DACS IV-2000 (512)
Digital Access and Cross-Connect System IV-2000
Release 5.3.1 Volume 1
Operations and Maintenance

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Preface

Purpose

This manual provides procedural information required to support the technician and central maintenance activities involved in the daily operation and maintenance of the DACS IV-2000 (512) Release 5.0. For ease of use, this manual has been divided into two volumes.

Audience

This manual is intended for individuals who are responsible for the acceptance, provisioning, operations, and maintenance of the DACS IV-2000 (512) Release 5.0.

Document Summary

This document is divided into two volumes. Volume 1 contains the first half of this document, up to and including Chapter 13. Volume 2 contains the second half of this document, beginning with Chapter 14. The parts of this document are summarized below:

- **Preface** provides the purpose, the audience, and a summary of this document. It also lists related documents and instructions for ordering the documents.
- **Chapter 1 - Introduction** provides an overview of the DACS IV-2000 and the 2000 family of transmission products.
- **Chapter 2 - Safety Precautions** contains general safety precautions pertaining to the DACS IV-2000.
- **Chapter 3 - Routine Maintenance** contains procedures for performing periodic maintenance of the DACS IV-2000.
- **Chapter 4 - Logging In and Out** contains procedures for logging in and out of the DACS IV-2000 and recovering from a system lock.
- **Chapter 5 - Provisioning Equipment** contains procedures for setting up frame equipment for service (that is, the network element and interface modules and circuit packs).
- **Chapter 6 - Provisioning Facilities** contains procedures for setting up transmission facilities for service (that is, DS1, DS3, EC-1, and VT1.5 facilities).
- **Chapter 7 - Deprovisioning Equipment** contains procedures for removing interface modules and circuit packs from service.
- **Chapter 8 - Frame Administration** contains procedures for booting the system, for database management, and for login administration.
- **Chapter 9 - Link Administration** contains procedures for changing link parameters and speed, and for adding and removing an interface terminal.
- **Chapter 10 - Cross-Connections** contains procedures for making cross-connections.
- **Chapter 11 - Test Access** contains procedures for using the test access capabilities.
- **Chapter 12 - Transport Self-Identification (TRANSID)** contains procedures for using the TRANSID features (that is, DS1 test signal identification [TSID] and DS3 path identification [PID]).
- **Chapter 13 - Loopbacks** contains procedures for creating loopbacks for far-end testing.

- **Chapter 14 - Performance Monitoring** contains procedures for using the DS1, DS3, STS-1, and VT1.5 performance monitoring (PM) features. Performance monitoring is used to detect and report the status of the DS1, DS3, EC-1 (STS-1 signals), and VT1.5 facilities.
- **Chapter 15 - Alarms** contains procedures for clearing critical, major, and minor alarms.
- **Chapter 16 - Diagnostic Messages** contains procedures for addressing diagnostic messages generated by the system.
- **Chapter 17 - Replacing Failed Components** contains procedures for replacing malfunctioning or failed components in the DACS IV-2000.
- **Chapter 18 - Equipping Modules** contains procedures for installing new hardware (for example, equipping a new interface module).
- **Chapter 19 - Upgrading Equipment** contains procedures for changing older versions of system hardware to new versions (for example, MUX2 circuit pack to MUX3 circuit pack).
- **Chapter 20 - Acceptance Testing** contains procedures for tests necessary to verify the proper installation of a DACS IV-2000, or for tests for added interface bays to an existing system.
- **Chapter 21 - Emergency Power Removal/Restoral** contains procedures to remove and restore -48V power from/to the DACS IV-2000 in emergency situations (for example, earthquakes).
- **Appendix A - Alarm, Scan, and Control Points** provides information on alarm, scan, and control (AS&C) points provided with the DACS IV-2000.
- **Glossary** gives definitions of terms used in the DACS IV-2000 documents.
- **Acronyms** gives definitions of acronyms used in this document.
- **Index** gives page locations of information used in this document.

Conventions

This manual uses special fonts in order for you to differentiate among computer input, output, and variables.

- `Constant Width Bold` — indicates input information that is keyed into the DACS IV-2000.
- `Constant Width` — indicates messages output by the DACS IV-2000 or responses to input commands.
- *Italic* — indicates a variable from which you have a choice of values to enter. In addition, this font is used for expected responses during procedural steps.

For command output, only COMMAND mode responses (with the CILINK number parameter in the ED-NE command turned off) are shown (extra lines shown in regular typeface are presented for position-defined parameters).

Related Documents

The following documents provide additional information about the DACS IV-2000:

— *DACS IV-2000 (512) Release 5.0 Reference Manual*, document number AT&T 365-340-900
This document provides in-depth DACS IV-2000 information for network planners and maintenance engineers.

— *DACS IV-2000 (512) Release 5.0 Commands and Messages*, document number AT&T 365-340-902
This manual gives a description of each command and its associated output response messages, including error codes. Also, each system-generated autonomous message is described. The appendices include command names, parameters, error codes, state modifier acronym tables, activity menus, user privilege codes, state names, and state diagrams.

— *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids*, document number AT&T 365-340-903
These aids, produced on laminated sheets, contain command names, error codes, fuse locations, test access, port addressing, loopbacks, and monitored parameter default and range values.

— *DACS IV-2000 (512) Release 5.0 Applications, Planning, and Ordering*, document number AT&T 365-340-904
This guide is designed for network planners, account representatives, account executives, and engineers. It contains descriptions of the DACS IV-2000 features, applications, and ordering information.

— *DACS IV-2000 (512) Release 5.0 Software Release Description*, document number AT&T 365-340-905
This document contains upgrade procedures for the new software release, status of problems fixed in previous releases, and operating issues for the specified software release. This document is not orderable as a stand-alone item; it accompanies the software release only.

Electronic Documentation

AT&T DACS IV-2000 customer documentation is available on CD-ROM. Consult your AT&T account executive for details.

Ordering Documents

To order copies of documents available for this release, send or call in an order using the title and its associated 9-digit document number as provided above:

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  AT&T
  Customer Information Center
  Attention: Order Entry Section
  2855 N. Franklin Road
  P. O. Box 19901
  Indianapolis, IN 46219

- To order by telephone (Monday through Friday):

  United States: 1-800-432-6600 (7:30 a.m. to 6:30 p.m. EST)

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Introduction

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Introduction

1

The DACS IV-2000 (512) Release 5.0 is a software-based, high-capacity, digital cross-connect system that merges cross-connect and multiplexer functions. It helps manage DS1, DS3, and EC-1[1] facilities more efficiently by automating network route restoration, remote service and facility provisioning, and remote surveillance and test access. Its software-controlled cross-connect facility allows centralization and automation of operation, administration, maintenance, and provisioning functions.

The DACS IV-2000 terminates DS1, DS3, and STS-1 signals and cross-connects DS1, DS3, STS-1, and VT1.5 signals from transmission facilities or from DS1, DS3, and/or STS-1 based network elements. All cross-connections occur at the 1.728 Mbits/s signal level. In the case of an STS-1 clear-channel Synchronous Payload Envelope (cc-SPE) signal or DS3cc signal, a group of 30 1.728-Mb/s signals is used. The DACS IV-2000 cross-connects:

- each DS3 signal as a clear-channel DS3 signal, or demultiplexes the DS3 signal into 28 DS1 signals to access the switch network.
- each STS-1 signal as a clear-channel STS-1 signal, to a DS3 as a gateway, or demultiplexes the STS-1 signal into 28 VT1.5 tributaries, which can be cross-connected as VT1.5 or DS1 signals.

1. Electrical Carrier-1 (EC-1) is the industry standard nomenclature for an electrical STS-1 signal.

The system architecture supports a wide range of termination mixes. The number of ports allocated to DS1, DS3, or EC-1 terminations depends on the particular application. The extreme cases are when all of the ports are allocated for STS-1 signals (480 STS-1s), DS3 signals (496 DS3s)[1], or for DS1 signals (13,888 DS1s).

The DACS IV-2000 accommodates synchronous optical network (SONET) STS-1 interface signals to support SONET -to-SONET cross-connections and provides a gateway between asynchronous and SONET networks.

The equipment architecture reduces start-up configuration costs, increases modular growth capability, and allows for reduced floor space. These benefits allow the DACS IV-2000 (512) to be deployed economically in any size office.

2000 Product Family

AT&T is focused on a carefully planned and growing product family designed to provide total network solutions. The 2000 Product Family complies with the SONET standard and builds on items that customers have found necessary to build an efficient and successful network. It includes single-ended maintenance features and in-service upgrade capabilities. The system's modular design allows graceful in-service upgrades to accommodate both synchronous and asynchronous network communications.

The AT&T 2000 product family includes:

- FT-2000 OC-48 Lightwave System — a high-capacity, synchronous digital transmission system.
- DDM-2000 OC-3/OC-12 Multiplexer — a low-capacity, synchronous digital transmission system. The DDM-2000 OC-3/OC-12 multiplexer is designed for loop feeder or interoffice applications.
- DACS III-2000 Cross-Connect System — a software-based, high-capacity, digital cross-connect system that automates many functions performed by manual DSX-3 cross-connect frames.
- DACS IV-2000 (256) Cross-Connect System — a software-based, high-capacity, digital cross-connect system that merges cross-connect and multiplexer functions. It provides interfaces at the STS-1/DS3/DS1 signal rates and cross-connects at the STS-1/VT1.5/DS1/DS3 signal levels.

1. The number 496 is based on the use of DS3 Interface Bays. The DS3 Interface Bays have been rated Discontinued Availability.

- DACS IV-2000 (512) Cross-Connect System — a software-based, high-capacity, digital cross-connect system that merges cross-connect and multiplexer functions. It provides interfaces at the STS-1/DS3/DS1 signal rates and cross-connects at the STS-1/VT1.5/DS1/DS3 signal levels, and has twice the capacity of the (256) system.
- DACScan®-2000 Controller — a workstation that automates control over diversely located network elements, such as the DACS III-2000 and DACS IV-2000 cross-connect systems.
- SLC®-2000 Access System — a system that supports standard switch interfaces such as TR08 and TR303, as well as standard feeder interfaces at DS1 and SONET OC-3 rates.
- Business Remote Terminal-2000 (BRT-2000) — a terminal that provides access for businesses through sophisticated fiber-optic telecommunications equipment.

DACS IV-2000 Features

New and enhanced features associated with Release 5.0 of the DACS IV-2000 (512) system are:

- In-Service Capacity Expansion of DACS IV-2000 (256) System
- Optical Remoting of Interface Bay Complexes
- DS3 Clear-Channel Cross-Connection
- DS3 Path Identification for the AT&T Transport Self-Identification Plan
- DS3 to STS-1 Gateway Cross-Connection
- Full-Time Performance Monitoring of DS1 tributaries Within DS3 Signals Without Loss of Capacity
- Unframed DS3 Signals
- DS3 Terminal Loopback
- DS3 Test Access
- Identification of VT1.5 or DS1 tributaries Within STS-1 Signals
- Synchronizer Enhancements.

