indicate failure conditions.
- **BCU LEDs**
 - **PMN** – AC power or power shelf trouble at the RT.
 - **MISC1** – Miscellaneous alarm activated at the RT.
 - **A, B, C, D DIGROUP LEDs** – a trouble condition has affected service on all channels associated with lighted DIGROUP indicator(s).
- **ADU LEDs**
 - **NE** or **FE** – the trouble has been isolated to the near end (**NE**) or far end (**FE**) equipment.
 - **MJ** or **MN** – the trouble affects one or more 24 channel digroups (**MJ**) or less than 24 or no channel (**MN**).
 - **CMP** – lights when option switches are set wrong or a common equipment incompatibility exists (circuit LEDs that normally light during an LED TEST will not light for the pack that caused the incompatibility alarm).
 - **PRV** – lights when the channel provisioning data is being updated or is corrupted (3-way mismatch also lights FAIL on ADU and BCU).
 - **008** – is normally flashing for FPI.
 - **303** – is normally off for FPI.
 - **LAN** – lights when the ADU is optioned for the LAN configuration (S1 position 8), and the LAN interface has failed. Flashes during an SIU LAN TEST.
- **CLF** on an **LIU** – indicates a loss of the incoming digital line. The CLF will flash if the data link between the *GTD-5* EAX and LIU-A is lost.

- **TRU** LEDs
 - **SPL** – lights when there is a special service channel unit incompatibility (wrong slot or incompatibility with the system configuration).
 - **PROT** – lights when LIU-A has switched to the protection LIU.

The meaning of other alarm indicators not listed above [for example **BUSY**, **WHITE/BLUE** (bank), **OPEN BATT** ...] are self explanatory.

Series 5 FPI MXU Alarm Plan

These procedures assume that the alarm condition was first detected by the craftsperson at the *GTD-5* EAX or Operations Interface. Table A summarizes the *GTD-5* alarm strings and ACDP alarm lamps for the most common Series 5 fault conditions. Following Table A is a list of the fault conditions detected by the Series 5 FPI MXU, and the resulting alarms displayed at the *GTD-5*, Operations Interface, and RT for each fault. This information, together with the RT TAPs, should be used to isolate and correct the problem.

Table A GTD-5 Alarm Summary (Notes)		
Fault Condition	ALARM STRING	ACDP LAMP
DS1 low error rate exceeded	SERIES 5 DS1 ERROR RATE EXCEEDED	MXU MINOR
PCU AB, CD, or CFU -48V CU fuse fail	SERIES 5 PCU ABCD / -48V CU FUSE FAIL	MXU MINOR
PCU FS or BFU -48V COMM fuse fail	SERIES 5 PCU FS / -48V COMM FUSE FAIL	MXU MINOR
CFU ringing fuse failure	SERIES 5 RINGING FUSE FAILURE	MXU MINOR
ACTU card failure	SERIES 5 ACTU FAILURE	MXU MINOR
SIU card or LAN failure	SERIES 5 SIU/ADU LAN FAILURE	MXU MINOR
SDU card failure	SERIES 5 SDU FAILURE	MXU MINOR
fan failure	SERIES 5 FAN FAILURE	MXU MINOR
DS1 A RED or YELLOW alarm	SERIES 5 DS1 A FAILURE	MXU MINOR
DS1 B RED or YELLOW alarm	SERIES 5 DS1 B FAILURE	MXU MINOR
DS1 C RED or YELLOW alarm	SERIES 5 DS1 C FAILURE	MXU MINOR
DS1 D RED or YELLOW alarm	SERIES 5 DS1 D FAILURE	MXU MINOR
MLIUA card failure	SERIES 5 LIU A (MLIU) FAILURE	MXU MINOR
SLIUB card failure	SERIES 5 LIU B (SLIU) FAILURE	MXU MINOR
SLIUC card failure	SERIES 5 LIU C (SLIU) FAILURE	MXU MINOR
SLIUD card failure	SERIES 5 LIU D (SLIU) FAILURE	MXU MINOR
EMU card failure	SERIES 5 LIU C (EMU) FAILURE	MXU MINOR
TRU AB card failure	SERIES 5 TRU AB FAILURE	MXU MINOR
TRU CD card failure	SERIES 5 TRU CD FAILURE	MXU MINOR
FMU card failure	SERIES 5 FMU FAILURE	MXU MINOR
ADU or BCU card failure	SERIES 5 BANK CONTROLLER FAILURE	MXU MINOR
commercial AC or rectifier failure	RU COML AC - AC OFF	REM AC MJ
door open	AUX A - DOOR OPEN	AUX-A MN
all ringing generators failure	SERIES 5 TOTAL RINGING FAILURE	AUX-A MJ
one ringing generator failure	SERIES 5 PWR SHLF/RING GEN FAIL	REM DC MN
open battery string, low voltage	SERIES 5 PWR SHLF/RING GEN FAIL	REM DC MN
miscellaneous environmental alarm	SERIES 5 ENVIRONMENTAL ALARM	AUX-A MN

Notes:

All alarm strings are prefixed by the hardware identity of the MXU generating the alarm (PC.MXU<mxu>).

The Series 5 FPI MXU contains 4 digroups of 24 lines each. When a digroup is removed from service, the status of all 24 lines within that digroup are updated to INS.IDLE_BLOCKED. The hardware identities of the four digroups, and the range of line identities within each digroup, are shown below.

DIUS.MXU<mxu>.0
LINE.MXU<mxu>.0.0.0.0 thru LINE.MXU<mxu>.0.0.1.1
DIUS.MXU<mxu>.1

LINE.MXU<mxu>.0.0.12.0 thru LINE.MXU<mxu>.0.0.23.1
DIUS.MXU<mxu>.2
LINE.MXU<mxu>.0.0.24.0 thru LINE.MXU<mxu>.0.0.35.1
DIUS.MXU<mxu>.3
LINE.MXU<mxu>.0.0.36.0 thru LINE.MXU<mxu>.0.0.47.1

The time required to transmit alarm information from the Bank Controller to the MLIU will delay the reporting of Power and Miscellaneous alarms up to 30 seconds (average 15 seconds). All other alarms will be reported as soon as the fault condition has been detected and verified.

When a failure occurs at the interface between two cards, it is sometimes difficult for the system to identify which card is at fault. In such cases, the alarms displayed at the *GTD-5* or RT may not directly identify the cause of the failure. The trouble clearing procedures in this document are written to help the craftsman identify the faulty card for these cases.

A number of the failures listed below cause the MXU to go into outage, and the LIU CLF LEDs to flash. The normal delay between insertion of failure and start of CLF flashing is about 2 minutes.

The various fault conditions detected by the Series 5 FPI MXU, and the corresponding alarm indications at the RT, OI, and *GTD-5* are shown below.

- ```
=====
1. Fault condition = low error rate exceeded on DS1 A, B, C, or D
 a) GTD-5 indication
 - alarm string : SERIES 5 DS1 ERROR RATE EXCEEDED
 - ACDP alarm lamp : MXU MINOR
 - SMA : 1.228 SERIES 5 DS1 ERROR RATE EXCEEDED
 HID = VLNK.MXUx.y.z
 - HID status change : none
 b) OI alarm indication
 - alarm string : none
 c) RT alarm indication
 - alarm lamps : none
 - SDU string : none
=====
2. Fault condition = high error rate exceeded on DS1 A, B, C, or D
 a) GTD-5 indication
 - alarm string : none
 - ACDP alarm lamp : none
 - SMA : 1.228 SERIES 5 DS1 ERROR RATE EXCEEDED
 HID = VLNK.MXUx.y.z
 - HID status change : none
 b) OI alarm indication
 - alarm string : none
 c) RT alarm indication
 - alarm lamps : none
 - SDU string : none
Note, an alarm is not asserted in this case since DS1 high error
is a transient condition. If the high error rate threshold is
exceeded for longer than 2.5 seconds, a DS1 RED alarm is asserted.
=====
3. Fault condition = 1-way DS1 A transmission failure in RT receive direction
 (RT detects RED alarm on DS1 A)
```

a) GTD-5 indication  
- alarm string : PC.MXU<mxu> OUTAGE - PROCESSOR COMPLEX FAILS  
TO RESPOND TO AUDIT  
- ACDP alarm lamp : MXU MAJOR  
CXR MINOR  
- SMA : 1.183 YELLOW (REMOTE) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
0.060 PROCESSOR COMPLEX AUDIT RESPONSE FAILURE  
HID = PC.MXU<mxu>  
- HID status change : SPAN.TCU... OOS.SYS.REMOTE \*  
PC.MXU<mxu> OUTAGE

b) OI alarm indication  
- alarm string : DS1 A CGA Red  
DS1 A DL Failure  
DS1 C DL Failure (mode 4 only)

c) RT alarm indication  
- alarm lamps : Mode 1 Mode 2 Mode 4  
LIU-A CLF LIU-A CLF LIU-A CLF  
LIU-B,C,D LIU-C flash EMU-C flash  
flash  
BCU A BCU A,B BCU A,B,C,D  
ADU MJ ADU MJ ADU MJ  
- SDU string : DS1 A HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.173 REMOTE ALARM IN DTU  
- SPAN.TCU... OOS.SYS

=====

4. Fault condition = 1-way DS1 B transmission failure in RT receive direction  
(mode 1 only)

(RT detects RED alarm on DS1 B)

a) GTD-5 indication  
- alarm string : SERIES 5 DS1 B FAILURE  
- ACDP alarm lamp : MXU MINOR  
CXR MINOR  
- SMA : 1.183 YELLOW (REMOTE) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
- HID status change : SPAN.TCU... OOS.SYS.REMOTE \*  
DIUS.MXU<mxu>.1 OOS.SYS

b) OI alarm indication  
- alarm string : DS1 B CGA Red

c) RT alarm indication  
- alarm lamps : Mode 1 Mode 2 Mode 4  
LIU-B CLF N/A N/A  
BCU B  
ADU MJ  
- SDU string : DS1 B HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.173 REMOTE ALARM IN DTU

- SPAN.TCU... OOS.SYS

=====

5. Fault condition = 1-way DS1 C transmission failure in RT receive direction  
(mode 1 and 2 only)

(RT detects RED alarm on DS1 C)

- a) GTD-5 indication
  - alarm string : SERIES 5 DS1 C FAILURE
  - ACDP alarm lamp : MXU MINOR  
CXR MINOR
  - SMA : 1.183 YELLOW (REMOTE) ALARM CONDITION DETECTED \*
  - HID = SPAN.TCU<tcu>.<fiu>.<span>
  - HID status change : SPAN.TCU. . OOS.SYS.REMOTE \*
  - DIUS.MXU<mxu>.2 OOS.SYS
  - DIUS.MXU<mxu>.3 OOS.SYS (mode 2 only)
- b) OI alarm indication
  - alarm string : DS1 C CGA Red  
DS1 C DL Failure (mode 2 only)
- c) RT alarm indication
  - alarm lamps : Mode 1 Mode 2 Mode 4
  - LIU-C CLF LIU-C CLF N/A
  - BCU C BCU C/D
- SDU string : DS1 C HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.173 REMOTE ALARM IN DTU
- SPAN.TCU... OOS.SYS

Also, a remote alarm is reported by the host processor only if DS1 C is not groomed. If DS1 C is groomed, then remote alarm will be reported by the connecting office, (and not by the host).

=====

6. Fault condition = 1-way DS1 D transmission failure in RT receive direction  
(mode 1 only)

(RT detects RED alarm on DS1 D)

- a) GTD-5 indication
  - alarm string : SERIES 5 DS1 D FAILURE
  - ACDP alarm lamp : MXU MINOR  
CXR MINOR
  - SMA : 1.183 YELLOW (REMOTE) ALARM CONDITION DETECTED \*
  - HID = SPAN.TCU<tcu>.<fiu>.<span>
  - HID status change : SPAN.TCU. . OOS.SYS.REMOTE \*
  - DIUS.MXU<mxu>.3 OOS.SYS
- b) OI alarm indication
  - alarm string : DS1 D CGA Red
- c) RT alarm indication
  - alarm lamps : Mode 1 Mode 2 Mode 4
  - LIU-D CLF N/A N/A
  - BCU D
  - ADU MJ

- SDU string : DS1 D HI ERK

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.173 REMOTE ALARM IN DTU
- SPAN.TCU... OOS.SYS

Also, a remote alarm is reported by the host processor only if DS1 D is not groomed. If DS1 D is groomed, then remote alarm will be reported by the connecting office, (and not by the host).

=====  
7. Fault condition = 1-way DS1 A transmission failure in RT transmit direction  
(RT receives YELLOW alarm from GTD-5)

a) GTD-5 indication

- alarm string : PC.MXU<mxu> OUTAGE - PROCESSOR COMPLEX FAILS  
TO RESPOND TO AUDIT
- ACDP alarm lamp : MXU MAJOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
0.060 PROCESSOR COMPLEX AUDIT RESPONSE FAILURE  
HID = PC.MXU<mxu>
- HID status change : SPAN.TCU... OOS.SYS.LOCAL \*  
PC.MXU<mxu> OUTAGE

b) OI alarm indication

- alarm string : DS1 A CGA Yel

c) RT alarm indication

- alarm lamps : Mode 1 Mode 2 Mode 4  
LIU-A,B,C,D LIU-A,C CLF LIU-A,EMU CLF  
CLF flash flash flash  
BCU A BCU A,B BCU A,B,C,D  
ADU MJ,FE ADU MJ,FE ADU MJ,FE

- SDU string : DS1 A YELL

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

=====  
8. Fault condition = 1-way DS1 B transmission failure in RT transmit direction  
(mode 1 only)

(RT receives YELLOW alarm from GTD-5)

a) GTD-5 indication

- alarm string : SERIES 5 DS1 B FAILURE
- ACDP alarm lamp : MXU MINOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>
- HID status change : SPAN.TCU... OOS.SYS.LOCAL \*  
DIUS.MXU<mxu>.1 OOS.SYS

b) OI alarm indication

- alarm string : DS1 B CGA Yel





- ACDP alarm lamp : MXU MINOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*
- HID = SPAN.TCU<tcu>.<fiu>.<span>
- HID status change : SPAN.TCU... OOS.SYS.LOCAL  
DIUS.MXU<mxu>.1 OOS.SYS
- b) OI alarm indication
  - alarm string : DS1 B CGA Red
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4  
LIU-B CLF        N/A                N/A  
BCU B  
ADU MJ
  - SDU string : DS1 B HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

-----  
13. Fault condition = 2-way DS1 C transmission failure in receive and transmit direction

(RED alarm detected at RT and GTD-5) (mode 1 and 2

only)

- a) GTD-5 indication
  - alarm string : SERIES 5 DS1 C FAILURE
  - ACDP alarm lamp : MXU MINOR  
CXR MINOR
  - SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*
  - HID = SPAN.TCU<tcu>.<fiu>.<span>
  - HID status change : SPAN.TCU... OOS.SYS.LOCAL \*
  - DIUS.MXU<mxu>.2 OOS.SYS  
DIUS.MXU<mxu>.3 OOS.SYS (mode 2 only)
- b) OI alarm indication
  - alarm string : DS1 C CGA Red  
DS1 C DL Failure (mode 2 only)
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4  
LIU-C CLF        LIU-C CLF        N/A  
BCU C            BCU C/D  
ADU MJ            ADU MJ
  - SDU string : DS1 C HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

A local alarm is reported by the host processor only if DS1 C is not groomed. If DS1 C is groomed, then local alarm will be reported by the connecting office, (and not by the host).

-----  
14. Fault condition = 2-way DS1 D transmission failure in receive and transmit

direction

(RED alarm detected at RT and GTD-5)

(mode 1 only)

a) GTD-5 indication

- alarm string : SERIES 5 DS1 D FAILURE
- ACDP alarm lamp : MXU MINOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>
- HID status change : SPAN.TCU... OOS.SYS.LOCAL \*  
DIUS.MXU<mxu>.3 OOS.SYS

b) OI alarm indication

- alarm string : DS1 D CGA Red

c) RT alarm indication

- alarm lamps : Mode 1 Mode 2 Mode 4  
LIU-D CLF N/A N/A  
BCU D  
ADU MJ

- SDU string : DS1 D HI ERR

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

A local alarm is reported by the host processor only if DS1 D is not groomed. If DS1 D is groomed, then local alarm will be reported by the connecting office, (and not by the host).

=====  
15. Fault condition = MLIU-A catastrophic failure (eg. power loss).

No communication with CO.

a) GTD-5 indication

- alarm string : PC.MXU<mxu> OUTAGE - PROCESSOR COMPLEX FAILS  
TO RESPOND TO AUDIT
- ACDP alarm lamp : MXU MAJOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
0.060 PROCESSOR COMPLEX AUDIT RESPONSE FAILURE

HID = PC.MXU<mxu>

- HID status change : SPAN.TCU... OOS.SYS.LOCAL  
PC.MXU<mxu> OUTAGE

b) OI alarm indication

- alarm string : LIU A CP Fail  
LIU B CP Fail  
LIU C CP Fail  
LIU D CP Fail  
DS1 A DL Fail  
DS1 C DL Fail (modes 2 and 4 only)

c) RT alarm indication

- alarm lamps : Mode 1 Mode 2 Mode 4

|             |             |             |
|-------------|-------------|-------------|
| LIU-B,C,D   | LIU-C FAIL  | EMU FAIL    |
| FAIL        | BCU A,B,C,D | BCU A,B,C,D |
| BCU A,B,C,D | ADU MJ,NE   | ADU MJ,NE   |
| ADU MJ,NE   |             |             |

- SDU string : LIU A FAIL (all modes)  
LIU B FAIL (mode 1 only)  
LIU C FAIL (all modes)  
LIU D FAIL (mode 1 only)

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

-----  
16. Fault condition = MLIU-A partial failure. Loss of communication with CO, but DS1 A framing maintained.

- a) GTD-5 indication
  - alarm string : PC.MXU<mxu> OUTAGE - PROCESSOR COMPLEX FAILS TO RESPOND TO AUDIT
  - ACDP alarm lamp : MXU MAJOR
  - SMA : 3.410 SERIES 5 RDLC COMMUNICATION AUDIT FAILURE  
HID = PC.MXU<MXU>  
0.060 PROCESSOR COMPLEX AUDIT RESPONSE FAILURE  
  
HID = PC.MXU<mxu>
  - HID status change : PC.MXU<mxu> OUTAGE  
DLNK.TCU<tcu>.<fiu>.<piu> OOS.SYS
- b) OI alarm indication
  - alarm string : LIU A CP Fail
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4  
LIU-A FAIL        LIU-A FAIL        LIU-A FAIL  
BCU A            BCU A,B            BCU A,B  
ADU MJ,NE        ADU MJ,NE        ADU MJ,NE
  - SDU string : LIU A FAIL

-----  
17. Fault condition = MLIU-A partial failure. Maintain communication with CO.

- a) GTD-5 indication
  - alarm string : SERIES 5 LIU A (MLIU) FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 0.302 SERIES 5 LIU FAILURE  
HID = PC.MXU<mxu>  
(additional data specifies cause of failure or incompatibility)
  - HID status change : DIUS.MXU<mxu>.0 OOS.SYS  
DIUS.MXU<mxu>.1 OOS.SYS (mode 2 and 4 only)
- b) OI alarm indication
  - alarm string : LIU A CP Fail
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4

|            |            |            |
|------------|------------|------------|
| LIU-A FAIL | LIU-A FAIL | LIU-A FAIL |
| BCU A      | BCU A,B    | BCU A,B    |
| ADU MJ,NE  | ADU MJ,NE  | ADU MJ,NE  |

- SDU string : LIU A FAIL

=====

18. Fault condition = SLIU-B failure (mode 1 only)

a) GTD-5 indication

- alarm string : SERIES 5 LIU B (SLIU) FAILURE  
 - ACDP alarm lamp : MXU MINOR  
 - SMA : 0.302 SERIES 5 LIU FAILURE  
           HID = PC.MXU<mxu>  
           (additional data specifies cause of failure  
           or incompatibility)  
 - HID status change : DIUS.MXU<mxu>.1 OOS.SYS

b) OI alarm indication

- alarm string : LIU B CP Fail

c) RT alarm indication

|               |            |        |        |
|---------------|------------|--------|--------|
| - alarm lamps | : Mode 1   | Mode 2 | Mode 4 |
|               | LIU-B FAIL | N/A    | N/A    |
|               | BCU B      |        |        |
|               | ADU MJ,NE  |        |        |

- SDU string : LIU B FAIL

=====

19. Fault condition = SLIU-C failure (mode 1 and 2 only)

a) GTD-5 indication

- alarm string : SERIES 5 LIU C (SLIU) FAILURE  
 - ACDP alarm lamp : MXU MINOR  
 - SMA : 0.302 SERIES 5 LIU FAILURE  
           HID = PC.MXU<mxu>  
           (additional data specifies cause of failure  
           or incompatibility)  
 - HID status change : DIUS.MXU<mxu>.2 OOS.SYS  
                       DIUS.MXU<MXU>.3 OOS.SYS (mode 2 only)

b) OI alarm indication

- alarm string : LIU C CP Fail

c) RT alarm indication

|               |            |            |        |
|---------------|------------|------------|--------|
| - alarm lamps | : Mode 1   | Mode 2     | Mode 4 |
|               | LIU-C FAIL | LIU-C FAIL | N/A    |
|               | BCU C      | BCU C,D    | N/A    |
|               | ADU MJ,NE  | ADU MJ,NE  |        |

- SDU string : LIU C FAIL

=====

20. Fault condition = SLIU-D failure (mode 1 only)

a) GTD-5 indication

- alarm string : SERIES 5 LIU D (SLIU) FAILURE  
 - ACDP alarm lamp : MXU MINOR  
 - SMA : 0.302 SERIES 5 LIU FAILURE  
           HID = PC.MXU<mxu>  
           (additional data specifies cause of failure  
           or incompatibility)

- HID status change : DIUS.MXU<mxu>.3 OOS.SYS
- b) OI alarm indication
  - alarm string : LIU D CP Fail
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4
  - LIU-D FAIL        N/A                N/A
  - BCU D
  - ADU MJ,NE
- SDU string : LIU D FAIL

-----  
21. Fault condition = EMU failure (mode 4 only)

- a) GTD-5 indication
  - alarm string : SERIES 5 LIU C (EMU) FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 0.302 SERIES 5 LIU FAILURE
  - HID = PC.MXU<mxu>
  - (additional data specifies cause of failure
  - or incompatibility)
  - HID status change : DIUS.MXU<mxu>.2 OOS.SYS
  - DIUS.MXU<mxu>.3 OOS.SYS
- b) OI alarm indication
  - alarm string : LIU C CP Fail
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4
  - N/A                                EMU FAIL
  - BCU C,D
  - ADU MJ,NE
- SDU string : LIU C FAIL

-----  
22. Fault condition = TRU AB Failure

- a) GTD-5 indication
  - alarm string : SERIES 5 TRU AB FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 1.348 SERIES 5 TRU FAULT
  - HID = PC.MXU<mxu>
  - (additional data specifies reason for failure)
  - HID status change : DIUS.MXU<mxu>.0 OOS.SYS
  - DIUS.MXU<mxu>.1 OOS.SYS
- b) OI alarm indication
  - alarm string : TRU A/B Fail
  - A/B Shelf OOS
- c) RT alarm indication
  - alarm lamps : Mode 1            Mode 2            Mode 4
  - TRU-AB FAIL        TRU-AB FAIL        TRU-AB FAIL
  - ADU MJ,NE        ADU MJ,NE        ADU MJ,NE
  - BCU A,B            BCU A,B            BCU A,B
- SDU string : TRU A FAIL
- FsDL FAIL

-----  
23. Fault condition = TRU CD failure

- a) GTD-5 indication
  - alarm string : SERIES 5 TRU CD FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 1.348 SERIES 5 TRU FAULT  
HID = PC.MXU<mxu>  
(additional data specifies reason for failure)
  - HID status change : DIUS.MXU<mxu>.2 OOS.SYS  
DIUS.MXU<mxu>.3 OOS.SYS
- b) OI alarm indication
  - alarm string : TRU C/D Fail  
C/D Shelf OOS
- c) RT alarm indication
  - alarm lamps : Mode 1 Mode 2 Mode 4  
TRU-CD FAIL TRU-CD FAIL TRU-CD FAIL  
BCU C,D BCU C,D BCU C,D  
ADU MJ,NE ADU MJ,NE ADU MJ,NE
- SDU string : TRU C FAIL

=====  
24. Fault condition = ADU/BCU failure

- a) GTD-5 indication
  - alarm string : SERIES 5 BANK CONTROLLER FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>  
(additional data identifies reason for failure)
  - HID status change : none
- b) OI alarm indication
  - alarm string : Target response failure
- c) RT alarm indication
  - alarm lamps : Mode 1 Mode 2 Mode 4  
ADU FAIL \* ----->  
BCU FAIL \* ----->
- SDU string : NO RESP

\* ADU or BCU FAIL LEDs will light if card is plugged in when failure occurs.  
=====

25. Fault condition = FMU failure

- a) GTD-5 indication
  - alarm string : SERIES 5 FMU FAILURE
  - ACDP alarm lamp : MXU MINOR
  - SMA : 0.307 SERIES 5 FMU FAILURE  
HID = PC.MXU<mxu>  
(additional data specifies reason for failure)
  - HID status change : none
- b) OI alarm indication
  - alarm string : none
- c) RT alarm indication
  - alarm lamps : Mode 1 Mode 2 Mode 4  
FMU FAIL \* ----->
- SDU string : none

\* The FMU FAIL LED will light only if FMU self diagnostics fail.

```
=====
26. Fault condition = ACTU failure
 a) GTD-5 indication
 - alarm string : SERIES 5 ACTU FAILURE
 - ACDP alarm lamp : MXU MINOR
 - SMA : 1.349 SERIES 5 ALARM DATA
 : HID = PC.MXU<mxu>
 : (additional data identifies reason for failure)
 - HID status change : none
 b) OI alarm indication
 - alarm string : ACTU circuit pack FAIL
 c) RT alarm indication
 - alarm lamps : Mode 1 Mode 2 Mode 4
 : ADU MN,NE----->
 : ACTU FAIL----->

 - SDU string : ACTU FAIL
=====
```

```
27. Fault condition = SDU FAILURE
 a) GTD-5 indication
 - alarm string : SERIES 5 SDU FAILURE
 - ACDP alarm lamp : MXU MINOR
 - SMA : 1.349 SERIES 5 ALARM DATA
 : HID = PC.MXU<mxu>
 : (additional data identifies reason for failure)
 - HID status change : none
 b) OI alarm indication
 - alarm string : SDU circuit pack FAIL
 c) RT alarm indication
 - alarm lamps : Mode 1 Mode 2 Mode 4
 : ADU MN,NE----->
 : SDU FAIL----->

 - SDU string : none
=====
```

```
28. Fault condition = Fan failure
 a) GTD-5 indication
 - alarm string : SERIES 5 FAN FAILURE
 - ACDP alarm lamp : MXU MINOR
 - SMA : 1.349 SERIES 5 ALARM DATA
 : HID = PC.MXU<MXU>
 : (additional data identifies reason for failure)
 - HID status change : none
 b) OI alarm indication
 - alarm string : MISC1 ENVIRON ALARM
 c) RT alarm indication
 - alarm lamps : Mode 1 Mode 2 Mode 4
 : ADU MJ/MN * ,NE----->
 : BCU MISC1----->

 - SDU string : MISC1 ALRM
```

\* ADU will light MJ or MN LED depending on the position of ADU option switch S1-7.

Note: In order to report fan failures to the GTD-5, the fan alarm lead must be connected to the MISC 1 sense point of one of the MXUs in the cabinet. Also the MISC 1 sense point for the same MXU must be associated with the fan alarm by specifying ALARM = FAN in the MAKE MXU command.

=====

29. Fault condition = SIU failure

a) GTD-5 indication

- alarm string : SERIES 5 SIU LAN FAILURE
- alarm string : SERIES 5 SIU/ADU LAN FAILURE
- ACDP alarm lamp : MXU MINOR
- SMA : 1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>  
(additional data identifies reason for failure)
- HID status change : none

b) OI alarm indication

- alarm string : none

c) RT alarm indication

- alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN,NE,LAN----->  
ADU FAIL,MN,NE,LAN----->  
SIU FAIL----->

- SDU string : SIU LAN

Note: ADU option switch S1-8 must be set to LAN in order to generate alarms.

=====

30. Fault condition = LTT failure

a) GTD-5 indication

- alarm string : none
- ACDP alarm lamp : none
- SMA : none
- HID status change : none

b) OI alarm indication

- alarm string : none

c) RT alarm indication

- alarm lamps : Mode 1                    Mode 2                    Mode 4  
LTT FAIL----->

- SDU string : none

=====

31. Fault condition = DTU failure

a) GTD-5 indication

- alarm string : none
- ACDP alarm lamp : none
- SMA : none
- HID status change : none

b) OI alarm indication

- alarm string : none

c) RT alarm indication

- alarm lamps : Mode 1                    Mode 2                    Mode 4  
DTU FAIL----->

- SDU string : none

=====

32. Fault condition = PCU A/B failure

a) GTD-5 indication

- alarm string : PC.MXU<mxu> OUTAGE - PROCESSOR COMPLEX FAILS  
TO RESPOND TO AUDIT
- ACDP alarm lamp : MXU MAJOR  
CXR MINOR
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
  
0.060 PROCESSOR COMPLEX AUDIT RESPONSE FAILURE  
  
HID = PC.MXU<mxu>
- HID status change : SPAN.TCU... OOS.SYS.RED(LOCAL)  
PC.MXU<mxu> OUTAGE

b) OI alarm indication

- alarm string : A/B PCU or -48V CU Fuse Fail

c) RT alarm indication

- alarm lamps : Mode 1 Mode 2 Mode 4  
ADU MJ,NE----->  
BCU A,B----->  
PCU AB FAIL

- SDU string : CU AB FUSE

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

Note: For most PCU AB failures, MLIUA loses power and the MXU goes into outage as shown above. There are a small number of failure modes where the MXU does not go into outage, in which case a SERIES 5 PCU ABCD / -48V CU FUSE FAIL alarm will be generated at the GTD-5, instead of the alarm indications and SMAs shown above.

33. Fault condition = PCU C/D failure

a) GTD-5 indication

- alarm string : SERIES 5 PCU ABCD / -48V CU FUSE FAIL  
SERIES 5 LIU C (SLIU) FAILURE (mode 1 and 2)  
SERIES 5 LIU C (EMU) FAILURE (mode 4 only)
- ACDP alarm lamp : MXU MINOR  
CXR MINOR (mode 1 and 2)
- SMA : 1.184 RED (LOCAL) ALARM CONDITION DETECTED \*  
  
HID = SPAN.TCU<tcu>.<fiu>.<span>  
0.302 SERIES 5 LIU FAILURE  
HID = PC.MXU<mxu>  
1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>  
(additional data identifies reason for failure)
- HID status change : DIUS.MXU<mxu>.2 OOS.SYS  
DIUS.MXU<mxu>.3 OOS.SYS  
SPAN.TCU. . OOS.SYS.LOCAL (mode 1 and 2)

b) OI alarm indication

- alarm string : C/D PCU or -48V CU Fuse Fail

- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
                  ADU MJ,NE- ----->  
                  BCU C,D----->  
                  PCU CD FAIL----->
  - SDU string        : CU CD FUSE

\* In SVR 1633, the SMA syndrome and span status differ from that shown above as follows:

- SYNDROME 0.174 LOCAL ALARM IN DTU
- SPAN.TCU... OOS.SYS

=====

34. Fault condition = PCU F/S failure

- a) GTD-5 indication
  - alarm string        : SERIES 5 PCU FS / -48V COMM FUSE FAIL  
                              SERIES 5 FMU FAILURE
  - ACDP alarm lamp    : MXU MINOR
  - SMA                 : 0.307 SERIES 5 FMU FAILURE  
                              1.349 SERIES 5 ALARM DATA  
                                  HID = PC.MXU<mxu>  
                                  (additional data identifies reason for failure)
  - HID status change : none
- b) OI alarm indication
  - alarm string        : F/S PCU/PROT LPU or BFU Fuse
- c) RT alarm indication
  - alarm lamps         : Mode 1                    Mode 2                    Mode 4  
                              ADU MN,NE----->  
                              PCU F/S FAIL----->
  - SDU string         : Ln P Fuse

=====

35. Fault condition = CFU -48V COMM fuse

- a) GTD-5 indication
  - alarm string        : SERIES 5 BANK CONTROLLER FAILURE
  - ACDP alarm lamp    : MXU MINOR
  - SMA                 : 1.349 SERIES 5 ALARM DATA  
                              HID = PC.MXU<mxu>  
                              (additional data identifies reason for failure)
  - HID status change : none
- b) OI alarm indication
  - alarm string        : Site connection failure
- c) RT alarm indication
  - alarm lamps         : Mode 1                    Mode 2                    Mode 4  
                              ADU FAIL,MN,NE----->  
                              CFU ALM
  - SDU string         : NO RESP

=====

36. Fault condition = CFU -48V AB fuse

- a) GTD-5 indication
  - alarm string        : SERIES 5 PCU ABCD / -48V CU FUSE FAIL
  - ACDP alarm lamp    : MXU MINOR
  - SMA                 : 1.349 SERIES 5 ALARM DATA

```

 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : DIUS.MXU<mxu>.0 OOS.SYS
 DIUS.MXU<mxu>.1 OOS.SYS
b) OI alarm indication
- alarm string : A/B PCU or -48V CU FUSE Fail
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 BCU A,B----->
 ADU NE,MJ----->
 CFU ALM

- SDU string : CU AB FUSE
=====
37. Fault condition = CFU -48V CD fuse
a) GTD-5 indication
- alarm string : SERIES 5 PCU ABCD / -48V CU FUSE FAIL
- ACDP alarm lamp : MXU MINOR
- SMA : 1.349 SERIES 5 ALARM DATA
 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : DIUS.MXU<mxu>.2 OOS.SYS
 DIUS.MXU<mxu>.3 OOS.SYS
b) OI alarm indication
- alarm string : C/D PCU or -48V CU FUSE Fail
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 BCU C,D----->
 ADU NE,MJ----->
 CFU ALM

- SDU string : CU CD FUSE
=====
38. Fault condition = CFU 20HZ A/B fuse
a) GTD-5 indication
- alarm string : SERIES 5 RINGING FUSE FAILURE
- ACDP alarm lamp : MXU MINOR
- SMA : 0.308 RINGING FAILURE
 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : none
b) OI alarm indication
- alarm string : 20HZ A/B CFU RING Fuse Fail
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 BCU A,B----->
 ADU NE,MJ----->
 CFU ALM

- SDU string : RG AB FUSE
=====
39. Fault condition = CFU 20HZ C/D fuse
a) GTD-5 indication
```

- alarm string : SERIES 5 RINGING FUSE FAILURE
- ACDP alarm lamp : MXU MINOR
- SMA : 0.308 SERIES 5 RINGING FAILURE  
HID = PC.MXU<mxu>  
(additional data identifies reason for failure)
- HID status change : none
- b) OI alarm indication
  - alarm string : 20 HZ C/D CFU RING Fuse Fail
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
BCU C,D----->  
ADU NE,MJ----->  
CFU ALM
- SDU string : RG CD FUSE

-----  
40. Fault condition = RING GEN L failure

- a) GTD-5 indication
  - alarm string : SERIES 5 PWR SHELF/RING GEN FAIL
  - ACDP alarm lamp : REMOTE DC MINOR
  - SMA : 1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>  
(additional data identifies reason for failure)
  - HID status change : none
- b) OI alarm indication
  - alarm string : Power Shelf Minor Alarm
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN,NE----->
- SDU string : PSMN ALM

-----  
41. Fault condition = RING GEN R failure

- a) GTD-5 indication
  - alarm string : none
  - ACDP alarm lamp : none
  - SMA : none
  - HID status change : none
- b) OI alarm indication
  - alarm string : none
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
none----->
- SDU string : none

Note: This case applies to distributed power shelf J1C182-BA only, where the standby ringing generator (Ring Gen R) is not loaded until the primary ringing generator fails. For bulk power shelves (J1C182-BA, ED-7C704-30), the ringing load is shared between both ringing generators, and the loss of either generator will be alarmed as shown in case 40.