Refer to Chapter 2 of the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) for information on the new and enhanced features.

In addition, this release supports all features offered with previous releases of the DACS IV-2000:

- SONET Networking Capability
  - — SONET STS-1 Interface
  - — Enhanced Cross-connection
  - — Enhanced Bridging and Rolling
  - — Enhanced Loopback
  - — Enhanced Test Access
  - — SONET Performance Monitoring
  - — SONET Synchronization
- Cross-Connections
  - — DS1 Cross-Connections
  - — DS3 Cross-Connections
  - — STS-1 Cross-Connections
  - — VT1.5 Cross-Connections
- Bridging and Rolling
- Loopbacks
  - — DS1 Loopbacks
  - — DS3 Loopbacks
  - — STS-1 Loopbacks
  - — VT1.5 Loopbacks
- Test Access
  - — DS1 Test Access
  - — DS3 Test Access
  - — STS-1 Test Access
  - — VT1.5 Test Access
- Performance Monitoring
  - — DS1 Performance Monitoring
  - — DS3 Performance Monitoring
  - — STS-1Performance Monitoring
  - — VT1.5 Performance Monitoring

- Main Controller Redundancy
  - Administrative Links
  - Dual Disk Capability
  - Optical Disk Drive for Secondary Storage and Database Backup
- Alarm Reporting
  - Office Alarms
  - Remote Alarms
  - Circuit Pack Alarms
  - Multiple Alarm Processing
- Communications and OS Interfaces
  - Security
  - Security Audit
  - Message Screening
  - User Priority Levels
  - Command Verification
  - X.25 Packet Assembler/Disassembler (PAD)
  - X.25 Clear-To-Send Detection
- Facility Maintenance
  - Application of Special Signals
  - Facility Failure Detection
  - AIS, Idle, and Out-of-Frame Signals
  - Supply of DS1 Signal Pattern
  - DS1 Input Port Status
  - Retrieval of Port Information
  - Automated Facility Turnup Test
  - Remote Multiplex Communications
  - DS1 Test Signal Generator/Receiver
- Frame Maintenance
  - Fault Isolation and Reporting
  - Automatic Circuit Pack Restoral
  - Fan Filter Replacement Indication

- Protection Switching
  - — Protection Groups
  - — Switch Protection Group
  - — Mapping Functions
  - — Automatic Protection Switching and Traffic
  - — Manual Protection Switching
- Architectural Flexibility
- Nonvolatile Backup Memory
- Support for Operations Systems
  - — Bellcore Operations Systems
  - — AT&T Operations Systems
  - — Autolocking
- BNC Connectors.

Refer to Chapter 2 of the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) for detailed information on system features.

Software Architecture

The DACS IV-2000 control architecture (Figure 1-1) is a distributed multiprocessor design that supports concurrent execution and performs real-time operations. The architecture consists of the following systems:

- High-Capacity Controller System
  - — Duplicated Control Complexes (CPU/MTC/SCI/SSC/UI circuit packs)
  - — Enhanced Communications Interface (ECI)
  - — Synchronizer Module
- Unit Controller System
  - — Unit Controllers
  - — Interface Circuit Packs
  - — DS3 Performance Monitoring (DS3PM) over a TABS interface (optional)

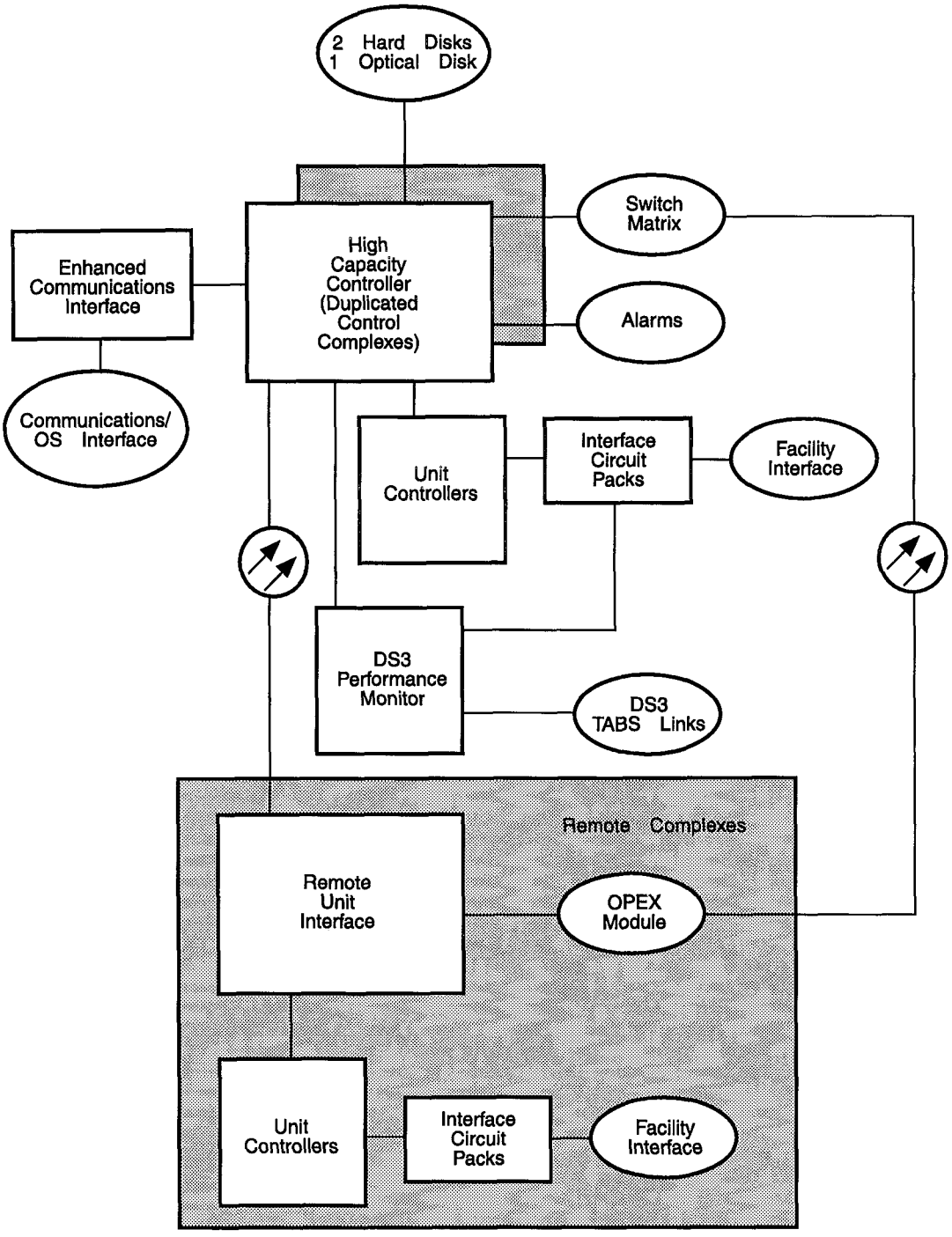


Figure 1-1. **System Software Architecture**

- Remote Unit Interface System (Remote Complexes Only)
  - — Remote Unit Interface (UIA/UIB/SCI/CLKGN circuit packs)
  - — Optical Extension to/from the HCC and Switch Matrix
  - — Remote Communications Interface (RCI) to the ECI

High-Capacity Controller System

The central component of the high-capacity controller system is the duplicated controller complex (CC). The CC:

- Runs application software to perform all system administration functions including cross-connection, provisioning, test access, and synchronization for the SONET interfaces
- Serves as the central point of coordination for all system maintenance functions such as diagnostics, fault recovery, and alarms
- Performs all database management functions for the system, with the secondary storage controller providing the interface between the main processor and the nonvolatile storage devices (disk and optical drives).

The Enhanced Communications Interface (ECI) supports the user interface to the duplicated control complex. The ECI:

- Parses commands and generates messages to support the system interface languages: TL1 (Transaction Language 1) and TABS (Telemetry Asynchronous Block Serial)
- Provides the physical and electrical interfaces supporting synchronous (X.25) and asynchronous (Snider, telemetry) protocols.

The two ECI circuit packs are equipped to provide redundancy or to provide additional communication links.

The DACS IV-2000 Release 5.0 contains a Synchronizer Module which accepts two external DS1 timing references. In the event of a timing reference failure, the synchronizer automatically switches to the secondary reference. If both references fail, the synchronizer operates in a stratum 3 holdover mode. The synchronizer is fully protected; if one synchronizer side fails, the system switches to the other side.

Unit Controller System

The unit controllers (UCs) maintain the DACS IV-2000 high-capacity controller system facility interfaces. The UCs support the high-capacity controller by:

- Providing communications with the interface circuit packs
- Performing real-time maintenance functions such as hardware fault detection

Individual controllers on some of the enhanced interface circuit packs provide expanded real-time capabilities for features such as enhanced DS1, DS3, and SONET performance monitoring.

The DS3PM circuit pack supports the TABS interface to the DS3 performance data.

NOTE:
The DS3PM circuit pack is not required unless you are using TABS interface language. The DS3PM circuit pack is supported in collocated interface bays but not in Remote Complex interface bays.

Remote Unit Interface System

The Remote Unit Interface (RUI) system provides the following functions:

- Optical Unit Interface (OUI) circuit packs, which replace the UI circuit packs in the HCC Module, provide LAN distribution functions for the (512) Switch Complex and also provide optical interface (for control) to the Remote Complexes.
- The UIA and UIB circuit packs provide LAN hubbing functions from the OUI circuit packs to the Remote Unit Interface.
- RCI provides RS232-to-RS422 conversion for CILINKs to the Remote Complex.
- Optical Extension (OPEX) circuit packs optically connect the Remote Complex interface modules to the Switch Complex Optical SWIO (OSWIO) circuit packs (OSWIO circuit packs replace the SWIO circuit packs).

Hardware

The DACS IV-2000 hardware consists of an arrangement of a Switch Complex, collocated interface bays and/or Remote Complexes. The Switch Complex contains one Main Controller Bay and two Switch Bays. Up to sixteen interface bays (with up to four Fuse and Alarm Bays) can be collocated with the Switch Complex. A Remote Complex can be used in place of collocated interface bays and consist of an Optical Extension Bay and up to eight interface bays. All Switch Complex and enhanced interface bay types use the seismic bay framework. For detailed information on the hardware, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Bays

The bay types are:

- Main Controller (MC) Bay — provides the control for the system. This bay contains a fan assembly to provide cooling of the associated equipment.
- Switch (SW) Bay — provides the cross-connections and interbay cabling. This bay contains a fan assembly to provide cooling of the associated equipment.
- Fuse and Alarm (FS & ALM) Bay — provides fuses for up to four collocated interface bays.
- Optical Extension (OPEX) Bay — provides the interface for extending the N-rate signals from the interface bays of a DACS IV-2000 Remote Complex onto fiber-optic cables to the SWIO Modules of the Switch Complex. The controller functions are also extended from the High-Capacity Controller (HCC) to the Remote Complex by fiber optic cables.
- DS1 Interface (INTFC) Bay — provides the interface for up to 868 DS1 signals (equivalent to 31 DS3 signals). Air baffles are provided for equipment cooling.
- Enhanced DS1 Interface (INTFC) Bay — provides the interface for up to 868 DS1 signals (equivalent to 31 DS3 signals). This bay contains a fan assembly to provide equipment cooling and also provides additional space for cable routing.
- DS3 Interface (INTFC) Bay — provides the interface for up to 62 DS3 signals (equivalent to 1736 DS1 signals). Air baffles are provided for equipment cooling.

NOTE:
The DS3 Interface Bay has been rated Discontinued Availability.

- STS1/DS3 Interface (INTFC) Bay — provides the interface for up to 60 DS3 or STS-1 signals (each DS3 is equivalent to 28 DS1 signals). This bay contains a fan assembly to provide equipment cooling.
- Enhanced STS1/DS3 Interface (INTFC) Bay — provides the interface for up to 60 DS3 or STS-1signals (each DS3 is equivalent to 28 DS1 signals). This bay contains a fan assembly to provide equipment cooling and also provides additional space for cable routing.
- STS1/DS3/DS1 Interface (INTFC) Bay — provides the interface for:
  - — Up to 420 DS1 signals (equivalent to 15 DS3 signals) and
  - — Up to 46 DS3 signals (equivalent to 1288 DS1 signals) and no STS-1 signals, up to 31 DS3 signals (equivalent to 868 DS1 signals) and 15 STS-1 signals, or up to 30 STS-1 signals and no DS3 signals.

  Air baffles are provided for equipment cooling.
- Enhanced STS1/DS3/DS1 Interface (INTFC) Bay — provides the interface for:
  - — Up to 420 DS1 signals (equivalent to 15 DS3 signals) and
  - — Up to 46 DS3 signals (equivalent to 1288 DS1 signals) and no STS-1 signals, up to 31 DS3 signals (equivalent to 868 DS1 signals) and 15 STS-1 signals, or up to 30 STS-1 signals and no DS3 signals.

  This bay contains a fan assembly to provide equipment cooling and also provides additional space for cable routing.

Table 1-1 identifies the different types of bays and their associated modules.

Table 1-1. **System Bays and Associated Modules**

Bay	Module		Modules Per Bay
Main Controller (MC)	Switch Power (SW PWR)	3	
	Status Panel	1	
	High-Capacity Controller (HCC)	1	
	Memory Storage (MEM)	1	
	Synchronizer (SYNC)	1	2
	Fan Assembly	1	
Switch (SW)	Switch Input/Output (SWIO)	2	1
	Switch Center Stage (SWCS)	1	
	Fuse and Alarm (FS & ALM) Panel	1	
	Fan Assembly	1	
Optical Extension (OPEX)	Optical Extension (OPEX)	1	
	Optical Extension Power (OPEX PWR)	1	
	Auxiliary Power (AUX PWR)	1	
	Remote Unit Interface (RUI)	1	
	Remote Unit Interface Power (RUI PWR)	1	
	Fuse and Alarm (FS & ALM) Panel	1	
	Fan Assembly	1	
Fuse and Alarm (FS & ALM)	Fuse and Alarm Panel	1	
DS1 Interface (DS1 INTFC)	DS1 Interface (INTFC)	3	
	DS1 Interface-Protection (INTFC-P)	1	
Enhanced DS1 Interface (ENH DS1 INTFC)	DS1 Interface (INTFC)	3	
	DS1 Interface-Protection (INTFC-P)	1	
	Fan Assembly	1	
DS3 Interface (DS3 INTFC)	DS3 Interface-32 (INTFC)	2	7
	BNC Panel	1	
STS1/DS3 Interface (STS1/DS3 INTFC)	DS3 Interface-16 (INTFC-16)	0 to 4	6
	Enhanced DS3 Interface-16 (ENH DS3-16)	0 to 4	3, 6
	DS3 Clear-Channel (DS3CC INTFC-16)	0 to 4	3, 6
	STS1 Interface-16 (INTFC-16)	0 to 4	6
	BNC Panel	1	
	Fan Assembly	1	

See notes at end of table.

Table continued on next page.

Table 1-1. System Bays and Associated Modules (Continued)

Bay	Module		Modules Per Bay
Enhanced STS1/DS3 Interface (ENH STS1/DS3 INTFC)	DS3 Interface-16 (INTFC-16);	0 to 4	6
	Enhanced DS3 Interface-16 (ENH DS3-16)	0 to 4	3, 6
	DS3 Clear-Channel (DS3CC INTFC-16)	0 to 4	3, 6
	STS1 Interface-16 (INTFC-16)	0 to 4	6
	BNC Panel	1	
	Fan Assembly	1	
STS1/DS3/DS1 Interface (STS1/DS3/DS1 INTFC)	DS1 Interface (INTFC)	1	
	DS1 Interface-Protection (INTFC-P)	1	
	DS3 Interface-32 (INTFC-32)	0 or 1	3, 4, 5
	DS3 Interface-16 (INTFC-16)	0 or 1	3, 4,5, 6
	Enhanced DS3 Interface-16 (ENH DS3-16)	0 to 2	3, 4, 5, 6
	DS3 Clear-Channel (DS3CC INTFC-16)	0 to 2	3, 4, 5, 6
	STS1 Interface-16 (INTFC-16)	0 to 2	4, 5
	BNC Panel	1	
	Fan Assembly	1	
Enhanced STS1/DS3/ DS1 Interface (ENH STS1/DS3/DS1 INTFC)	DS1 Interface (INTFC)	1	
	DS1 Interface-Protection (INTFC-P)	1	
	DS3 Interface-32 (INTFC-32)	0 or 1	4, 5
	DS3 Interface-16 (INTFC-16)	0 or 1	4, 6
	Enhanced DS3 Interface-16 (ENH DS3-16);	0 to 2	3, 4, 5,6
	DS3 Clear-Channel (DS3CC INTFC-16);	0 to 2	3, 4, 5, 6
	STS1 Interface-16 (INTFC-16)	0 to 2	4, 5, 6
	BNC Panel	1	
	Fan Assembly	1	

Notes

1. SWIO Modules can contain either SWIO or OSWIO circuit packs: SWIO for collocated interfaces, OSWIO for remote interfaces. You cannot mix circuit pack types within a Switch Bay.
2. The SYNC Module for new systems contains version 2 circuit packs. Existing systems can use either version 1 or version 2 circuit packs.
3. The DS3 Interface-32 Module, DS3 Interface-16 Module, Enhanced DS3 Interface-16, and DS3CC Interface-16 can be referred to generically as DS3 Interface Modules.
4. The total number of DS3 and STS1 Interface Modules in an STS1/DS3/DS1 Interface Bay may not exceed two.
5. STS1/DS3/DS1 and ENH STS1/DS3/DS1 Interface Bays can be equipped with an STS1 Interface-16 Module, Enhanced DS3 Interface-16, or DS3CC Interface-16 in place of the DS3 Interface-32 Module. When used this way, the DACS IV-2000 capacity is decreased by 15 DS3-equivalent signals.
6. The STS1/DS3 Interface-16 shelves can be equipped with DS3 Interfaces, Enhanced DS3 Interface-16, DS3CC Interface-16, or STS-1 Interface-16 Modules. STS1/DS3 Interface Bays can be equipped with any combination of DS3 Interface-16, Enhanced DS3 Interface-16, DS3CC Interface-16, or STS1 Interface-16 Modules totaling four.
7. The DS3 Interface Bay has been rated Discontinued Availability. The DS3 Interface-32 Module is still available on the STS1/DS3/DS1 Interface Bay. The existing DS3 Interface Bays are still supported.

Interface Module (Unit) Numbering

In this section we describe the unit numbering conventions for collocated and remote interface modules. To provide a standard numbering convention for the DACS IV-2000, the complete bay lineup for the system is considered.

Collocated Interface Bays

Figure 1-2 shows a 23-bay arrangement with each interface bay having four units (shelf positions). The numbering scheme assigns fixed unit numbers to the 64 possible shelf positions in a complete system. The type of module in a shelf position depends on the bay type. For example, an initial six-bay configuration of an STS1/DS3/DS1 Interface Bay, two Switch Bays, a Main Controller Bay, and two Fuse and Alarm Bays has four units. From bottom to top, these units are numbered 29 through 32. For DS3 Interface Bays, shelf positions 1 and 4 remain empty with no unit labels. For example, if an initial arrangement consists of a DS3 Interface Bay, the equipped shelves are units 30 and 31, while the unequipped shelves do not have unit labels.

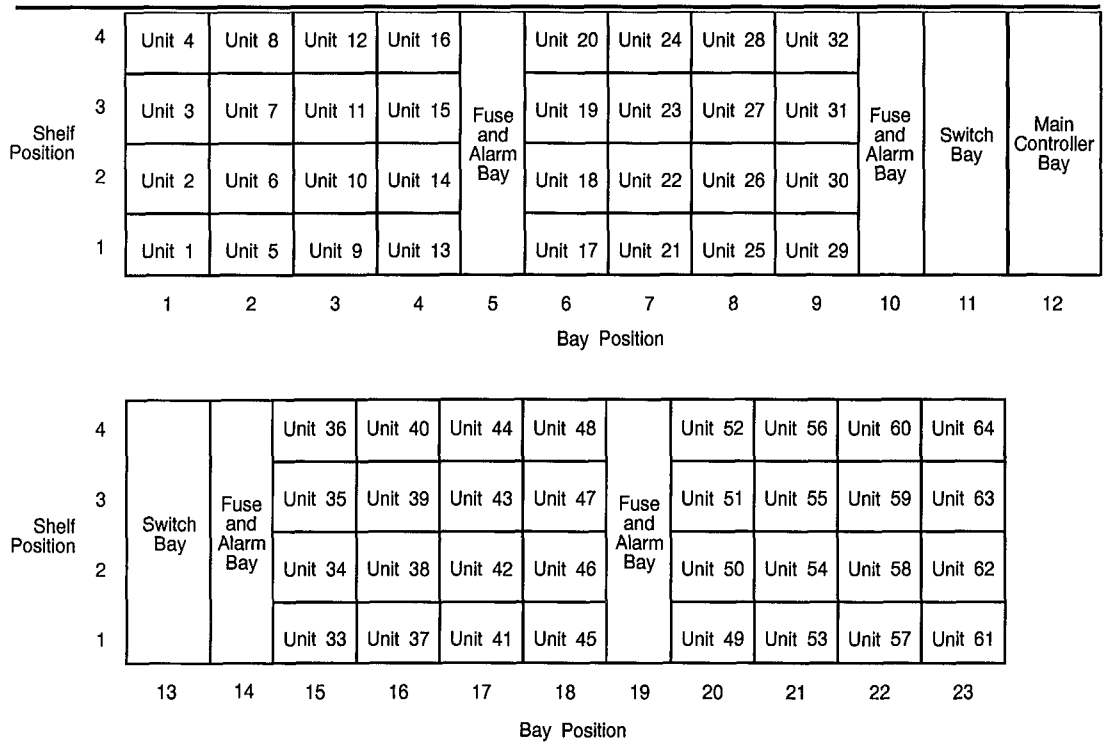


Figure 1-2. **Recommended Interface Module (Unit) Numbering (Collocated Interface Bays)**

One Remote Complex

Figure 1-3 shows the bay arrangement with one Remote Complex, the Switch Complex, and its associated collocated interface bays. Each interface bay has four units (shelf positions). The numbering scheme assigns fixed unit numbers to the 64 possible shelf positions in a complete system. The type of module in a shelf position depends on the bay type. Note that the unit numbering begins on the Remote Complex, units 1-32. The unit numbering scheme continues with unit 33 being the first interface module collocated with the Switch Complex.