-----  
42. Fault condition = Both ring generators fail

- a) GTD-5 indication

```
- alarm string : SERIES 5 TOTAL RINGING FAILURE
- ACDP alarm lamp : AUX-A MAJOR
- SMA : 0.308 SERIES 5 RINGING FAILURE
 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : none
b) OI alarm indication
- alarm string : RT RING GENS or PRUS Failure
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 ADU MJ,NE----->
 BCU A,B,C,D----->

- SDU string : RING GEN
```

-----  
43. Fault condition = Battery failure

```
a) GTD-5 indication
- alarm string : SERIES 5 PWR SHELF/RING GEN FAIL
- ACDP alarm lamp : REMOTE DC MINOR
- SMA : 1.349 SERIES 5 ALARM DATA
 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : none
b) OI alarm indication
- alarm string : Power Shelf Minor Alarm
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 ADU MN,NE----->

- SDU string : PSMN ALM
```

-----  
44. Fault condition = AC or rectifier failure

```
a) GTD-5 indication
- alarm string : RU COML AC - AC OFF
- ACDP alarm lamp : REMOTE AC MAJOR
- SMA : 1.349 SERIES 5 ALARM DATA
 HID = PC.MXU<mxu>
 (additional data identifies reason for failure)
- HID status change : none
b) OI alarm indication
- alarm string : RT AC POWER LOSS - PMN
c) RT alarm indication
- alarm lamps : Mode 1 Mode 2 Mode 4
 ADU PMN,NE----->

- SDU string : RECT FUSE
```

-----  
45. Fault condition = Door open

```
a) GTD-5 indication
- alarm string : AUX A - DOOR OPEN
- ACDP alarm lamp : AUX-A MINOR
- SMA : 1.349 SERIES 5 ALARM DATA
 HID = PC.MXU<mxu>
```

- (additional data identifies reason for failure)
- HID status change : none
- b) OI alarm indication
  - alarm string : MISC1 ENVIRON ALARM
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MJ/MN \* ,NE----->  
BCU MISC1----->
  - SDU string : MISC1 ALRM

\* ADU MN or MJ is generated, depending on setting of ADU option switch S1-7.  
Note: In order to report the door open status to the GTD-5, the door open sensing device must be wired to the MISC 1 sense point of one of the MXUs in the cabinet. Also the MISC 1 sense point of the same MXU must be associated with the door open alarm by specifying ALARM = DOOR in the MAKE MXU command.

=====  
46. Fault condition - Channel Unit failure (stuck test relay)

- a) GTD-5 indication
  - alarm string : none
  - ACDP alarm lamp : none
  - SMA : 1.350 SERIES 5 CHANNEL UNIT FAILURE  
HID = CARD.MXU<mxu>.0.0.<card>  
(additional data specifies cause of failure)
  - HID status change : CARD.MXU<mxu>.0.0.<card> INS.TRBL
- b) OI alarm indication
  - alarm string : RT Port Failure : x,y  
(where x,y identify the lines on the failing channel unit)
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN,NE----->
  - SDU string : CH## FAIL  
(where ## identifies the line associated with the first circuit on the failing channel unit)

=====  
47. Fault condition - Channel unit failure (incorrect channel unit type)

- a) GTD-5 indication
  - alarm string : none
  - ACDP alarm lamp : none
  - SMA : 1.350 SERIES 5 CHANNEL UNIT FAILURE  
HID = CARD.MXU<mxu>.0.0.<card>  
(additional data specifies cause of failure)
  - HID status change : CARD.MXU<mxu>.0.0.<card> INS.TRBL
- b) OI alarm indication
  - alarm string : CMP invalid CU
- c) RT alarm indication
  - alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN,NE,CMP----->
  - SDU string : CH## COMP  
(where ## identifies the line associated with the

first circuit on the failing channel unit)

-----  
48. Fault condition - Line circuit ACTU routine failure

(ACTU routine is initiated either by OI request or channel unit power up.)

a) GTD-5 indication

- alarm string : none  
- ACDP alarm lamp : none  
- SMA : 1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>

(additional data specifies that ACTU has detected failing line circuit.)

at least one

- HID status change : none

b) OI alarm indication

- alarm string : CH## FAIL

c) RT alarm indication

- alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN,NE----->

- SDU string : ACTU CUs  
RT## FAIL

(where ## identifies the failing line)

Note: SMA 1.349 identifies the fact that at least one line has failed the ACTU routine test, but it does not identify the failing line(s). If the power up test fails, then the craftsman at the RT can use the SDU to identify the failing line. If an OI initiated routine fails, then the OI will identify the failing line.

-----  
49. Fault condition - Environmental alarm

a) GTD-5 indication

- alarm string : SERIES 5 ENVIRONMENTAL ALARM  
- ACDP alarm lamp : AUX-A MINOR  
- SMA : 1.349 SERIES 5 ALARM DATA  
HID = PC.MXU<mxu>

(additional data identifies reason for failure)

- HID status change : none

b) OI alarm indication

- alarm string : MISC1 ENVIRON ALARM

c) RT alarm indication

- alarm lamps : Mode 1                    Mode 2                    Mode 4  
ADU MN/MJ \* ,NE----->  
BCU MISC1----->

- SDU string : MISC1 ALRM

\* ADU MN or MJ is generated, depending on setting of ADU option switch S1-7.

Note: The environmental alarm is provided to enable general environmental abnormalities at the RT to be reported to the GTD-5. The appropriate sensing device (supplied by the operating company) must be wired to the ADU MISC 1 sense point of one of the MXUs in the cabinet. Also the MISC 1 sense point of the same MXU must be associated with the environmental alarm by specifying ALARM = ENV in the MAKE MXU command.

This alarm can also be used to report both fan failures and the door open status when only one MXU is equipped in a cabinet. In this case, the alarm

leads for both the Door Open Sensor and the Fan Failure sensor should be connected (OR'd) to the MISCl sense point.

## Use System Display Unit (SDU) to Examine System Alarms or Check Channel Unit Test Results

**SUMMARY:** The SDU has two 4 character displays on the faceplate. Press the **CATEGORY** button until *Bank Alrm (at the COT)* or *Blue/White Alrm* (at the RT) is displayed. Press the **DATA** button to view alarm reports. The first row will identify what caused the alarm condition in the second row (for example; row 1 ADU, row 2 FAIL means the ADU has failed). Use the **CLEAR** pin jack to refresh the alarm data after doing any maintenance activity (such as replacing a circuit pack or changing an option switch).

1. Press the **SDU CATEGORY** button until *Blue/White Alrm* is displayed (see Figure 1 for SDU information flow).
2. Once in the *Alrm* category press the **DATA** button to cycle through the alarm data reports.
3. Use the SDU alarm table to assist in clearing the system trouble as follows:
  - Read the second row of the SDU display and find the alarm in the first column Table A on one of the pages.
  - Read the first row of the SDU display and find the identifier in the second column of Table A. This second column may have more than one possible identifier separated with a comma [for example "NE,FE" mean either NE or FE may be displayed; "LIU(A,B,C,D,P)" means LIUA or LIUB or ... will be displayed].
  - The third column of the table explains the cause of the alarm and gives the recommended action to clear the alarm.
  - Each time you perform a maintenance activity (such as changing a circuit pack) refresh the alarm category data by momentarily inserting a pin plug into the **SDU CLEAR** jack.
  - When clearing a system trouble, always replace blown fuses before replacing other circuit packs.



| <b>Table A — AUA8 System Display Unit Alarms</b> |                                 |                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm<br/>SDU row 2</b>                       | <b>Identifier<br/>SDU row 1</b> | <b>Description/Action</b>                                                                                                                                                                                                                                                                                                                                        |
| ACTV                                             | PROV                            | Either a provisioning data transfer or clearing operation is in progress. The message clears when the operation completes.                                                                                                                                                                                                                                       |
| ADMN                                             | PROV                            | An updating of administration memory through the OI. This message clears when the updating activity stops.                                                                                                                                                                                                                                                       |
| ALM                                              | TEST                            | A failure to setup a test through the ACTU at the RT. If an ACTU-FAIL message also appears under this category, remove LTT cable and replace the ACTU. Reconnect LTT cable. Otherwise, examine the test setup procedure.                                                                                                                                         |
| ALRM                                             | MSC1                            | A MISC1 alarm is present at the RT. Use local procedures to clear the alarm.                                                                                                                                                                                                                                                                                     |
| BK (A,B,C,D,P)                                   | LOOP                            | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                                                                                                                     |
| CKTS                                             | PROV                            | An updating of circuit provisioning memory through the OI and CIU. This message clears when the updating activity stops.                                                                                                                                                                                                                                         |
| COMP                                             | (anything)                      | This indicates an incompatible switch setting, wrong circuit pack version is installed, or circuit pack is installed in the wrong slot. This trouble should not be present when first looking at ALRM DATA. It will come up if you made a mistake when you replaced a circuit pack. Fix the option switch settings or install a compatible version circuit pack. |
| CUs                                              | ACTU                            | The detection of one or more channel unit failures by the ACTU. Replace those CUs with CH## FAIL messages under this category.                                                                                                                                                                                                                                   |
| CLR                                              | CUT                             | On the RT ADU, the NORM/CLR option switch is set to CLR and switch S2-3 is set to CUT. Not advisable since these settings can clear memory when AutoCut occurs. Correct the settings.                                                                                                                                                                            |
| DGR(A,B,C,D)                                     | FE                              | An alarm on digroup (A,B,C,D) at the far end. Have switching personnel check for syndrome 1.348 "TRU ALARM" If present replace TRU then LIU.                                                                                                                                                                                                                     |

| <b>Table A — AUA8 System Display Unit Alarms – Continued</b> |                                |                                                                                                                                    |
|--------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm</b><br>SDU row 2                                    | <b>Identifier</b><br>SDU row 1 | <b>Description/Action</b>                                                                                                          |
| FAIL                                                         | ACTU                           | A failure on the ACTU. Remove LTT cable and replace the ACTU. Reconnect LTT cable.                                                 |
|                                                              | ADU                            | A failure on the ADU. Replace the ADU.                                                                                             |
|                                                              | CH##                           | A failure in the CU associated with channel ## (where ## is an odd number between 1 and 95). Replace the CU.                       |
|                                                              | FsDL                           | A failure of the data link. Replace the AB shelf TRU.                                                                              |
|                                                              | LAN                            | A failure of the LAN localized to the LAN cabling. Check and/or replace the SIU jumper, LAN main, and DCB-T cables.                |
|                                                              | LIU(A,B,C,D,P)                 | A failure on the digroup A LIU. If a TRUA FAIL alarm is also present, replace the TRU in the AB shelf. Otherwise, replace the LIU. |
|                                                              | LSU                            | A failure on the LSU. Replace the LSU.                                                                                             |
|                                                              | PROV                           | Failure to successfully provision a system with the CIU. Replace the BCU and ADU in that order.                                    |
|                                                              | SDU                            | A failure on the SDU. Replace the SDU.                                                                                             |
|                                                              | TRUA, TRUC                     | A failure on the TRU in the AB (TRUA) or CD (TRUC) shelf. Replace the TRU.                                                         |

| <b>Table A — AUA8 System Display Unit Alarms – Continued</b> |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm<br/>SDU row 2</b>                                   | <b>Identifier<br/>SDU row 1</b> | <b>Description/Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FUSE                                                         | BATT                            | A fuse is blown on the 181A apparatus mounting (battery shelf), an AC power failure at the RT, or an RT fan alarm. Replace the fuse. Otherwise, check the AC circuit breaker and AC power. Otherwise, check the FCU and the fan unit.                                                                                                                                                                                                                  |
|                                                              | CuAB                            | The AB fuse on the CFU providing –48 V DC protection to the digroup A and B CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                            |
|                                                              | CuCD                            | The CD fuse on the CFU providing –48 V DC protection to the digroup C and D CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                            |
|                                                              | Ln P                            | The protection fuse on the LFU providing –48 V DC protection to the protection LIUs (blue and white system) is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                |
|                                                              | RECT                            | Signals a possible failure of a rectifier. Check the faceplate LED on the rectifiers. If only one rectifier has its LED lighted, replace the rectifier. If all rectifiers have their LEDs lighted, check the AC circuit breaker and AC power.                                                                                                                                                                                                          |
|                                                              | RgAB                            | The AB fuse on the CFU providing 20-Hz ringing protection to the digroup A and B CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                       |
|                                                              | RgCD                            | The CD fuse on the CFU providing 20-Hz ringing protection to the digroup C and D CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                       |
| GEN                                                          | RING                            | A failure of one or more ring generators or ring control unit (RCU), or blown fuse on positive ring unit (PRU), or other power shelf ring equipment. Relace blown fuse (if present) and verify ringing voltages. Replace the ring equipment with its FAIL or other faceplate LED lighted or no/low (less than 80 V AC) ringing voltages.                                                                                                               |
| HiEr                                                         | DS1(A,B,C,D,P)                  | The number of BPVs on digroup (A,B,C,D,P) DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE DS1 interface, and, if present, on the multiplexers (AMI is equivalent to ZCS) are the same. If the line code settings are the same, replace the DS1 interface at the FE. Otherwise, do T1 fault-locating procedures or maintenance on the multiplexers. |

| <b>Table A — AUA8 System Display Unit Alarms – Continued</b> |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm<br/>SDU row 2</b>                                   | <b>Identifier<br/>SDU row 1</b> | <b>Description/Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| LAN                                                          | ADU                             | A failure of the LAN localized to the ADU. If ADU switch S1-8 is set toward NLAN, set it toward LAN. Otherwise, replace the ADU.                                                                                                                                                                                                                                                                                                                            |
|                                                              | SIU                             | A failure of the LAN localized to the SIU. Replace the SIU.                                                                                                                                                                                                                                                                                                                                                                                                 |
| LoEr                                                         | (A,B,C,D,P)                     | The number of BPVs on digroup (A,B,C,D,P) DS1 is between the protection switch threshold ( $10^{-4}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE DS1 interface, and, if present, on the multiplexers (AMI is equivalent to ZCS) are the same. If the line code settings are the same, replace the DS1 interface at the FE. Otherwise, do T1 fault-locating procedures. |
| MJ                                                           | FE                              | Communication failure between the switch and the RT. Read other SDU alarms at near end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                         |
| MEM                                                          | ADMN                            | 3-way mismatch of administration memory. Remove the ADU and set the NORM/CLR option plug for CLR. Reinstall the ADU. At the RT wait for the PRV LED on the ADU to go out. Remove the ADU and set the NORM/CLR option plug for NORM. Reinstall the ADU.                                                                                                                                                                                                      |
|                                                              | ADU                             | A failure on the ADU EEPROM. Replace the ADU.                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                              | BCU                             | A failure on the BCU EEPROM. Replace the BCU.                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                              | CKT                             | 3-way mismatch of CU provisioning memory. Remove the BCU and insert a pin plug into the PROV TRANS pin jack on the BCU faceplate. Reinstall the BCU. At the RT, wait for the PRV LED on the ADU to go out. Remove the pin plug and use the CIU to verify that the provisioning data agrees with the office records. Change corrupt data.                                                                                                                    |
| MSC1                                                         | NE                              | A MISC1 alarm at the RT. Use local procedures to clear the alarm.                                                                                                                                                                                                                                                                                                                                                                                           |

| <b>Table A — AUA8 System Display Unit Alarms – Continued</b> |                                 |                                                                                                                                                                                                                                                |
|--------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm<br/>SDU row 2</b>                                   | <b>Identifier<br/>SDU row 1</b> | <b>Description/Action</b>                                                                                                                                                                                                                      |
| PROT                                                         | ON                              | A switch of a digroup to the DS1 protection line. Another message in this category identifies the digroup on protection. Do the steps listed under that message.                                                                               |
|                                                              | A ON                            | A switch of LIU-A to the LIU-P. If the digroup A force switch on the LSU faceplate was unintentionally set toward <i>f</i> , move it away from <i>f</i> . Ignore this message if intentionally set toward <i>f</i> . Otherwise, replace LIU-A. |
| PMN                                                          | NE                              | A power minor alarm at the RT. Check the AC circuit breaker and AC power at the RT. Replace any 336A( ) rectifier with its ALARM LED lighted.                                                                                                  |
| SWCH                                                         | ADU,<br>LIU(A,B,C,D),<br>or LSU | An incompatible switch setting on the ADU, LIU(A,B,C,D), or LSU. Remove the ADU, LIU(A,B,C,D), or LSU and correct the switch option setting.                                                                                                   |
|                                                              | NE,FE                           | Incompatible switch settings between the NE and switch data base. Correct the incompatible switch settings.                                                                                                                                    |
| XMIT                                                         | DL A, DL C                      | Outgoing data link failure. Replace the AB (DL A) or CD (DL C) shelf TRU.                                                                                                                                                                      |

Abbreviations :

ACTU — Automated Channel Test Unit  
ADU — Alarm Display Unit  
AMI — Alternate Mark Inversion  
B8ZS — Bipolar with 8-Zeros Substitution  
BCU — Bank Control Unit  
LSU — Line Switch Unit  
BPV — Bipolar Violations  
CFU — Channel Fuse Unit  
CIU — Craft Interface Unit  
COT — Central Office Terminal  
CTU — Channel Test Unit  
CU — Channel Unit  
FCU — Fan Control Unit  
FE — Far End  
LAN — Local Area Network  
LFU — Line Fuse Unit  
LIU — Line Interface Unit  
NE — Near End  
OI — Operations Interface  
PCM — Pulse Code Modulation  
RT — Remote Terminal  
SDU — System Display Unit  
SIU — Site Interface Unit  
TRU — Transmit/Receive Unit  
ZCS — Zero Code Suppression

## Set Line Switch Unit (LSU) Option Switch Settings

1. Get one **AUA73B** LSU (line switch unit) and inspect for possible damage.
2. Set switch **S2** located on the side of the **LSU** circuit pack (Figure 1) to position **64**.

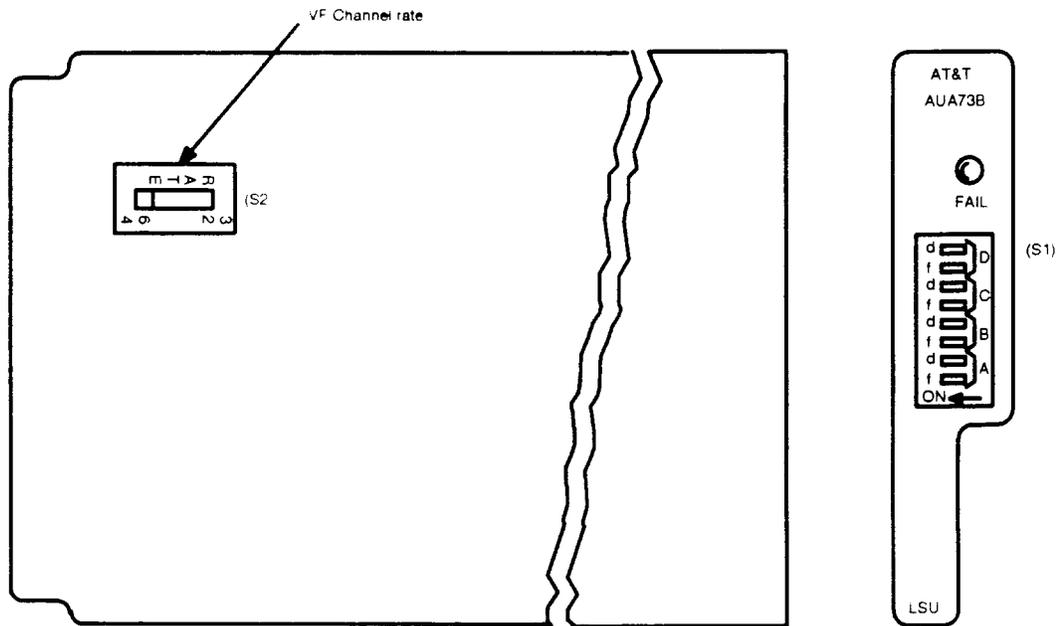


Figure 1 — AUA73 LSU Option Switches

3. Set all eight switches on **LSU** faceplate to **OFF** (right-hand side) position.

4.



**CAUTION:**

*Incorrectly set LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.*

Insert **LSU** into appropriate **LSU** slot in facility shelf.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Set Alarm Display Unit (ADU) Option Switch Settings

1. Get one **ADU** circuit pack with correct code and inspect for possible damage.

2.



**CAUTION:**

*For an FPI RT bank equipped for Mode 2 or Mode 4, the AUB28 switch S1 position 2 should be depressed toward 2; for Mode 1, it should be set toward 4.*

On **ABU28 ADU** (see Figure 1 and Table A) system configuration option switch **S1**, set switch positions to agree with data on facility record.

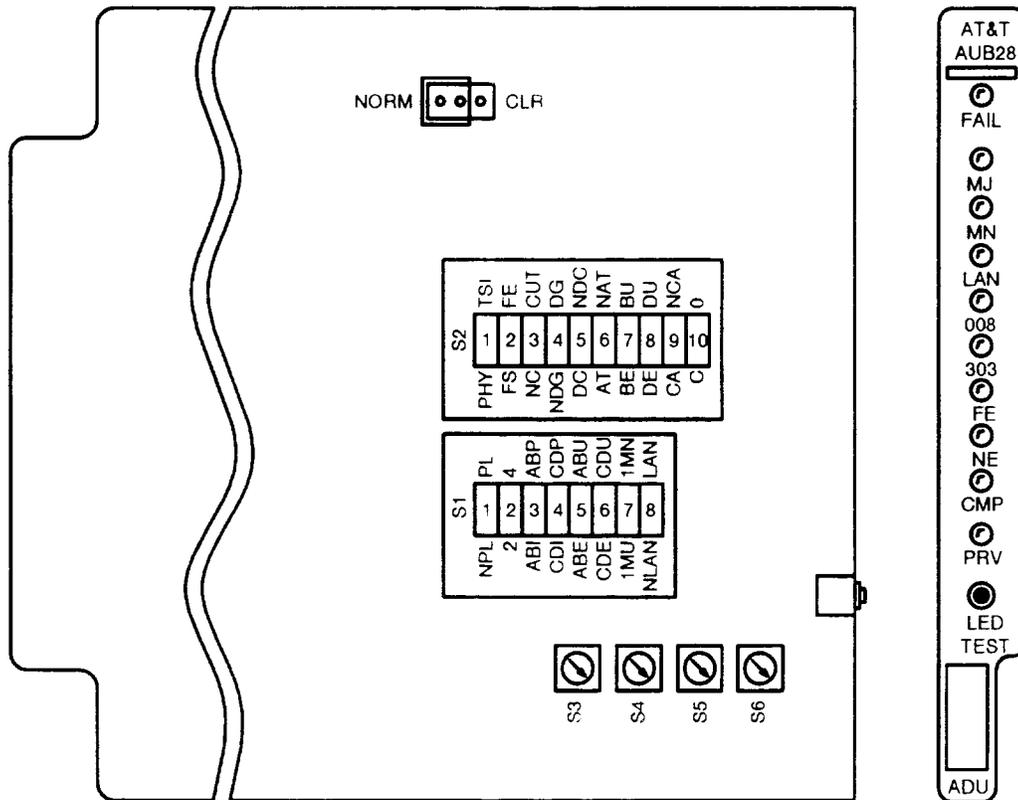
3. On **AUB28 ADU** system configuration option switch **S2**, set switch positions to agree with data on facility record.
4. Set **AUB28 ADU** option plug **CLEAR/NORM** to **NORM**.
5. Set system identification rotary switches **S3** (most significant digit) through **S6** (least significant digit) per facility record.

6.  **CAUTION:**  
*Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.*

Insert **ADU** into **ADU** slot.

Comment: The AUB28 ADU CMP indicator will light when incompatible option switches have been set. The AUB28 PRV indicator may light for up to 1 minute when the ADU is installed.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**



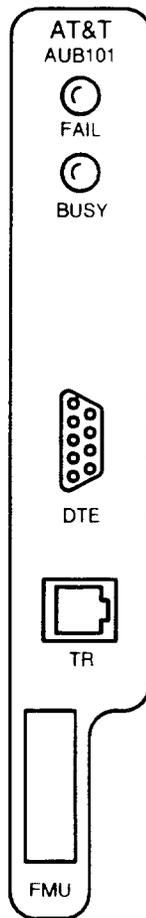
tpa 813566/01

Figure 1 — AUB28 RT ADU Option Switch Settings

| <b>Table A<br/>AUB28 Switch Setting</b>                                                        |    |                                                                      |                     |
|------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------|---------------------|
| <b>S1 Switch</b>                                                                               |    |                                                                      | Required<br>for FPI |
| No Protection Line ( <i>NPL</i> )                                                              | 1  | Protection Line ( <i>PL</i> )                                        | <b>NPL</b>          |
| Mode 2 or Mode 4 Operation ( <i>2</i> )                                                        | 2  | Mode 1 Operation ( <i>4</i> )                                        | *                   |
| AB In-Service ( <i>ABi</i> )                                                                   | 3  | AB Preservice ( <i>ABP</i> )                                         | <b>ABi</b>          |
| CD In-Service ( <i>CDi</i> )                                                                   | 4  | CD Preservice ( <i>CDP</i> )                                         | <b>CDi</b>          |
| AB Equipped ( <i>ABE</i> )                                                                     | 5  | AB Unequipped ( <i>ABU</i> )                                         | <b>ABE</b>          |
| CD Equipped ( <i>CDE</i> )                                                                     | 6  | CD Unequipped ( <i>CDU</i> )                                         | <b>CDE</b>          |
| Major Alarm for MISC1 ( <i>1MJ</i> )                                                           | 7  | Minor Alarm for MISC1 ( <i>1MN</i> )                                 | *                   |
| No LAN Alarm ( <i>NLAN</i> )                                                                   | 8  | LAN Alarm ( <i>LAN</i> )                                             | *                   |
| <b>S2 Switch</b>                                                                               |    |                                                                      |                     |
| Use <i>PHY</i>                                                                                 | 1  | <i>TSI</i>                                                           | <b>PHY</b>          |
| FS Framing ( <i>FS</i> )                                                                       | 2  | ESF Framing ( <i>FE</i> )                                            | <b>FS</b>           |
| No Cutover Hunting ( <i>NC</i> )                                                               | 3  | Cutover Hunting Enabled ( <i>CUT</i> )                               | <b>NC</b>           |
| Use <i>NDG</i> for everything except<br>Mode 1 Grooming                                        | 4  | Use <i>DG</i> only for FPI with<br>Mode 1 Grooming                   | *                   |
| Use <i>DC</i> to Enable the supplemental Data Link<br>for FPG System with a Series 5 COT       | 5  | Otherwise, Use <i>NDC</i>                                            | <b>NDC</b>          |
| Automated Testing ( <i>AT</i> )<br>(Use <i>AT</i> to Enable Automated Channel Unit<br>Testing) | 6  | No Automated Testing ( <i>NAT</i> )                                  | *                   |
| B DS1 Equipped ( <i>BE</i> )                                                                   | 7  | B DS1 Unequipped ( <i>BU</i> )                                       | <b>BE</b>           |
| D DS1 Equipped ( <i>DE</i> )                                                                   | 8  | D DS1 Unequipped ( <i>DU</i> )                                       | <b>DE</b>           |
| Channel Unit Alarm ( <i>CA</i> )<br>(Use <i>CA</i> to Enable Channel Unit Alarms)              | 9  | <b>NCA</b> No Channel Unit Alarms                                    | <b>CA</b>           |
| Closed ( <i>C</i> ) - Unused                                                                   | 10 | Open ( <i>O</i> ) - Unused                                           | <b>either</b>       |
| <b>CLEAR/NORM Plug</b>                                                                         |    |                                                                      |                     |
| Clear Provisioning<br>(Use <i>CLEAR</i> When ADU is First Installed In a<br>New System)        |    | Do Not Clear Provisioning<br>(Use <i>NORM</i> for In-Service System) | <b>NORM</b>         |
| <b>S3, S4, S5, and S6 Rotary Switches</b>                                                      |    |                                                                      |                     |
| System ID Number                                                                               |    |                                                                      | *                   |
| * Optional switch setting. Set according to system records. (Same as ADU being replaced)       |    |                                                                      |                     |

## Install the Flash Memory Unit (FMU)

1. Get one **AUB101 FMU** (Figure 1) and inspect for possible damage.



tpa 813549/01

Figure 1 — AUB101 Faceplate Layout and Board Outline

2. Disconnect **FMU DTE** connector and ED-7C728-30 cable and replace the **FMU** with a new **FMU**.

3. Does **FAIL** indicator on the **FMU** light steady and then go out after 5 seconds?

If **YES**, then proceed to Step 7.  
If **NO**, then continue with Step 4.

4. Replace **FMU**.

5. Does **FAIL** indicator on the **FMU** light steady and then go out after 5 seconds?

If **YES**, then proceed to Step 7.  
If **NO**, then continue with Step 6.

6. Consult the Technical Assistance Center (TAC) by calling 602-582-7305 or the local technical support group.

Repeat procedure from Step 2 after locating and correcting trouble.

7. Connect a 9 pin FULL NULL MODEM (ED-7C730-30,G1 cable; comcode 601382419) to the **DTE** connector on the faceplate of the **FMU**.
8. Connect the FULL NULL MODEM from the **FMU** faceplate to an IBM compatible personal computer (PC) and start the DTFIO software package on the PC (refer to DTFIO User Guide for bringup sequence).



12. Disconnect FULL NULL MODEM connector from **FMU** faceplate. Replace **FMU**. Reconnect FULL NULL MODEM to the **DTE** connector on the **FMU** faceplate.
13. From the DTFIO PC, set up a direct connection to the **FMU**. Does **FMU** load information display on the DTFIO PC screen?

If **YES**, then go to Step 15.

If **NO**, then continue with Step 14.

14. Refer to DTFIO User Guide for troubleshooting procedures for the DTFIO and/or its PC. Repeat procedure from Step 9 after locating and correcting trouble.

15.



**NOTE:**

The **FMU** has no load stored in its memory as delivered from the factory. However, if the **FMU** has a load residing in its memory from a previous installation, it will be used to load the MLIUs installed in the dual bank assembly. If this is the incorrect load, it can be replaced by loading the **FMU** through the DTFIO.

Follow local procedures for determining the correct **FMU** load identities.

16. Does the DTFIO PC screen display the correct **FMU** load identities?

If **YES**, proceed to Step 26.

If **NO**, continue with Step 17.

17. From the DTFIO PC, initiate a fill load of one of the copies of the **FMU** (refer to DTFIO User Guide for DTFIO operation). Using a 9600 bps local connection, the load of the **FMU** should take approximately 5-10 minutes.

18. Does the DTFIO PC screen indicate that the load transfer was successful?

If **YES**, proceed to Step **26**.  
If **NO**, continue with Step **19**.

19. Does the DTFIO PC screen display that the load failed?

If **YES**, go to Step **4**.  
If **NO**, continue with Step **20**.

20. From the DTFIO PC, attempt to load the **FMU** again.

21. Does the DTFIO PC screen indicate that the load transfer was successful?

If **YES**, proceed to Step **26**.  
If **NO**, continue with Step **22**.

22. Replace the FULL NULL MODEM connector connecting the **FMU** to the DTFIO PC.

23. From the DTFIO PC, attempt to load the **FMU** again.

24. Does the DTFIO PC screen indicate that the load transfer was successful?

If **YES**, proceed to Step **26**.  
If **NO**, continue with Step **25**.

25. Refer to DTFIO User Guide for troubleshooting procedures for the DTFIO and/or its PC. Repeat procedure from Step **17** after locating and correcting trouble.

26.



**NOTE:**

The **FMU** has no password stored in its memory as delivered from the factory. Additionally, the **FMU** could have a password in its memory from a previous installation. If no password is established or if an unknown password is present, dial-up connection will not be possible. Also, the password installed at the **FMU** must also be input at the central DTFIO location that will be remotely accessing this **FMU**.

Select "**Modify Password**" command from DTFIO menu and establish **FMU** password.

27. Disconnect the FULL NULL MODEM and DTFIO PC from the **FMU** faceplate and store appropriately.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

## Install and Bringup Feature Package I Line Interface Unit (LIU)

1.  **CAUTION:**  
*Incorrectly set LIU/ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.*

Select desired **LIU** (either **AUA161** or **AUA162**) (Figure 1) or **EMU** (**AUA163**) if Mode 4 and inspect for possible damage.

2. Are you installing an **AUA161** (**LIU-A** or **LIU-P**)?

If **YES**, then proceed to Step 13.  
If **NO**, then continue with Step 3.

3. Remove installed **LIU** and replace with selected **LIU**, ensuring that all option switches are set identically to the **LIU** removed.

4. Does the **FAIL** indicator come on steady and go out within 30 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**  
If **NO**, then continue with Step 5.

5. Depress **ADU LED TEST** push button.

6. Is **FAIL** LED on replaced **LIU** lighted?

If **YES**, then proceed to Step 11.  
If **NO**, then continue with Step 7.

7. Is **ADU CMP** LED lighted?

If **YES**, then continue with Step 8.

If **NO**, then proceed to Step 9.

8. An incompatibility problem exists in the FPI system. Check the mode, grooming, and protection settings on the **ADU** and the equalization settings and grooming switch on the **LIU** to ensure correct settings. Also verify that *GTD-5\** EAX data base settings are compatible with **ADU/LIU** settings. Resolve incompatibility problem and return to Step 5.

9. Replace **LIU (AUA162 or AUA163)** with another correctly optioned **LIU** (See Table A and B).

10. Does the **FAIL** indicator come on steady and go out within 30 seconds?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 11.

11. This **LIU/EMU** cannot establish communication with the master **LIU (LIU in slot A or P)**. Repeat procedure to replace **LIU-A** and then continue with Step 12.

12. Does the **FAIL** indicator go off on **AUA162** or **AUA163**?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then contact technical assistance.

13. Remove installed **LIU-A** or **LIU-P** and replace with selected **LIU**, ensuring that any option switches are set identically to the **LIU** removed.

---

\* Registered trademark used under license from the GTE Corporation.

14. Does the **FAIL** indicator come on steady?

If **YES**, proceed to Step 17.  
If **NO**, continue with Step 15.

15. Remove **LIU** just installed and replace with another correctly optioned **LIU**.

16. Does the **FAIL** indicator come on steady?

If **YES**, continue with Step 17.  
If **NO**, **STOP**. Contact Technical Assistance.

17.



**NOTE:**

When an **AUA161 LIU** is installed, it must be loaded by the RT before it becomes operational. There are two methods of loading; **FMU** loading and cross-loading. With **FMU** loading, **LIU-A** (or **P**) is loaded directly from the **FMU**. This type of loading is used when only one **AUA161 LIU** is installed. **FMU** loading takes about 2 minutes. The **FMU BUSY** LED will blink during load transfer. Cross-loading loads the newly installed **LIU** (**LIU-A** or **LIU-P**) from the opposite copy active **LIU** (**LIU-P** or **LIU-A**). This method of loading is used only in systems equipped with **LIU-P**. Cross loading takes about 2 to 4 minutes depending on call processing traffic. Therefore, it is advisable to perform these maintenance procedures during periods of low call processing traffic.

Does the **FAIL** indicator go out and stay out after loading is complete?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 18.

18. Depress **ADU LED TEST** push button.

19. Is **FAIL** LED on replaced **LIU** lighted?

If **YES**, then proceed to Step **24**.  
If **NO**, then continue with Step **20**.

20. Is **ADU CMP** LED lighted?

If **YES**, then continue with Step **21**.  
If **NO**, then proceed to Step **22**.

21. An incompatibility problem exists in the FPI system. Check the mode, grooming, and protection settings on the **ADU** and the equalization settings and grooming switch on the **LIU** to ensure correct settings. Also verify that *GTD-5* EAX data base settings are compatible with **ADU/LIU** settings. Resolve incompatibility problem and return to Step **18**.

22. Remove **LIU** just installed and replace with another correctly optioned **LIU**.

23.



**NOTE:**

When an **AUA161 LIU** is installed, it must be loaded by the RT before it becomes operational. There are two methods of loading; **FMU** loading and cross-loading. With **FMU** loading, **LIU-A** (or **P**) is loaded directly from the **FMU**. This type of loading is used when only one **AUA161 LIU** is installed. **FMU** loading takes about 2 minutes. The **FMU BUSY** LED will blink during load transfer. Cross-loading loads the newly installed **LIU (LIU-A or LIU-P)** from the opposite copy active **LIU (LIU-P or LIU-A)**. This method of loading is used only in systems equipped with **LIU-P**. Cross loading takes about 2 to 4 minutes depending on call processing traffic. Therefore, it is advisable to perform these maintenance procedures during periods of low call processing traffic.

Does the **FAIL** indicator go out and stay out after loading is complete?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then **STOP.** Contact technical assistance.

24. Are you installing **LIU-A**?

If **YES**, continue with Step **25**.

If **NO**, proceed to Step **34**.

25. Is **FAIL** indicator on **FMU** lighted?

If **YES**, continue with Step **26**.

If **NO**, proceed to Step **28**.

26. Replace **FMU** and follow procedures in **DLP-504** to install and load the new **FMU**. When properly installed, all diagnostics should pass.

27. Does the **FAIL** indicator on **LIU-A** come on steady and go out within two minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step **28**.

28. Replace **LIU** with another correctly optioned **AUA161**.

29. Does the **FAIL** indicator come on steady and go out within two minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step **30**.

30. Did **BUSY** indicator on **FMU** flash and then go out?

If **YES**, then **STOP**. Call for technical assistance and then proceed with alarm clearing procedures.  
If **NO**, then continue with Step **31**.

31. Replace **FMU** and follow procedures in **DLP-504** to install and load the new **FMU**. When properly installed, all diagnostics should pass.

32. Does the **FAIL** indicator come on steady and go out within two minutes?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**  
If **NO**, then continue with Step **33**.

33. Check wiring using SD-7C118. Isolate and correct any problems and repeat procedure.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

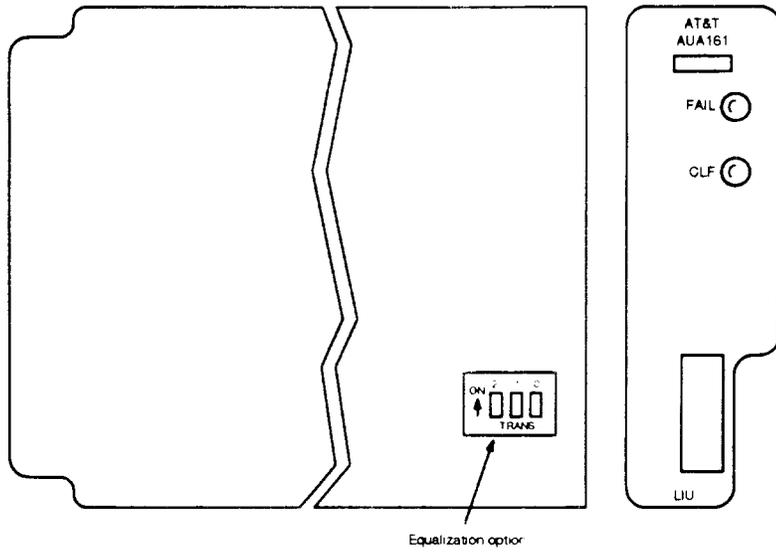
34. Replace **LIU** with another correctly optioned **AUA161**.

35. Does the **FAIL** indicator come on steady and go off within two minutes?

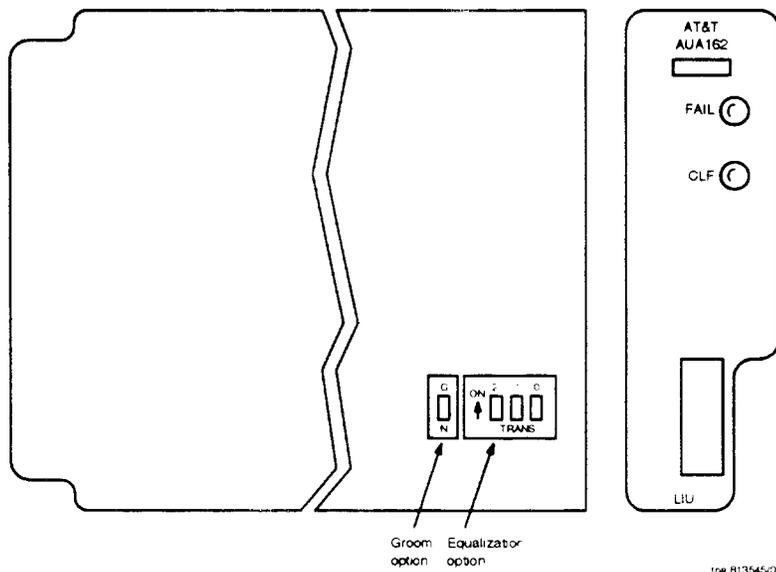
If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**  
If **NO**, then continue with Step **36**.

36. Problem may be due to a bad **LIU-A** or the Y-cable connection, ED-7C717-30. First repeat procedure, replacing **LIU-A**, then replace Y-cable. If troubles persist, contact technical assistance.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE.**



1pa 813543/01



1pa 813545/01

Figure 1 — AUA161 and AUA162 LIUs

| <b>Table A</b><br><b>AUA161 or AUA162</b><br><b>LIU Equalizer Settings</b> |                                                         |          |          |
|----------------------------------------------------------------------------|---------------------------------------------------------|----------|----------|
| <b>Distance to DSX-1</b><br><b>(Note 1)</b><br><br><b>(Feet)</b>           | <b>Equalizer Switch (S2) Setting</b><br><b>(Note 2)</b> |          |          |
|                                                                            | <b>2</b>                                                | <b>1</b> | <b>0</b> |
| 0-132                                                                      | OFF                                                     | OFF      | ON       |
| 133-265                                                                    | OFF                                                     | ON       | OFF      |
| 266-398                                                                    | OFF                                                     | ON       | ON       |
| 399-532                                                                    | ON                                                      | OFF      | OFF      |
| 533-655                                                                    | ON                                                      | OFF      | ON       |

Note 1: These distances are for ABAM cable used in central office. Refer to AT&T 915-710-115G for calculations for other types of cables used at collocated RT and T1 extension applications.

Note 2: Invalid setting of the equalization option will be shown by the **FAIL** LED lighting after the **LIU** is loaded.

| <b>Table B</b><br><b>AUA162 Grooming Switch Settings</b> |                       |
|----------------------------------------------------------|-----------------------|
| <b>LIU Grooming Option</b>                               | <b>Switch Setting</b> |
| Groomed (Mode 1 or Mode 2 only)                          | G                     |
| Not Groomed                                              | N                     |

## Perform Test of RT Batteries Using 197A Battery Load Test Set

1.



**CAUTION:**

*Service interruption will occur if batteries are disconnected and AC power is not available.*

Obtain **197A BATTERY LOAD TEST SET (197A)** and place near batteries to be tested (Figure 1).

2.



**NOTE:**

The 197A test set is intended to test batteries that are fully charged. A minimum of two days must be allowed between the time the batteries (new or replacement) are put on high rate charge and this test is made. After testing is completed, the batteries must be put on high rate charge using the **337A BATTERY CHARGER**.

Remove cover from **197A** test set.

3. Check **197A** test set for proper operation (if not already performed).

Reference: **DLP-507**

4. Ensure that system(s) associated with batteries to be tested has AC power available (**PMN** or **P/M** indicator on **BCU** circuit pack not lighted).

5. On **337A BATTERY CHARGER** associated with batteries to be tested, is **HIGH RATE CHG/ON** indicator lighted?

If **YES**, then continue with Step 6.

If **NO**, then proceed to Step 7.

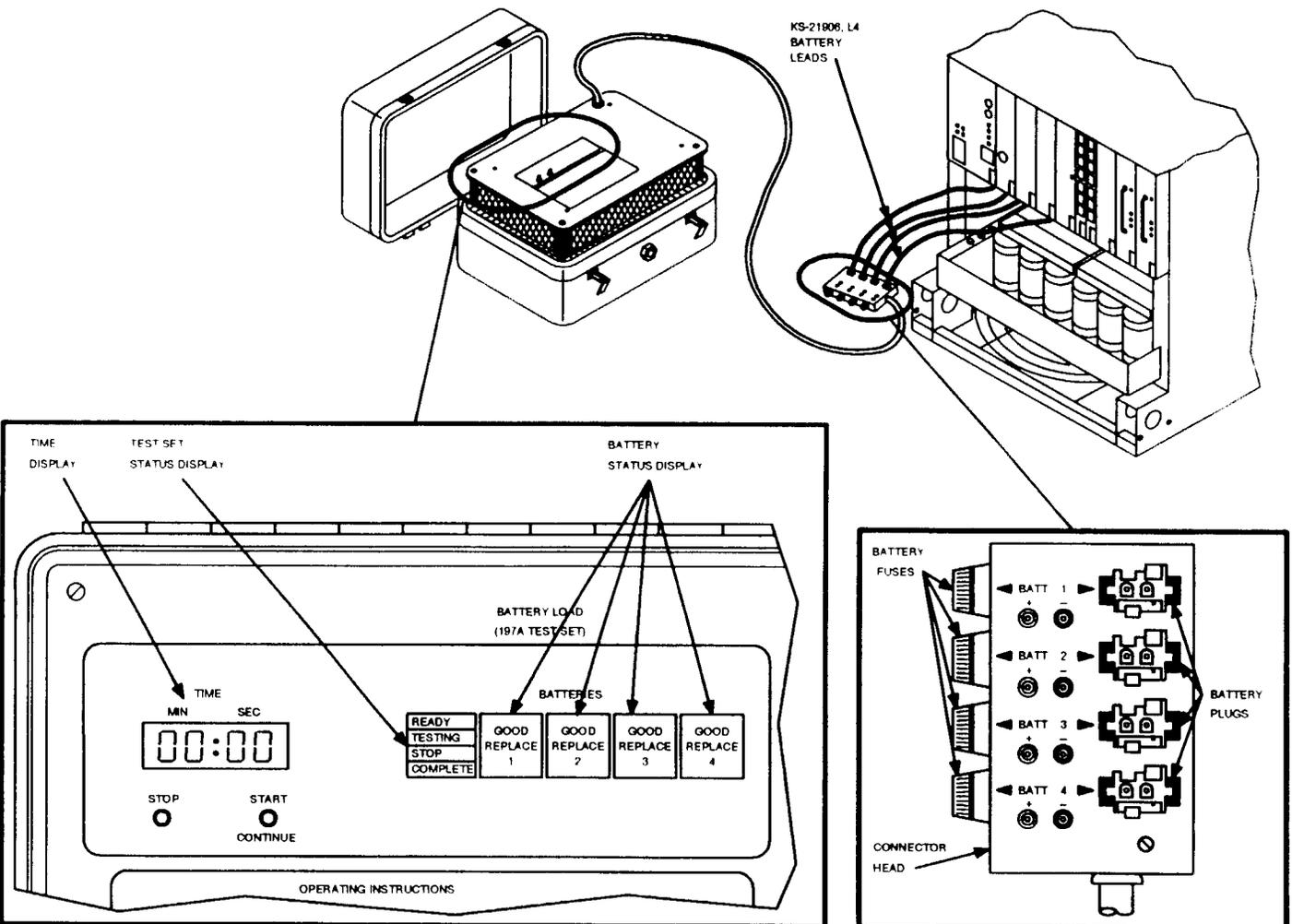


Figure 1 — 197A Battery Load Test Set Test Connections

6. Batteries are on high charge and may require up to 24 hours to charge. Do not perform this procedure until **HIGH RATE CHG/ON** indicator on **BATTERY CHARGER** goes off.

7.  **CAUTION:**  
*Service interruption will occur if batteries are disconnected and AC power is not available.*

Disconnect battery leads of batteries to be tested from battery shelf.

8.  **NOTE:**  
Under normal conditions, when the first battery is connected, the following occurs: (a) the test set **TIME** display indicates **00 MIN:00 SEC**; (b) the status display indicates which test set **BATT** plug the battery is connected to, status of the battery (**GOOD** or **REPLACE**), and the **READY** indicator lights; and (c) test set fan operates.

At test set connector head (Figure 1), connect battery leads (up to four) to **BATT 1, 2, 3, and 4** plugs.

9.  **NOTE:**  
If status display does not indicate battery number or battery status, **BATT** fuse may be blown, connector head or test set defective, or battery pack is defective.

Does test set display indicate **REPLACE** for all batteries being tested?

If **YES**, then continue with Step 10.  
If **NO**, then proceed to Step 12.

10. Replace all batteries and connect good batteries to battery shelf.

11. Place batteries on high charge by depressing **HIGH RATE CHG/ACTIVATE** push button on **BATTERY CHARGER** and repeat from Step 6.

12.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*



**NOTE:**

This test must run for a full 15 minutes to be valid or until all batteries indicate **REPLACE**. The **STOP** button should only be used if a problem occurs during the test, if the test is to be terminated early because of loss of AC power, or all batteries indicate **REPLACE**. The **START/CONTINUE** button is used to continue the test if no problem is found.

Depress **197A** test set **START/CONTINUE** button.

Response: At **197A** test set, **TESTING** indicator is lighted, **READY** indicator is off, and **TIME** display is counting time.

13.



**NOTE:**

If one, two, or three, but not all, batteries show **REPLACE** during the test period, the remaining batteries still must be tested for the full 15 minutes.

Does test set show **REPLACE** for all batteries within the 15-minute test period shown on **TIME** display?

If **YES**, then continue with Step 14.

If **NO**, then proceed to Step 15.

14.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Depress test set **STOP** button.

Response: **STOP** indicator on test set lights

Proceed to Step 17.

15. After 15 minutes, the test set **COMPLETE** indicator lights.

16. Is any **REPLACE** indicator on test set lighted?

If **YES**, then continue with Step 17.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

17. Unplug and set aside all defective batteries.

18. Install and connect replacement batteries to battery shelf. Reconnect any remaining good batteries to battery shelf.

19. Place batteries on high charge by depressing **HIGH RATE CHG ACTIVATE** push button on **BATTERY CHARGER** and repeat from Step 6.

## Check 197A Battery Load Test Set for Proper Operation

1. Obtain **197A BATTERY LOAD TEST SET** (Figure 1).
2. Remove cover from test set.
3. At test connector head, verify that battery fuse holders each contain a 20 amp fast-blow fuse.
4. Obtain one KS-21906, L4 battery.
- 5.



**NOTE:**

Under normal conditions, when the first battery is connected, the following occurs: (a) test set **TIME** display indicates **00 MIN: 00 SEC**; (b) status display indicates which test set **BATT** plug that battery is connected to, status of the battery (**GOOD** or **REPLACE**), and the **READY** indicator lights; and (c) test set fan operates.

At test set connector head, connect battery lead to **BATT 1, 2, 3, or 4** plug being tested.

6.



**CAUTION:**

*Damage will occur if test set is operated without fan operating.*

Does test set fan operate?

If **YES**, then proceed to Step 15.  
If **NO**, then continue with Step 7.

7. Connect battery lead to remaining **BATT** plugs, one at a time, and note if fan operates.

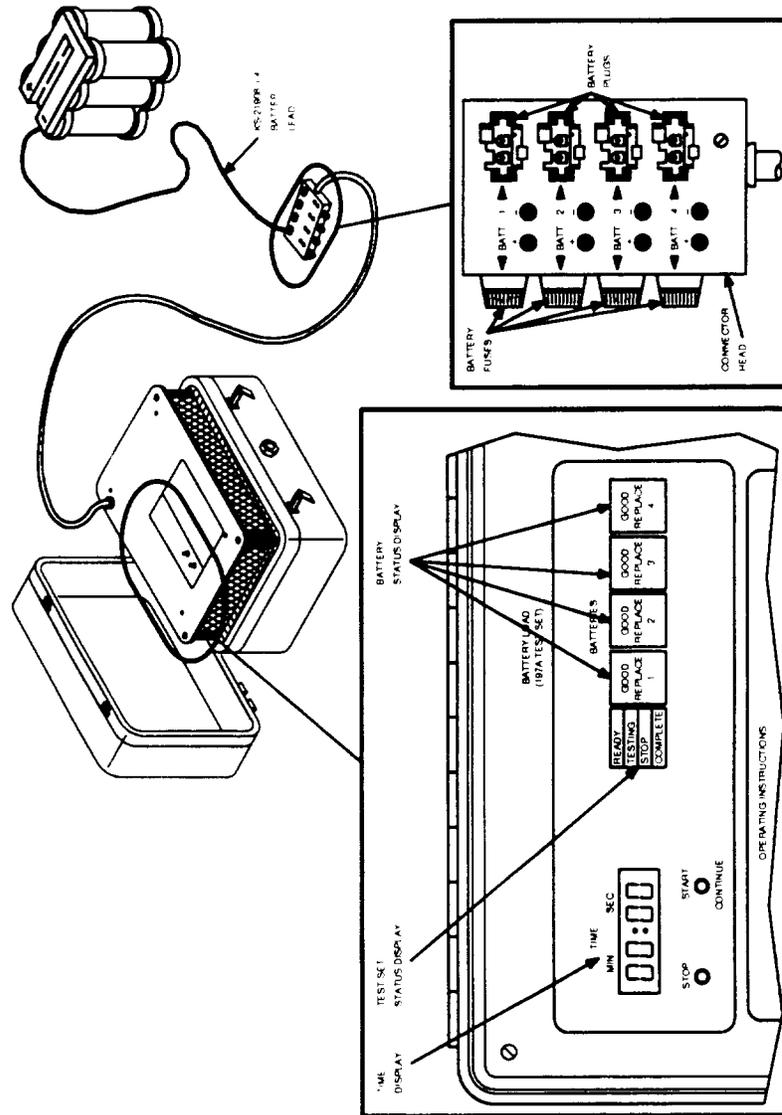


Figure 1 — 197A Battery Load Test Set Arrangement

8. Did test set fan operate for any **BATT** plug connection?

If **YES**, then proceed to Step 11.

If **NO**, then continue with Step 9.

9.  **NOTE:**  
The test set is intended to test fully charged batteries. Before new batteries or replacement batteries are tested, a minimum of two days must have passed between the time the batteries are put on high rate charge and this test is made.

Disconnect lead. Using a different battery pack, connect battery lead to any **BATT** plug.

10. Does test set fan operate?

If **YES**, then proceed to Step 15.  
If **NO**, then proceed to Step 35.

11. On test set connector head, remove battery lead and check for blown fuse(s).

12. Is fuse(s) blown?

If **YES**, then continue with Step 13.  
If **NO**, then proceed to Step 14.

13. Replace fuse(s) and repeat from Step 5.

14.  **NOTE:**  
Test set may be used for testing using one, two, three or all four **BATT** plug positions.

Defective test set or connector head. Note defective **BATT** plug position(s). Continue with test procedures using remaining **BATT** plugs.

15. Does test set **TIME** display indicate **00 MIN:00 SEC** without blinking?
- If **YES**, then continue with Step 16.  
If **NO**, then proceed to Step 35.
16. Does status display indicate which battery was connected, status (**GOOD** or **REPLACE**) of the battery, and is **READY** indicator lighted?
- If **YES**, then continue with Step 17.  
If **NO**, then proceed to Step 35.
17. Does status display indicate **GOOD** or **REPLACE**?
- If **YES**, then proceed to Step 19.  
If **NO**, then continue with Step 18.
18.  **DANGER:**  
*A high discharge current is present at connector head if **TESTING** indicator is lighted. Batteries must not be connected or disconnected when **TESTING** indicator is lighted.*
- Battery pack is defective. Ensure that **TESTING** indicator is not lighted (**READY** indicator lighted), unplug and set aside defective battery pack, and repeat from Step 5.
19. Have **TIME** display and **STATUS** indicators been tested for each good **BATT** plug position?
- If **YES**, then proceed to Step 21.  
If **NO**, then continue with Step 20.

20.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Ensure that TESTING indicator is not lighted. (READY indicator lighted).  
Unplug battery pack and repeat from Step 5.

21.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Depress test set **START/CONTINUE** button.

22. Does test set **TESTING** indicator light, **READY** indicator go off, and **TIME** display start counting time?

If **YES**, then proceed to Step 24.  
If **NO**, then continue with Step 23.

23.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Defective test set. Depress **STOP** button and unplug battery. Return test set for repair.

24. Depress test set **STOP** button.

25. Does test set **STOP** indicator light and **TIME** display stop counting time?

If **YES**, then proceed to Step 27.  
If **NO**, then continue with Step 26.

- 26.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Defective test set. Allow test to run for 15 minutes as shown on **TIME** display. When **COMPLETE** indicator lights and unplug battery. Return test set for repair.

- 27.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Depress test set **START/CONTINUE** button.

28. Does test set **TESTING** indicator light, **STOP** indicator go off, and **TIME** display start counting time?

If **YES**, then continue with Step 29.  
If **NO**, then proceed to Step 34.

29. Allow test set to run for 15 minutes as shown on **TIME** display.

30. During 15-minute test period, does test set show **REPLACE**?

If **YES**, then continue with Step 31.  
If **NO**, then proceed to Step 32.

31. Note that battery being used is defective.

32. After 15 minutes, does **COMPLETE** indicator light?

If **YES**, then continue with Step 33.  
If **NO**, then proceed to Step 34.

33. Unplug battery. Store connector head in test set cover. Reinstall cover.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

34.



**DANGER:**

*A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.*

Defective test set. Depress **STOP** button and unplug battery. Return test set for repair.

35. Defective test set. Return for repair.

### Set Option Switches and Install the SIU

1. Get one **AUA77** site interface unit (**SIU**) and inspect for possible damage (See Figure 1).

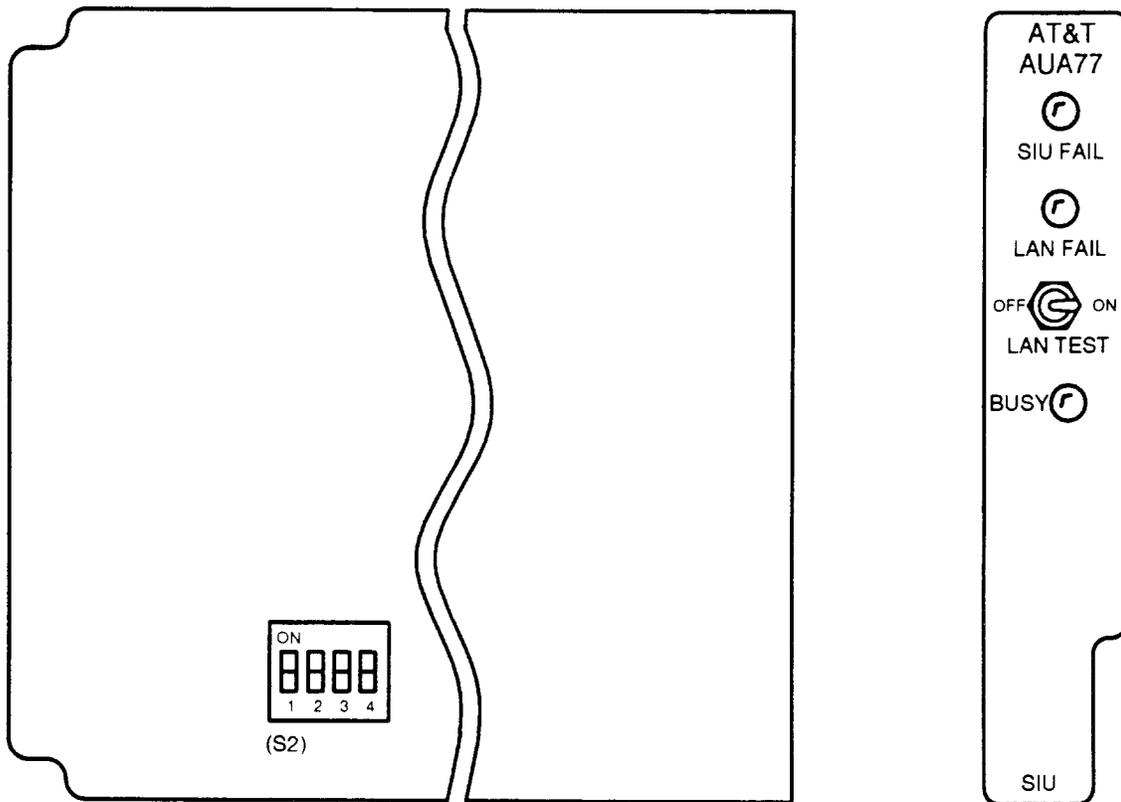


Figure 1 — SIU Switch Location and Faceplate Diagram

2. On **SIU** switch **S2** set switch positions as follows:
- **1** - Up (away from number) for dial-up access by the operations interface (OI), or down (toward number) for dedicated access.
  - **2** - Up to enable the modem; down to disable the modem. This switch must be up for dial-up access; ignored for dedicated access (modem is always enabled for dedicated access).
  - **3** - Unused.
  - **4** - Down to reset the **SIU** and write a default login and password to the **SIU** EEPROM (for initial OI contact).

3.  **NOTE:**  
When the **SIU** is inserted with **S2-4** in the down position (reset position), then the login and password stored in the **SIU** EEPROM is overwritten with the defaults. All **SIU** LEDs will remain lighted while the reset operation is in progress. After completion of the operation, all **SIU** LEDs should flash continuously.

Set the faceplate **LAN TEST** toggle switch **OFF**. Insert the **SIU** in slot 12 (channel **23/24**) of the A digroup.

4. Does the **SIU FAIL** LED remain lighted (ignore the **BUSY** and **LAN FAIL** LEDs)?

If **YES**, then proceed to Step 8.

If **NO**, then continue with Step 5.

5. After the LEDs start flashing, remove the **SIU** and set **S2-4** to the up position.
6. Reinsert the **SIU** in slot 12 (channel **23/24**) of the A digroup.
7. Does the **SIU FAIL** LED light momentarily (ignore the **BUSY** and **LAN FAIL** LEDs) and then go off?  
  
If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE**  
If **NO**, then continue with Step 8.
8. Repeat the above steps with another **SIU**. If the **SIU FAIL** LED remains lighted after completing the optioning and installation of the second **SIU**, replace the **SIU** with the one removed previously and check the wiring using SD-7C117-01 and SD-7C117-02.

---

# Fault-Locating Introduction

## SLC® Series 5 Carrier System

### Fault Locating tab

---

## Overview

This tab section is used at a Feature Package G (FPG) central office terminal (COT), a DSX-1 cross-connect panel, and remote terminal (RT) to clear T1 digital line troubles for a SLC® Series 5 Carrier System FPG or Feature Package I (FPI) system configurations. This document provides fault-locating procedures for limited older versions of Fault Locate Test Sets (FLTS). If you are using an FLTS not included in this document, use documentation for the type of test set you have (or local procedures) after making test set connections as shown in this tab section, to perform fault-locating procedures.

At the top of each page the document number and issue information are on the inside of the page, and the tab Section: TOP Element and page count are on the outside top of the page.

This tab provides all the procedures necessary to perform the type of activity being done. This tab is stand-alone and can be removed from the binder if desired.

## How to Use This Document

To find the instructions for performing FPG Maintenance tasks proceed as follows:

1. Read the **Introduction-000**, then find your task in the TASK INDEX LIST (**IXL-001**).
2. Turn to the desired trouble-clearing or detailed level procedure. All procedures in each section are in numerical order, regardless of type. Procedures in this TOP are of three types:

- a. Trouble Analysis Procedure (**TAP**) - Detailed step-by-step instructions used to clear system troubles.
  - b. Detailed Level Procedure (**DLP**) - Detailed step-by-step instructions that support **TAPs**.
  - c. Trouble Analysis Data (**TAD**) - The *TAD element* is used to provide supplemental information when performing a task. This *element* may include information about philosophies, diagrams, and supporting equipment used with or connected to this system.
3. Perform all the items in the trouble-clearing procedure in the indicated order unless it sends you to another trouble-clearing procedure. When you complete a trouble-clearing procedure, you have finished the task. Where more detailed information is required, you will be sent to a Detailed Level Procedure **DLP-( )**. You may also be sent to a DLP by another DLP.
  4. **IMPORTANT:** When you complete a DLP, you **MUST** return to the same step in the procedure which sent you there.
  5. **IMPORTANT:** In most cases, if one trouble-clearing procedure sends you to another trouble-clearing procedure, you should not return to the first trouble-clearing procedure after you complete the second.
  6. Sometimes you will be asked to verify that things have occurred. This may take the form of a formal statement of the expected response. At other times, the instructions will merely state *verify that ...*.  
If the expected response is not observed and a specific trouble-clearing reference is not made, you should check to ensure that prior steps were performed correctly and that circuit pack options are correct.  
If the expected response is not observed and a specific trouble-clearing reference is made, you should perform the reference trouble-clearing procedure and then return to the point in the procedure that sent you there.
  7. If you need assistance after completing all the applicable procedures in this section, call the AT&T Regional Technical Assistance Center (RTAC). The telephone number is **1-800-225-RTAC**.

Circuit packs being returned for repair should be sent, along with your company's repair and return form, to the following address:

AT&T Network Systems  
Carolinas Service Center  
6701-A North Park Blvd.  
Charlotte, NC 28216

## Safety Lables

Safety lables in this document have the following definitions:



**DANGER:**

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



**WARNING:**

*This indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.*



**CAUTION:**

*This indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. This includes equipment damage, loss of software, or service interruption.*

## Equipment and Craft Personnel Considerations



**CAUTION:**

*An electrostatic discharge wrist strap with a minimum resistance of 250K Ohms should be worn when handling Series 5 circuit packs to prevent possible damage to the circuit packs. Before using the wrist strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks it should not be used. To avoid possible personal injury while using the wrist strap, do not connect it to the power shelf or adjacent portions of the RT frame. Connect the wrist strap to **ESD GRD** jack on the fan unit, if present. If grounding jack is not present, connect wrist strap to bare-metal section of the frame well away from the power shelf.*

The Series 5 channel bank assembly and associated equipment provide high voltage ringing current and high amperage power distribution. You should remove any metal jewelry before working on this equipment, particularly around the backplane. *Follow local personel safety procedures when working on any AT&T product.*

## Checklist

The following tab Index Table provides a means to verify that all elements are present. This information should not be used for direct access to a particular element because *most elements are not stand-alone procedures*.

| <b>Fault Locating Tab Index</b> |                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Element</b>                  | <b>Title</b>                                                                                                  |
| Introduction-000                | Fault-Locating Introduction                                                                                   |
| IXL-001                         | Task Index List                                                                                               |
| TAP-101                         | Isolate Digital Line Trouble Using Fault-Locating Procedures from COT - Single Ended or Double Ended (Side 1) |
| TAP-102                         | Isolate Trouble to Digital Line Section or Repeater                                                           |
| TAP-103                         | Clear Fault Locate Line and System Trouble                                                                    |
| TAP-104                         | Isolate Side 2 Digital Line Trouble Using Fault-Locating Procedures from RT                                   |
| TAP-105                         | Perform Single-Ended Fault-Locating Procedures on T1 Lines from DSX Cross-Connect                             |
| DLP-500                         | Typical Fault-Locate Test Set Connections                                                                     |
| DLP-501                         | Check Fault-Locate Line and System                                                                            |
| DLP-502                         | Perform Transmission Test from the COT Using Fault-Locate Test Set                                            |
| DLP-503                         | Perform Transmission Test from RT Using Fault-Locate Test Set                                                 |
| DLP-504                         | Perform Transmission Test from DSX Cross-Connect Using Fault-Locate Test Set                                  |
| DLP-505                         | Perform Obscure Trouble Test from COT Using 315B or 415A-2 Fault-Locate Test Set                              |
| DLP-506                         | Perform Obscure Trouble Test from COT Using J98725AD (25AD) FLTS (Fault-Locate Test Set)                      |
| DLP-507                         | Perform Obscure Trouble Test from RT Using J98725AD (25AD) FLTS (Fault-Locate Test Set)                       |
| DLP-508                         | Perform Obscure Trouble Test from RT Using 315B or 415A-2 FLTS (Fault-Locate Test Set)                        |
| DLP-509                         | Obtain FLR (Fault-Locating Record) Forms and Prepare for Fault-Locating at the COT                            |
| DLP-510                         | Analyze Obscure Trouble Test Results Obtained Using 315B or 415A-2 Fault-Locate Test Set                      |
| DLP-511                         | Analyze Obscure Trouble Test Results Obtained Using J98725AD (25AD) Fault-Locate Test Set                     |
| DLP-512                         | Prepare for Fault-Locating at DSX Cross-Connect Panel                                                         |
| DLP-513                         | Perform Obscure Trouble Test from DSX Cross-Connect Panel Using Fault-Locate Test Set                         |

| <b>Fault Locating Tab Index (Continued)</b> |                                                                               |
|---------------------------------------------|-------------------------------------------------------------------------------|
| <b>Element</b>                              | <b>Title</b>                                                                  |
| DLP-514                                     | Obtain FLR (Fault-Locating Record) Forms and Prepare for Fault-Locating at RT |
| DLP-515                                     | Connect Fault Locating Test Sets for 80D or 80E Cabinet T1 Extensions         |

## Fault-Locating

### Introduction

This tab provides procedures to fault locate T1 digital lines serving Feature Package G (FPG) or Feature Package I (FPI) SLC® Series 5 Carrier Systems.

This section assumes a trouble condition has been isolated to the T1 digital line using FPG or FPI maintenance procedures.



**CAUTION:**

*Fault-locating procedures require a test signal to be transmitted on the T1 facility. This will interrupt service if the digital line is active. If you must interrupt service to fault locate, choose a time when few or no customers are busy. Fault-locating digroup A of an FPI system will interrupt service for all customers served by the system.*

## Task Index List

---

**FIND YOUR JOB IN THE LIST BELOW** **THEN GO TO**

---

|                                                                                                                        |         |
|------------------------------------------------------------------------------------------------------------------------|---------|
| Isolate Digital Line Trouble Using Fault-Locating Procedures from<br>COT - Single Ended or Double Ended (Side 1) ..... | TAP-101 |
| Isolate Trouble to Digital Line Section or Repeater .....                                                              | TAP-102 |
| Clear Fault Locate Line and System Trouble .....                                                                       | TAP-103 |
| Isolate Side 2 Digital Line Trouble Using Fault-Locating Procedures<br>from RT .....                                   | TAP-104 |
| Perform Single-Ended Fault-Locating Procedures on T1 Lines from<br>DSX Cross-Connect.....                              | TAP-105 |
| Typical Fault-Locate Test Set Connections .....                                                                        | DLP-500 |
| T1 Digital Line Extensions — Connect Fault Locating Test<br>Sets.....                                                  | DLP-515 |

 **CAUTION:**  
***In dusty areas (for example, near construction sites), AT&T  
recommends tenting the RT cabinet to protect electronic equipment  
whenever the cabinet doors are opened for extended periods.***

## Isolate Digital Line Trouble Using Fault-Locating Procedures from COT - Single Ended or Double Ended (Side 1)

1. Has fault-locating line and system been checked for proper operation?

If **YES**, then proceed to Step 4.  
If **NO**, then continue with Step 2.

2. Check fault-locating line and system for proper operation.

Reference: **DLP-501**

- 3.



**NOTE:**

Trouble on fault-locating line must be cleared before performing fault-locating procedures.

Was any trouble found?

If **YES**, then do **TAP-103**.  
If **NO**, then continue with Step 4.

- 4.



**CAUTION:**

*If other test sets are used, do not send properly framed or unframed all 1s signal.*

Perform transmission test on digital line(s) using Sierra **315B (415A-2)** or **J98725AD (25AD)** test set.

Reference: **DLP-502**

5. Was any trouble found?

If **YES**, and if fault was sectionalized, repair using local procedures.  
If fault was not sectionalized, then do **TAP-102**.  
If **NO**, then continue with Step 6.

6. Which test set will be used to perform obscure trouble tests?

If **315B OR 415A-2**, then continue with Step 7.  
If **J98725AD (25AD)**, then proceed to Step 8.

7. Perform obscure trouble test on digital line(s) using **315B** or **415A-2** test set and proceed to Step 9.

Reference: **DLP-505**

8. Perform obscure trouble test on digital line(s) using **J98725AD** test set and proceed to Step 10.

Reference: **DLP-506**

9. Analyze obscure trouble test results obtained and proceed to Step 11.

Reference: **DLP-510**

10. Analyze obscure trouble test results obtained and proceed to Step 11.

Reference: **DLP-511**

11. Was any trouble found?

If **YES**, then do **TAP-102**.  
If **NO**, then continue with Step 12.

12. Could both Side 1 and Side 2 of digital line(s) be tested from COT?

If **YES**, then continue with Step 13.

If **NO**, then do **TAP-104**.

13. Report no trouble found on digital line(s).

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Isolate Trouble to Digital Line Section or Repeater

1. See Table A. Determine test equipment to be used at apparatus case location and test location [COT (central office terminal), RT (remote terminal), or DSX cross-connect panel].

| <b>Table A</b>                                 |                                                                              |
|------------------------------------------------|------------------------------------------------------------------------------|
| <b>Equipment Required<br/>At Test Location</b> | <b>Recommended Type</b>                                                      |
| FLTS (Fault Locate Test Set)                   | Sierra 315B,<br>Sierra 415A-2, or<br>J98725AD (25AD)                         |
| (2) P3-type Patch Cords                        | P3BH                                                                         |
| <b>At Apparatus Case</b>                       | <b>At Apparatus Case</b>                                                     |
| Line and Repeater Test Set                     | Sierra 317B, 417A-2, or<br>J98725AB<br>Bipolar Violation Detector            |
| Sierra Test Set Insert                         | C02979601                                                                    |
| Test Set Probe                                 | Sierra 240B-3 (317B),<br>244A-3 (417A-2), ED-<br>3C564-30,G1 or G4<br>(25AB) |

2. Establish communication between test location and apparatus case location suspected of causing trouble.

3.  **NOTE:**  
Single-ended fault-locating is performed from COT or DSX cross-connect panel.

Is fault locating to be performed from COT, RT, or a DSX cross-connect panel?

If **COT**, then continue with Step 4.  
If **RT**, then proceed to Step 5.  
If **DSX CROSS-CONNECT**, then proceed to Step 6.

4. Prepare COT for fault locating and proceed to Step 7.

Reference: **DLP-509**

5. Prepare RT for fault locating and proceed to Step 7.

Reference: **DLP-514**

6. Prepare DSX cross-connect panel for fault locating.

Reference: **DLP-512**

7. Is **317B**, **417A-2** or 25AB test set being used at apparatus case?

If **317B** or **417A-2**, then proceed to Step 25.  
If **25AB**, then continue with Step 8.

8. At rear of 25AB test set, set **RPTR TYPE** switch to **BI-DIRECTIONAL**.

9.