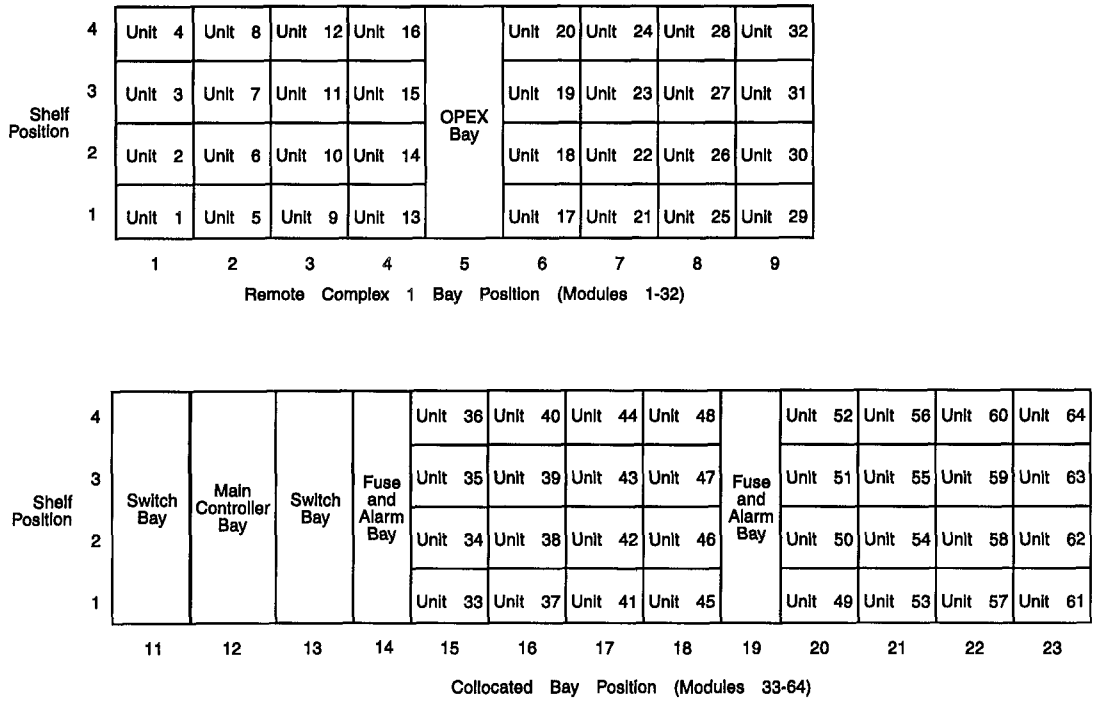


Figure 1-3. **Recommended Interface Module (Unit) Numbering (One Remote Complex)**

Two Remote Complexes

Figure 1-4 shows the unit numbering scheme if you have a system with two Remote Complexes associated with the Switch Complex. The first remote complex (RX-1) contains units 1-32; the second Remote Complex (RX-2) contains units numbered 33-64.

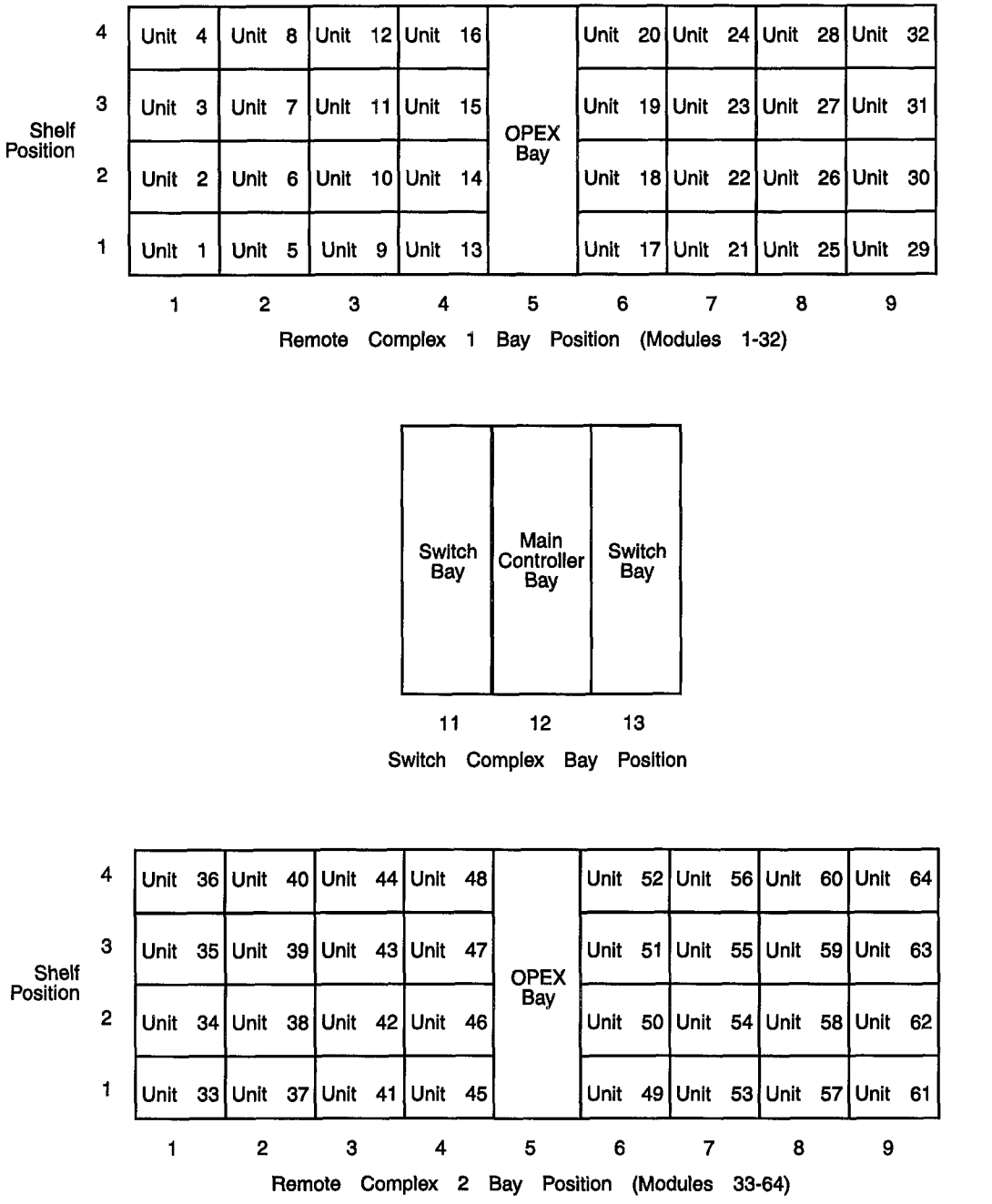


Figure 1-4. **Recommended Interface Module (Unit) Numbering (Two Remote Complexes)**

Circuit Pack Numbering

The numbering convention used in a central office environment generally differs from the numbering convention used for the DACS IV-2000. The DACS IV-2000 facility numbering convention uses DS3 or STS-1 equivalents that correspond to a Multiplexer (MUX) circuit pack supporting one DS3, a SONET Multiplexer (SMUX) circuit pack supporting one STS-1, or a Switch Interface (SWIF) circuit pack supporting 28 DS1s. If the other end of a facility connected to the DACS IV-2000 connects to a DSX-3 or a DSX-1, it is difficult to reconcile the numbering conventions. The numbering convention uses the slot number in the interface module to designate a DS3, STS1, or a DS1. Table 1-2 shows the valid slot numbers in the DACS IV-2000 frame.

Table 1-2. **Valid Slot Number Conventions**

Interface Module Type	Slot Number
STS1 Interface-16	1-15
DS3 Interface-32	1-31
DS3 Interface-16	1-15
Enhanced DS3 Interface-16	1-15
DS3 Clear-Channel Interface-16	1-15
DS1 Interface	1A,1B-8A,8B
DS1 Interface-Protection	1A,1B-7A,7B

Each slot in a DS3 Interface-32, DS3 Interface-16, or STS1 Interface-16 Module corresponds to one MUX/SMUX circuit pack. Each MUX/SMUX circuit pack allows for addressing of 28 DS1/VT1.5 signals within a DS3/STS-1 signal. For example, a DS3 facility terminating in a DS3 Interface Module located in unit 31 on the MUX circuit pack in slot 14 is numbered 31-14. The associated DS1 signals are numbered 31-14-1 through 31-14-28.

To form a DS3 equivalent (identified by the slot number), two DS1IF circuit packs are required. Each DS1IF is associated with 14 DS1 ports. Therefore, one of the DS1IF circuit packs is identified by an A appended to the slot number (addresses ports 1 through 14 of the equivalent DS3) and the other by a B appended to the slot number (addresses ports 15 through 28 of the equivalent DS3). For example, a DS1 facility terminating in a DS1 Interface Module located in unit 24 at slot 8B on port 20 of the DS1IF circuit pack is numbered 24-8-20.

In contrast to the above, a typical DSX numbering convention uses SRV (Service) to designate a DS3 group (28 DS1 signals) and CRT (Circuit) to designate individual DS1 signals within the group.

Bay Mounting

The DACS IV-2000 Main Controller, Switch, and Interface Bays are each 2-feet, 2-inches wide, 7-feet high, and 12-inches deep.

- For a Switch Bay equipped with OSWIO circuit packs, bay-front-mounted fiber organizers are required; the nominal depth of a Switch Bay with optical fiber connections is 13 inches.
- The nominal depth of the EMC-enclosed Switch Bay with optical fiber connections is 14 inches.

The Main Controller, Switch Bay, and Enhanced Interface Bays use the seismic network bay framework. Equipment shelves mounted on these bays are factory installed. The only expansion that occurs is for additional circuit packs or growth bays.

The Optical Extension (OPEX) Bay is 7 feet high, and 2 feet, 2 inches wide. An OPEX Bay without an EMC enclosure is 14 inches deep. An OPEX Bay equipped with the optional EMC enclosure is 15 inches deep.

The Main Controller, Switch, OPEX, Enhanced DS1 Interface, STS1/DS3 Interface and Enhanced STS1/DS3/DS1 Interface Bays have forced-air cooling while the DS1 Interface, DS3 Interface, and STS1/DS3/DS1 Interface Bays are cooled by free convection. Bays equipped with a fan assembly take in air near the floor and exhaust it out the top rear of the bay.

Unequipped circuit pack slots are not permitted and must either contain a circuit pack or be covered with filler assemblies so that cooling air does not escape, but is directed upward through the bay. On bays without a fan assembly, heat baffles are used between the shelves on the interface bays to direct rising heat away from the circuit packs, located above. The initial configuration for:

- collocated systems consists of a Main Controller Bay, two Switch Bays, two Fuse and Alarm Bays, one interface bay, and two Cable Storage Bays. This initial configuration is 10 feet, 10 inches wide.
- one Remote Complex consists of a single DACS IV-2000 (256) frame that may have been in service and capacity-expanded to a DACS IV-2000 (512) frame. Any facilities that were intertied between the (256) and (512) systems are now available for additional capacity.
- two Remote Complexes consists of two DACS IV-2000 (256) frames and a DACS IV-2000 (512) Switch Complex. Either or both Remote Complexes may have been capacity-expanded to the (512) system.

The Cable Storage Bays, located at each end of a collocated lineup, are used to store and protect the cables until they are needed. All bays are bolted to the floor

during installation. The interface bay required for the initial configuration is shipped separately.

Interbay Cabling Arrangements

There are three types of interbay cables: N-rate, Control, and Fiber Optic cables.

- N-rate cables carry N-rate signals between the SWIO/OPEX Modules in the Switch/OPEX Bays and the interface modules in the interface bays.
- Control cables connect the unit controller (UC) circuit packs in the interface modules to the SWIO circuit packs in the Switch Bays.
- Fiber optic cables extend the N-rate and controller functions from the Switch Complex to its associated Remote Complexes.

N-rate Cables for Collocated Interface Bays

In a fully equipped frame, N-rate cables carry 4,096 N-rate signals between interface modules and the Switch Bays (1,024 service signals and 1,024 protection signals in each direction). A total of 512 cables is used for this purpose.

These cables are divided into 32 groups designated by letters running from AA through AS and BA through BS, omitting I, O, and Q. (In Remote Complexes the old labelling scheme is altered in the software to map into the (512) labelling scheme.) Each of the 32 groups contains 16 cables. Those in the AA group are labelled J1-AA, J2-AA, ..., J16-AA, for example. J1-AA through J8-AA serve SWIO-1-1, and J9-AA through J16-AA serve SWIO-1-2 (SWIO-1-1's mate circuit pack). Cables J1-AB through J16-AB serve SWIO-1-3 and SWIO-1-4, and so on to J1-BS through J16-BS which serve SWIO-4-15 and SWIO-4-16. Table 1-3 shows the N-rate cable group that serves each SWIO circuit pack.

Each N-rate cable carries eight data and two timing signals, either service or protection, to or from each of four MUX, four SMUX, or four SWIF circuit packs (eight 2-wire pairs) and two 2-wire pairs to carry a clock/synchronizing signal resulting in a total of ten 2-wire pairs per cable.

N-rate Cable groups labelled with the letter A connect to interface modules on the left side of the Switch Complex and N-rate Cable groups labelled with the letter B connect to interface modules on the right side of the Switch Complex as seen from the front of the frame. A DS3 Interface-32 Module requires two N-rate cable groups; a DS3 Interface-16 Module or STS1 Interface-16 requires one N-rate cable group; and two DS1 Interface Modules share an N-rate cable group. N-rate cable group AA connects to the lowest module on the interface bay (Bay 9) closest to the Switch Complex, and the other N-rate cable groups run alphabetically upward and outward from the Switch Complex. N-rate cable groups

labelled BA serve the interface bays on the right side of the Switch Complex in a similar fashion.

Table 1-3. **SWIO N-Rate Cable Connections (Collocated Interface Bays)**

N-rate Cable Group	SWIO Circuit Packs		N-rate Cable Group	SWIO Circuit Packs	
	Cables J1-An — J8-An	Cables J9-An — J16-An		Cables J1-Bn — J8-Bn	Cables J9-Bn — J16-Bn
AA	1-1	1-2	BA	3-1	3-2
AB	1-3	1-4	BB	3-3	3-4
AC	1-5	1-6	BC	3-5	3-6
AD	1-7	1-8	BD	3-7	3-8
AE	1-9	1-10	BE	3-9	3-10
AF	1-11	1-12	BF	3-11	3-12
AG	1-13	1-14	BG	3-13	3-14
AH	1-15	1-16	BH	3-15	3-16
AJ	2-1	2-2	BJ	4-1	4-2
AK	2-3	2-4	BK	4-3	4-4
AL	2-5	2-6	BL	4-5	4-6
AM	2-7	2-8	BM	4-7	4-8
AN	2-9	2-10	BN	4-9	4-10
AP	2-11	2-12	BP	4-11	4-12
AR	2-13	2-14	BR	4-13	4-14
AS	2-15	2-16	BS	4-15	4-16

N-rate Cables for Remote Complex Interface Bays

In a fully-equipped Remote Complex Interface Bay, cables must carry 2048 N-rate signals between interface modules and the OPEX Bay (512 service signals and 512 protection signals in each direction for a total of 2048).

A total of 256 cables is used for this purpose. These cables are divided into 16 groups and designated by letters running from A through T, omitting I, O, Q, and S. Table 1-4 shows mappings of N-rate cable groups (A-T) that serve 256 frames to each Remote Complex (AA-AS and BA-BS) through the OPEX circuit packs. These mappings show how the Remote Complex equipment is addressed by the Switch Complex.

Each of the 16 groups contains 16 cables. These cables are labelled A through T, for example. J1-A through J8-A serve OPEX-{1,3}-1, and J9-A through J16-A serve OPEX-{1,3}-2 (OPEX-{1,3}-1 circuit pack's mate). Table 1-4 contains the N-rate cable group that serves each OPEX circuit pack.

Table 1-4. (256) Frame to Remote Complex N-Rate/SWIO Mappings

N-Rate Cable Group			SWIO/OSWIO/OPEX Assignment		
256 Frame	Remote Complex 1	Remote Complex 2	256 Frame (SWIO)	Remote Complex1 (OSWIO/ OPEX)	Remote Complex2 (OSWIO/ OPEX)
A	AA	BA	1/2	1-1/1-2	3-1/3-2
B	AB	BB	3/4	1-3/1-4	3-3/3-4
C	AC	BC	5/6	1-5/1-6	3-5/3-6
D	AD	BD	7/8	1-7/1-8	3-7/3-8
E	AE	BE	9/10	1-9/1-10	3-9/3-10
F	AF	BF	11/12	1-11/1-12	3-11/3-12
G	AG	BG	13/14	1-13/1-14	3-13/3-14
H	AH	BH	15/16	1-15/1-16	3-15/3-16
J	AJ	BJ	17/18	2-1/2-2	4-1/4-2
K	AK	BK	19/20	2-3/2-4	4-3/4-4
L	AL	BL	21/22	2-5/2-6	4-5/4-6
M	AM	BM	23/24	2-7/2-8	4-7/4-8
N	AN	BN	25/26	2-9/2-10	4-9/4-10
P'	AP	BP	27/28	2-11/2-12	4-11/4-12
R'	AR	BR	29/30	2-13/2-14	4-13/4-14
T	AS	BS	31/32	2-15/2-16	4-15/4-16

Since 2048 N-rate signals are handled, each of the 256 cables must carry eight N-rate signals. Each cable also contains two-wire pairs to carry a clock/ synchronizing signal so that each cable contains 20 wires. Any given cable serves four SWIF, four MUX, four SMUX circuit packs, carrying two N-rate signals, either service or protection, to or from each circuit pack.

N-rate Cable groups A through H connect to interface modules on the left side of the OPEX Bay and N-rate Cable groups J through T connect to interface modules on the right side of the OPEX Bay as seen from the front of the Remote Complex. A DS3 Interface-32 Module requires two N-rate cable groups; a DS3 Interface-16 or STS1 Interface-16 Module requires one N-rate cable group; and two DS1 Interface Modules share an N-rate cable group.

N-rate cable group A connects to the lowest module on the interface bay (Bay 4) closest to the OPEX Bay, and the other N-rate cable groups run alphabetically upward and outward from the OPEX Bay. N-rate cable group starting with J serve the interface bays on the right side of the OPEX Bay in a similar fashion.

Control Cables for Collocated Interface Bays

The 64 control cables that connect the unit controllers to the Switch Bays are labelled J1 through J64. J1 through J32 serve the interface bays on the left side of the Switch Complex, and J33 through J64 serve the interface bays on the right side of the Switch Complex. Numbering of control cables corresponds to the numbering of interface modules (units) in that numbering starts at the bottom of Bay 1 and goes upward and to the right. Just as in the numbering of the 64 units, a number is assigned to each of the four available interface module positions even if some positions are not occupied. For example, a DS3 Interface-32 Module in Bay 9 would have cables J30 and J31 assigned and cables J29 and J32 unassigned.

As many as 32 DS3PM2 circuit packs can be used, one for each DS3 Interface-32 or Interface-16 Module. Numbering of the control cables to DS3PM2 circuit packs to the left of the Switch Complex starts at J1 and runs upward and outward through J16. DS3PM2 circuit pack control cable numbers to the right of the Switch Complex start at J49 with the DS3 Interface Module at the bottom unit position furthest from the Switch Complex and run upward and inward through J64.

These DS3PM2 circuit pack control cable designations are the same as some of the set used for unit controller control cables. However, there is no numbering conflict in a given frame because unit controller control cable designations J1 through J16 are used for Bays 1, 2, 3, and 4 and J49 through J64 are used for Bays 20, 21 22, and 23.

NOTE:
You can only use DS3PM circuit packs in collocated configurations.

For any given configuration of DS3 Interface Modules in the frame, a combination of Bays 1, 2, 3, 4, 20, 21, 22, and 23 is not present allowing the use of the associated UC control cables for the DS3PM2 circuit packs.

Table 1-5 shows the control cable assignment for each collocated interface module unit location.

Table 1-5. **Control Cable Assignments for Collocated Bays**

Unit	Control Cable	Unit	Control Cable	Unit	Control Cable	Unit	Control Cable
1	J1	17	J17	33	J33	49	J49
2	J2	18	J18	34	J34	50	J50
3	J3	19	J19	35	J35	51	J51
4	J4	20	J20	36	J36	52	J52
5	J5	21	J21	37	J37	53	J53
6	J6	22	J22	38	J38	54	J54
7	J7	23	J23	39	J39	55	J55
8	J8	24	J24	40	J40	56	J56
9	J9	25	J25	41	J41	57	J57
10	J10	26	J26	42	J42	58	J58
11	J11	27	J27	43	J43	59	J59
12	J12	28	J28	44	J44	60	J60
13	J13	29	J29	45	J45	61	J61
14	J14	30	J30	46	J46	62	J62
15	J15	31	J31	47	J47	63	J63
16	J16	32	J32	48	J48	64	J64

Control Cables for Remote Complex Interface Bays

The 32 control cables that connect the unit controllers to the OPEX Bay are labelled J1 through J32. Table 1-6 shows the mappings of the control cables that served a (256) frame to control cable assignments for the Remote Complexes. J1 through J16 serve the interface bays on the left side of the OPEX Bay, and J17 through J32 serve the interface bays on the right side of the OPEX Bay. Numbering of control cables is similar to the letter assignments of N-rate cables in that numbering starts at the bottom of the interface bay (Bays 4 and 6) nearest the OPEX Bay and goes upward and outward. However, just as in the numbering of the 32 units, a number is assigned to each of the four available module positions even if some positions are not occupied. For example, a DS3 Interface-32 Module in Bay 4 would have cables J2 and J3 assigned and cables J1 and J4 unassigned.