**NOTE:**

If **BAT CHK** lamp does not light, low test set battery voltage is indicated. Replacement batteries are (4) KS-14368 type or equivalent AA size batteries.

Depress spring loaded **BAT CHK** switch.

Response: **BAT CHK** lamp lights.

10.



**CAUTION:**

*Removal of wrong repeater will cause service interruption.*

Determine which repeater is associated with digital line being tested, then remove repeater.

11. Insert test set probe into apparatus case slot, then insert repeater into test set.

12. At apparatus case location, set both 25AB 100-ohm **TERM/LINE** switches to **LINE**.

13. On 25AB, position **TEST** switch to side (**SIDE 1** or **SIDE 2**) of digital line being tested.

14. On 25AB, is **SIG LOSS** lamp lighted?

If **YES**, then proceed to Step 20.

If **NO**, then continue with Step 15.

15. On 25AB, is **BV** lamp lighted?

If **YES**, then proceed to Step 17.  
If **NO**, then continue with Step 16.

- 16.



**NOTE:**

If **Side 1** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward test location on **Side 2**. If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX cross-connect panel on **Side 2**.

Tests indicate that digital line is good at this location. If further tests are to be performed, disconnect the test equipment, remove repeater from test set and reinsert into apparatus case, move to next repeater location in direction of trouble indication, and repeat from Step 10.

17. On 25AB for side being tested, set **100-ohm TERM/LINE** switch to **100 ohms**.
18. On 25AB, is **BV** lamp lighted?
- If **YES**, then proceed to Step 20.  
If **NO**, then continue with Step 19.
19. A faulty output cable pair is incorrectly terminating repeater at this location. Locate and repair trouble using local procedures. Check cable for bridged taps, build-out capacitors, bad splices, opens, or shorts.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

20. Has repeater been replaced?

If **YES**, then proceed to Step 22.

If **NO**, then continue with Step 21.

21. On replacement repeater, set options same as on the original and replace repeater and repeat from Step 12.

22. Did results of fault-locating tests (transmission and obscure trouble tests) indicate more than one trouble location?

If **YES**, then continue with Step 23.

If **NO**, then proceed to Step 24.

23. Move to other repeater location that indicates trouble and repeat from Step 10.

24.



**NOTE:**

If **Side 1** is being tested from COT or DSX cross-connect panel, trouble is at a location toward COT or DSX cross-connect panel on **Side 1**. If **Side 2** is being tested from COT or DSX cross-connect panel, trouble may be between this location and RT on **Side 2** or anywhere on **Side 1** if not previously tested. If **Side 2** is being tested from RT, the trouble is at a location toward RT on **Side 2**.

Indications are that trouble is at another location. Move to next repeater location in direction of trouble or to a repeater location in direction of trouble halfway between this location and test location and repeat from Step 10.

25.  **NOTE:**  
If meter does not read above green mark (**417A-2**) or in **BATT GOOD** area (**317B**), low battery voltage is indicated. Replacement batteries are eight D-size 1.5 V DC carbon type.

Check the batteries of the **317B** test set by setting **POWER** switch to **ON**, operate the **ERRORS/PULSES** switch to either position, and turn the **METER** switch to **BATT**. For the **417A-2** test set, set **POWER** switch to **BATT CHK**.

26. Return test set controls to **OFF**.
27. Equip **317B** or **417A-2** test set with appropriate probe per Table A.
28. Equip test set with **C02979601** insert.
29.  **CAUTION:**  
*Removal of wrong repeater will cause service interruption.*

Determine which repeater is associated with digital line being tested, then remove repeater.

30. Insert test set probe into repeater slot.
31. Insert repeater into test set insert.

32. Is **317B** or **417A-2** test set being used?

If **317B**, then continue with Step **33**.  
If **417A-2**, then proceed to Step **34**.

33.



NOTE:

**REPEATER** switch is set to **SIDE (SIDE 1 or SIDE 2)** of digital line being tested.

Set controls per Table B and proceed to Step **35**.

| Table B<br>317B Test Set |                             |
|--------------------------|-----------------------------|
| Control/Switch           | Position                    |
| RPTR POWER LOOP control  | 60 mA                       |
| TERMINATION              | NORMAL                      |
| METER                    | NORM                        |
| REPEATER                 | BI-DIR (A) SIDE 1 or SIDE 2 |
| RPTR POWER LOOP (toggle) | OFF                         |
| POWER                    | ON                          |

34.



NOTE:

**REPEATER** switch is set to **SIDE (SIDE 1 or SIDE 2)** of digital line being tested.

Set controls per Table C.

| Table C                                                                                     |                             |
|---------------------------------------------------------------------------------------------|-----------------------------|
| 417A-2 Test Set                                                                             |                             |
| Control/Switch                                                                              | Position (Note 1)           |
| SYSTEM Mb/s                                                                                 | 1.544                       |
| RPTR POWER LOOP control                                                                     | 30 mA                       |
| TERMINATION                                                                                 | NORM                        |
| METER                                                                                       | NORM                        |
| REPEATER                                                                                    | BI-DIR (A) SIDE 1 or SIDE 2 |
| RPTR POWER LOOP (toggle)                                                                    | OFF                         |
| <b>Note 1:</b> After power is applied to the line, adjust line current to 60 mA $\pm$ 3 mA. |                             |

35. Is **PULSES** lamp lighted?

If **YES**, then continue with Step **36**.  
If **NO**, then proceed to Step **43**.

36. Are you using **317B** test set?

If **YES**, then continue with Step **37**.  
If **NO**, then proceed to Step **38**.

37. Set **ERRORS/PULSES** switch to **ERRORS**.

38. Is **ERRORS** lamp lighted or flashing?

If **YES**, then continue with Step **39**.  
If **NO**, then proceed to Step **40**.

39.



**NOTE:**

If **Side 1** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward test location on **Side 2**. If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX cross-connect panel on **Side 2**.

Tests indicate that digital line is good at this location. If further tests are to be performed, disconnect the test equipment and move to next repeater location in the direction of trouble indication and repeat from Step 25.

40. If using **317B** test set, position **TERMINATION** switch to **100-ohms SIDE ( )**. If using **417A-2** test set, position **TERMINATION** switch to **SIDE ( )**.

41. Is **ERRORS** lamp lighted or flashing?

If **YES**, then proceed to Step 43.  
If **NO**, then continue with Step 42.

42. Test indicates a faulty output cable pair incorrectly terminating repeater at this location. Locate and repair the fault using local procedures. Check cable pair for bridged taps, build-out capacitors, bad splices, opens, or shorts.

43. Has repeater been replaced?

If **YES**, then proceed to Step 45.  
If **NO**, then continue with Step 44.

44. On replacement repeater, set options same as on the original. Replace repeater and repeat from Step 32.

45. Did results of fault-locating tests (transmission and obscure trouble tests) indicate more than one trouble location?

If **YES**, then continue with Step 46.

If **NO**, then proceed to Step 47.

46. Move to other repeater location that indicates trouble and repeat from Step 25.

47.



**NOTE:**

If **Side 1** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX cross-connect panel, trouble may be at another location toward test location on **Side 2**. If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX cross-connect panel on **Side 2**.

Indications are that trouble is at another location. Move to next repeater location in direction of trouble or to a repeater location in direction of trouble halfway between this location and test location.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Clear Fault Locate Line and System Trouble

1. Condition DMM (digital multimeter) to measure DC volts.
2. Is fault line or system trouble being cleared from COT or a DSX cross-connect?

If **COT**, then continue with Step 3.

If **DSX CROSS-CONNECT**, then proceed to Step 6.

3. Is trouble on fault-locate (FL) line, or does fault-locate line **READY LED** not light?

If **FL LINE**, then proceed to Step 35.

If **READY LAMP**, then continue with Step 4.

4. Is **BUSY LED** lighted on FL panel?

If **YES**, then continue with Step 5.

If **NO**, then proceed to Step 10.

5. On **TS2** at rear of FL panel (Figure 1), connect DMM leads to **T** (tip) and **R** (ring) of **FL LINE** pins associated with FL line being tested and proceed to Step 9.
6. At rear of DSX cross-connect at maintenance panel, connect DMM leads to **T** (tip) and **R** (ring) pins associated with FL line being tested.



7. Does DMM indicate voltage greater than 12 V DC?

If **YES**, then proceed to Step 26.  
If **NO**, then continue with Step 8.

8. Use AT&T Practice 365-301-101, *DSX-1*, *DSX-1C*, and *DSX-2 Patch and Cross-Connect General Description*, to clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

9. Does DMM indicate voltage greater than 12 V DC, (reverse meter leads if necessary)?

If **YES**, then proceed to Step 26.  
If **NO**, then proceed to Step 11.

10. Does **READY** LED light for other **FL LINE** switch positions?

If **YES**, then continue with Step 11.  
If **NO**, then proceed to Step 14.

11. Replace **FLT LOC CONT** unit in FL panel. Insert P3-type patch cord into **FL LINE OUT** jack.

12. Does **READY** LED light?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**  
If **NO**, then continue with Step 13.

13. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

14. Condition DMM to measure DC volts.
15. On **TS2**, at rear of FL panel (Figure 1), connect DMM negative (-) black lead to pin 19 (-48) and positive (+) red lead to pin 18 (**GRD**).
16. Does DMM indicate between 43 and 53 V DC?  
  
If **YES**, then continue with Step 17.  
If **NO**, then proceed to Step 19.
17. Replace **FLT LOC CONT** unit in FL panel. Reinsert P3 patch cord into **FL LINE OUT** jack.
18. Does **READY** LED light?  
  
If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**  
If **NO**, then proceed to Step 24.
19. Is -48 V fuse blown on Group 4 heat baffle?  
  
If **YES**, then proceed to Step 21.  
If **NO**, then continue with Step 20.
20. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

21. Replace blown fuse.

22. Does fuse blow again?

If **YES**, then continue with Step 23.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

23. Replace **FLT LOC CONT** unit in FL panel and replace fuse. Insert a P3 patch cord into **FL LINE OUT** jack.

24. Does fuse blow again?

If **YES**, then continue with Step 25.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

25. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

26. Is another FL panel installed at other end of FL line?

If **YES**, then continue with Step 27.

If **NO**, then proceed to Step 34.

27. Is other end being used to perform fault-locating procedures?

If **YES**, then proceed to Step 33.

If **NO**, then continue with Step 28.

28. At other end, remove any plug in FL panel **FL LINE OUT** jack.

29. Is trouble still present?

If **YES**, then continue with Step **30**.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

30. Replace **FLT LOC CONT** unit in FL panel at other end.

31. Is trouble still present?

If **YES**, then continue with Step **32**.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

32. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

33. Other end is in use causing **BUSY** lamp at this end. Wait for line to clear.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

34. Foreign voltage is present on FL pair. Locate source of foreign voltage and repair trouble using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

35. Remove cord from FL panel **FL LINE OUT** jack on **FLT LOC CONT** unit (FLCU).

36. At main distributing frame (MDF), check protection units for FL line being tested. Also check MDF connections and jumpers.

37. Was any trouble found?

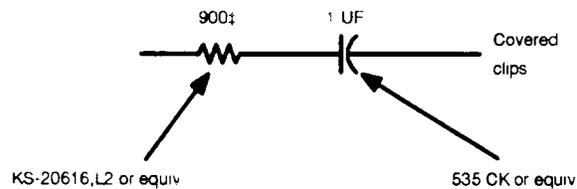
If **YES**, then continue with Step 38.  
If **NO**, then proceed to Step 40.

38. Replace protection units, repair connections, or replace jumpers as required.

39. Is FL line still bad?

If **YES**, then do Step 34.  
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

40. Open FL pair at MDF by installing a 262C-type (900-ohm terminating) plug across office side of FL pair (Figure 2).



**Figure 2 — 900 Ohm Test Termination**

41. Insert P3 patch cord into FL Panel **FL LINE OUT** jack.

42. Is FL line still bad?

If **YES**, then continue with Step 43.  
If **NO**, then proceed to Step 47.

43. Replace **FLT LOC CONT** unit in FL panel.

44. Is FL line still bad?

If **YES**, then proceed to Step 46.  
If **NO**, then continue with Step 45.

45. Remove test termination (Figure 2), reconnect FL pair at MDF.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

46. Trouble is in office wiring, FL Panel, or bay wiring. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

47. Trouble is on outside FL pair. Refer trouble to maintenance of outside pair.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Isolate Side 2 Digital Line Trouble Using Fault-Locating Procedures from RT

1.  **NOTE:**  
Fault-locating tests on Side 2 (RT to COT) of digital line(s) require cooperation with COT personnel.

Obtain original FLR (fault-locating record) forms for system and prepare fault-locating system and test equipment for fault-locating.

Reference: **DLP-514**

2. Perform transmission test on digital line(s) using Sierra **315B**, **415A-2**, or **J98725AD** (25AD) test set.

Reference: **DLP-503**

3. Was any trouble found?

If **YES**, then do **TAP-102**.  
If **NO**, then continue with Step 4.

4. Which test set is being used?

If **315B OR 415A-2**, then continue with Step 5.  
If **J98725AD**, then proceed to Step 6.

5. Perform obscure trouble test on digital line(s) using **315B** or **415A-2** test set and proceed to Step 7.

Reference: **DLP-508**

6. Perform obscure trouble test on digital line(s) using **J98725AD** test set and proceed to Step **8**.

Reference: **DLP-507**

7. Analyze obscure trouble test results obtained and proceed to Step **9**.

Reference: **DLP-510**

8. Analyze obscure trouble test results obtained and proceed to Step **9**.

Reference: **DLP-511**

9. Was any trouble found?

If **YES**, then do **TAP-102**.

If **NO**, then continue with Step **10**.

10. Report no trouble found on Side 2 of digital line(s).

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Perform Single-Ended Fault-Locating Procedures on T1 Lines from DSX Cross-Connect

1. Has fault-locating line and system been checked for proper operation?

If **YES**, then proceed to Step 4.  
If **NO**, then continue with Step 2.

2. Check fault-locating line and system for proper operation.

Reference: **DLP-501**

- 3.



**NOTE:**

Trouble on the fault-locate line must be cleared before performing fault-locating procedures.

Was any trouble found?

If **YES**, then do **TAP-103**.  
If **NO**, then continue with Step 4.

4. Prepare the test equipment for fault locating.

Reference: **DLP-512**

5. Perform transmission tests on digital line(s) using the Sierra **315B**, **415A-2**, or the **J98725AD** (25AD) test set.

Reference: **DLP-504**

6. Was any trouble found?

If **YES**, then do **TAP-102**.

If **NO**, then continue with Step 7.

7. Perform obscure trouble tests on line(s).

Reference: **DLP-513**

8. Which test set is being used?

If **315A OR 415A-2**, then continue with Step 9.

If **J98725AD (25AD)**, then proceed to Step 10.

9. Analyze obscure trouble test results obtained and proceed to Step 11.

Reference: **DLP-510**

10. Analyze obscure trouble test results obtained.

Reference: **DLP-511**

11. Was any trouble found?

If **YES**, then do **TAP-102**.

If **NO**, then continue with Step 12.

12. Report no trouble found on digital line(s).

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Typical Fault-Locate Test Set Connections

### General

Fault locating a T1 digital line is done to find failed or marginal line repeaters or bad spans in the T1 line. A fault-locating test signal is transmitted on the T1 digital line. At each repeater apparatus case, a filter at the output of the repeaters returns a tone on the fault locate pair. By comparing the level of this tone with previous measurements, the status of the repeater can be determined.

Filters at the apparatus case are passive or active. Active filters are turned on by applying a DC voltage on the fault located pair. The polarity of this applied voltage determines how the filter is activated (for example, side 1 or side 2). This voltage can be applied by a fault locate and order wire panel, fault line powering module, or by newer fault locate test sets.

For proper operation the fault locate pair must be terminated with a 900 ohm 1  $\mu$ F series circuit. The fault locate test set (FLTS) provides this termination at one end. The fault locate and order wire panel at the central office, or the LDU or miscellaneous pair panel (with a 900 ohm 262C-type terminating plug) at the remote terminal (RT) provides this termination.

The FLTS test is applied to the T1 line at the channel bank by replacing the LIU with an AUA78 T1 line fault locate test adapter, at a DSX-1 cross-connect panel or digital line protectors for T1 extensions. Figure 1 shows a typical test set connection at a central office terminal (COT). Figure 2 show a typical test set connection at a DSX. If the FPG COT LIU *ENB* option is selected, a far end loopback can be caused by grounding TIP or RING toward the COT bank. The AUA78 has a switch to do a far end loop (FPG only). Figure 3 shows a typical test set connection at the RT. Typical test set connections for T1 extensions are shown in DLP-515.

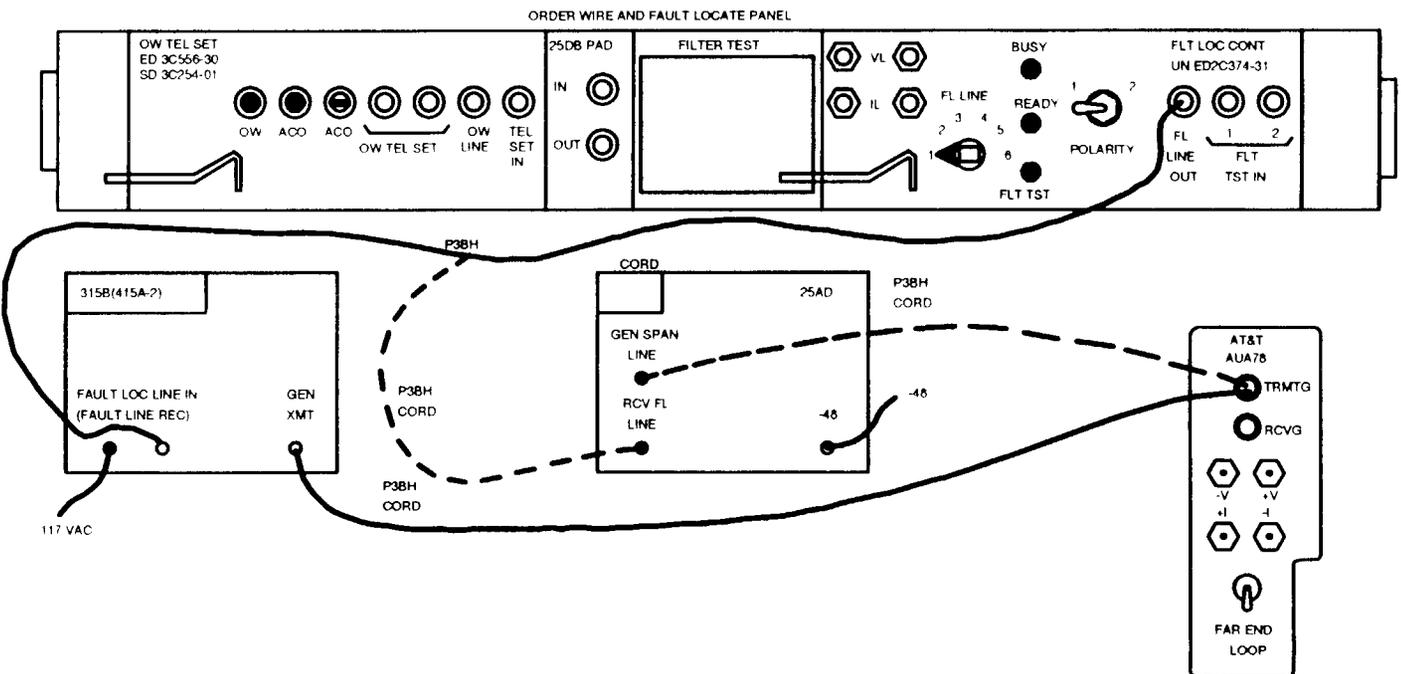


Figure 1 — COT Fault-Locating Configuration

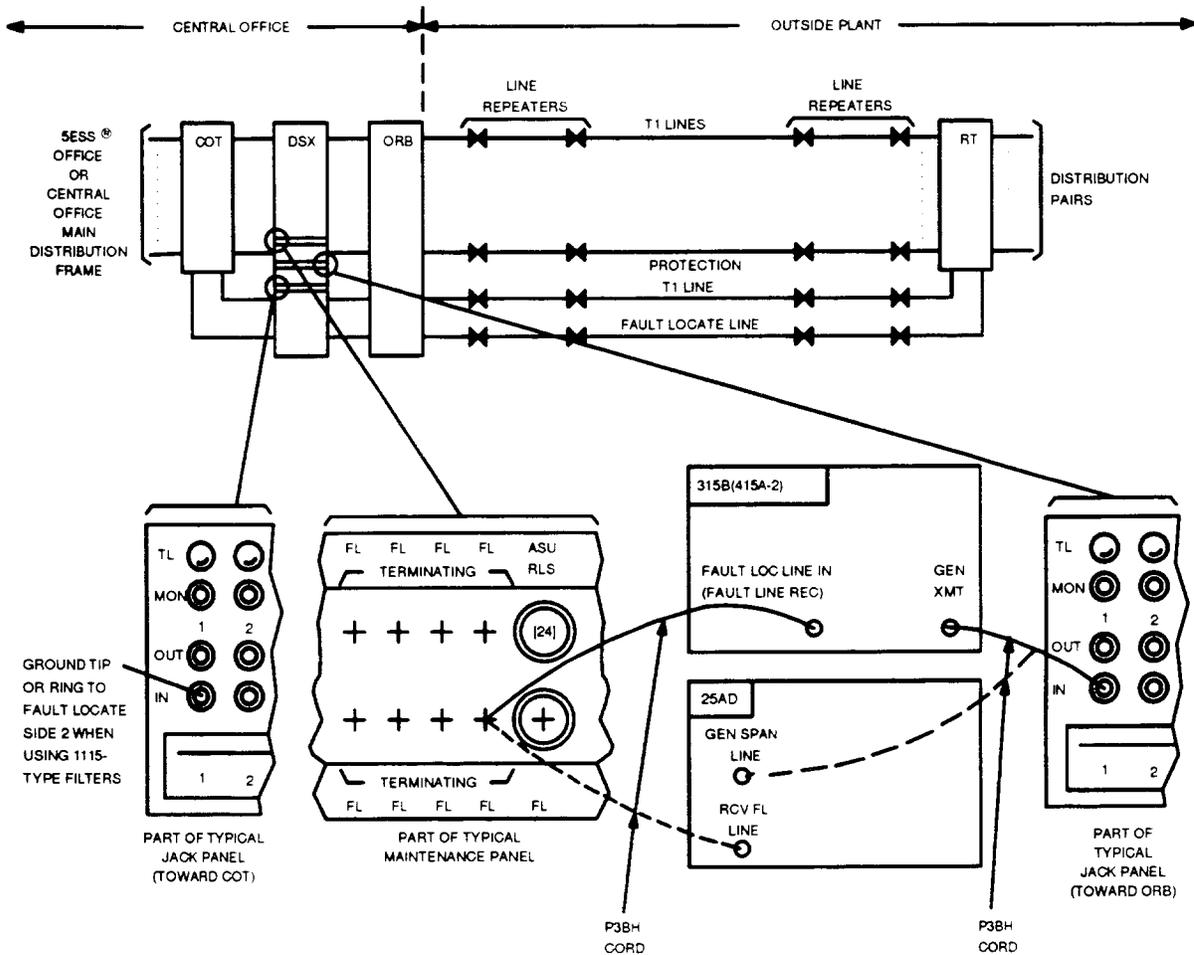


Figure 2 — Typical DSX Cross-Connect Fault-Locating Configuration

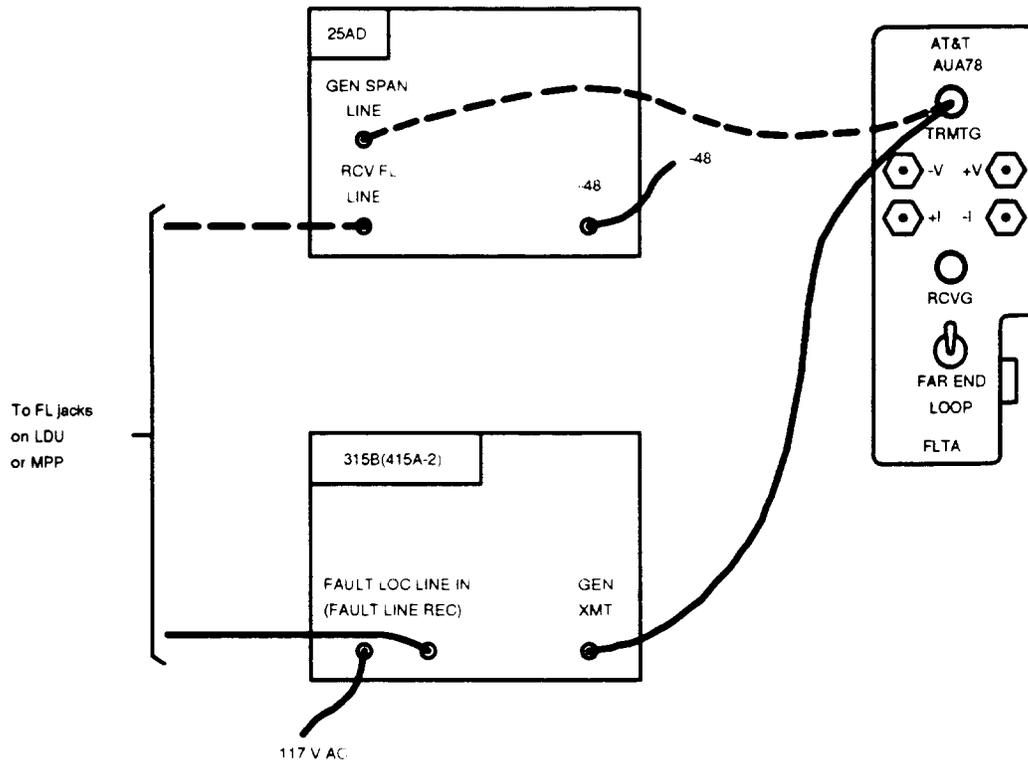


Figure 3 — RT Fault-Locating Configuration

## Check Fault-Locate Line and System

1. Obtain test equipment per Table A.

| Table A                      |                                  |
|------------------------------|----------------------------------|
| Equipment Required           | Recommended Type                 |
| FLTS (Fault Locate Test Set) | Sierra 315B, 415A-2, or J98725AD |
| Two P3-type Patch Cords      | P3BH                             |

2.  **NOTE:**  
Passive FL lines use 598- or 1068-type filters. Active FL lines use 1114- or 1115-type filters.

From office records, determine type of fault-locating (FL) filters that are used on fault-locating line.

3.  **NOTE:**  
Location of authorized tip and ring reversal determines which **POLARITY** setting on FL panel will activate 1114-type filters. A tip and ring reversal will exist if more than twelve 1114-type filters are on same FL line.

From office records, determine location of authorized tip and ring reversal (if any) on FL line.

4. Is fault locating to be performed from central office terminal (COT) or DSX cross-connect panel?

If **COT**, then continue with Step 5.

If **DSX CROSS-CONNECT**, then proceed to Step 6.

5. Prepare COT for fault locating and proceed to Step 7.

Reference: **DLP-509**

6. Prepare DSX cross-connect panel for fault locating.

Reference: **DLP-512**

7. Which test set is being used?

If **315B** or **415A-2**, then continue with Step 8.

If **25AD**, then proceed to Step 9.

8. If using **315B** test set, set controls per Table B; if using **415A-2** test set, set controls per Table C and proceed to Step 10.

| <b>Table B<br/>315B Test Set</b> |                                                          |
|----------------------------------|----------------------------------------------------------|
| <b>Control/Switch</b>            | <b>Position</b>                                          |
| POWER                            | POWER                                                    |
| FUNCTION                         | QRW GEN                                                  |
| NORM                             | NORM                                                     |
| PULSE PERIOD                     | REF 11                                                   |
| RCV LEVEL dBm                    | -90 with red center vernier knob rotated fully clockwise |
| LINE FILTER                      | Set to letter code of first filter out from COT          |

| Table C<br>415A-2 Test Set      |                                                                |
|---------------------------------|----------------------------------------------------------------|
| Control/Switch                  | Position                                                       |
| POWER                           | ON                                                             |
| FUNCTION                        | QRSS                                                           |
| NORM                            | NORM                                                           |
| RECEIVE FAULT LINE<br>LEVEL dBm | -90 with red center vernier<br>knob rotated fully<br>clockwise |
| SYSTEM Mb/s                     | 1.544                                                          |
| LINE FILTER                     | Set to letter code of first<br>filter<br>out from COT          |

9. Set controls per Table D.

| Table D<br>25AD Test Set |                                                       |
|--------------------------|-------------------------------------------------------|
| Control/Switch           | Position                                              |
| CLOCK RATE               | T1                                                    |
| FUNCTION                 | BI-POLAR SIGNAL                                       |
| PULSE DENSITY            | 11 REF                                                |
| RECEIVER SENSITIVITY     | -80                                                   |
| FILTER                   | Set to letter code of first<br>filter<br>out from COT |

10. Is fault locating being performed from COT or DSX cross-connect panel?

If **COT**, then continue with Step 11.

If **DSX CROSS-CONNECT**, then proceed to Step 15.

11. At FL panel, set **FL LINE** switch to number of fault-locate line being used (Figure 1).

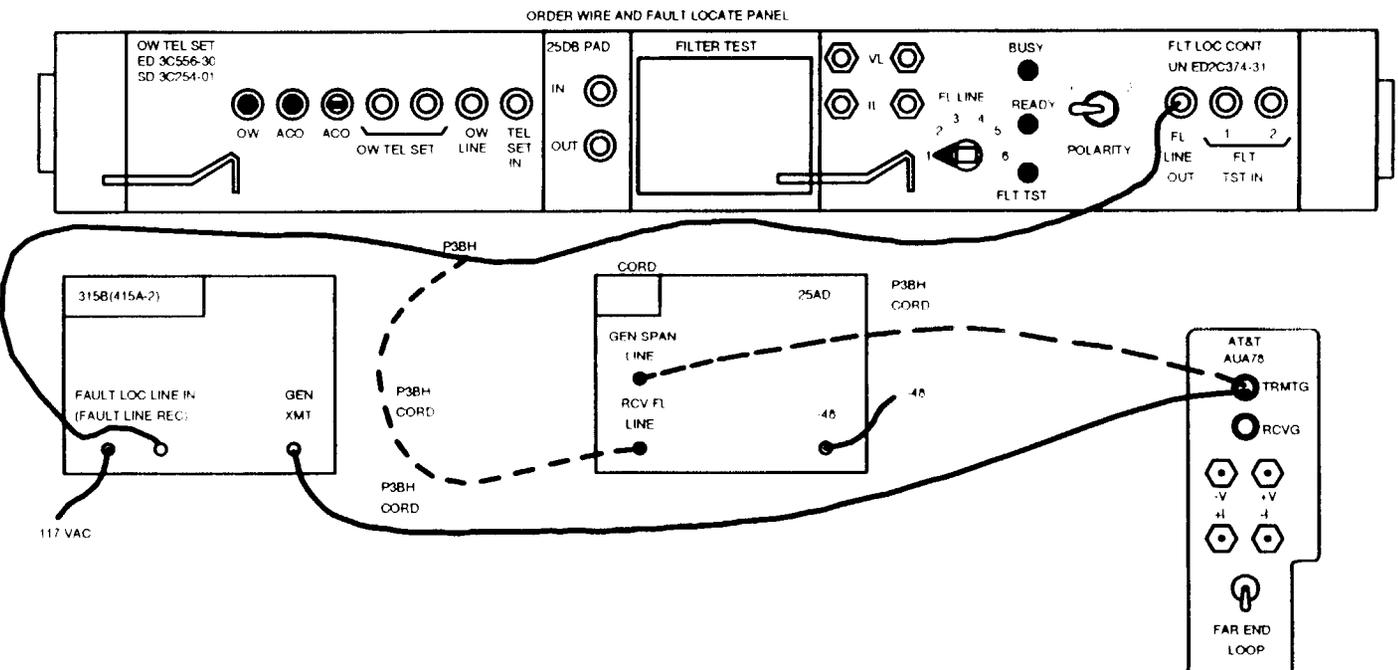


Figure 1 — COT Fault-Locating Configuration

12. Make test connections as shown in Figure 1.

13.



**NOTE:**

**READY** LED may be delayed for several seconds by **BUSY** lamp.

Does **READY** LED light?

If **YES**, then proceed to Step **16**.

If **NO**, then continue with Step **14**.

14. Do troubles exist on FL panel?

If **YES**, then do **TAP-103**.

If **NO**, then continue with Step **16**.

15. Make maintenance panel test connections as shown in Figure 2.

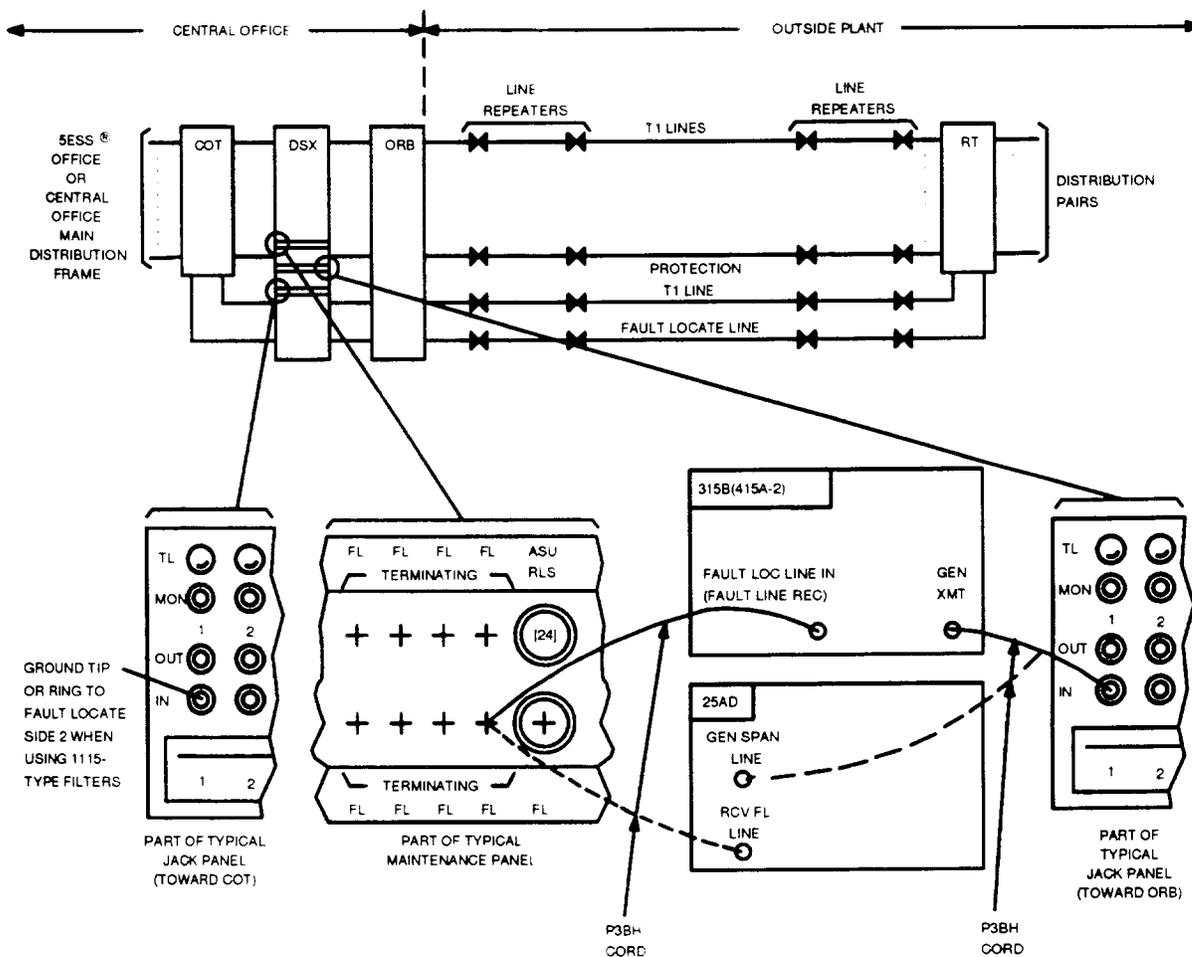


Figure 2 — Typical DSX Cross-Connect Fault-Locating Configuration

16. Is FL line equipped with 1114-type or 1115-type filters?

If **1114-TYPE**, then continue with Step 17.  
If **1115-TYPE**, then proceed to Step 18.

17.



**NOTE:**

When 1115-type filters are used, **POLARITY 1** will activate filter group for **Side 1** of digital line and **POLARITY 2** will activate filter group for **Side 2**. When 1114-type filters are used, **POLARITY 2** activates filter group closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filter group after authorized tip and ring reversal.

At FL panel, set **POLARITY** switch to **2** for 1114-type filters and proceed to Step **19**.