Table 1-6. (256) Frame to Remote Complex Control Cable Assignment Mappings

Unit Numbering			J-Cable Numbering		
256 Frame	Remote Complex 1	Remote Complex 2	256 Frame	Remote Complex1 (RX=1)	Remote Complex2 (RX=2)
1	1	33	J13	J13	J13
2	2	34	J14	J14	J14
3	3	35	J15	J15	J15
4	4	36	J16	J16	J16
5	5	37	J9	J9	J9
6	6	38	J10	J10	J10
7	7	39	J11	J11	J11
8	8	40	J12	J12	J12
9	9	41	J5	J5	J5
10	10	42	J6	J6	J6
11	11	43	J7	J7	J7
12	12	44	J8	J8	J8
13	13	45	J1	J1	J1
14	14	46	J2	J2	J2
15	15	47	J3	J3	J3
16	16	48	J4	J4	J4
17	17	49	J17	J17	J17
18	18	50	J18	J18	J18
19	19	51	J19	J19	J19
20	20	52	J20	J20	J20
21	21	53	J21	J21	J21
22	22	54	J22	J22	J22
23	23	55	J23	J23	J23
24	24	56	J24	J24	J24
25	25	57	J25	J25	J25
26	26	58	J26	J26	J26
27	27	59	J27	J27	J27
28	28	60	J28	J28	J28
29	29	61	J29	J29	J29
30	30	62	J30	J30	J30
31	31	63	J31	J31	J31
32	32	64	J32	J32	J32

Fiber Optic Cables

In (512) systems configured with Remote Complex(es), network traffic is carried from the remote interface modules to the Switch Complex by fiber optic cables between the OSWIO circuit packs and the OPEX circuit packs. In addition, controller functions of the HCC Module are extended to the RUI Module by fiber optic cables between the OUI circuit packs and the UIA/UIB circuit packs.

Each OSWIO and OPEX circuit pack is equipped with a pair of fibers, with each fiber carrying traffic in one direction (either from the Remote Complex to the Switch Complex or from the Switch Complex to the Remote Complex). The fiber pairs terminate on OPEX circuit packs at the Remote Complex, and on OSWIO circuit packs at the Switch Complex. The addressing of the OSWIO and the OPEX circuit packs on each end uniquely identifies the pairs of fibers between these two circuit packs.

Each OUI circuit pack is equipped with four pairs of fibers, with each fiber carrying traffic in one direction (either from the Remote Complex to the Switch Complex or from the Switch Complex to the Remote Complex). One pair of fibers services a UIA or UIB circuit pack.

Each UIA and UIB circuit pack is equipped with two pairs of fibers, with each fiber carrying traffic in one direction (either from the Remote Complex to the Switch Complex or from the Switch Complex to the Remote Complex). One pair of fibers services an OUI circuit pack in one of the control complexes.

During the upgrade procedure, the physical circuit pack locations of the OPEX Module are renumbered for consistency with the OSWIO circuit packs in the SWIO Module. Table 1-7 shows the fiber-optic cable labels used in the DACS IV-2000.

Table 1-7. **Fiber-Optic Cable Labelling**

Remote Complex 1			Remote Complex 2		
OSWIO End Label	**(256) SWIO Location**	**OPEX End Label**	**OSWIO End Label**	**(256) SWIO Location**	**OPEX End Label**
OSWIO MOD 1-1	1	OPEX MOD 1-1	OSWIO MOD 3-1	1	OPEX MOD 3-1
OSWIO MOD 1-2	2	OPEX MOD 1-2	OSWIO MOD 3-2	2	OPEX MOD 3-2
OSWIO MOD 1-3	3	OPEX MOD 1-3	OSWIO MOD 3-3	3	OPEX MOD 3-3
OSWIO MOD 1-4	4	OPEX MOD 1-4	OSWIO MOD 3-4	4	OPEX MOD 3-4
OSWIO MOD 1-5	5	OPEX MOD 1-5	OSWIO MOD 3-5	5	OPEX MOD 3-5
OSWIO MOD 1-6	6	OPEX MOD 1-6	OSWIO MOD 3-6	6	OPEX MOD 3-6
OSWIO MOD 1-7	7	OPEX MOD 1-7	OSWIO MOD 3-7	7	OPEX MOD 3-7
OSWIO MOD 1-8	8	OPEX MOD 1-8	OSWIO MOD 3-8	8	OPEX MOD 3-8
OSWIO MOD 1-9	9	OPEX MOD 1-9	OSWIO MOD 3-9	9	OPEX MOD 3-9
OSWIO MOD 1-10	10	OPEX MOD 1-10	OSWIO MOD 3-10	10	OPEX MOD 3-10
OSWIO MOD 1-11	11	OPEX MOD 1-11	OSWIO MOD 3-11	11	OPEX MOD 3-11
OSWIO MOD 1-12	12	OPEX MOD 1-12	OSWIO MOD 3-12	12	OPEX MOD 3-12
OSWIO MOD 1-13	13	OPEX MOD 1-13	OSWIO MOD 3-13	13	OPEX MOD 3-13
OSWIO MOD 1-14	14	OPEX MOD 1-14	OSWIO MOD 3-14	14	OPEX MOD 3-14
OSWIO MOD 1-15	15	OPEX MOD 1-15	OSWIO MOD 3-15	15	OPEX MOD 3-15
OSWIO MOD 1-16	16	OPEX MOD 1-16	OSWIO MOD 3-16	16	OPEX MOD 3-16
OSWIO MOD 2-1	17	OPEX MOD 2-1	OSWIO MOD 4-1	17	OPEX MOD 4-1
OSWIO MOD 2-2	18	OPEX MOD 2-2	OSWIO MOD 4-2	18	OPEX MOD 4-2
OSWIO MOD 2-3	19	OPEX MOD 2-3	OSWIO MOD 4-3	19	OPEX MOD 4-3
OSWIO MOD 2-4	20	OPEX MOD 2-4	OSWIO MOD 4-4	20	OPEX MOD 4-4
OSWIO MOD 2-5	21	OPEX MOD 2-5	OSWIO MOD 4-5	21	OPEX MOD 4-5
OSWIO MOD 2-6	22	OPEX MOD 2-6	OSWIO MOD 4-6	22	OPEX MOD 4-6
OSWIO MOD 2-7	23	OPEX MOD 2-7	OSWIO MOD 4-7	23	OPEX MOD 4-7
OSWIO MOD 2-8	24	OPEX MOD 2-8	OSWIO MOD 4-8	24	OPEX MOD 4-8
OSWIO MOD 2-9	25	OPEX MOD 2-9	OSWIO MOD 4-9	25	OPEX MOD 4-9
OSWIO MOD 2-10	26	OPEX MOD 2-10	OSWIO MOD 4-10	26	OPEX MOD 4-10
OSWIO MOD 2-11	27	OPEX MOD 2-11	OSWIO MOD 4-11	27	OPEX MOD 4-11
OSWIO MOD 2-12	28	OPEX MOD 2-12	OSWIO MOD 4-12	28	OPEX MOD 4-12
OSWIO MOD 2-13	29	OPEX MOD 2-13	OSWIO MOD 4-13	29	OPEX MOD 4-13
OSWIO MOD 2-14	30	OPEX MOD 2-14	OSWIO MOD 4-14	30	OPEX MOD 4-14
OSWIO MOD 2-15	31	OPEX MOD 2-15	OSWIO MOD 4-15	31	OPEX MOD 4-15
OSWIO MOD 2-16	32	OPEX MOD 2-16	OSWIO MOD 4-16	32	OPEX MOD 4-16
OUI End Label*	**UIA/ UIB Location**	**UIA/UIB End Label***	**OUI End Label***	**UIA/ UIB Location**	**UIA/UIB End Label***
RX1 OUI 0 (half) RX1 OUI 1 (half)	UIA	CC-0 UIA CC-1 UIA	RX2 OUI 0 (half) RX2 OUI 1 (half)	UIA	CC-0 UIA CC-1 UIA
RX1 OUI 0 (half) RX1 OUI 1 (half)	UIB	CC-0 UIB CC-1 UIB	RX2 OUI 0 (half) RX2 OUI 1 (half)	UIB	CC-0 UIB CC-1 UIB

Note: Each fiber-optic cable label identifies a transmit and receive fiber-optic cable. The OUI circuit pack labels identify two sets of transmit and receive cables.

* The OUI circuit pack connection has four fiber-optic cables that are associated with both Remote Complexes. Two of the fiber-optic cables go to Remote Complex 1 and two fiber-optic cables go to Remote Complex 2.

Modules

The system bays contain modules comprising circuit packs to create the different functional segments of the DACS IV-2000. Figure 1-5 (Collocated configuration) and Figure 1-6 (Remote Complex configuration) are functional block diagrams showing the main components of the DACS IV-2000 (512).

Each module in the system is equipped with circuit packs. These circuit packs are required to perform the functions of the system.

The High-Capacity Controller, Memory Storage, Switch Center Stage, and Switch Power Modules (located in the Switch Bays) are always fully equipped with the required circuit packs.

The Remote Complex is equipped with circuit packs UIA and UIB to communicate with the OUI circuit packs in the HCC. These interface by a duplex optical link.

The Switch Input/Output Modules located in the Switch Bays and the DS1, DS3, and STS1 Interface Modules located in the interface bays are equipped as required with circuit packs, depending on service requirements.

The Synchronizer Module must be fully equipped when used in systems supporting SONET interfaces and/or DS3 Clear-Channel cross-connections. Use either Version 1 or Version 2 circuit packs with this release.

Circuit packs are identified by functional name and circuit pack code. A suffix number after a circuit pack functional name indicates a series version. When there is no suffix number, a **1** is assumed. Higher series versions can be substituted in slots labeled for a lower series version, but not the reverse. For example, a PWRE3 circuit pack can be substituted in a slot labeled PWRE, but a PWRE1 circuit pack cannot be substituted in a slot labeled PWRE2 or other higher series version.

Switch Complex Modules

The (512) Switch Complex consists of two Switch Bays and the Main Controller Bay. The modules housed in these bays are:

- Two Switch Bays
  - — Switch Input/Output (SWIO) Module — performs the cross-connection functions in conjunction with the Switch Center Stage Modules. For systems that use Remote Complexes, the associated modules are equipped with optical SWIO (OSWIO) circuit packs in place of SWIO circuits packs to allow for the receiving/transmitting of the extended N-rate signals from optical fiber cable from/to the Optical Extension (OPEX) Module.
  - — Switch Center Stage (SWCS) Module — performs the cross-connection functions in conjunction with the Switch Input/Output Modules.