18. At FL panel, set **POLARITY** switch to **1** for 1115-type filters.
19. Verify that fault-locating pair is properly terminated with a 262C-type (900-ohm terminating) plug in the fault locate jack on each branch of FL pair at the last RT.
20. If using **315B** test set, adjust **RCV LEVEL dBm** control for on-scale reading; if using **415A-2** test set, adjust **RECEIVE FAULT LINE LEVEL dBm** for on-scale reading; if using 25AD test set, adjust **RECEIVER SENSITIVITY** for on-scale reading.
21. Does meter on test set indicate less than  $-90$  dBm (0 dBm), ( $-92$  dBm is less than  $-90$  dBm)?
  - If **YES**, then continue with Step **22**.
  - If **NO**, then proceed to Step **24**.
22. Have all filter codes (A through M) in this group been tested?
  - If **YES**, then proceed to Step **25**.
  - If **NO**, then continue with Step **23**.
23. Set test set **FILTER** switch to next filter code to be tested and repeat from Step **20**.

24. The FL line is bad, note trouble indication and repair per local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

25. Is FL line equipped with 1114-type or 1115-type filters?

If **1114-TYPE**, then continue with Step 26.

If **1115-TYPE**, then proceed to Step 30.

26. Are more than 12 filters on FL line?

If **YES**, then continue with Step 27.

If **NO**, then proceed to Step 31.

27. After tip and ring reversal (**POLARITY 1** switch setting), have all filters for **Side 1** been tested?

If **YES**, then proceed to Step 31.

If **NO**, then continue with Step 28.

28. Set FL panel **POLARITY** switch to 1.

29. Set test set **FILTER** switch to code letter of next filter on FL line and repeat from Step 20.

30. Have filters for **Side 2** been tested (**POLARITY 2** switch setting)?

If **YES**, then continue with Step 31.

If **NO**, then proceed to Step 32.

31. Leave test connections set up if more fault-locating tests are to be performed. Otherwise, proceed to Step 34.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

32. Set FL panel **POLARITY** switch to **2**.
33. Set test set **FILTER** switch to code letter of first filter back from RT and repeat from Step **20**.
34. Disconnect fault-locate and test connections (Figure 1 and Figure 2).
35. Is fault locating being performed from COT or DSX cross-connect panel?

If **COT**, then continue with Step **36**.

If **DSX CROSS-CONNECT**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

36. At **AUA78 FLTA**, remove far end loop by positioning toggle switch opposite **FAR END LOOP** position.
37. Remove **AUA78 FLTA**.
38. Replace **AUA78 FLTA** with **LIU** circuit pack.
- 39.



**CAUTION:**

*If option switches on LIU are not set correctly, service could be affected at the present time and also at some future time.*

Ensure that option switches on **LIU** are set identical to those on **FLTA** circuit pack.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Perform Transmission Test from the COT Using Fault-Locate Test Set

1.  **NOTE:**  
Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** [central office terminal (COT) to remote terminal (RT)]. If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

Are 1115-type, 1114-type, or passive filters installed on FL line?

If **1115-TYPE**, then proceed to Step 4.

If **1114-TYPE** or **PASSIVE**, then continue with Step 2.

2. Is direction of transmission trouble on **Side 1** (COT to RT), **Side 2** (RT to COT), or unknown?

If **SIDE 1 OR UNKNOWN**, then proceed to Step 4.

If **SIDE 2**, then continue with Step 3.

3. Transmission tests on **Side 2** of digital line cannot be performed from COT. Move to RT to test.

Reference: **DLP-503**

### **STOP. YOU HAVE COMPLETED THIS PROCEDURE**

4. Prepare COT for fault locating (Figure 1).

Reference: **DLP-509**



5. Which test set is being used?

If **315B**, then continue with Step 6.

If **415A-2**, then proceed to Step 7.

If **25AD**, then proceed to Step 8.

6. Set controls per Table A and proceed to Step 9.

| Table A<br>315B Test Set |                                                 |
|--------------------------|-------------------------------------------------|
| Control/Switch           | Position                                        |
| POWER                    | POWER                                           |
| RCV LEVEL dBm            | Set for an on-scale reading                     |
| LINE FILTER              | Set to letter code of first filter out from COT |

7. Set controls per Table B and proceed to Step 9.

| Table B<br>415A-2 Test Set   |                                                 |
|------------------------------|-------------------------------------------------|
| Control/Switch               | Position                                        |
| POWER                        | ON                                              |
| RECEIVE FAULT LINE LEVEL dBm | Set for an on-scale reading                     |
| LINE FILTER                  | Set to letter code of first filter out from COT |

8. Set controls per Table C.

| Table C<br>25AD Test Set |                                                 |
|--------------------------|-------------------------------------------------|
| Control/Switch           | Position                                        |
| CLOCK RATE               | T1                                              |
| RECEIVER SENSITIVITY     | Set for an on-scale reading                     |
| FILTER                   | Set to letter code of first filter out from COT |

9.  NOTE:  
Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

On FL panel, set **POLARITY** switch to activate first filter out from COT.

10. Record reading on fault-locating record (FLR) form (Figure 2).



11. Does meter indicate greater than  $-74$  dBm ( $-72$  dBm is greater than  $-74$  dBm) and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then proceed to Step **29**.  
If **NO**, then continue with Step **12**.

12. Is this last filter on digital line to be tested?

If **YES**, then proceed to Step **18**.  
If **NO**, then continue with Step **13**.

13. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

14. Record meter indication on FLR form.

15. Does meter indicate greater than  $-74$  dBm and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then continue with Step **16**.  
If **NO**, then proceed to Step **17**.

16. Previously tested filter is faulty; note location of filter and clear fault using local procedures and proceed to Step **29**.

17. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

18. Are you performing tests on **Side 1** or **Side 2**?

If **SIDE 1**, then proceed to Step 20.

If **SIDE 2**, then continue with Step 19.

19. Faulty filter is at this location, or digital line section is faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

20. Are 1115-type, 1114-type, or passive filters installed?

If **1114-TYPE** or **PASSIVE**, then continue with Step 21.

If **1115-TYPE**, then proceed to Step 22.

21. Faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

- 22.



**NOTE:**

Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

On FL panel, set **POLARITY** switch to 2.

23.  **NOTE:**  
Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

Set FLTS **FILTER** switch to code letter of first filter back from RT.

24. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.
25. Record meter indication on FLR form.
26. Does meter indicate greater than  $-74$  dBm and within  $\pm 6$  dBm of that recorded on original FLR form?  
  
If **YES**, then proceed to Step **28**.  
If **NO**, then continue with Step **27**.
27. Digital line section or repeater at previously tested filter location (last filter on **Side 1**) has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

28. Previously tested filter (last filter on **Side 1**) is faulty. Note location of faulty filter for future replacement.
29. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.
30. Record meter indication on FLR form.

31. If using **315B** or **415A-2** test set, does meter indicate 4 to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within  $\pm 2$  dB of **MEAS 1** value?

If **YES**, then continue with Step **32**.  
If **NO**, then proceed to Step **35**.

32. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.

33. Record meter indication on FLR form.

34. Does meter indicate within  $\pm 1$  dB of **MEAS 2** value?

If **YES**, then proceed to Step **36**.  
If **NO**, then continue with Step **35**.

35. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

36. Is this last filter on digital line side being tested?

If **YES**, then proceed to Step **38**.  
If **NO**, then continue with Step **37**.

37. Set FLTS **FILTER** switch to code letter of next filter on line. Ensure that FL panel **POLARITY** switch is set correctly (if required) and repeat from Step **5**.

38. Are 1115-type, 1114-type, or passive filters installed?

If **1115-TYPE**, then proceed to Step **40**.

If **1114-TYPE OR PASSIVE**, then continue with Step **39**.

39. Note no trouble found on **Side 1** of this digital line. Fault locating procedures on **Side 2** must be performed from RT.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

40. Has **Side 2** of digital line been tested (if necessary)?

If **YES**, then continue with Step **41**.

If **NO**, then proceed to Step **42**.

41. Report no trouble found on digital line.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

- 42.



**NOTE:**

Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

On FL panel, set **POLARITY** switch to **2**.

43. On test adapter (**AUA78**), ensure that Far End Loop switch is set to **FAR END LOOP** position.
  
44.  **NOTE:**  
Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

Set FLTS **FILTER** switch to code letter of first filter back from RT and repeat from Step 5.

## Perform Transmission Test from RT Using Fault-Locate Test Set

1.  **NOTE:**  
Active fault locate (FL) lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

Is FL line active or passive?

If **ACTIVE**, then continue with Step 2.  
If **PASSIVE**, then proceed to Step 5.

2.  **NOTE:**  
If 1114-type filters are used, **POLARITY 1** activates filters closest to remote terminal (RT) between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and central office terminal (COT). If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

Request COT personnel to set **POLARITY** switch on FL panel to activate first filter out from RT.

3. Ensure that COT FL panel **FL LINE** switch is set to correct number (**1, 2, 3, 4, 5, or 6**) to access FL line being used.
4. Prepare for transmission test from RT and proceed to Step 5.

Reference: **DLP-514**

5. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of first filter out from RT; if using 25AD test set, set **FILTER** switch to code letter of first filter out from RT.
6. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.
7. If using **315B** test set, set **REC LEVEL dBm** switch for on-scale reading; if using **415A-2** test set, set **RECEIVE FAULT LINE LEVEL dBm** switch for on-scale reading; if using 25AD test set, set **SENSITIVITY** switch to obtain on-scale reading.
8. Record reading on fault-locating record (FLR) form.
9. Does meter indicate greater than  $-74$  dBm ( $-72$  dBm is greater than  $-74$  dBm) and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then proceed to Step 17.  
If **NO**, then continue with Step 10.

10. Is this last filter on digital line side being tested?

If **YES**, then continue with Step 11.  
If **NO**, then proceed to Step 12.

11. A faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

12. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

13. Record meter indication. (Ensure that FL panel **POLARITY** switch is positioned to proper setting.)
14. Does meter indicate greater than  $-74$  dBm and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then continue with Step 15.

If **NO**, then proceed to Step 16.

15. Previously tested filter is faulty. Note location of filter for future replacement and proceed to Step 17.
16. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and use local procedures to clear fault.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

17. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.
18. Record meter indication on FLR form.
19. If using **315B** or **415A-2** test set, does meter indicate 4 to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within  $\pm 2$  dB of **MEAS 1** value?  
  
If **YES**, then continue with Step 20.  
If **NO**, then proceed to Step 23.
20. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.

21. Record meter indication on FLR form.
22. Does meter indicate within  $\pm 1$  dB of **MEAS 2** value?  
  
If **YES**, then proceed to Step **24**.  
If **NO**, then continue with Step **23**.
23. Digital line section or repeater at this location has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

24. Is this last filter on digital line side being tested?  
  
If **YES**, then proceed to Step **26**.  
If **NO**, then continue with Step **25**.
25. Set **FLTS FILTER** switch to code letter of next filter on line (Ensure that FL panel **POLARITY** switch is set correctly if required) and repeat from Step **6**.
26. Report no trouble found on digital line.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Perform Transmission Test from DSX Cross-Connect Panel Using Fault-Locate Test Set

1. Prepare for transmission test from DSX cross-connect panel and proceed to Step 2.

Reference: **DLP-512**

2.



**NOTE:**

Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

Are 1115-type, 1114-type, or passive filters installed on FL line?

If **1115-TYPE**, then proceed to Step 5.

If **1114-TYPE** or **PASSIVE**, then continue with Step 3.

3. Is direction of transmission trouble on **Side 1** (COT to RT), **Side 2** (RT to COT), or unknown?

If **SIDE 1** or **UNKNOWN**, then proceed to Step 5.

If **SIDE 2**, then continue with Step 4.

4. Transmission tests on **Side 2** of digital line cannot be performed from COT; move to RT to test.

Reference: **DLP-503**

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

5. Which test set is being used?

If **315B**, then continue with Step 6.

If **415A-2**, then proceed to Step 7.

If **25AD**, then proceed to Step 8.

6. Set controls per Table A and proceed to Step 9.

| <b>Table A<br/>315B Test Set</b> |                                                 |
|----------------------------------|-------------------------------------------------|
| <b>Control/Switch</b>            | <b>Position</b>                                 |
| POWER                            | POWER                                           |
| RCV LEVEL dBm                    | Set for an on-scale reading                     |
| LINE FILTER                      | Set to letter code of first filter out from COT |

7. Set controls per Table B and proceed to Step 9.

| <b>Table B<br/>415A-2 Test Set</b> |                                                 |
|------------------------------------|-------------------------------------------------|
| <b>Control/Switch</b>              | <b>Position</b>                                 |
| POWER                              | ON                                              |
| RECEIVE FAULT LINE LEVEL dBm       | Set for an on-scale reading                     |
| LINE FILTER                        | Set to letter code of first filter out from COT |

8. Set controls per Table C.

| Table C<br>25AD Test Set |                                                 |
|--------------------------|-------------------------------------------------|
| Control/Switch           | Position                                        |
| CLOCK RATE               | T1                                              |
| RECEIVER SENSITIVITY     | Set for an on-scale reading                     |
| FILTER                   | Set to letter code of first filter out from COT |

9.  NOTE:  
Active lines use 1114- or 1115-type filters. If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

On FL panel, set **POLARITY** switch to activate first filter out from COT.

10. Record reading on fault-locating record (FLR) form (Figure 1).



11. Does meter indicate greater than  $-74$  dBm ( $-72$  dBm is greater than  $-74$  dBm) and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then proceed to Step **31**.

If **NO**, then continue with Step **12**.

12. Is this last filter on digital line side being tested?

If **YES**, then proceed to Step **18**.

If **NO**, then continue with Step **13**.

13. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

14. Record meter indication on FLR form.

15. Does meter indicate greater than  $-74$  dBm and within  $\pm 6$  dBm of that recorded on original FLR form?

If **YES**, then continue with Step **16**.

If **NO**, then proceed to Step **17**.

16. Previously tested filter is faulty; note location of filter and clear fault using local procedures and proceed to Step **31**.

17. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

18. Are you performing tests on **Side 1** or **Side 2**?

If **SIDE 1**, then proceed to Step 20.  
If **SIDE 2**, then continue with Step 19.

19. Faulty filter is at this location, or digital line section or repeater is faulty.  
Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

20. Are 1115-type, 1114-type, or passive filters installed?

If **1114-TYPE** or **PASSIVE**, then continue with Step 21.  
If **1115-TYPE**, then proceed to Step 22.

21. Faulty filter is at this location, or digital line section or repeater is faulty.  
Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

22.



**NOTE:**

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** for digroup A is off, a far-end loop cannot be done for line being tested.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

If **YES**, then do Step 21.  
If **NO**, then continue with Step 23.

23. On FL panel, set **POLARITY** switch to 2.

24. At DSX cross-connect **IN** jack toward COT, ground tip or ring lead of digital line being tested.
25.  **NOTE:**  
Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

Set FLTS **FILTER** switch to code letter of first filter back from RT.

26. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.
27. Record meter indication on FLR form.
28. Does meter indicate greater than  $-74$  dBm and within  $\pm 6$  dBm of that recorded on original FLR form?  
  
If **YES**, then proceed to Step **30**.  
If **NO**, then continue with Step **29**.
29. Digital line section or repeater at previously tested filter location (last filter on **Side 1**) has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

30. Previously tested filter (last filter on **Side 1**) is faulty. Note location of faulty filter for future replacement.
31. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.

32. Record meter indication on FLR form.
33. If using **315B** or **415A-2** test set, does meter indicate 4 to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within  $\pm 2$  dB of **MEAS 1** value?  
  
If **YES**, then continue with Step **34**.  
If **NO**, then proceed to Step **37**.
34. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.
35. Record meter indication on FLR form.
36. Does meter indicate within  $\pm 1$  dB of **MEAS 2** value?  
  
If **YES**, then proceed to Step **38**.  
If **NO**, then continue with Step **37**.
37. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

38. Is this last filter on digital line side being tested?  
  
If **YES**, then proceed to Step **41**.  
If **NO**, then continue with Step **39**.
39. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.

40. Set **FLTS FILTER** switch to code letter of next filter on line, ensuring that FL panel **POLARITY** switch is set correctly, if required, and repeat from Step 10.

41. Are 1115-type, 1114-type, or passive filters installed?

If **1115-TYPE**, then proceed to Step 43.

If **1114-TYPE** or **PASSIVE**, then continue with Step 42.

42. Note no trouble found on **Side 1** of this digital line. Fault locating procedures on **Side 2** must be performed from RT.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

43. Has **Side 2** of digital line been tested (if necessary)?

If **YES**, then continue with Step 44.

If **NO**, then proceed to Step 45.

44. Report no trouble found on digital line.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

45.



**NOTE:**

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** for digroup A is off, a far-end loop cannot be done for line being tested.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

If **YES**, then continue with Step 46.

If **NO**, then proceed to Step 47.

46. Fault-locating procedures on **Side 2** cannot be performed from COT until A digroup failure has been cleared.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

47.  **NOTE:**  
**POLARITY 1** activates 1115-type filters on **Side 1** (COT to RT) and  
**POLARITY 2** activates filters on **Side 2** (RT to COT) with loop at RT.

On FL panel, set **POLARITY** switch to **2**.

48. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.
49. At DSX cross-connect **IN** jack toward COT, ground tip or ring lead of digital line being tested.
50.  **NOTE:**  
Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

Set FLTS **FILTER** switch to code letter of first filter back from RT and repeat from Step **10**.

## Perform Obscure Trouble Test from COT Using 315B or 415A-2 Fault-Locate Test Set

1. Ensure that central office terminal (COT) fault locate (FL) panel **FL LINE** switch is set to correct number (**1, 2, 3, 4, 5, or 6**) to access FL line being tested (Figure 1).

2.



**NOTE:**

If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

On FL panel, set **POLARITY** switch to activate first filter out from COT on **Side 1** (if required).

3. Prepare COT for fault locating.

Reference: **DLP-509**

4. Which test set is being used?

If **315B**, then continue with Step 5.  
If **415A-2**, then proceed to Step 6.

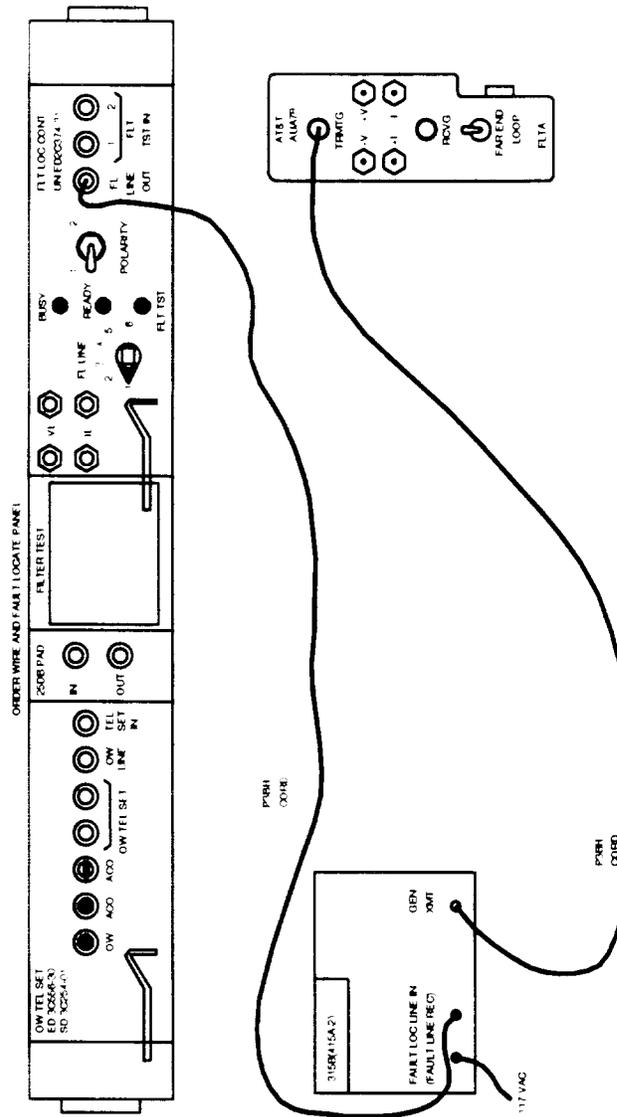


Figure 1 — COT Fault-Locating Configuration Using 315B or 415A-2 Test Set

5. Set test set controls per Table A and proceed to Step 7.

| <b>Table A<br/>315B Test Set</b> |                                           |
|----------------------------------|-------------------------------------------|
| <b>Control/Switch</b>            | <b>Position</b>                           |
| FUNCTION                         | MEAS 1                                    |
| PULSE PERIOD                     | 11 REF                                    |
| RCV LEVEL dBm                    | Adjust for meter indication of -2.0 dB    |
| LINE FILTER                      | Set to letter code of filter being tested |

6. Set test set controls per Table B.

| <b>Table B<br/>415A-2 Test Set</b> |                                           |
|------------------------------------|-------------------------------------------|
| <b>Control/Switch</b>              | <b>Position</b>                           |
| FUNCTION                           | MEASURE 1                                 |
| PULSE PERIOD                       | REF (Pulse period 11 LED will be lighted) |
| RECEIVE FAULT LINE LEVEL dBm       | Adjust for meter indication of 0 dB       |
| LINE FILTER                        | Set to letter code of filter being tested |

7.



**NOTE:**

When using **415A-2** test set, if **PULSE PERIOD** switch is set to **AUTO**, **PULSE PERIOD** lamps will automatically advance in approximately 2-second intervals. The **HOLD** position is used to stop lighted lamp at desired position.

If using **315B** test set, set **PULSE PERIOD** control to next lower number (10, 9, etc.); if using **415A-2** test set, advance **PULSE PERIOD** to light next lower numbered LED (10, 9, etc.).

8.



**NOTE:**

If meter deviation from reference value is not more than  $\pm 0.5$  dB, a zero is entered. If deviation is greater than  $+0.5$  dB, **deviation amount** preceded by a plus (+) sign is recorded (for example,  $+0.6$ ). If deviation is less than reference level by more than  $-0.5$  dB, **deviation amount** preceded by minus (-) is recorded (for example,  $-0.6$ ).

On FLR form (Figure 2), record meter deviation from reference level ( $-2.0$  dB if using **315B** test set or  $0$  dB if using or **415A-2** test set).

9. Was last measurement made at **PULSE PERIOD 4**?

If **YES**, then continue with Step 10.

If **NO**, then repeat from Step 7.

10. Have measurements been made at all filter locations on side being tested?

If **YES**, then proceed to Step 12.

If **NO**, then continue with Step 11.

11. Go to next filter location to be tested, ensuring that FL **POLARITY** switch is set correctly, and repeat from Step 5.



12. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?

If **SIDE 1**, then continue with Step 13.

If **SIDE 2**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

13. Are 1115-type, 1114-type, or passive filters installed?

If **1115-TYPE**, then proceed to Step 15.

If **1114-TYPE** or **PASSIVE**, then continue with Step 14.

14. Test on **Side 2** must be made from RT.

Reference: **DLP-507 (J98725AD FLTS)**

Reference: **DLP-508 (315B or 415A-2 FLTS)**

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

- 15.



**NOTE:**

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done for line being tested.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **TRU ON PROT** LED for A digroup off?

If **YES**, then do Step 14.

If **NO**, then continue with Step 16.

16.



**NOTE:**

Obscure trouble tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT. The **POLARITY 2** switch setting on the FL panel activates filters on **Side 2** of FL line.

On FL panel, set **POLARITY** switch to activate first filter back from RT and repeat from Step 4.

### Perform Obscure Trouble Test from COT Using J98725AD (25AD) FLTS (Fault-Locate Test Set)

1. Ensure that central office terminal (COT) fault locate (FL) panel FL LINE switch is set to correct number (**1, 2, 3, 4, 5, or 6**) to access FL line being tested.

2.  **NOTE:**  
If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters nearest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. Passive filters require no **POLARITY** switch setting.

On FL panel, set **POLARITY** switch to activate first filter out from COT on **Side 1** (if required).

3. Prepare COT for fault locating.

Reference: **DLP-509**

4. Set controls of 25AD test set per Table A.

| Table A<br>25AD Test Set |                                                        |
|--------------------------|--------------------------------------------------------|
| Control/Switch           | Position                                               |
| CLOCK RATE               | T1                                                     |
| FUNCTION                 | MEAS 1 SIGNAL                                          |
| PULSE DENSITY            | 10                                                     |
| FILTER                   | Set to letter code of filter being tested              |
| RECEIVER SENSITIVITY     | Adjust control for an on-scale indication on the meter |

5. On FLR form (Figure 1), record meter indication in space marked **PULSE PERIOD** (10, 9, etc.).
  
6. Was last measurement made at **PULSE DENSITY 4**?  
  
If **YES**, then proceed to Step 8.  
If **NO**, then continue with Step 7.
  
7. Set **PULSE DENSITY** switch to next lower number (9, 8, 7, etc.) and repeat from Step 5.
  
8. Have measurements been made at all filter locations on side being tested?  
  
If **YES**, then proceed to Step 10.  
If **NO**, then continue with Step 9.
  
9. Set 25AD **FILTER** switch to next filter to be tested. Ensure that FL **POLARITY** switch is set correctly and repeat from Step 5.
  
10. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?  
  
If **SIDE 1**, then continue with Step 11.  
If **SIDE 2**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
  
11. Are 1115-type, 1114-type, or passive filters installed?  
  
If **1115-TYPE**, then proceed to Step 13.  
If **1114-TYPE** or **PASSIVE**, then continue with Step 12.



12. Test on **Side 2** must be made from RT.

Reference: **DLP-507 (J98725AD FLTS)**

Reference: **DLP-508 (315B or 415A-2 FLTS)**

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

13.



**NOTE:**

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **TRU ON PROT** LED for A digroup off?

If **YES**, then do Step **12**.

If **NO**, then continue with Step **14**.

14.



**NOTE:**

Obscure trouble tests on **Side 2** (RT to COT) start with filter nearest to RT and work toward COT. **POLARITY 2** switch setting activates filters on **Side 2** of digital line.

On FL panel, set **POLARITY** switch to activate first filter back from RT and repeat from Step **5**.

## Perform Obscure Trouble Test from RT Using J98725AD (25AD) FLTS (Fault-Locate Test Set)

1. Obtain test equipment per Table A.

| Table A                      |                  |
|------------------------------|------------------|
| Equipment Required           | Recommended Type |
| FLTS (Fault Locate Test Set) | J98725AD (25AD)  |
| Two P3-type Patch Cords      | P3BH             |

2.  **NOTE:**  
Active fault locate (FL) lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

From office records determine type of fault-locating (FL) filters that are used on fault-locating line.

3. Is fault locate line active or passive?

If **ACTIVE**, then continue with Step 4.  
If **PASSIVE**, then proceed to Step 6.

4.  **NOTE:**  
If 1114-type filters are used, **POLARITY 1** activates filters nearest to remote terminal (RT) between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and central office terminal (COT). If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

Have personnel at COT FL panel set **POLARITY** switch to activate first filter out from RT (Figure 1).

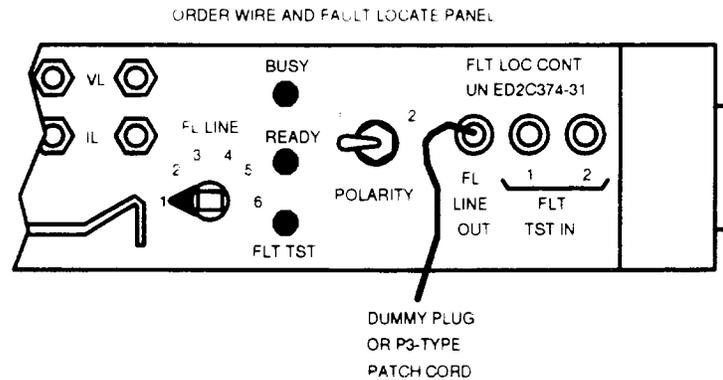


Figure 1 — Part of Order Wire and Fault Locate Panel

5. At COT FL panel, set **FL LINE** switch to correct number (1, 2, 3, 4, 5, or 6) to access FL line being used.
6. At COT FL panel, insert dummy plug or one end of P3-type patch cord into **FL LINE OUT** jack.
7. Prepare RT for fault locating.

Reference: **DLP-514**

8. Set Test Set controls per Table B.

| Table B<br>25AD Test Set |                                                 |
|--------------------------|-------------------------------------------------|
| Control/Switch           | Position                                        |
| FUNCTION                 | MEAS 1 SIGNAL                                   |
| CLOCK RATE               | T1                                              |
| FILTER                   | Set to letter code of first filter out from COT |
| PULSE DENSITY            | 10                                              |
| RECEIVER SENSITIVITY     | Set for an on-scale reading                     |



9. Record reading on Fault-Locating Record (FLR) form in space marked **PULSE PERIOD (10, 9, etc.)** (Figure 2).
  
10. Was last measurement made at **PULSE DENSITY 4**?  
  
If **YES**, then proceed to Step **12**.  
If **NO**, then continue with Step **11**.
  
11. Set **PULSE DENSITY** switch to next lower number (**9, 8, 7, etc.**) and read meter indication and repeat from Step **9**.
  
12. Have measurements been made at all filter locations on side being tested?  
  
If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE**.  
If **NO**, then continue with Step **13**.
  
13. Set test set controls to test next filter and repeat from Step **9**.

## Perform Obscure Trouble Test from RT Using 315B or 415A-2 Fault-Locate Test Set (FLTS)

1. Obtain test equipment per Table A.

| Table A                      |                       |
|------------------------------|-----------------------|
| Equipment Required           | Recommended Type      |
| FLTS (Fault Locate Test Set) | Sierra 315B or 415A-2 |
| Two P3-type Patch Cords      | P3BH                  |

2.  **NOTE:**  
Active fault locate (FL) lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

From office records determine type of fault-locating (FL) filters that are used on fault-locating line.

3. Is fault locate line active or passive?

If **ACTIVE**, then continue with Step 4.  
If **PASSIVE**, then proceed to Step 6.

4.  **NOTE:**  
For 1114-type filters, **POLARITY 1** activates filters closest to remote terminal (RT) between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and central office terminal (COT). If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

Have personnel at COT FL panel set **POLARITY** switch to activate first

filter out from RT (Figure 1).

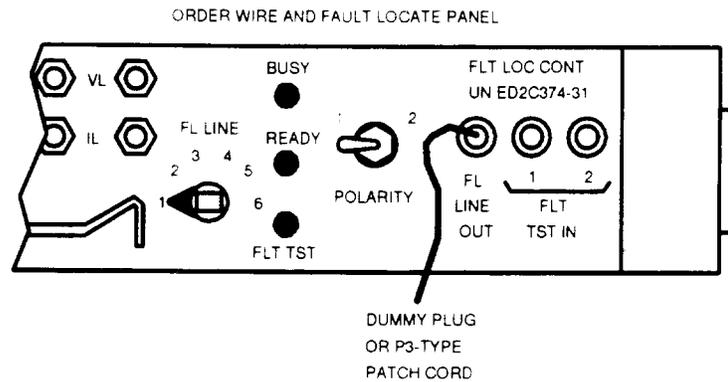


Figure 1 — Part of Order Wire and Fault Locate Panel

5. On COT FL panel, set **FL LINE** switch to correct number to access FL line being used.
6. At COT FL panel, insert dummy plug or one end of P3-type patch cord into **FL LINE OUT** jack.
7. Prepare RT for fault locating.

Reference: **DLP-514**

8. Which test set is being used?

If **315B**, then continue with Step **9**.  
If **415A-2**, then proceed to Step **10**.

9. Set test set controls per Table B and proceed to Step 11.

| <b>Table B<br/>315B Test Set</b> |                                           |
|----------------------------------|-------------------------------------------|
| <b>Control/Switch</b>            | <b>Position</b>                           |
| FUNCTION                         | MEAS 1                                    |
| PULSE PERIOD                     | 11 REF                                    |
| LINE FILTER                      | Set to letter code of filter being tested |
| RCV LEVEL dBm                    | Adjust for meter indication of -2.0 dB    |

10. Set test set controls per Table C.

| <b>Table C<br/>415A-2 Test Set</b> |                                           |
|------------------------------------|-------------------------------------------|
| <b>Control/Switch</b>              | <b>Position</b>                           |
| POWER                              | ON                                        |
| FUNCTION                           | MEASURE 1                                 |
| PULSE PERIOD                       | REF                                       |
| NORM                               | NORM                                      |
| LINE FILTER                        | Set to letter code of filter to be tested |
| RECEIVE FAULT LINE LEVEL dBm       | Adjust for a meter indication of 0 dB     |

11.  NOTE:  
On **415A-2** Test Set, if **PULSE PERIOD** switch is set to **AUTO**,  
**PULSE PERIOD** LEDs will automatically advance in approximately  
2-second intervals. The **HOLD** position is used to stop lighted lamp at  
desired position.

If using **315B** test set, set **PULSE PERIOD** switch to next lower number; if  
using **415A-2** test set, operate **PULSE PERIOD AUTO HOLD** switch to  
advance **PULSE PERIOD** LED to next lower numbered LED (**10, 9**, etc.).

12.  NOTE:  
If meter deviation from reference value is not more than  $\pm 0.5$  dB, a  
zero is entered; if deviation is more than reference level (more than  
0.5 dB to right of reference level), deviation amount preceded by plus  
(+) sign is recorded (for example, +0.6); if deviation is less than  
reference level (more than 0.5 dB to left of reference level), deviation  
amount preceded by a minus (-) sign is recorded (for example, -0.6).

Record meter deviation from reference level (-2 dB for **315B** Test Set or 0  
dB for **415A-2** Test Set) on Fault-Locating Record (FLR) form in space  
marked **PULSE PERIOD** (**10, 9**, etc.) (Figure 2) .

13. Was last measurement made at **PULSE DENSITY 4**?

If **YES**, then continue with Step 14.

If **NO**, then repeat from Step 11.

14. Have measurements been made at all filter locations on side being  
tested?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS  
PROCEDURE.**

If **NO**, then continue with Step 15.

15. Set test set controls to test next filter and repeat from Step 8.



## Obtain FLR (Fault-Locating Record) Forms and Prepare for Fault-Locating at the COT

1. Obtain test equipment (Table A).

| Table A                      |                                                      |
|------------------------------|------------------------------------------------------|
| Equipment Required           | Recommended Type                                     |
| FLTS (Fault Locate Test Set) | Sierra 315B,<br>Sierra 415A-2, or<br>J98725AD (25AD) |
| Two P3-type Patch Cords      | P3BH                                                 |

2. Obtain original FLR form(s) for system being tested (Figure 1).
3. Obtain blank fault-locating record (FLR) forms (Figure 2).
4. Which test set is being used?

If **315B** or **415A-2**, then continue with Step 5.  
If **25AD**, then proceed to Step 10.

5. Plug power cord into 117 V AC outlet.
6. Set **POWER** switch to **LAMP TEST** position.

Response: All lamps lighted.





7. Is **315B** or **415A-2** test set being used?

If **315B**, then continue with Step 8.  
If **415A-2**, then proceed to Step 9.