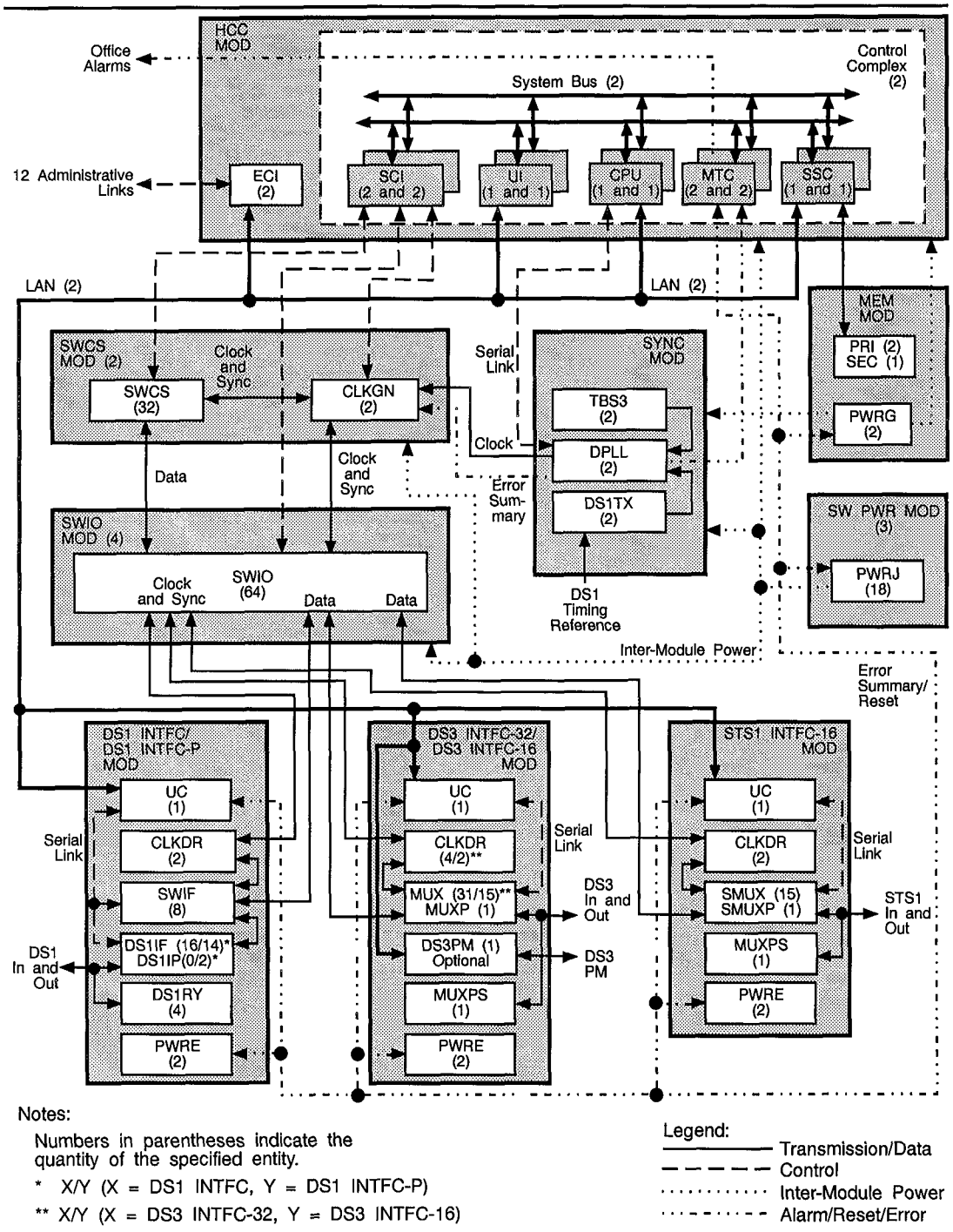
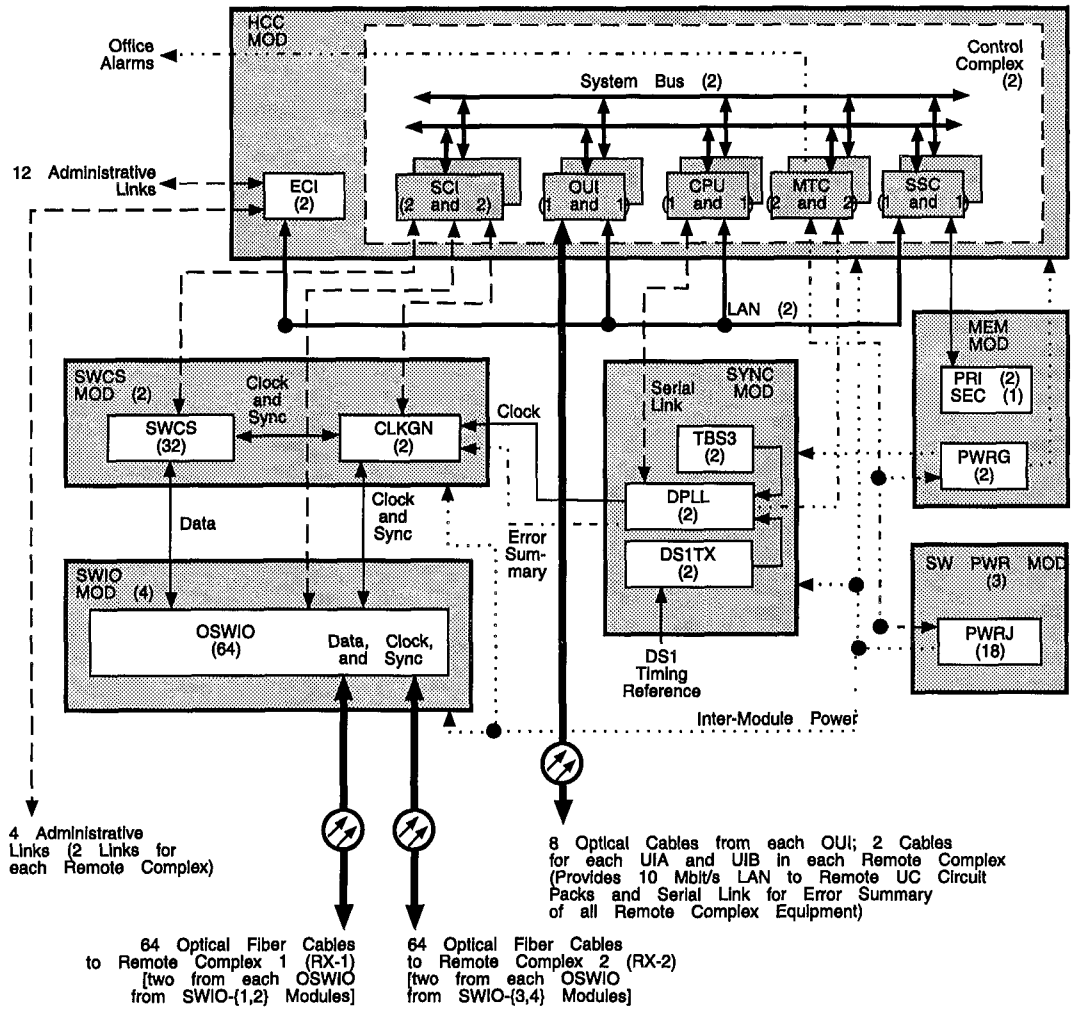


Figure 1-5. **Switch Complex and Collocated Interface Modules**



Notes:

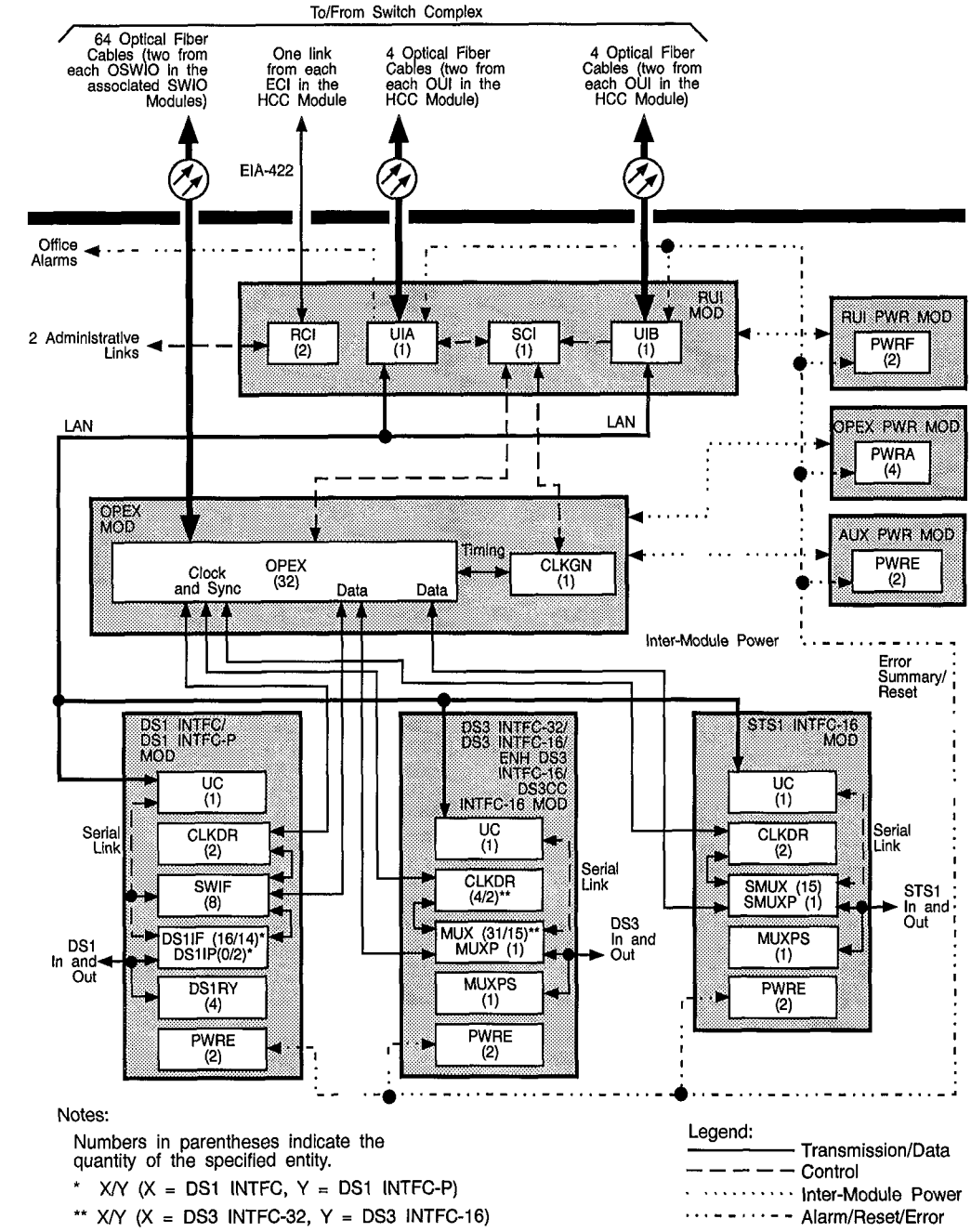
Numbers in parentheses indicate the quantity of the specified entity.