8. Set controls per Table B and proceed to Step 23.

| <b>Table B<br/>315B Test Set</b> |                                                   |
|----------------------------------|---------------------------------------------------|
| <b>Control/Switch</b>            | <b>Position</b>                                   |
| POWER                            | POWER                                             |
| FUNCTION                         | MEAS 1                                            |
| NORM                             | NORM                                              |
| PULSE PERIOD                     | REF 11                                            |
| RCV LEVEL dBm                    | -90 with red counter vernier knob fully clockwise |

9. Set controls per Table C and proceed to Step 23.

| <b>Table C<br/>415A-2 Test Set</b> |                                                          |
|------------------------------------|----------------------------------------------------------|
| <b>Control/Switch</b>              | <b>Position</b>                                          |
| POWER                              | ON                                                       |
| FUNCTION                           | MEASURE 1                                                |
| NORM                               | NORM                                                     |
| RECEIVE FAULT LINE LEVEL dBm       | -90 with red center vernier knob rotated fully clockwise |
| SYSTEM Mb/s                        | 1.544                                                    |
| PULSE PERIOD                       | REF 11                                                   |

10. Plug power cord into -48 V source (Figure 3).

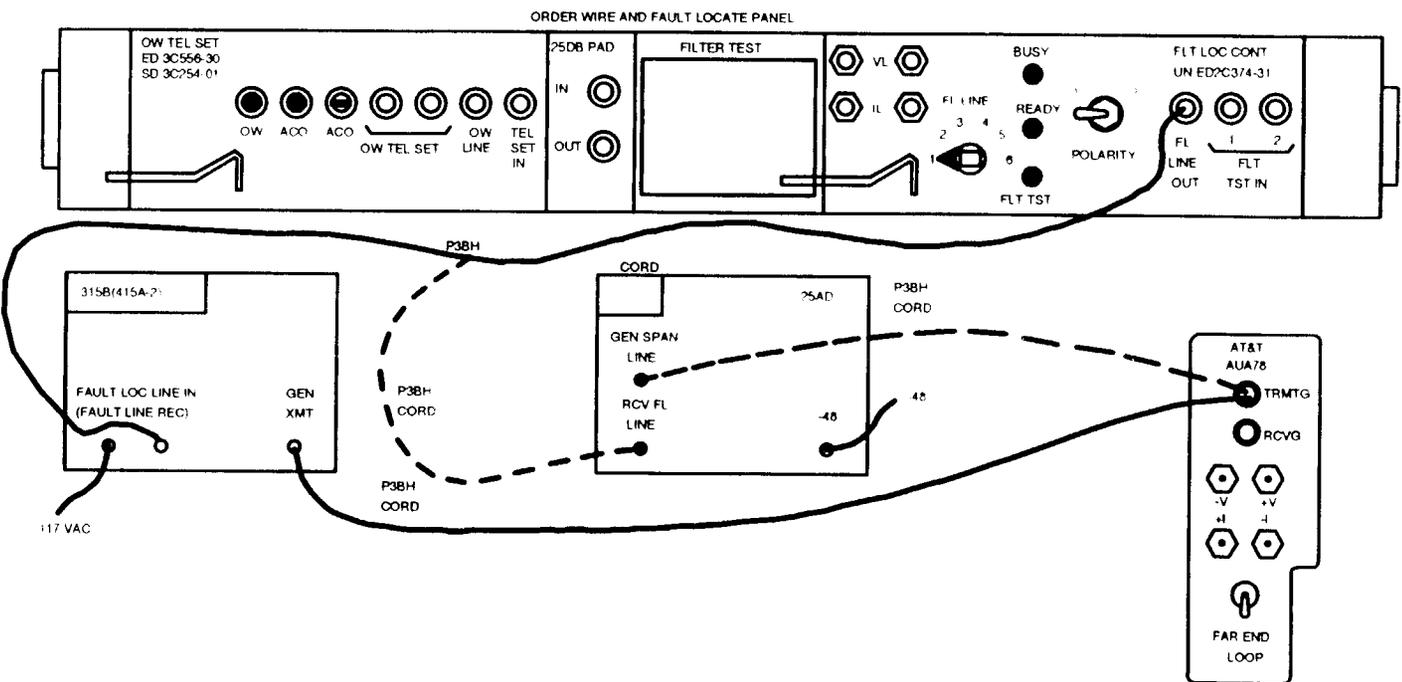


Figure 3 — COT Fault-Locating Configuration

11. Set **FUNCTION** switch to **SPAN TERMINATE**.
12. Set **CLOCK RATE** switch to **T1**
13. Set **PULSE DENSITY** switch to **11 REF**.
14. Set **FILTER** switch to **A**.
15. Set **RECEIVER SENSITIVITY** switch to **-60**.
16. Depress and hold **RCV CAL** push button.
17. Does meter indicate 0 on **DBM** scale?  
If **YES**, then proceed to Step **21**.  
If **NO**, then continue with Step **18**.
18. Adjust **RCV CAL** potentiometer for 0 indication.
19. Does meter indicate 0 on **DBM** scale?  
If **YES**, then proceed to Step **21**.  
If **NO**, then continue with Step **20**.
20. Release **RCV CAL** push button and return test set for repair. Obtain new test set and repeat from Step **10**.
21. Release **RCV CAL** push button.

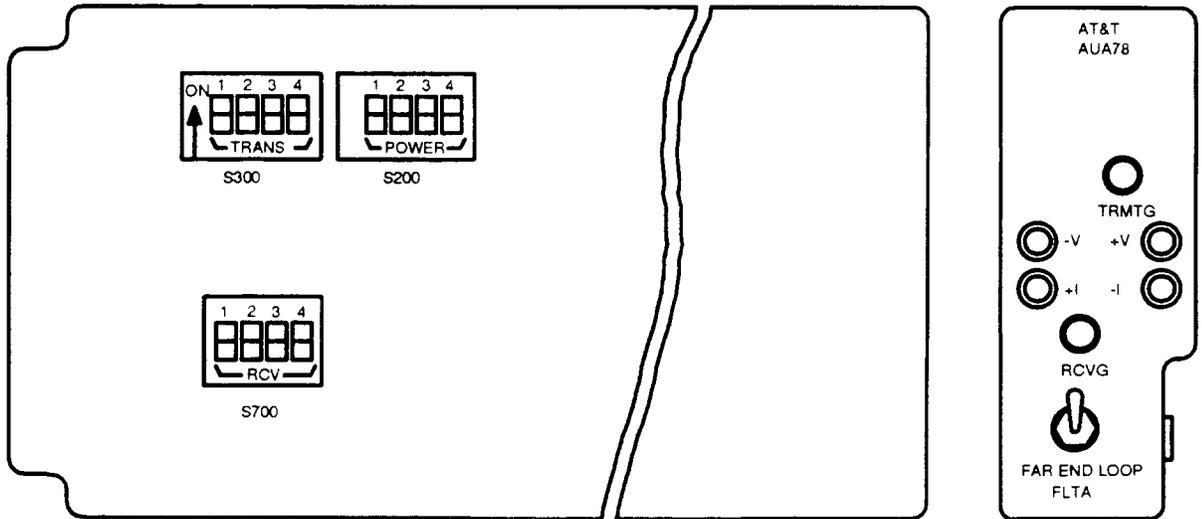
22. Set controls per Table D.

| Table D<br>25AD Test Set |               |
|--------------------------|---------------|
| Control/Switch           | Position      |
| CLOCK RATE               | T1            |
| FUNCTION                 | MEAS 1 SIGNAL |
| PULSE DENSITY            | 11 REF        |
| RECEIVER SENSITIVITY     | -80           |

23.  **NOTE:**  
Positioning an **LSU A, B, C, or D** switch to **f** position will force digroup **A, B, C, or D** onto protection line.

If you do not have a protection line, proceed to **Step 24**. At **LSU**, position faceplate switch for digroup being tested (**A, B, C, or D**) to (**f**) position.

24. Remove **LIU** associated with line being tested.
25. Use **AUA78** T1 line fault-locate test adapter (**FLTA**) to perform tests.
26. On **FLTA** (Figure 4), set switches **S300** (Table E) to agree with switch settings on either **S1/S2** or **S400** on **LIU** removed in **Step 24**. Set switches **S700** (Table F) to agree with switch settings on **S100** and either **S4** or **S200** on **LIU**. Set switches **S200** (Table G) to line powering if the **FLTA** powers the T1 line or to power loop if the **FLTA** loops the received line-powering current.



NOTE: THE AUA78 HAS A DAUGHTER BOARD. HOWEVER, S300 AND S700 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD. S200 IS ACCESSIBLE FROM THE EDGE OF THE BOARD.

Figure 4 — AUA78 FLTA Option Switches

| Table E<br>Option Switch S300 Settings |          |          |          |          |
|----------------------------------------|----------|----------|----------|----------|
|                                        | Switch 1 | Switch 2 | Switch 3 | Switch 4 |
| 0 dB                                   | ON       | OFF      | OFF      | OFF      |
| 7.5 dB                                 | OFF      | ON       | OFF      | OFF      |
| 15 dB                                  | OFF      | OFF      | ON       | OFF      |
| 22.5 dB                                | OFF      | OFF      | OFF      | ON       |

| Table F<br>Option Switch S700 Settings |          |          |          |          |
|----------------------------------------|----------|----------|----------|----------|
|                                        | Switch 1 | Switch 2 | Switch 3 | Switch 4 |
| 0 dB                                   | CLOSED   | OPEN     | —        | —        |
| 7.5 dB                                 | OPEN     | CLOSED   | —        | —        |
| 32                                     | —        | —        | OPEN     | —        |
| 64                                     | —        | —        | CLOSED   | —        |

| Table G<br>Option Switch S200 Settings |               |               |
|----------------------------------------|---------------|---------------|
| Switch                                 | Line Powering | Power Looping |
| 1                                      | OPEN          | CLOSED        |
| 2                                      | OPEN          | CLOSED        |
| 3                                      | CLOSED        | OPEN          |
| 4                                      | CLOSED        | OPEN          |

27. Insert **AUA78** into **LIU** slot for line under test.
28. On fault locat (FL) panel, set **FL LINE** switch to appropriate line number (Figure 3).
29.  **NOTE:**  
 For 1115-type filters, **POLARITY 1** will activate filter group for **Side 1** (COT to RT) of digital line and **POLARITY 2** will activate filter group for **Side 2** (RT to COT). For 1114-type filters, **POLARITY 2** activates filter group closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filter group after authorized tip and ring reversal.

At FL panel, set **POLARITY** switch to **1** for 1115-type filters or to **2** for 1114-type filters.

30. Connect test set to **FLTA** and order wire and fault locate panel as shown in Figure 3.

31. Are 1115-type filters installed on fault line?

If **YES**, then continue with Step 32.

If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

32.



**NOTE:**

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done for line being tested.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

If **YES**, then continue with Step 33.

If **NO**, then proceed to Step 34.

33. Fault-locating procedures on **Side 2** cannot be performed from COT until A digroup failure has been cleared.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

34. On **FLTA**, loop far-end (RT) by positioning toggle switch to **FAR END LOOP**.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Analyze Obscure Trouble Test Results Obtained Using 315B or 415A-2 Fault Locate Test Set

1.  **NOTE:**  
On FLR form in Figure 1 for filter code **B**, first point in row that fails to show **positive** increase is at **PULSE PERIOD 4**. For filter code **E** first point is at **PULSE PERIOD 7**. Only one mark should appear in each row.

On Fault-Locating Record (FLR) form (Figure 1), search each row of **PULSE PERIOD** data from left to right for a point where recorded data fails to show **positive** increase.

2. Ignore zero entries until a nonzero entry is encountered, then mark first point in each row of data that fails to show positive increase.
3. In FLR **MAX SHIFT** column for each row of data, note **PULSE PERIOD** setting in which a mark was made.

4.  **NOTE:**  
On FLR form in Figure 1 in **MAX SHIFT** column, **PULSE PERIOD** setting increased from **6** to **10** (increase of 4) between filter code **G** and **H** making trouble section at filter **H**. Between filters **D** and **E** increase was from **PULSE PERIOD 4** to **7** (increase of 3) making a second trouble section candidate at filter code **E**.

In FLR **MAX SHIFT** column, locate row of data having largest **positive** increase in **PULSE PERIOD** setting with respect to previous row.



5. In FLR **NOTES** column, mark row with largest positive increase in **PULSE PERIOD** setting as **trouble section**.
6. Mark other rows with next largest positive increase in **PULSE PERIOD** setting as likely candidates for trouble.
7. Can suspected trouble section be identified?

If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO**, then continue with Step 8.

8. Are there any marks on FLR form where **PULSE PERIOD** data failed to show positive increase?

If **YES**, then proceed to Step 10.

If **NO**, then continue with Step 9.

9. Report no trouble found.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

10.  **NOTE:**  
On FLR form in Figure 1, first mark encountered in highest **PULSE PERIOD** column is at filter code **H**, **PULSE PERIOD 10**.

Mark as trouble section filter code at first mark encountered in highest **PULSE PERIOD** column working from top down.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Analyze Obscure Trouble Test Results Obtained Using J98725AD (25AD) Fault-Locate Test Set

1.



**NOTE:**

On FLR form in Figure 1, in filter row **D**, value recorded in **MAX SHIFT** column is **1.7**. This value is the difference between **37.2** (at **PULSE PERIOD 7**) and **35.5** (at **PULSE PERIOD 4**).

On Fault-Locating Record (FLR) form (Figure 1), for each row of **PULSE PERIOD** data determine lowest and highest reading for **PULSE PERIOD** setting **10** through **4**.

2. Calculate difference between highest and lowest reading for each row of data.
3. Record difference calculated in Step 2 in **MAX SHIFT** column of FLR form for each row of data.
4. In **MAX SHIFT** column, note any value greater than 1.0.
5. Is any value greater than 1.0 recorded in **MAX SHIFT** column?

If **YES**, then continue with Step 6.

If **NO**, then proceed to Step 7.



6. In **NOTES** column, mark row with largest number greater than 1.0 as **trouble section**.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

7. Report no trouble found.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

### Prepare for Fault-Locating at DSX Cross-Connect Panel

1. Obtain test equipment per Table A.

| Table A                      |                                                      |
|------------------------------|------------------------------------------------------|
| Equipment Required           | Recommended Type                                     |
| FLTS (Fault Locate Test Set) | Sierra 315B,<br>Sierra 415A-2, or<br>J98725AD (25AD) |
| Two P3-type Patch Cords      | P3BH                                                 |

2. Obtain original Fault-Locating Record (FLR) form(s) for system being tested (Figure 1).
3. Obtain blank FLR forms (Figure 2).
4. Which test set is being used?

If **315B** or **415A-2**, then continue with Step 5.  
If **25AD**, then proceed to Step 10.

5. Plug power cord into 117 V AC convenience outlet.
6. Set **POWER** switch to **LAMP TEST** position.

Response: All lamps lighted.





7. Is **315B** or **415A-2** test set being used?

If **315B**, then continue with Step 8.  
If **415A-2**, then proceed to Step 9.

8. Set controls per Table B and proceed to Step 23.

| Table B<br>315B Test Set |                                                  |
|--------------------------|--------------------------------------------------|
| Control/Switch           | Position                                         |
| POWER                    | POWER                                            |
| FUNCTION                 | MEAS 1                                           |
| NORM                     | NORM                                             |
| PULSE PERIOD             | REF 11                                           |
| RCV LEVEL dBm            | -90 with red center vernier knob fully clockwise |

9. Set controls per Table C and proceed to Step 23.

| Table C<br>415A-2 Test Set   |                                                          |
|------------------------------|----------------------------------------------------------|
| Control/Switch               | Position                                                 |
| POWER                        | ON                                                       |
| FUNCTION                     | MEASURE 1                                                |
| NORM                         | NORM                                                     |
| RECEIVE FAULT LINE LEVEL dBm | -90 with red center vernier knob rotated fully clockwise |
| SYSTEM Mb/s                  | 1.544                                                    |
| PULSE PERIOD                 | REF 11                                                   |

10. Plug power cord into -48 V source (Figure 3).

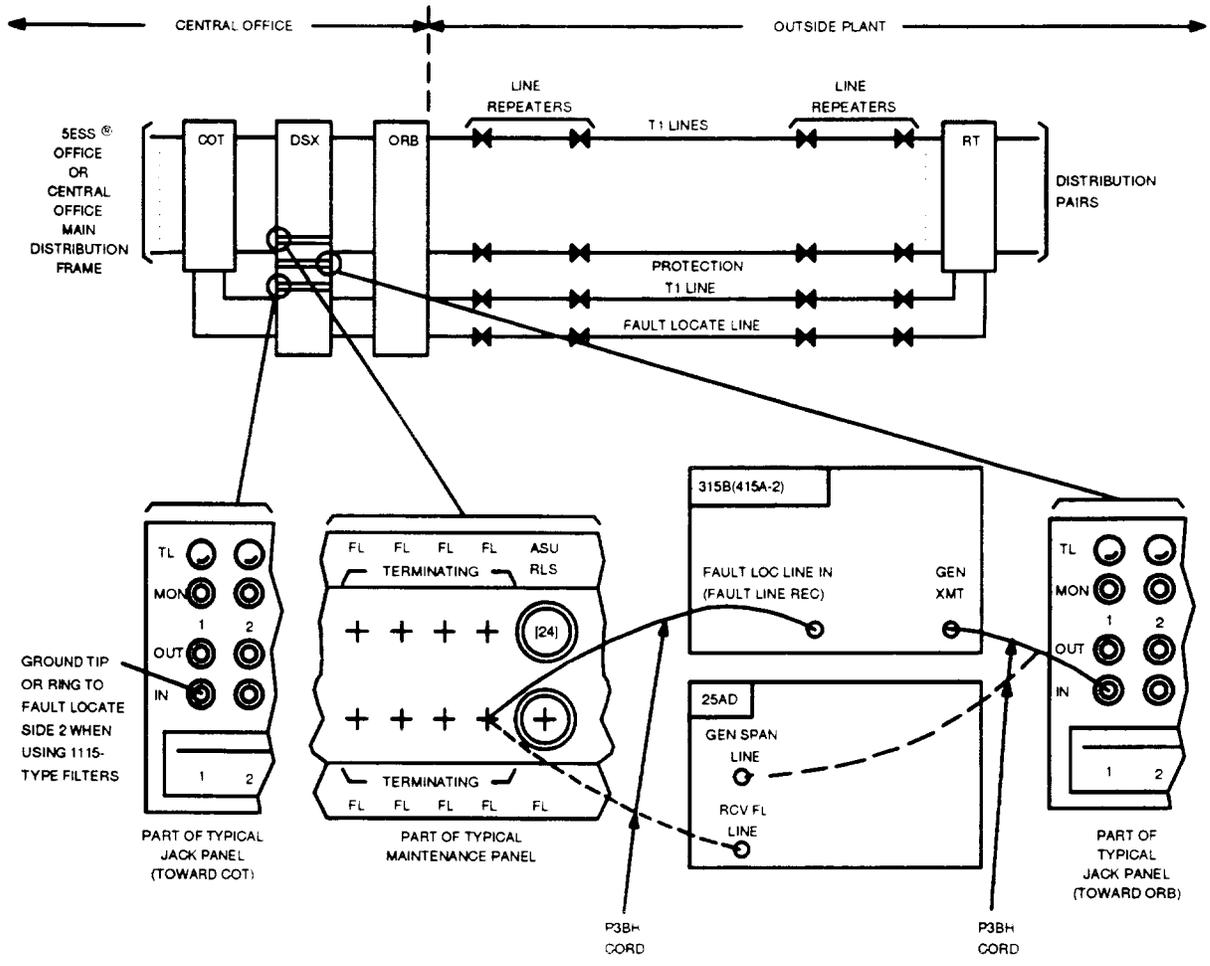


Figure 3 — Typical DSX Cross-Connect Fault-Locating Configuration

11. Set **FUNCTION** switch to **SPAN TERMINATE**.
12. Set **CLOCK RATE** switch to **T1**.

13. Set **PULSE DENSITY** switch to **11 REF**.
14. Set **FILTER** switch to **A**.
15. Set **RECEIVER SENSITIVITY** switch to **-60**.
16. Depress and hold **RCV CAL** push button.
17. Does meter indicate 0 on **DBM** scale?  
If **YES**, then proceed to Step **21**.  
If **NO**, then continue with Step **18**.
18. Adjust **RCV CAL** potentiometer for 0 indication.
19. Does meter indicate 0 on **DBM** scale?  
If **YES**, then proceed to Step **21**.  
If **NO**, then continue with Step **20**.
20. Release **RCV CAL** push button and return test set for repair. Obtain new test set and repeat from Step **10**.
21. Release **RCV CAL** push button.

22. Set controls per Table D.

| Table D<br>25AD Test Set |               |
|--------------------------|---------------|
| Control/Switch           | Position      |
| CLOCK RATE               | T1            |
| FUNCTION                 | MEAS 1 SIGNAL |
| PULSE DENSITY            | 11 REF        |
| RECEIVER SENSITIVITY     | -80           |

- 23.



**NOTE:**

At COT, positioning an **LSU A, B, C, or D** switch to **f** position forces digroup associated with that switch onto protection line.

If you do not have a protection line, proceed to Step 2. At COT **LSU** associated with lines being tested, position faceplate switch for line being tested (**A, B, C, or D**) to (**f**) position.

24. Connect DSX cross-connect panel and test equipment per Figure 3.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Perform Obscure Trouble Test from DSX Cross-Connect Panel Using Fault-Locate Test Set

1. Which test set is being used?

If **315B**, then continue with Step 2.  
If **415A-2**, then proceed to Step 3.  
If **J98725AD**, then proceed to Step 4.

2. Set test set controls per Table A and proceed to Step 5.

| <b>Table A<br/>315B Test Set</b> |                                           |
|----------------------------------|-------------------------------------------|
| Control/Switch                   | Position                                  |
| FUNCTION                         | MEAS 1                                    |
| PULSE PERIOD                     | REF 11                                    |
| LINE FILTER                      | Set to letter code of filter being tested |
| RCV LEVEL dBm                    | Adjust for meter indication of -2.0 dB    |

3. Set test set controls per Table B and proceed to Step 5.

| <b>Table B<br/>415A-2 Test Set</b> |                                           |
|------------------------------------|-------------------------------------------|
| Control/Switch                     | Position                                  |
| FUNCTION                           | MEASURE 1                                 |
| PULSE PERIOD                       | REF (Pulse period 11 LED will be lighted) |
| LINE FILTER                        | Set to letter code of filter being tested |
| RECEIVE FAULT LINE LEVEL dBm       | Adjust for meter indication of 0 dB       |

4. Set test set controls per Table C.

| Table C<br>25AD Test Set |                                                        |
|--------------------------|--------------------------------------------------------|
| Control/Switch           | Position                                               |
| CLOCK RATE               | T1                                                     |
| FUNCTION                 | MEAS 1 SIGNAL                                          |
| PULSE DENSITY            | 11 REF                                                 |
| FILTER                   | Set to letter code of filter being tested              |
| RECEIVER SENSITIVITY     | Adjust control for an on-scale indication on the meter |

5.  NOTE:  
When using **415A-2** test set, if **PULSE PERIOD** switch is set to **AUTO**, **PULSE PERIOD** lamps will automatically advance in approximately 2-second intervals. The **HOLD** position is used to stop lighted lamp at desired position.

If using **315B** test set, set **PULSE PERIOD** control to **10**; if using **415A-2** test set, advance **PULSE PERIOD** to light LED **10**; if using 25AD test set, set **PULSE DENSITY** control to **10**.

6.  NOTE:  
If meter deviation from reference value is not more than  $\pm 0.5$  dB, a zero is entered. If deviation is greater than +0.5 dB, **deviation amount** preceded by a plus (+) sign is recorded (for example, +0.6). If deviation is less than reference level by more than -0.5 dB, **deviation amount** preceded by minus (-) is recorded (for example, -0.6).

On Fault-Locating Record (FLR) form (Figure 1), record meter deviation from reference level [-2.0 dB if using **315B** test set or 0 dB if using **J98725AD** (25AD) or **415A-2** test set].



7. Was last measurement made at **PULSE PERIOD 4**?  
  
If **YES**, then proceed to Step 9.  
If **NO**, then continue with Step 8.
  
8. If using **315B** test set, set **PULSE PERIOD** switch to next lower number (9, 8, etc.); if using **415A-2** test set, advance **PULSE PERIOD** to light next lower numbered LED (9, 8, etc.); if using 25AD test set, set **PULSE DENSITY** switch to next lower number (9, 8, etc.).
  
9. Have measurements been made at all filter locations on side being tested?  
  
If **YES**, then proceed to Step 11.  
If **NO**, then continue with Step 10.
  
10. Go to next filter location to be tested.
  
11. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?  
  
If **SIDE 1**, then continue with Step 12.  
If **SIDE 2**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
  
12. Are 1115-type, 1114-type, or passive filters installed?  
  
If **1115-TYPE**, then proceed to Step 14.  
If **1114-TYPE** or **PASSIVE**, then continue with Step 13.
  
13. Test on **Side 2** must be made from RT.  
  
Reference: **DLP-507 (J98725AD FLTS)**  
  
Reference: **DLP-508 (315B or 415A-2 FLTS)**

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

14.



NOTE:

If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED (only if you have a protection line) for A digroup is off, a far-end loop cannot be done for line being tested.

Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **LSU ON PROT** LED for A digroup off?

If **YES**, then proceed to Step 13.  
If **NO**, then continue with Step 15.

15.



NOTE:

Obscure trouble tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT. The **POLARITY 2** switch setting on the FL panel activates filters on **Side 2** of FL line.

On fault locate (FL) panel, set **POLARITY** switch to activate first filter back from RT.

16. On test adapter (**AUA78**) being used at the COT, ensure that far-end loop switch is set to **FAR-END LOOP** position and repeat from Step 1.

## Obtain Fault-Locating Record (FLR) Forms and Prepare for Fault-Locating at RT

1. Obtain test equipment listed in Table A.

| Table A                      |                                                      |
|------------------------------|------------------------------------------------------|
| Equipment Required           | Recommended Type                                     |
| FLTS (Fault Locate Test Set) | Sierra 315B,<br>Sierra 415A-2, or<br>J98725AD (25AD) |
| Two P3-type Patch Cords      | P3BH                                                 |

2. Obtain original Fault-Locating Record (FLR) forms (Figure 1).
3. Obtain blank FLR forms for system being tested (Figure 2).
4. Which fault-locate test set is being used?

If **315A** or **415A-2**, then continue with Step 5.  
If **25AD**, then proceed to Step 13.

5. Plug power cord into 117 V AC convenience outlet.
6. Set **POWER** switch to **LAMP TEST** position.
7. Set **POWER** switch to **POWER** position.

Response: All lamps lighted.

Response: **POWER** lamp lighted.





8. Set **PULSE PERIOD** switch to **REF 11**.
9. Is **315B** or **415A-2** test set being used?  
  
    If **315B**, then continue with Step **10**.  
    If **415A-2**, then proceed to Step **11**.
10. Set **RCV LEVEL dBm** center vernier control fully clockwise.
11. Set **RECEIVE FAULT LINE LEVEL dBm** center vernier control fully clockwise.
12. Set **SYSTEM Mb/s** control to **1.544** and proceed to Step **25**.
13. Plug power cord into **-48 V** source (Figure 3).
14. Set **FUNCTION** switch to **SPAN TERMINATE**.
15. Set **CLOCK RATE** switch to **T1**.
16. Set **PULSE DENSITY** switch to **11 REF**.
17. Set **FILTER** switch to **A**.
18. Set **RECEIVER SENSITIVITY** switch to **-60**.
19. Depress and hold **RCV CAL** push button.

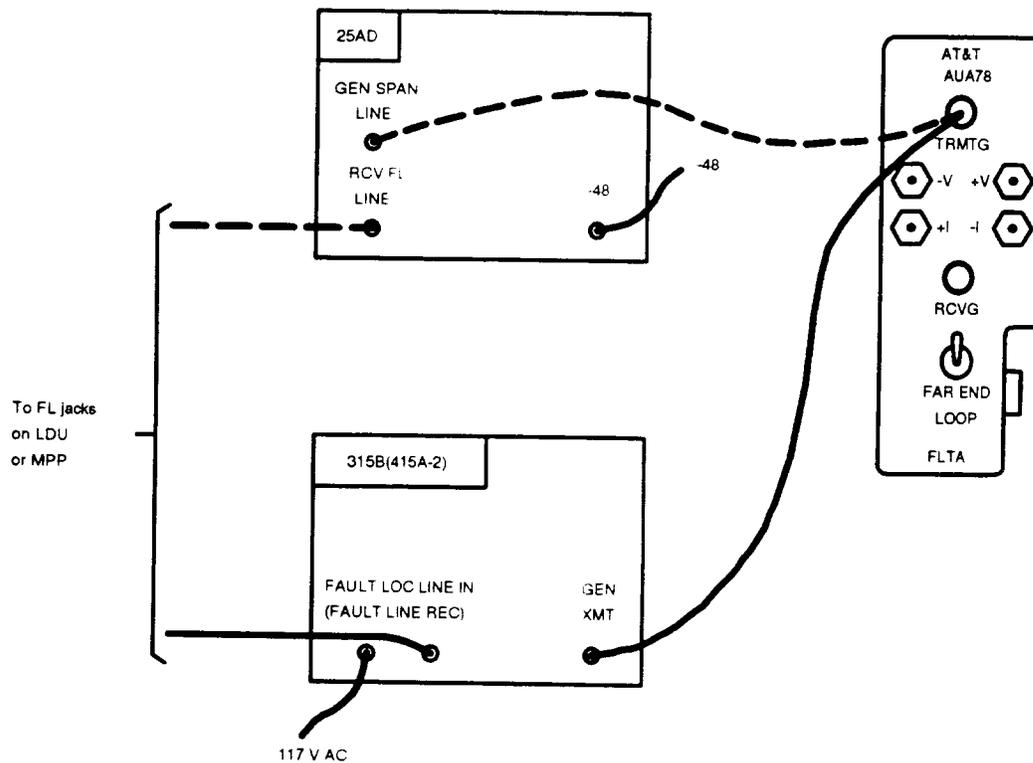


Figure 3 — Remote Terminal (RT) Fault-Locating Configuration

20. Does meter indicate 0 on **DBM** scale?

If **YES**, then proceed to Step 24.

If **NO**, then continue with Step 21.

21. Adjust **RCV CAL** potentiometer for 0 indication.

22. Does meter indicate 0 on **DBM** scale?

If **YES**, then proceed to Step 24.

If **NO**, then continue with Step 23.

23. Release **RCV CAL** push button and return test set for repair. Obtain new test set and repeat from Step 13.

24. Release **RCV CAL** push button

25.  **NOTE:**  
Passive fault locate (FL) lines use 598- or 1068-type filters. Active FL lines use 1114-type filters.

Determine type of fault-locating filters that are installed on FL (fault-locating) line.

26. Are 1114-type filters installed on FL line?

If **YES**, then continue with Step 27.

If **NO**, then proceed to Step 31.

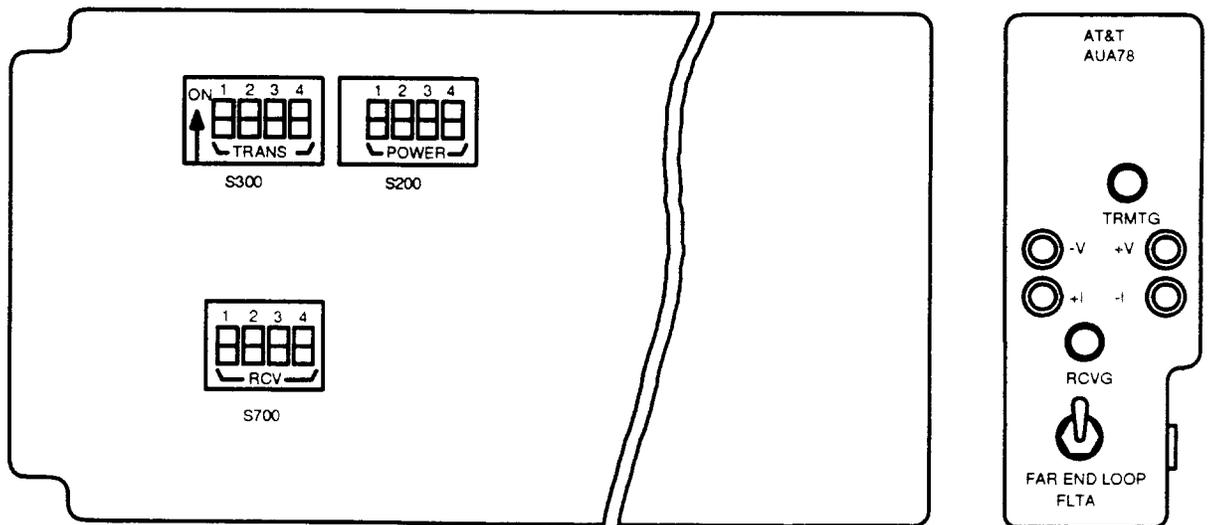
27.  **NOTE:**  
Location of authorized tip and ring reversal determines which **POLARITY** setting on central office terminal (COT) FL panel will activate 1114-type filters. Tip and ring reversal will exist if more than twelve 1114-type filters are on same FL line.

Determine location of authorized tip and ring reversal (if any) on FL line.

28. Request COT personnel at FL panel to set **FL LINE** switch to access FL line being used.

29. Request COT personnel at FL panel to set **FL LINE** switch to appropriate number and insert a dummy plug (258G or equivalent) or one end of P3-type patch cord into **FL LINE OUT** jack.

30. If you do not have a protection line, proceed to Step 31. At **LSU**, position switch associated with line being tested to **f** position.
31. At **RT**, remove **LIU** associated with line being tested.
32. Use **AUA78** T1 line fault-locate test adapter (**FLTA**) to perform tests.
33. On **FLTA** (Figure 4), set switches **S300** (Table B) to agree with switch settings on either **S1/S2** or **S400** on **LIU** removed in Step 31. Set switches **S700** (Table C) to agree with switch settings on **S100** and either **S4** or **S200** on **LIU**. Set switches **S200** (Table D) to line powering if the **FLTA** powers the T1 line or to power loop if the **FLTA** loops the received line-powering current.



NOTE: THE AUA78 HAS A DAUGHTER BOARD. HOWEVER, S300 AND S700 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD. S200 IS ACCESSIBLE FROM THE EDGE OF THE BOARD.

Figure 4 — AUA78 FLTA Option Switches

| Table B<br>Option Switch S300 Settings |          |          |          |          |
|----------------------------------------|----------|----------|----------|----------|
|                                        | Switch 1 | Switch 2 | Switch 3 | Switch 4 |
| 0 dB                                   | ON       | OFF      | OFF      | OFF      |
| 7.5 dB                                 | OFF      | ON       | OFF      | OFF      |
| 15 dB                                  | OFF      | OFF      | ON       | OFF      |
| 22.5 dB                                | OFF      | OFF      | OFF      | ON       |

| Table C<br>Option Switch S700 Settings |          |          |          |          |
|----------------------------------------|----------|----------|----------|----------|
|                                        | Switch 1 | Switch 2 | Switch 3 | Switch 4 |
| 0 dB                                   | CLOSED   | OPEN     | —        | —        |
| 7.5 dB                                 | OPEN     | CLOSED   | —        | —        |
| 32                                     | —        | —        | OPEN     | —        |
| 64                                     | —        | —        | CLOSED   | —        |

| Table D<br>Option Switch S200 Settings |               |               |
|----------------------------------------|---------------|---------------|
| Switch                                 | Line Powering | Power Looping |
| 1                                      | OPEN          | CLOSED        |
| 2                                      | OPEN          | CLOSED        |
| 3                                      | CLOSED        | OPEN          |
| 4                                      | CLOSED        | OPEN          |

34. Insert **FLTA** into **LIU** slot for line under test.
  
35. Connect test set to **FLTA** and fault locate jacks located on either the Load Distribution Unit (**LDU**) or on the miscellaneous pair panel (**MPP**) as shown in Figure 3.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE**

## Connect Fault Locating Test Sets For 80D or 80E Cabinet T1 Extensions

### **SUMMARY:**

Access to the T1 extension digital lines in 80-type cabinets is provided at 307-type protector block connectors, or 800 and 900 series DSX-1 cross-connect shelves. For 800 or 900 series DSX-1, the fault locate test set GEN signal is patched to the IN jack on the span side (repeater shelf side) of the cross-connect panel, and the test set REC FAULT LINE is patched to the fault locate (FL) pair (through a fault line powering module if required).

For 307-type protector block cross-connect, each T1 extension line has protector appearances on the DDM-1000 side of the repeater shelf (4C12C protectors) and the T1 side of the repeater shelf (3C3C protectors) for side 1 (transmit) and side 2 (receive). Access to the fault locate line and miscellaneous pairs are provided at the 3B1E protectors. These protectors are located at the frame side 2 (back side) of the 80-type cabinet in 307-type blocks located between the two equipment frames.

Three test cords are supplied with the cabinet. The W2HR bridging test access cord connects to the protectors and allows bridging or monitoring of the pair. This cord cannot be used to monitor DS1 signals unless the test set has built-in monitor level input impedance (440 ohms on both tip and ring plus 110 ohm test set impedance). The T-BERD 209A test set can be used to monitor DS1 signals with the W2HR cord. The W4DE test cord replaces the 3C3E or 4C12C (DDM-1000 side) protector. These cords have two 310-type jacks for access to the facility or DDM-1000 directions of the digital line (one side only, for example, transmit or receive side). The 6W3A cord has a protector block on one end and a plug that replaces a protector and another plug that bridges onto a protector. The optional W4DF test cord (Comcode 105414973) can be used to loop the line by replacing the digital line transmit and receive side protectors.

Fault locating T1 extensions from an 80-type cabinet requires both the 6W3A and W4DE test cords, a J98725AJ fault line powering module (FLPM) (if your fault locate test set cannot provide fault line power) and a 3W14A test cord (310 jack on one end and alligator clips on the other end), a fault locate test set (315B, 415A-2, 25AD, or equivalent), and a 107B digital line powering module if connecting to the T1 side (a second W4DE test cord is needed if the 107B is used). The W4DE cord connects between the signal generator jack of the fault locate test set and the 4C12C protector position. The 6W3A replaces the 3B1E

protector for the fault locate pair and the 3W14A cord connects the 6W3A protector block to the fault line powering module to power the fault locate pair.

A simple method would be to do single ended fault-locating from the equipment at the other end of the T1 line. The W4DF test cord is used at the 4C12C protectors to loop back the digital line and a 262C terminating plug is inserted in the appropriate FL jack on the LDU.

This procedure provides steps that should be taken to connect fault locating test equipment at an 80D type cabinet for groups 90 and 91 or group 92 equipment arrangement, or an 80E group 91 cabinet. If you have another equipment arrangement, find the protectors for the transmit side of the digital line, and fault locate pair and make test set connections as indicated in the following procedure (see AT&T 640-250-XXX for the cabinet equipage group you have to locate these protectors).

1. Before connecting fault-locating test equipment, replace blown fuse; measure line voltage (+V and -V) and current (I and +V) and compare with records; and replace repeater in SXSS (small cross-section office repeater shelf) if trouble is found.

Comment: 0 current reading indicates bad T1 line power loop. To find trouble loop digital line at apparatus cases, one at a time until, bad section is found.

Comment: High voltage reading indicates an open on TIP or RING of T1 pairs.

Comment: Low voltage reading indicates short between TIP and RING of T1 pairs.

2. At frame side 2 of the 80-type cabinet, find the protectors associated with the digital line. See Table A for 80D group 90 or 91 equipment arrangement. See Table B for 80D group 92 equipment arrangement. See Table C for 80E group 91 equipment arrangement.

3. Fault locating can be done single ended from far-end connecting equipment, from the 3C3E protectors for T1 line access using the 107B digital line powering set, or from the 4C12C protectors for DS1 level (through the repeater) access. See Figure 1 for a block diagram of T1 line arrangement. What type of fault locating do you want?

If **DS1 LINE ACCESS** , then continue with Step 4.

If **T1 LINE ACCESS**, then proceed to Step 7.

If **FAR ENDED**, then proceed to Step 10.

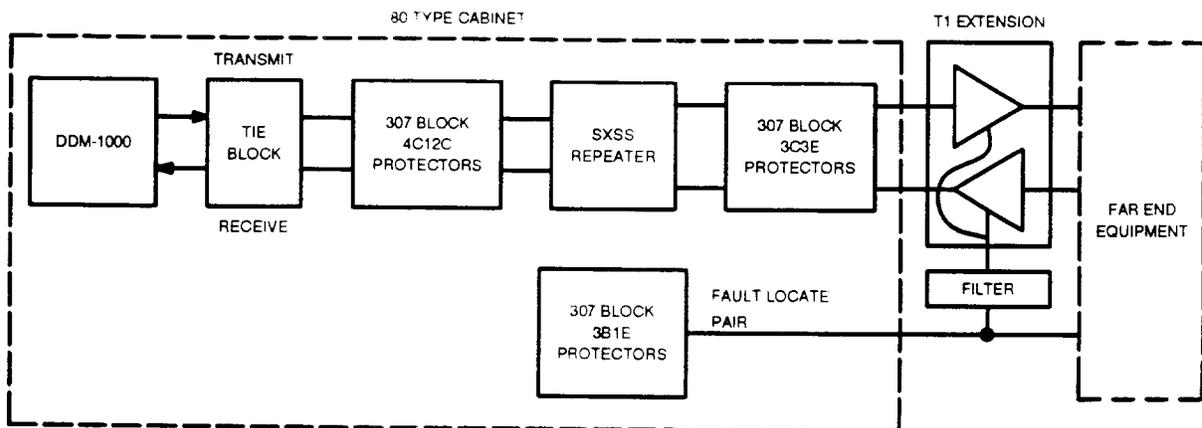


Figure 1 — 80-Type Cabinet T1 Extension Digital Line Configuration

4. Make connection from J98725AJ fault line powering module to 6W3A and 3W14A test cords. (See Figure 2.)

Comment: Some FLTS provide fault line powering internally.

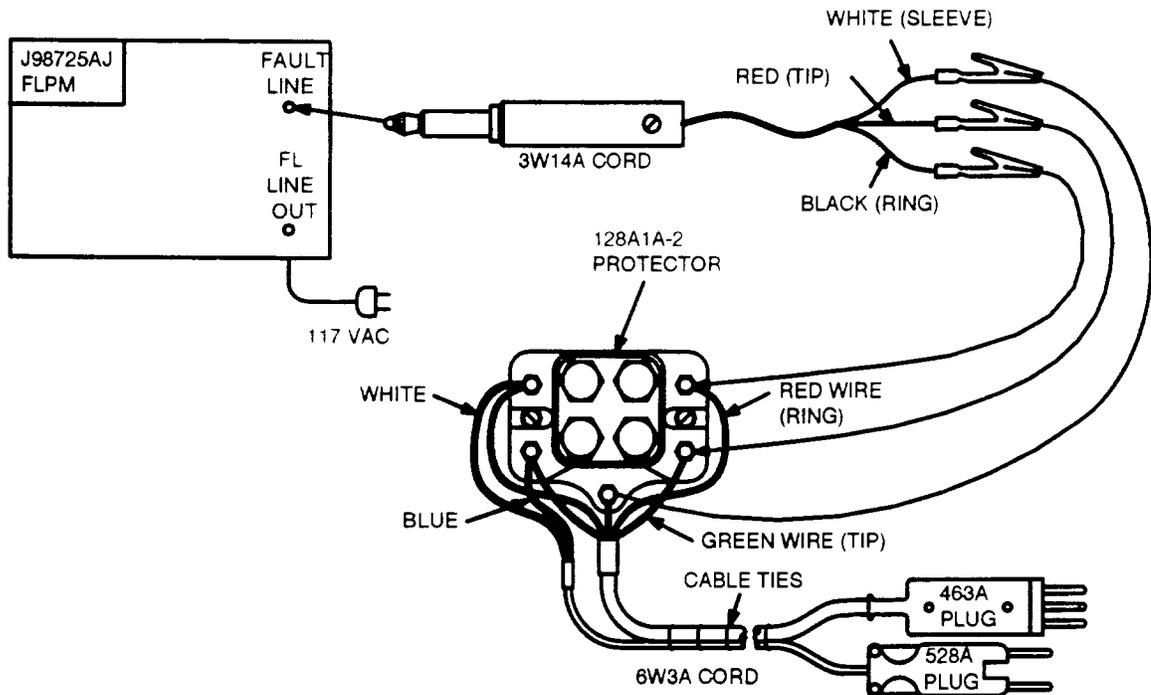


Figure 2 — Fault Line Powering Module Connections to 6W3A and 3W14A Test Cords

5. Make connections from fault locate test set (315D, 415A-2, 25AD) to W4DE test cord. (See Figure 3.)

Comment: For Bulk Power cabinets you may need to make this connection as shown in Figure 5.

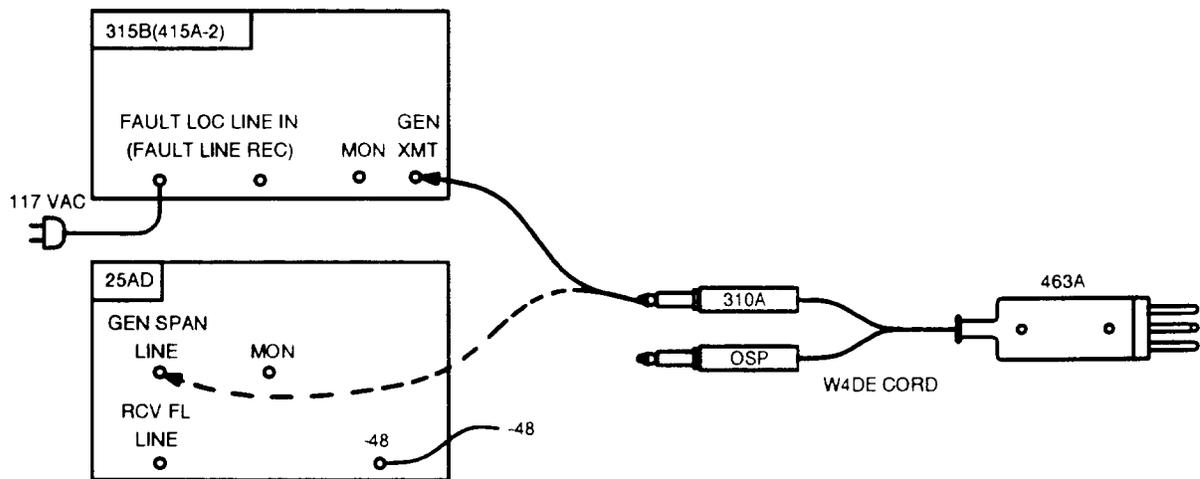


Figure 3 — Fault-Locating Equipment Connections to W4DE Test Cord for DSX-1 Level Access

6. Make fault-locating test equipment connections to protector positions of 307 block on 80-type cabinet frame side 2 as shown in Figure 4. Refer to Table A, B, or C for protector appearances. Replace fault locate pair 3B1E protector with 6W3A test cord and connect 3W14A cord to FLPM. Remove transmit pair 4C12C protector and connect output of fault locate test set. Then continue with Step 11.

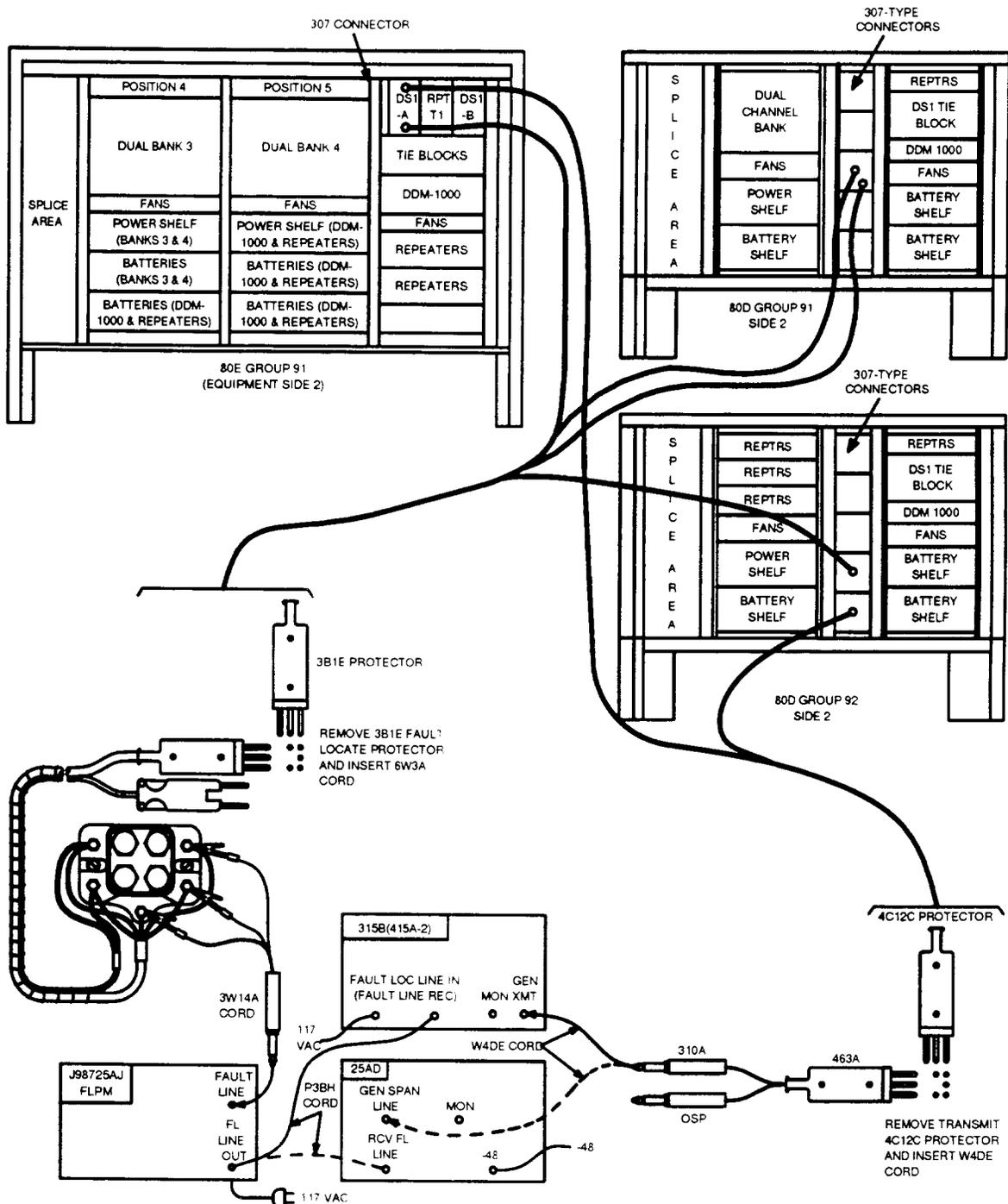


Figure 4 — Typical Fault-Locating Equipment Test Connections for DSX-1 Level Access

7. Make connection from J98725AJ fault line powering module to 6W3A and 3W14A test cords. (See Figure 2.)

Comment: Some FLTS provide fault line powering internally.

8. Make connections from 107B test set (315D, 415A-2, 25AD) to W4DE test cords. (See Figure 5.)

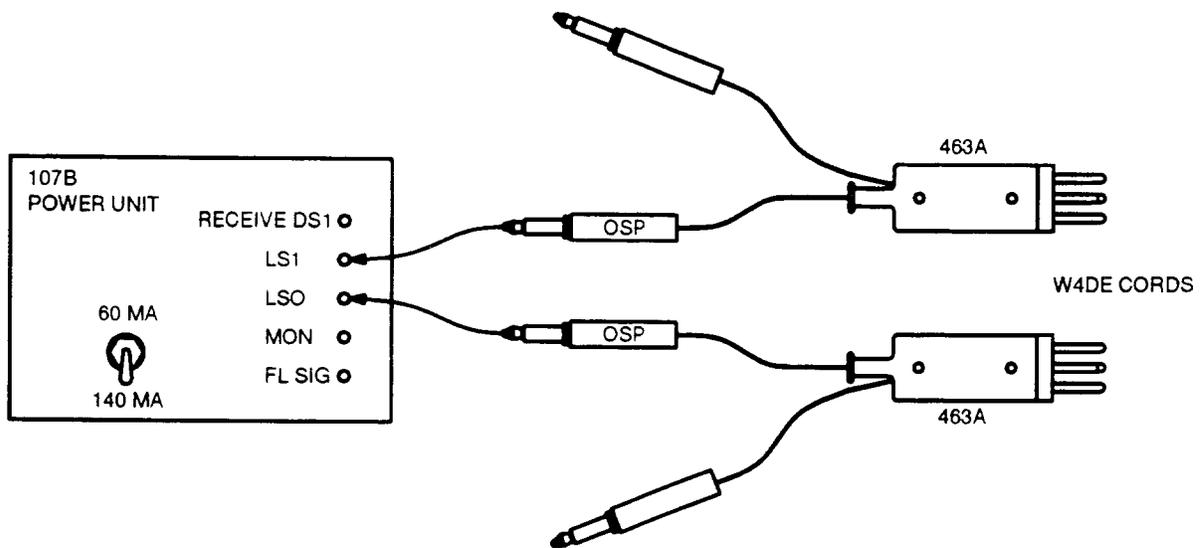


Figure 5 — Fault-Locating Equipment Connections to Test W4DE Cords for T1 Line Access

9. Make fault-locating test equipment connections to protector positions of 307 block on 80-type cabinet frame side 2 as shown in Figure 6. Refer to Table A, B, or C for protector appearances. Replace fault locate pair 3B1E protector with 6W3A test cord and connect 3W14A cord to FLPM. Remove 3C3E transmit pair protector and connect output of the 107B test set. Remove 3C3E receive pair protector and connect input of the 107B test set. Then continue with Step 11.

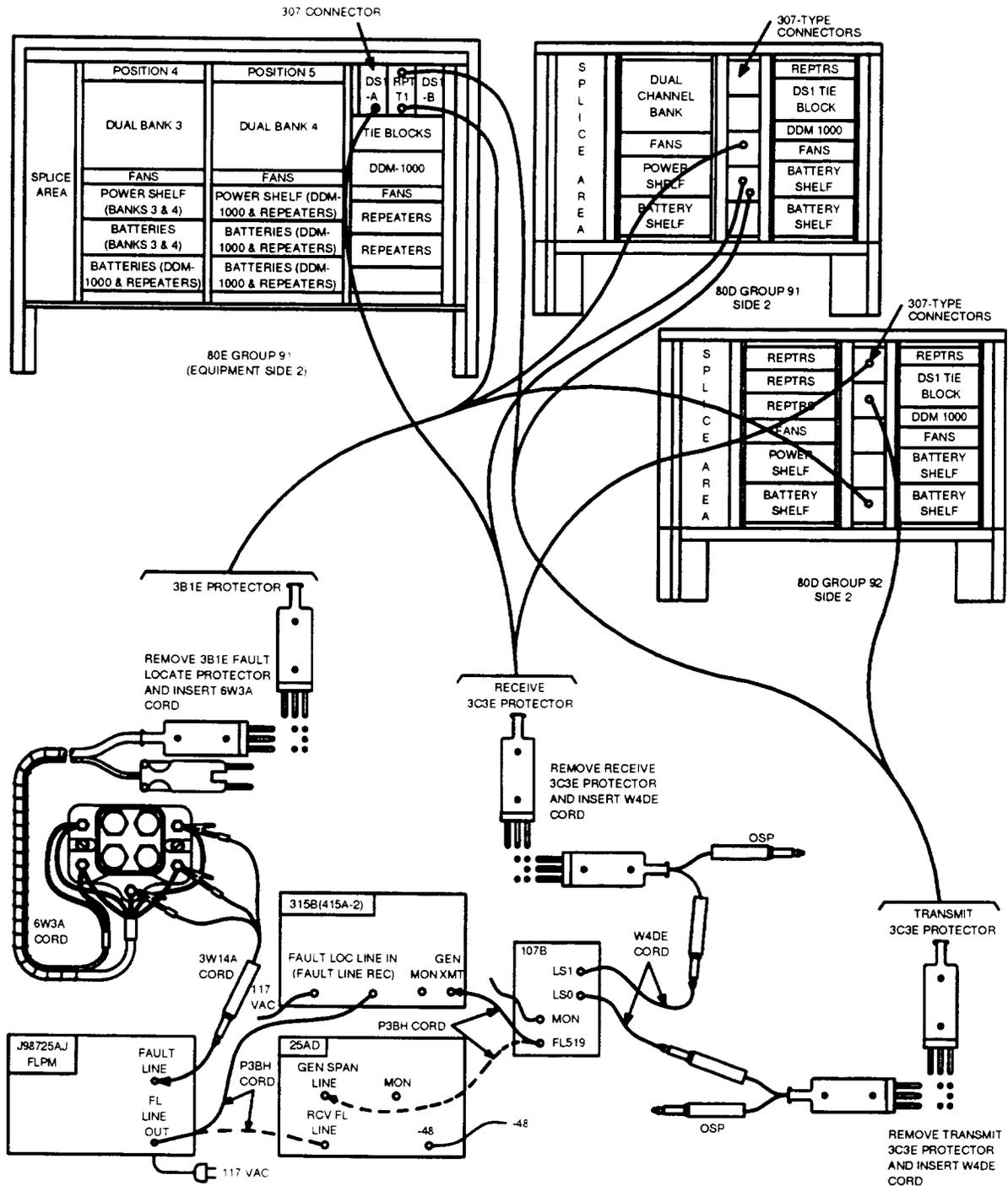


Figure 6 — Typical Fault-Locating Equipment Test Connections For T1 Line Access

10. Use Table A, B, or C to find 4C12C (DSX-1 level) protectors for digital line to be looped. Replace 4C12C protectors with W4DF looping test cord (see Figure 7). Insert 262C fault line terminating plug into appropriate **FL** jack on **LDU** unit.

| <b>Table A</b>                               |                                     |                          |                                         |                         |
|----------------------------------------------|-------------------------------------|--------------------------|-----------------------------------------|-------------------------|
| <b>T1 Extension Line Protector</b>           |                                     |                          |                                         |                         |
| <b>Positions for Group 90/91 80D Cabinet</b> |                                     |                          |                                         |                         |
| <b>for 307 Blocks on Frame Side 2</b>        |                                     |                          |                                         |                         |
| <b>SXSS<br/>Repeater<br/>Slot</b>            | <b>Protector Type and Positions</b> |                          |                                         |                         |
|                                              | <b>3rd 307 Block<br/>DS1 Access</b> |                          | <b>4th 307 Block<br/>T1 Line Access</b> |                         |
|                                              | <b>Transmit<br/>4C12C</b>           | <b>Receive<br/>4C12C</b> | <b>Transmit<br/>3C3E</b>                | <b>Receive<br/>3C3E</b> |
| 1                                            | 81                                  | 11                       | 51                                      | 1                       |
| 2                                            | 82                                  | 12                       | 52                                      | 2                       |
| 3                                            | 83                                  | 13                       | 53                                      | 3                       |
| 4                                            | 84                                  | 14                       | 54                                      | 4                       |
| 5                                            | 85                                  | 15                       | 55                                      | 5                       |
| 6                                            | 86                                  | 16                       | 56                                      | 6                       |
| 7                                            | 87                                  | 17                       | 57                                      | 7                       |
| 8                                            | 88                                  | 18                       | 58                                      | 8                       |
| 9                                            | 89                                  | 19                       | 59                                      | 9                       |
| 10                                           | 90                                  | 20                       | 60                                      | 10                      |
| 11                                           | 91                                  | 21                       | 61                                      | 11                      |
| 12                                           | 92                                  | 22                       | 62                                      | 12                      |
| 13                                           | 93                                  | 23                       | 63                                      | 13                      |
| <b>Miscellaneous Pairs on 3rd 307 Block</b>  |                                     |                          |                                         |                         |
| <b>Function</b>                              | <b>3B1E Protector<br/>Position</b>  |                          |                                         |                         |
| DC Test                                      | 51                                  |                          |                                         |                         |
| Order Wire                                   | 52                                  |                          |                                         |                         |
| Fault Locate In 1                            | 53                                  |                          |                                         |                         |
| Fault Locate In 2                            | 54                                  |                          |                                         |                         |

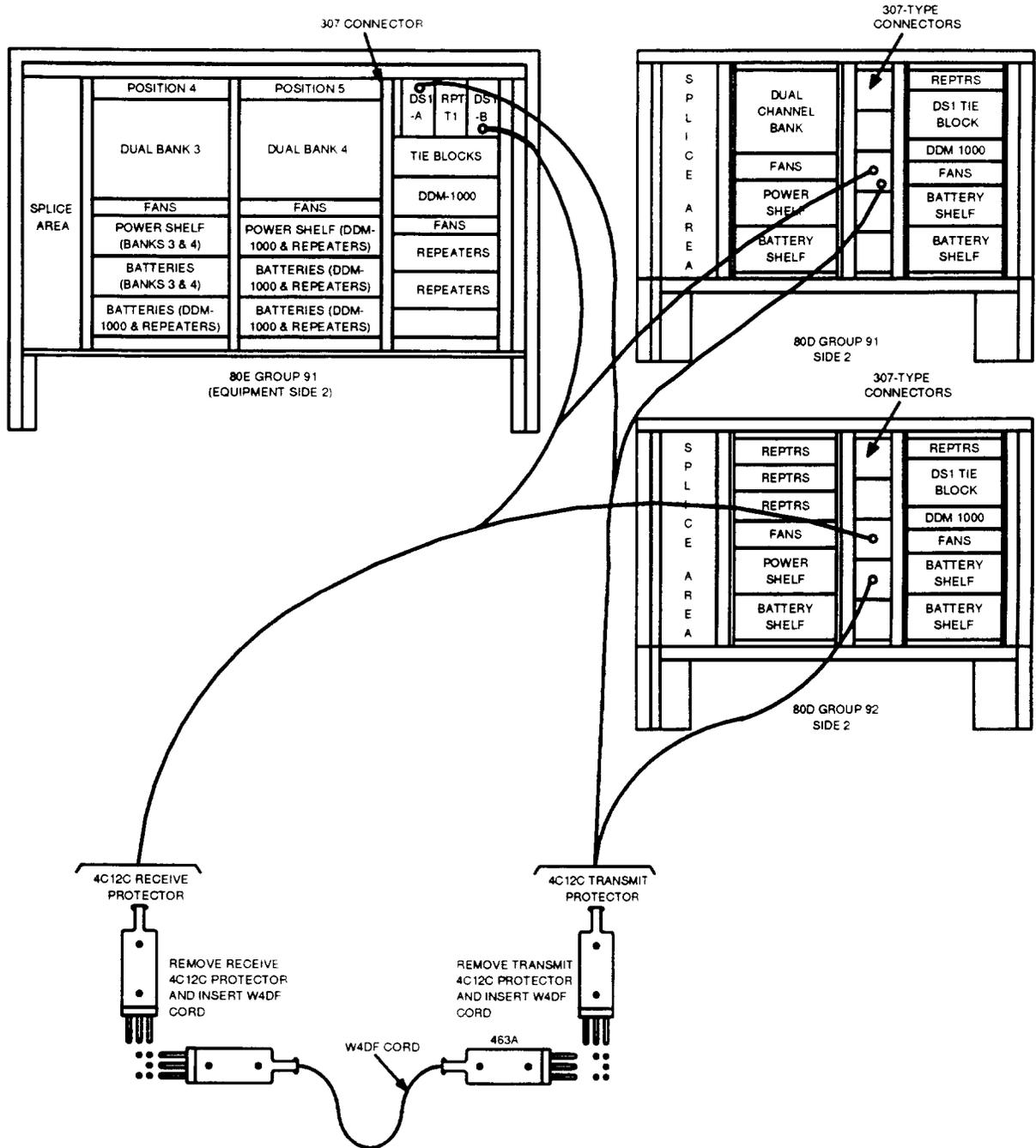


Figure 7 — DSX-1 Level Access T1 Line Loopback for Far Ended Fault Locating

11. Perform fault locating procedures after test set connections have been made (use local procedure or TAP-101 for guidelines noting test connections have already been made). After clearing T1 extension line trouble, remove test connections and replace protectors in 307 block.

**STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

| <b>Table B</b>                              |                           |                                                 |                                                |                                                |                                               |
|---------------------------------------------|---------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------------|-----------------------------------------------|
| <b>T1 Extension Line Protector</b>          |                           |                                                 |                                                |                                                |                                               |
| <b>Positions for Group 92 80D Cabinet</b>   |                           |                                                 |                                                |                                                |                                               |
| <b>for 307 Blocks on Frame Side 2</b>       |                           |                                                 |                                                |                                                |                                               |
| <b>SXSS<br/>Shelf<br/>Number</b>            | <b>Repeater<br/>Slots</b> | <b>Protector Type and Positions</b>             |                                                |                                                |                                               |
|                                             |                           | <b>DS1 Access</b>                               |                                                | <b>T1 Line Access</b>                          |                                               |
|                                             |                           | <b>4th 307<br/>Block<br/>Transmit<br/>4C12C</b> | <b>3rd 307<br/>Block<br/>Receive<br/>4C12C</b> | <b>2nd 307<br/>Block<br/>Transmit<br/>3C3E</b> | <b>1st 307<br/>Block<br/>Receive<br/>3C3E</b> |
| 1                                           | 1-5                       | 1-5                                             | 1-5                                            | 1-5                                            | 1-5                                           |
|                                             | 6-10                      | 6-10                                            | 6-10                                           | 6-10                                           | 6-10                                          |
|                                             | 11-13                     | 11-13                                           | 11-13                                          | 11-13                                          | 11-13                                         |
| 2                                           | 1-5                       | 26-30                                           | 26-30                                          | 26-30                                          | 26-30                                         |
|                                             | 6-10                      | 31-35                                           | 31-35                                          | 31-35                                          | 31-35                                         |
|                                             | 11-13                     | 36-38                                           | 36-38                                          | 36-38                                          | 36-38                                         |
| 3                                           | 1-5                       | 51-55                                           | 51-55                                          | 51-55                                          | 51-55                                         |
|                                             | 6-10                      | 56-60                                           | 56-60                                          | 56-60                                          | 56-60                                         |
|                                             | 11-13                     | 61-63                                           | 61-63                                          | 61-63                                          | 61-63                                         |
| 4                                           | 1-5                       | 76-80                                           | 76-80                                          | 76-80                                          | 76-80                                         |
|                                             | 6-10                      | 81-85                                           | 81-85                                          | 81-85                                          | 81-85                                         |
|                                             | 11-13                     | 86-88                                           | 86-88                                          | 86-88                                          | 86-88                                         |
| <b>Miscellaneous Pairs on 5th 307 Block</b> |                           |                                                 |                                                |                                                |                                               |
| <b>Function</b>                             |                           | <b>3B1E Protector<br/>Position</b>              |                                                |                                                |                                               |
| Order Wire                                  |                           | 2                                               |                                                |                                                |                                               |
| Fault Locate In 1                           |                           | 3                                               |                                                |                                                |                                               |
| Fault Locate In 2                           |                           | 4                                               |                                                |                                                |                                               |

| <b>Table C</b><br><b>T1 Extension Line Protector</b><br><b>Positions for Group 91 80E Cabinet</b><br><b>for 307 Blocks on Frame Side 2</b> |                                 |                                                                     |                                                                    |                                                                 |                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------|
| <b>SXSS</b><br><b>Shelf</b><br><b>Number</b>                                                                                               | <b>Repeater</b><br><b>Slots</b> | <b>Protector Type and Positions</b>                                 |                                                                    |                                                                 |                                                                |
|                                                                                                                                            |                                 | <b>DS1 Access</b>                                                   |                                                                    | <b>T1 Line Access</b>                                           |                                                                |
|                                                                                                                                            |                                 | <b>DS1-A 307</b><br><b>Block</b><br><b>Transmit</b><br><b>4C12C</b> | <b>DS1-B 307</b><br><b>Block</b><br><b>Receive</b><br><b>4C12C</b> | <b>T1 307</b><br><b>Block</b><br><b>Transmit</b><br><b>3C3E</b> | <b>T1 307</b><br><b>Block</b><br><b>Receive</b><br><b>3C3E</b> |
| 1                                                                                                                                          | 1-5                             | 51-55                                                               | 51-55                                                              | 51-55                                                           | 1-5                                                            |
|                                                                                                                                            | 6-10                            | 56-60                                                               | 56-60                                                              | 56-60                                                           | 6-10                                                           |
|                                                                                                                                            | 11-13                           | 61-63                                                               | 61-63                                                              | 61-63                                                           | 11-13                                                          |
| 2                                                                                                                                          | 14-15                           | 64-65                                                               | 64-65                                                              | 64-65                                                           | 14-15                                                          |
|                                                                                                                                            | 16-20                           | 66-70                                                               | 66-70                                                              | 66-70                                                           | 16-20                                                          |
|                                                                                                                                            | 21-25                           | 71-75                                                               | 71-75                                                              | 71-75                                                           | 21-25                                                          |
| <b>Miscellaneous Pairs on DS1-A 307 Block</b>                                                                                              |                                 |                                                                     |                                                                    |                                                                 |                                                                |
| <b>Function</b>                                                                                                                            |                                 | <b>3B1E Protector</b><br><b>Position</b>                            |                                                                    |                                                                 |                                                                |
| Order Wire                                                                                                                                 |                                 | 81                                                                  |                                                                    |                                                                 |                                                                |
| Fault Locate In 1                                                                                                                          |                                 | 82                                                                  |                                                                    |                                                                 |                                                                |
| Fault Locate In 2                                                                                                                          |                                 | 83                                                                  |                                                                    |                                                                 |                                                                |



## **SLC<sup>®</sup> Series 5 Carrier System**

### **AUA8 System Display Unit — NCPQDCB Data Sheet/User's Manual**

---

This data sheet describes the AUA8 system display unit (SDU) (COMCODE 103841011) and is intended for the end-user of the unit. The AUA8 SDU provides an 8-character alphanumeric display for the SLC<sup>®</sup> Series 5 Carrier System when used with an MC97775A1 bank control unit (BCU). The AUA8 SDU also provides bank overflow relays to indicate when all available timeslots in a digroup are busy (only in Mode 2). The AUA8 SDU is an option plug and is used in the sixth line interface unit (LIU) slot of the blue bank at the Feature Package I remote terminal (RT).

Figure 1 is a functional block diagram of the AUA8 SDU, and Figure 2 shows the faceplate. A *User's Manual* for the AUA8 SDU is provided as an attachment.

The AUA8 SDU provides craft personnel with access to information in the bank controller (BC) data base. Information is structured into categories, each of which has a list of data. Faceplate mounted pushbuttons are used to display this information. Since the information is stored in the BCU, the messages displayed depend on the BCU firmware.

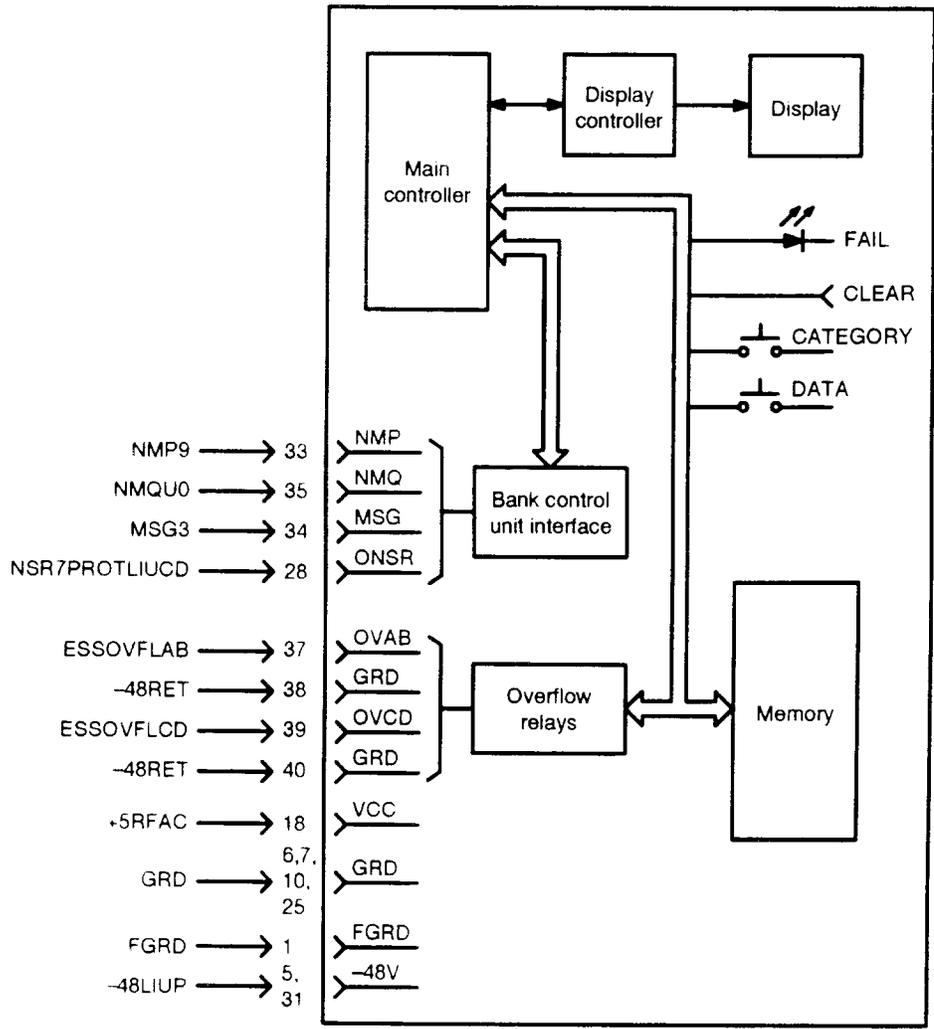
The following pin jack, LED indicator, and pushbuttons form the user interface and are located on the faceplate of the SDU.

**CLEAR** (pin jack) — When a pin is inserted into this jack, selected data is reset, when allowed by the BCU (for example, counters).

**FAIL** (Red LED) — When lighted, this LED indicates the AUA8 SDU is running the initialization routine. Also lights when the BCU decides the AUA8 SDU is not usable.

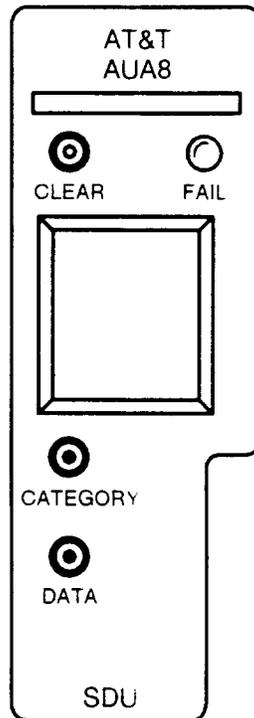
**CATEGORY** (Faceplate-mounted pushbutton) — When pushed, brings the AUA8 SDU out of the idle time-out mode and steps through the list of category names.

**DATA** (Faceplate-mounted pushbutton) — When pushed, steps through the data list of a category.



tpa 813557/01

Figure 1. AUA8 SDU Block Diagram



tpa 813558/01

---

**Figure 2. AUA8 SDU Faceplate**

Follow local procedures for obtaining technical assistance. AT&T also provides in-hours or emergency out-of-hours help for the SLC Series 5 Carrier System. Call the AT&T Regional Technical Assistance Center at **1-800-225-RTAC**.

Additional copies of this document (AT&T 363-005-155) are available from the Customer Information Center — call 1-800-432-6600.

Comments about this document can be directed to:

AT&T  
Document Development Organization  
Attention: Publishing Services Department  
2400 Reynolda Road  
Winston-Salem, NC 27106

Copyright © 1992 AT&T  
All Rights Reserved  
Printed in U.S.A.



---

## SLC<sup>®</sup> Series 5 Carrier System

### AUA8 System Display Unit — User's Manual

---

The AUA8 system display unit (SDU) is a general purpose display unit with two 4-character dot-matrix displays. By using the SDU, craftspersons can display certain data associated with a system (blue or white). Each bank control unit (BCU) stores data for its system. However, an SDU in the blue system at the remote terminal (RT) communicates with the white system BCU through the automated channel test unit (ACTU). Therefore, the RT needs one SDU in the blue system to display data for both systems. At the central office terminal (COT), each system needs an SDU to display data. The data is stored in BCU memory under categories that differ at the COT and RT.

### Faceplate Controls

---

In addition to the dot-matrix displays, the SDU has two faceplate-mounted pushbutton switches (CATEGORY and DATA) and a pin jack (CLEAR) (Figure 1).

### CATEGORY Button

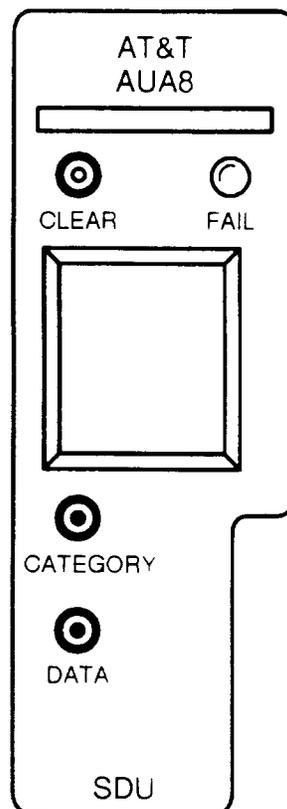
---

When the SDU is in the idle state, pushing the CATEGORY button activates the SDU. The SDU retrieves the category list and displays the first category name. When the SDU is displaying a category name, pushing the CATEGORY button displays the next category name. When the SDU is displaying `End ctgy` (signaling the end of the category list), pushing the CATEGORY button returns the SDU to the beginning of the list (first category name).

Pushing and holding the CATEGORY button circles the SDU through the category names.

If the SDU is displaying a data item and on pushing the CATEGORY button, the SDU displays the category name corresponding to the data item. At this point, pushing the DATA button returns the SDU to the last data item viewed.

---



tpa 813558/01

---

**Figure 1. SDU Faceplate**

## **DATA Button**

---

When the SDU is displaying a category name and on pushing the DATA button, the SDU retrieves from BCU memory the data associated with the category and displays the first data item under the category. If there are no data items under the category, the SDU displays *End Data* or *No Alm*. When displaying a data item and on pushing the DATA button, the SDU displays the next data item under the same category. When the SDU is displaying *End Data*, pushing the DATA button returns the SDU to the first data item under the same category. If there are no data items under the category, the SDU displays *End Data* or *No Alm* again.

Pushing and holding the DATA button circles the SDU through the data items under a category.

When the SDU is displaying a data item and on pushing the CATEGORY button, the SDU displays the category name where the data item falls. At this point, pushing the DATA button returns the SDU to the last data item viewed.

The data in the RT power-up test and routine test result categories is always current. For other categories, if the data in BCU memory changes (for example, an alarm clears) after the data retrieval, the SDU continues to display the data present at the time of the data retrieval (not the current data).

**NOTE:**

Resetting the bank controller clears all BCU category data. If viewing a category during the reset, the data clearing for that category is only evident on exiting and returning to the category.

To get the current data, exit the category (press the CATEGORY button while the SDU displays the category name) and come back to the category (go through all other category names until again the SDU displays the desired category name). When viewing alarm data, follow the above procedure or simply insert the pin into the CLEAR pin jack.

**NOTE:**

Inserting the pin into the pin jack when viewing clearable data items (those falling under the blocked call data, peak hourly traffic, and channel busy data categories) resets the data item.

## CLEAR Pin Jack

The CLEAR pin jack allows the craftsman at the COT to clear the blocked call (AB BLK and CD BLK), peak hourly traffic (AB TRAF and CD TRAF), and channel busy (AB BUSY and CD BUSY) data in the BCU of a COT system operating in concentrated mode (Mode 2). Use the following sequence to clear a data item.

1. Use the CATEGORY and DATA buttons to display the data item to clear.
2. Insert the pin into the CLEAR pin jack and wait for the data item to clear (reset to zero).
3. Remove the pin from the pin jack.

If a craftsman attempts to clear a nonclearable data item, the SDU displays an error message (CANT RSET) while the pin remains in the pin jack. On removal of the pin, the data item remains unchanged.

When in an alarm category, inserting the pin into the CLEAR pin jack retrieves the current alarms.

## SDU Categories

There are eight categories at the COT (Figure 2) and six at the RT (Figure 3). At the COT, whether a category contains data depends on RT routine test results (in a system with a supplemental data link), the mode of operation (Mode 1 or Mode 2), and the presence of system alarms. At the RT, whether a category contains data depends on RT routine test results, RT power-up test results, and the presence of alarms.

## Routine Test Results

Routine test results is a list of those channels that failed the RT automated channel test unit (ACTU) routine channel test. If the failed channel passes a later routine test or its channel unit is removed from the system, the BCU removes the channel from the list. The SDU displays `ITEM RMVD` if a channel is removed while viewing the corresponding SDU message for the channel. If while in this category new routine test results overwrite the data being viewed, the SDU displays `NEW TEXT`.

In a system with a supplemental data link, the `Rout Test` category at the COT contains a list of channels that failed the RT ACTU routine test. The `Blue Rout` and `White Rout` categories on the RT SDU contain a list of channels that failed the RT ACTU routine test in the blue and white systems.

If no channels failed the routine test, the category is empty (pushing the `DATA` button, the SDU displays only `End Data`). When the COT SDU is displaying `Rout Test` in systems without a supplemental data link and on pushing the `DATA` button, the SDU displays `Wrng Mode`. This message signals that the supplemental data link must be enabled for a COT SDU to display RT routine test results.

The following data format is displayed by the SDU:

- RT##  
Fail

where ## is the channel number (1 to 96).

Table 1 contains the list of ACTU routine testable channel units.

**Table 1. ACTU Routine Testable Channel Units**

| <u>Code</u> | <u>Description</u>                                 |
|-------------|----------------------------------------------------|
| AUA25B      | M <i>SPOTS</i> <sup>®</sup> channel unit (CU)      |
| AUA27       | POTS with <i>VerSuS</i> <sup>*</sup> alarm service |
| AUA51       | POTS/ <i>SPOTS</i> CU                              |
| AUA53       | Coin                                               |
| AUA55       | Multiparty                                         |
| AUA56       | DID                                                |
| AUA57       | FSR                                                |
| AUA58B      | POTS                                               |
| AUA59       | <i>SPOTS</i> CU                                    |
| AUA150      | <i>SPOTS</i> CU                                    |
| AUA158      | ALC POTS                                           |
| AUA159      | ALC POTS/ <i>SPOTS</i> CU                          |

<sup>\*</sup> Registered trademark of Versus Technology, Inc.

## Power-Up Test Results

Power-up test results is a list of the results of RT ACTU channel power-up and type test. On insertion of a channel unit, the ACTU does a power-up and type test on each channel. On removal of the channel unit, the BCU removes the channel from the list. The SDU displays *ITEM RMVD* if a channel unit is removed while viewing the corresponding SDU message for the channel.

The *Blue PwUp* and *White PwUp* categories on the RT SDU contain the power-up test results for the blue and white systems. A COT SDU does not display this information.

The following data formats are displayed by the SDU:

- RT##  
Pass
- RT##  
No T
- RT##  
Fail

where ## is the channel number (1 to 96).

**⇒ NOTE:**

Inserting a pin in the CLEAR pin-jack while in this category removes all RT## Pass and No-T messages.

The SDU displays RT## Pass if the channel passes the ACTU power-up test. RT## No-T signals that the channel is not power-up testable. RT## Fail signals that the channel failed the power-up or type test.

**⇒ NOTE:**

Although the AUA52(B) office channel unit (OCU) dataport is not power-up testable by the ACTU, no RT## No-T appears in this category. The craft should not assume this unit is faulty because of the absence of a power-up message.

Table 2 contains the list of ACTU power-up testable channel units.

**Table 2. ACTU Power-Up Testable Channel Units**

| <u>Code</u>         | <u>Description</u>                     |
|---------------------|----------------------------------------|
| AUA25B              | M SPOTS <sup>+</sup> channel unit (CU) |
| AUA27               | POTS with VerSuS* alarm service        |
| AUA41               | 4W special services (CF)               |
| AUA42               | 2W E SPOTS special services (CS)       |
| AUA43               | 2W E SPOTS special services (CF)       |
| AUA44               | 4W special services (CS)               |
| AUA45B <sup>†</sup> | Dual ringing repeater (DRR)            |
| AUA51               | POTS/SPOTS CU                          |
| AUA53               | Coin                                   |
| AUA54               | 4W E&M special services                |
| AUA55               | Multiparty                             |
| AUA56               | DID                                    |
| AUA57               | FSR                                    |
| AUA58B              | POTS                                   |
| AUA59               | SPOTS CU                               |
| AUA75               | 2W PLAR                                |
| AUA141              | 4W special services (CF)               |
| AUA142              | 2W E SPOTS (CS)                        |
| AUA150              | SPOTS CU                               |
| AUA158              | ALC POTS                               |
| AUA159              | ALC POTS/SPOTS CU                      |

\* Registered trademark of Versus Technology, Inc

† Only type testing is performed on this unit

## Blocked Call Data

Blocked call data is the number of calls blocked by the system in Mode 2. The AB BLK and CD BLK categories on the COT SDU contain this data. The RT SDU does not display this information. Clear this data by inserting the pin in the CLEAR pin jack.

The following data format is displayed by the SDU:

■ Or##  
Te##

where ## is the number of blocked calls (0 to 99).

Or## is the number of originating calls blocked; Te## is the number of terminating calls blocked. If the number of blocked calls exceeds 99, the SDU displays 99. In a Mode 1 system, pushing the data button when the COT SDU is displaying AB BLK or CD BLK results in the SDU displaying *Wrng Mode*; this message signals that this data is not present in Mode 1 systems.

## Peak Hourly Traffic

Peak hourly traffic is a calculation of the peak hourly traffic rate in terms of hundred called seconds (CCS) for a Mode 2 system. The AB TRAF and CD TRAF categories on the COT SDU contain this data. The RT SDU does not display this information. Clear this data by inserting the pin in the CLEAR pin jack.

The following data format is displayed by the SDU:

■ ###  
CCS

where ### is a number between 0 and 999.

In a Mode 1 system, pushing the DATA button when the COT SDU is displaying AB TRAF or CD TRAF results in the SDU displaying *Wrng Mode*; this message signals that this data is not present in Mode 1 systems.

## Channel Busy Data

---

Channel busy data is the number of seconds all channels in a Mode 2 system are busy. The `AB BUSY` and `CD BUSY` categories on the COT SDU contain this data. The RT SDU does not display this data. Clear this data by inserting the pin in the CLEAR pin jack.

The following data format is displayed by the SDU:

■ ####  
Sec

where #### is a number between 0 and 9999.

In a Mode 1 system, pushing the DATA button when the COT SDU is displaying `AB BUSY` or `CD BUSY` results in the SDU displaying `Wrng Mode`; this message signals that this data is not present in Mode 1 systems.

## System Alarms

---

The SDU displays system alarms. The `Bank Alrm` category on a COT SDU shows alarms for its system (bank). The `White Alrm` and `Blue Alrm` categories on the RT SDU show alarms in the white and blue systems. If no alarms are present, pushing the DATA button while in an alarm category results in the SDU displaying `No Alrm`.

### ⇒ NOTE:

If alarms change after entering an alarm category, the SDU is not displaying the current alarms. To get the current alarms, insert a pin into the CLEAR pin jack, or exit the alarm category and circle back to it.

If there are no alarms present, the `No Alrm` message appears under the alarm categories.

Table 3 contains a list of SDU alarms. If the recommended action in Table 3 fails to clear the alarm, refer to AT&T 363-205-500G.

## Miscellaneous Messages

If a channel fails a power-up test or routine test while the SDU is idle, the SDU displays `CU FAIL`. To clear the message, either press the category button (the SDU displays the first category name) or remove the failed channel unit.

If additional data is transferring from the BCU to the SDU, the SDU displays `WAIT` and ignores the faceplate pushbuttons until the transfer completes.

If the SDU has problems retrieving data from the BCU, the SDU displays `NO RESP` and ignores the faceplate pushbuttons for 2 seconds. To clear the `NO RESP` message, push either the `DATA` or `CATEGORY` button. The buttons advance the display to the next data item or category.

**Table 3. AUA8 System Display Unit Alarms**

| <b>Alarm</b> | <b>Description/Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A ON PROT    | A switch of digroup A to the DS1 protection line. If the digroup A force switch on the LSU faceplate was unintentionally set toward <i>f</i> , move it away from <i>f</i> . Ignore this message if intentionally set toward <i>f</i> . Otherwise, check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, do T1 fault locating (see AT&T 363-200-001). |
| ACTU CUs     | The detection of one or more channel unit failures by the ACTU. Replace those CUs with CH## FAIL messages under this category.                                                                                                                                                                                                                                                                                                                                                                |
| ACTU FAIL    | A failure on the ACTU. Replace the ACTU.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ADMN MEM     | 3-way mismatch of administration memory. Remove the ADU and set the NORM/CLR option plug for CLR. Reinstall the ADU. If at the RT, wait for the PRV LED on the ADU to go out; at the COT, wait 5 minutes. Remove the ADU and set the NORM/CLR option plug for NORM. Reinstall the ADU.                                                                                                                                                                                                        |
| ADU FAIL     | A failure on the ADU. Replace the ADU.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ADU LAN      | A failure of the LAN localized to the ADU. If ADU switch S1-8 is set toward NLAN, set it toward LAN. Otherwise, replace the ADU.                                                                                                                                                                                                                                                                                                                                                              |
| ADU MEM      | A failure on the ADU EEPROM. Replace the ADU.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ADU SWCH     | An incompatible switch setting on the ADU. Remove the ADU and correct the switch option setting.                                                                                                                                                                                                                                                                                                                                                                                              |
| B ON PROT    | A switch of digroup B to the DS1 protection line. If the digroup B force switch on the LSU faceplate was unintentionally set toward <i>f</i> , move it away from <i>f</i> . Ignore this message if intentionally set toward <i>f</i> . Otherwise, check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, do T1 fault locating (see AT&T 363-200-001). |
| BATT FUSE    | A fuse is blown on the 181A apparatus mounting (battery shelf), an AC power failure at the RT, or an RT fan alarm. Replace the fuse. Otherwise, check the AC circuit breaker and AC power. Otherwise, check the FCU and the fan unit.                                                                                                                                                                                                                                                         |
| BCU MEM      | A failure on the BCU EEPROM. Replace the BCU.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

*Continued on next page*

Table 3. AUA8 System Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C ON PROT | A switch of digroup C to the DS1 protection line. If the digroup C force switch on the LSU faceplate was unintentionally set toward <i>f</i> , move it away from <i>f</i> . Ignore this message if intentionally set toward <i>f</i> . Otherwise, check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, do T1 fault locating (see AT&T 363-200-001). |
| CH## COMP | The CU associated with channel ## (where ## is an odd number between 1 and 95) is incompatible. Check the work order or office records to remedy the compatibility problem.                                                                                                                                                                                                                                                                                                                   |
| CH## FAIL | A failure in the CU associated with channel ## (where ## is an odd number between 1 and 95). Replace the CU.                                                                                                                                                                                                                                                                                                                                                                                  |
| CKT MEM   | 3-way mismatch of CU provisioning memory. Remove the BCU and insert a pin plug into the PROV TRANS pin jack on the BCU faceplate. Reinstall the BCU. If at the RT, wait for the PRV LED on the ADU to go out; at the COT, wait 5 minutes. Remove the pin plug and use the CIU to verify that the provisioning data agrees with the office records. Change corrupt data.                                                                                                                       |
| CTU COMP  | An incompatible CTU in the dual-channel bank. At the RT, replace the CTU with an AUB22, AUB25, or AUB30. At the COT, replace the CTU with an AUB2B CTU.                                                                                                                                                                                                                                                                                                                                       |
| CuAB FUSE | The AB fuse on the CFU providing -48 V DC protection to the digroup A and B CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                                                                   |
| CuCD FUSE | The CD fuse on the CFU providing -48 V DC protection to the digroup C and D CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                                                                   |
| CUT CLR   | On the RT ADU, the NORM/CLR option switch is set to CLR and switch S2-3 is set to CUT. Not advisable since these settings can clear memory when autocut. Correct the settings.                                                                                                                                                                                                                                                                                                                |
| D ON PROT | A switch of digroup D to the DS1 protection line. If the digroup D force switch on the LSU faceplate was unintentionally set toward <i>f</i> , move it away from <i>f</i> . Ignore this message if intentionally set toward <i>f</i> . Otherwise, check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, do T1 fault locating (see AT&T 363-200-001). |

Continued on next page

Table 3. AUA8 System Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DCUA COMP | DCUs in digroup A. DCUs are incompatible with this feature package, remove the DCUs.                                                                                                                                                                                                                                                                                                                                                        |
| DCUB COMP | DCUs in digroup B. DCUs are incompatible with this feature package, remove the DCUs.                                                                                                                                                                                                                                                                                                                                                        |
| DCUC COMP | DCUs in digroup C. DCUs are incompatible with this feature package, remove the DCUs.                                                                                                                                                                                                                                                                                                                                                        |
| DCUD COMP | DCUs in digroup D. DCUs are incompatible with this feature package, remove the DCUs.                                                                                                                                                                                                                                                                                                                                                        |
| DL A RECV | Incoming data link failure. Replace the AB shelf TRU at the FE.                                                                                                                                                                                                                                                                                                                                                                             |
| DL A XMIT | Outgoing data link failure. Replace the AB shelf TRU.                                                                                                                                                                                                                                                                                                                                                                                       |
| DL C RECV | Incoming data link failure. Replace the CD shelf TRU at the FE.                                                                                                                                                                                                                                                                                                                                                                             |
| DL C XMIT | Outgoing data link failure. Replace the AB shelf TRU.                                                                                                                                                                                                                                                                                                                                                                                       |
| DS1A HiEr | The number of BPVs on digroup A DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001) or maintenance on the multiplexers.      |
| DS1A LoEr | The number of BPVs on digroup A DS1 is between the protection switch threshold ( $10^{-5}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001). |
| DS1B HiEr | The number of BPVs on digroup B DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001) or maintenance on the multiplexers.      |

*Continued on next page*

Table 3. AUA8 System Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DS1B LoEr | The number of BPVs on digroup B DS1 is between the protection switch threshold ( $10^{-5}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001). |
| DS1C HiEr | The number of BPVs on digroup C DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001) or maintenance on the multiplexers.      |
| DS1C LoEr | The number of BPVs on digroup C DS1 is between the protection switch threshold ( $10^{-5}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001). |
| DS1D HiEr | The number of BPVs on digroup D DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001) or maintenance on the multiplexers.      |
| DS1D LoEr | The number of BPVs on digroup D DS1 is between the protection switch threshold ( $10^{-5}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001). |

*Continued on next page*

Table 3. AUA8 Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DS1P HiEr | The number of BPVs on protection DS1 exceeds the $10^{-4}$ protection switch threshold, or a complete DS1 failure. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001) or maintenance on the multiplexers.      |
| DS1P LoEr | The number of BPVs on protection DS1 is between the protection switch threshold ( $10^{-5}$ or $10^{-6}$ ) set through the OI and the $10^{-4}$ threshold. Check that the line code settings (B8ZS and ZCS) on the NE and FE LIU, and, if present, on the multiplexers (AMI is compatible with ZCS) are the same. If the line code settings are the same, replace the LIU at the FE. Otherwise, do T1 fault locating (see AT&T 363-200-001). |
| FE DGRA   | An alarm on digroup A at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                 |
| FE DGRB   | An alarm on digroup B at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                 |
| FE DGRC   | An alarm on digroup C at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                 |
| FE DGRD   | An alarm on digroup D at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                 |
| FE MJ     | A major alarm at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                         |
| FE MN     | A minor alarm at the far end. Read other SDU alarms at near and far end to determine cause of alarm.                                                                                                                                                                                                                                                                                                                                         |
| FE MSC1   | A MISC1 alarm at the RT. Use local procedures to clear the alarm.                                                                                                                                                                                                                                                                                                                                                                            |
| FE MSC2   | A MISC2 alarm at the RT. Use local procedures to clear the alarm.                                                                                                                                                                                                                                                                                                                                                                            |
| FE PMN    | A power minor alarm at the RT. Check the AC circuit breaker and AC power at the RT. Replace any 336A( ) rectifier with its ALARM LED lighted.                                                                                                                                                                                                                                                                                                |
| FsDL FAIL | A failure of the data link. Replace the AB shelf TRU.                                                                                                                                                                                                                                                                                                                                                                                        |
| LAN FAIL  | A failure of the LAN localized to the LAN cabling. Check and/or replace the SIU jumper, LAN main, and DCB-T cables.                                                                                                                                                                                                                                                                                                                          |

*Continued on next page*

Table 3. AUA8 Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LIUA COMP | An incompatible LIU in digroup A. Replace the LIU with a D-version LIU.                                                                                           |
| LIUA FAIL | A failure on the digroup A LIU. If a TRUA FAIL alarm is also present, replace the TRU in the AB shelf. Otherwise, replace the LIU.                                |
| LIUA SWCH | An incompatible switch option setting on the digroup A LIU. Remove the LIU and correct the switch setting.                                                        |
| LIUA SwRq | The GTD-5* EAX is preventing a copy switch back to LIU A to allow the system to stabilize. This alarm clears after the GTD-5 EAX determines the system is stable. |
| LIUB COMP | An incompatible LIU in digroup B. Replace the LIU with a D-version LIU.                                                                                           |
| LIUB FAIL | A failure on the digroup B LIU. If a TRUA FAIL alarm is also present, replace the TRU in the AB shelf. Otherwise, replace the LIU.                                |
| LIUB SWCH | An incompatible switch option setting on the digroup B LIU. Remove the LIU and correct the switch setting.                                                        |
| LIUC COMP | An incompatible LIU in digroup C. Replace the LIU with a D-version LIU.                                                                                           |
| LIUC FAIL | A failure on the digroup C LIU. If a TRUC FAIL alarm is also present, replace the TRU in the CD shelf. Otherwise, replace the LIU.                                |
| LIUC SWCH | An incompatible switch option setting on the digroup C LIU. Remove the LIU and correct the switch setting.                                                        |
| LIUD COMP | An incompatible LIU in digroup D. Replace the LIU with a D-version LIU.                                                                                           |
| LIUD FAIL | A failure on the digroup D LIU. If a TRUC FAIL alarm is also present, replace the TRU in the CD shelf. Otherwise, replace the LIU.                                |
| LIUD SWCH | An incompatible switch option setting on the digroup D LIU. Remove the LIU and correct the switch setting.                                                        |

\* Registered trademark used under license from the GTE Corporation.

*Continued on next page*

Table 3. AUA8 System Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LIUP COMP | An incompatible LIU in the LIU-P slot. Replace the LIU with a D-version LIU.                                                                                                                                                                                   |
| LIUP FAIL | A failure on the protection LIU. Replace the LIU.                                                                                                                                                                                                              |
| LIUP SWCH | An incompatible switch option setting on the protection LIU. Remove the LIU and correct the switch setting.                                                                                                                                                    |
| LIUP SwRq | The <i>GTD-5</i> EAX is preventing a copy switch back to LIU P to allow the system to stabilize. This alarm clears after the <i>GTD-5</i> EAX determines the system is stable.                                                                                 |
| LOOP BK A | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                   |
| LOOP BK B | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                   |
| LOOP BK C | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                   |
| LOOP BK D | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                   |
| LOOP BK P | The PCM looping test message — clears when test is complete.                                                                                                                                                                                                   |
| LSU COMP  | The rate switch (S2) on the LSU is incorrectly set to position 32. Set S2 to position 64.                                                                                                                                                                      |
| LSU FAIL  | A failure on the LSU. Replace the LSU.                                                                                                                                                                                                                         |
| LSU SWCH  | A faceplate switch on the LSU is set to force or deny a protection switch. If the switch was unintentionally set toward <i>f</i> or <i>d</i> , move it away from <i>f</i> or <i>d</i> . Ignore this message if intentionally set toward <i>f</i> or <i>d</i> . |
| Ln P FUSE | The protection fuse on the LFU providing –48 V DC protection to the protection LIUs (blue and white system) is blown. Replace the fuse.                                                                                                                        |
| LnAB FUSE | The AB fuse on the LFU providing –48 V DC protection to the digroup A and B LIUs is blown. Replace the fuse.                                                                                                                                                   |
| LnCD FUSE | The CD fuse on the LFU providing –48 V DC protection to the digroup C and D LIUs is blown. Replace the fuse.                                                                                                                                                   |
| M2 A LOOP | Failure to receive loop test message for digroup AB. Replace the COT AB shelf TRU.                                                                                                                                                                             |
| M2 A NoAL | In Mode 2 applications, failure to receive the keep alive message for digroup AB. Replace the COT AB shelf TRU.                                                                                                                                                |
| M2 C LOOP | Failure to receive loop test message for digroup CD. Replace the COT AB shelf TRU.                                                                                                                                                                             |

Continued on next page

**Table 3. AUA8 System Display Unit Alarms (Contd)**

| <b>Alarm</b> | <b>Description/Action</b>                                                                                                                                        |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M2 C NoAL    | In Mode 2 applications, failure to receive the keep alive message for digroup CD. Replace the COT CD shelf TRU.                                                  |
| MSC1 ALRM    | A MISC1 alarm is present at the RT. Use local procedures to clear the alarm.                                                                                     |
| MSC2 ALRM    | A MISC2 alarm is present at the RT. Use local procedures to clear the alarm.                                                                                     |
| NEFE SWCH    | Incompatible switch settings between the NE and FE. Correct the incompatible switch settings.                                                                    |
| NEFE IDs     | The system ID switch settings at the NE and FE do not agree. Correct the switch settings.                                                                        |
| OFFC CLCK    | A failure of the office clock input. Check the office clock wiring.                                                                                              |
| ON PROT      | A switch of a digroup to the DS1 protection line. Another message in this category identifies the digroup on protection. Do the steps listed under that message. |
| PROV ACTV    | Either a provisioning data transfer or clearing operation is in progress. The message clears when the operation completes.                                       |
| PROV ADMN    | An updating of administration memory through the OI. This message clears when the updating activity stops.                                                       |
| PROV CKTS    | An updating of circuit provisioning memory through the OI and CIU. This message clears when the updating activity stops.                                         |
| PROV FAIL    | Failure to successfully provision a system with the CIU. Replace the BCU and ADU in that order.                                                                  |

*Continued on next page*

Table 3. AUA8 System Display Unit Alarms (Contd)

| Alarm     | Description/Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSM ALM   | A minor alarm condition caused by the failure of one ringing generator, positive ringing unit (PRU), ring switch unit (RSU), or ring control unit (RCU); or a blown output fuse (faceplate accessible) on a PRU or RCU; battery shelf fuse failure, rectifier failure, failed or open battery string, battery charger failure. Replace any blown output fuses. If no fuses are blown, replace the failed PRU (if present), ringing generator (FAIL LED lighted), failed RCU (if present) (RMN LED lighted), rectifier (FAIL LED lighted), or battery charger (FAIL LED lighted). If battery charger "OPEN BAT" LED is lighted, check battery shelf fuses and check for failed battery string(s) or failed battery charger. If an RSU is present, measure the AC and DC ringing voltages, -20 Hz (1) and -20 Hz (2), on the RSU. If the AC voltages are not between 90 and 110 volts and the DC voltages are not between -50 and -60 volts, replace the RSU. |
| RING GEN  | A major alarm condition caused by the failure of the main or main & protection ringing generators, PRU, RSU, or RCU; or a blown output fuse (faceplate accessible) on a PRU or RCU. Replace any blown output fuses. If no fuses are blown, replace the failed PRU (if present) or ringing generators (FAIL LED lighted), or replace the failed RCU (if present) (RMJ LED lighted). If an RSU is present, measure the AC and DC ringing voltages, -20 Hz (1) and -20 Hz (2), on the RSU. If the AC voltages are not between 90 and 110 volts and the DC voltages are not between -50 and -60 volts, replace the RSU.                                                                                                                                                                                                                                                                                                                                         |
| RgAB FUSE | The AB fuse on the CFU providing 20-Hz ringing protection to the digroup A and B CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| RgCD FUSE | The CD fuse on the CFU providing 20-Hz ringing protection to the digroup C and D CUs is blown. Replace the fuse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SDU COMP  | An SDU is installed in the white system at the RT. Remove the SDU from the white system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| SDU FAIL  | A failure on the SDU. Replace the SDU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| SIU LAN   | A failure of the LAN localized to the SIU. Replace the SIU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

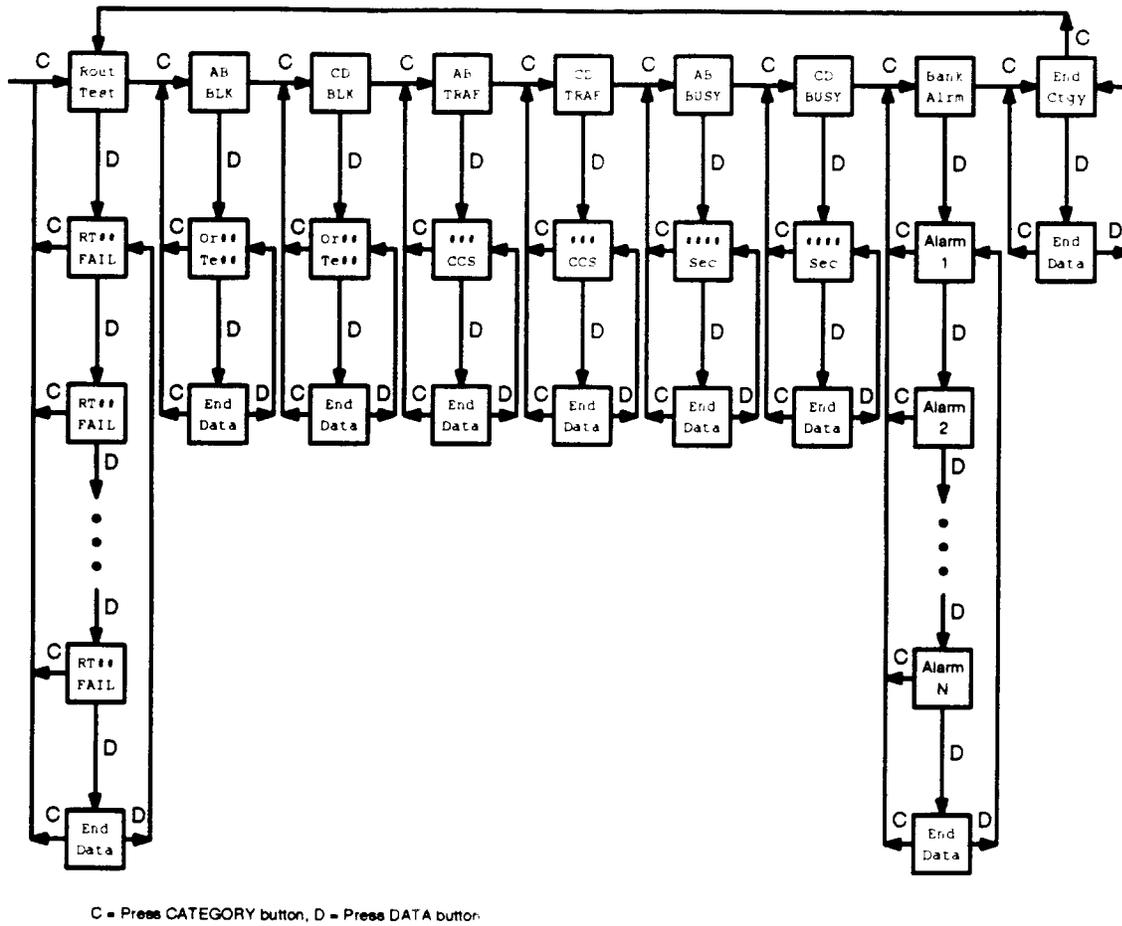
*Continued on next page*

Table 3. AUA8 System Display Unit Alarms (Contd)

| <u>Alarm</u> | <u>Description/Action</u>                                                                                                                                                      |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUPL DLNK    | A failure of the supplemental data link. Check for a mismatch between COT ADU switch S1-7 and RT ADU switch S2-5. Otherwise, replace the TRU, ADU, and BCU in that order.      |
| TEST ALM     | A failure to setup a test through the ACTU at the RT. If an ACTU FAIL message also appears under this category, replace the ACTU. Otherwise, examine the test setup procedure. |
| TRUA COMP    | An incompatible TRU in the AB shelf. Replace the TRU with an AUA111 TRU.                                                                                                       |
| TRUA FAIL    | A failure on the TRU in the AB shelf. Replace the TRU.                                                                                                                         |
| TRUC COMP    | An incompatible TRU in the CD shelf. Replace the TRU with an AUA111 TRU.                                                                                                       |
| TRUC FAIL    | A failure on the TRU in the CD shelf. Replace the TRU.                                                                                                                         |

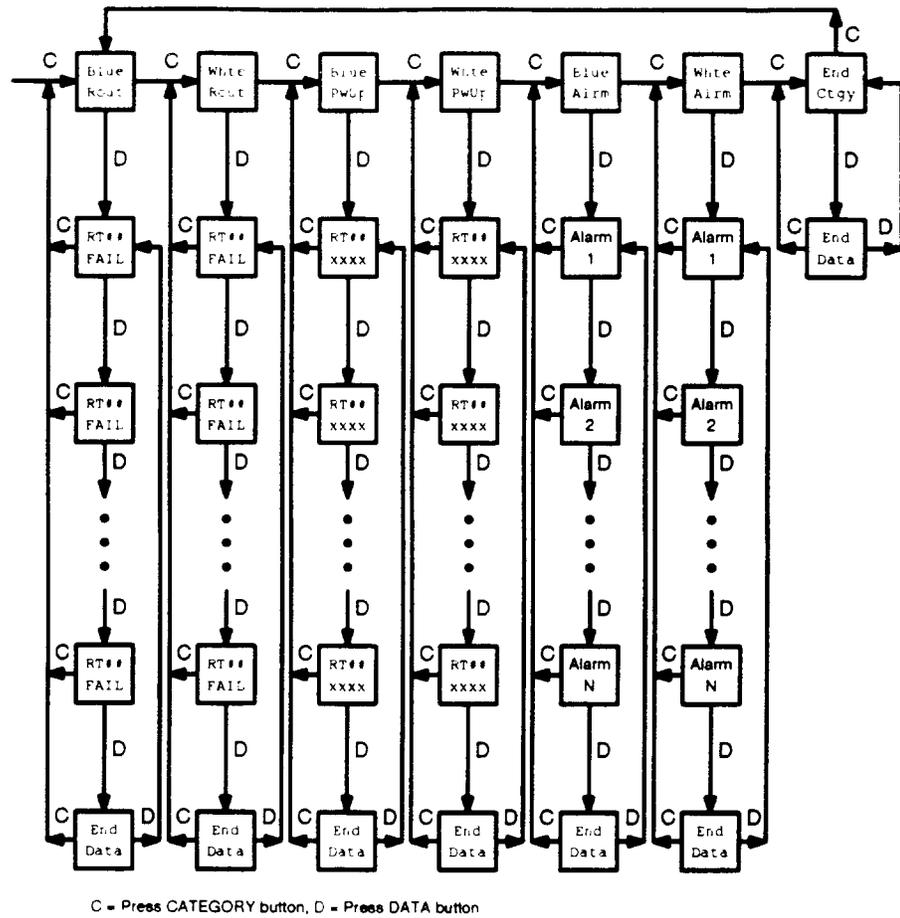
**Abbreviations :**

|                                          |                             |
|------------------------------------------|-----------------------------|
| ACTU — automated channel test unit       | FCU — fan control unit      |
| ADU — alarm display unit                 | FE — far end                |
| AMI — alternate mark inversion           | LAN — local area network    |
| B8ZS — bipolar with 8-zeros substitution | LFU — line fuse unit        |
| BCU — bank control unit                  | LIU — line interface unit   |
| LSU — line switch unit                   | NE — near end               |
| BPV — bipolar violations                 | OI — Operations Interface   |
| CFU — channel fuse unit                  | PCM — pulse code modulation |
| CIU — craft interface unit               | RT — remote terminal        |
| COT — central office terminal            | SDU — system display unit   |
| CTU — channel test unit                  | SIU — site interface unit   |
| CU — channel unit                        | TRU — transmit/receive unit |
| DCU — digital connectivity unit          | ZCS — zero code suppression |



tpa 813888/01

Figure 2. SDU Display Flow at the Central Office Terminal



tpa 813889/01

Figure 3. SDU Display Flow at the Remote Terminal