Legend:

- Transmission/Data
- Control
- Inter-Module Power
- Alarm/Reset/Error

A. Switch Complex

Figure 1-6. **Optical Remoting Functional Block Diagram (Sheet 1 of 2)**



B. Remote Complex

Figure 1-6. **Optical Remoting Functional Block Diagram (Sheet 2 of 2)**

- Main Controller Bay
  - — High-Capacity Controller (HCC) Module — manages the user interface (administrative links), performs user-specified functions, and coordinates database management, maintenance, and fault recovery operations. For systems that use Remote Complexes, this module also provides the controlled functions to the Remote Complex. These functions are communicated over fiber optic cables to the Remote Unit Interface (RUI) Module.
  - — Switch Power (SW PWR) Module — provides the +5 Vdc and -5 Vdc power and fuse protection for the High-Capacity Controller, the Switch Input/Output, and the Switch Center Stage Modules.
  - — Synchronizer (SYNC) Module — generates the timing information for the DACS IV-2000.
  - — Memory Storage (MEM) Module — provides primary and secondary program and database backup capabilities. In addition, provides the means to load new software release onto the frame. Also provides the +12 Vdc and -12 Vdc power for the MEM and HCC modules.

Remote Complex Modules

The Remote Complex is a DACS IV-2000 (256) frame (containing at least one Interface Bay and an OPEX Bay) whose Switch Module is replaced with an OPEX Module and connected with optical fiber to the Switch Input/Output (equipped with OSWIO circuit packs) Module in the Switch Complex of a (512) system with at least 256 DS3 equivalents available. The modules contained in the OPEX Bay are:

- Optical Extension (OPEX) — is based on the Switch Module in the (256); it contains circuit packs for optically connecting the N-rate signals to and from the Remote Complex Interface Modules and the switch matrix (OSWIO and SWCS circuit packs) of the Switch Complex.
- Optical Extension Power (OPEX PWR) — provides the +5V required by the OPEX circuit packs.
- Auxiliary Power (AUX PWR) — provides the -5.2V power for the OPEX Module.
- Remote Unit Interface (RUI) — contains the Unit Interface (UIA and UIB) circuit packs that optically extend the controller functions from the High-Capacity Controller in the Switch Complex to the Remote Complex. In addition, the RUI Module contains the Remote Communications Interface (RCI) circuit packs that are used to provide a communications interface terminal at the Remote Complex.
- Remote Unit Interface Power (RUI PWR) — provides power and fuse protection for the RUI Module.

Interface Modules

Interface Bays are available for either collocation with the Switch Complex or with a Remote Complex. When collocated with the Switch Complex, Fuse and Alarm Bays are required to provide fuse protection for up to four Interface Bays. Fuse protection for remote Interface Bays are provided by the Fuse and Alarm Panel in the OPEX Bays. The following Interface modules can be equipped in the various interface bays:

- DS1 Interface (INTFC) Module — provides up to 224 DS1 interfaces for the incoming and outgoing DS1 facilities or network elements. These modules accept DS1 signals (in a format that is compatible with a DSX-1) and interface these signals to and from the Switch Module. Protection for the interfaces of these modules are provided by the DS1 Interface-Protection Module contained in the same DS1 Interface Bay.
- IDS1 Interface-Protection (INTFC-P) Module — provides up to 196 DS1 interfaces for the incoming and outgoing DS1 facilities or network elements. These modules accept DS1 signals (in a format that is compatible with a DSX-1) and interface these signals to and from the Switch Module. These modules provide protection for itself in addition to the other DS1 Interface Modules (up to three) within the same DS1 Interface Bay.
- DS3 Interface-32 (INTFC-32) Module — provides up to 31 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a M13 or C-bit parity format compatible with a DSX-3 and interface the signals to and from the Switch Module.
- DS3 Interface-16 (INTFC-16) Module — provides up to 15 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a M13 or C-bit parity format compatible with a DSX-3 and interface the signals to and from the Switch Module.
- Enhanced DS3 Interface-16 (ENH DS3 INTFC-16) Module — provides up to 15 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept framed DS3 signals in a format compatible with a DSX-3 and interface the signals to and from the Switch Module. In this module, the DS1s within the received DS3s can have full-time DS1 performance monitoring, without loss of system capacity.
- DS3 Clear-Channel Interface-16 (DS3CC INTFC-16) Module — provides up to 15 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a format compatible with a DSX-3 and interface the signals to and from the Switch Module. When the MUX3 circuit pack is operating in the DS1 mode, the received DS3 must be framed. When the MUX3 circuit pack is operating in the clear-channel mode, the received signal format can be framed or unframed. In this module, the DS1s within the received DS3s can have full-time DS1 performance monitoring, without loss of system capacity.

- STS1 Interface-16 (INTFC-16) Module — provides up to 15 interfaces with protection for incoming and outgoing EC-1 facilities. These modules accept STS-1 signals in a format compliant with the SONET specifications and interface the signals to and from the Switch Module.

Fan Assembly

In the DACS IV-2000 (512), fan assemblies are provided in the Main Controller, Switch, OPEX, STS1/DS3 Interface, Enhanced DS1 Interface, and Enhanced STS1/DS3/DS1 Interface Bays. The fan assemblies are used to cool vertically mounted modules. Each fan assembly consists of three horizontally mounted fans with a filter, control switches, and indicators. The air intake (under the assembly) must be kept free of obstructions. In addition, the fan filter needs to be replaced on a routine basis. For fan assemblies ED-2C816-30 and ED-2C906-30, an autonomous message (`REPT FAN FILTER`) is generated (after the recommended filter replacement interval of 91 days has occurred) to remind you that the fan filter needs to be replaced. For fan assembly WP-92310L4 and ED-9C130-30, a minor FILTER alarm LED on the fan assembly turns on when the fan filter must be replaced.

Circuit Packs

Circuit packs have latches, faceplates, and keying to prevent insertion in an incorrect slot. All circuit packs (with the exception of version 1 Synchronizer, BXA, and BXC circuit packs) have LED indicators to aid in fault isolation. A full listing of circuit pack equipment is located in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Power

Two sets of power requirements for the DACS IV-2000 are addressed in this section, one for the DACS IV-2000 (512) Switch Complex and collocated interface bays and one for the Remote Complexes [converted DACS IV-2000 (256) frames]. For complete power information, see the *Floor Plan Data* (FPD 801-500-168-15).

Switch Complex and Collocated Interface Bays

The DACS IV-2000 Switch Complex and collocated interface bays operates with two Lineage® 2000 (or equivalent) battery plants, Battery Distribution Feeder Board (BDFB) A and B (-48 Vdc nominal) in the central office environment with collocated interface bays. Each BDFB supplies four power buses in each fuse and alarm panel in the Switch Bays and four power buses in the fuse and alarm panel in the Fuse and Alarm Bays. BDFB A supplies power buses AA through AD and

BDFB B supplies power buses BA through BD. All feeders have four connections to the fuse and alarm panels.

The two BDFBs provide duplication of the power supply and allow the system to operate in the event one battery plant fails.

Remote Complex

The DACS IV-2000 Remote Complex is configured to accept two power supply arrangements, standard or duplex. The standard configuration consists of one Battery Distribution Feeder Board (BDFB) powered from a single Lineage 2000 (or equivalent) battery plant. The duplex configuration consists of two BDFBs powered from one or two Lineage 2000 (or equivalent) battery plants.

Standard Power Configuration

In the standard configuration, the DACS IV-2000 Remote Complex operates with a Lineage 2000 (or equivalent) battery plant (-48 Vdc nominal) in a central office environment supplying power to a single BDFB. Seven power feeders and seven returns are terminated at the OPEX Bay and provide power for the entire Remote Complex. The feeders are designated by the loads they serve: A, B, C, D, E, F, and G. Each load is fused separately.

- Feeders A, B, C, D, and E (connected through the Fuse and Alarm Panel) supply power to the facility interface bays, the OPEX PWR Module, and the fan assemblies.
- Feeders F and G (connected directly to the RUI PWR Module) supply power to the RUI PWR Module.

Duplex Power Configuration

The duplex power feature configuration, provides compatibility with the "red and blue" central office power distribution being deployed in the AT&T Network, and with other power-distribution arrangements. The duplex power feature uses one or two -48V diverse power plants. (A diverse power plant is one that does not share common components, such as rectifiers, batteries, BDFBs, and cable racks.)

Twelve power feeders (A1 through F1 and A2 through F2) and twelve returns are terminated at the OPEX Bay and provide power for the entire Remote Complex. The red battery plant supplies A, B, and E; the blue battery plants supplies C, D, and F. All power feeders are connected to the Fuse and Alarm Panel.

When the Remote Complex is powered using two battery plants, the following requirements apply:

- Power feeders to the Remote Complex must be placed in two groups to allow connection to two separate BDFBs.
- Two battery plants (red and blue) are required.

- Feeders A, B, and E are fed from the red battery plant; feeders C and D are fed from the blue battery plant.

Loss of one battery plant or one group of feeders connected to that plant does not cause any loss of service (except where there is only one battery plant supplying power).

Fuses

In the DACS IV-2000 (512), fuses are required for the Fuse and Alarm Bay, Switch Bay, and OPEX Bay Fuse Panels. Fuses are also required in the fuse boards contained in the Switch Power, Memory, OPEX Power, and RUI Power Modules. Complete information on all fuses and their locations can be found in "Primary Fuses" (page 15-78) of this manual as well as in the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) and in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Switches and Indicators

Equipment Control Switches

The Switch Complex and each Remote Complex contains its own status panel. The following sections describe the controls for each type of status panel.

Switch Complex Status Panel

The Switch Complex status panel (Figure 1-7) in the DACS IV-2000 (512) Main Controller Bay has four momentary contact switches used for equipment control. They are:

- ACO (alarm cutoff) — silences the audible alarms associated with the Switch Complex and collocated interface bays when pressed.
- LED/LAMP TEST — tests the operation of the LEDs/lamps in the DACS IV-2000 Switch Complex and Remote Complexes. This function is performed on a per-shelf basis in sequential order. Pressing this switch is equivalent to entering the `EX-EQPT` command. If the system is busy executing another command, there is a delay before the LEDs light. When this switch is pressed, the LEDs on the High Capacity Controller Module, status panel (except FE LED), Switch Power Modules, SWCS and SWIO circuit packs, and provisioned interface modules are lit on a module- by- module basis. Fan Assembly and Header Designation Assembly LED's are also exercised as part of the system LED test function.

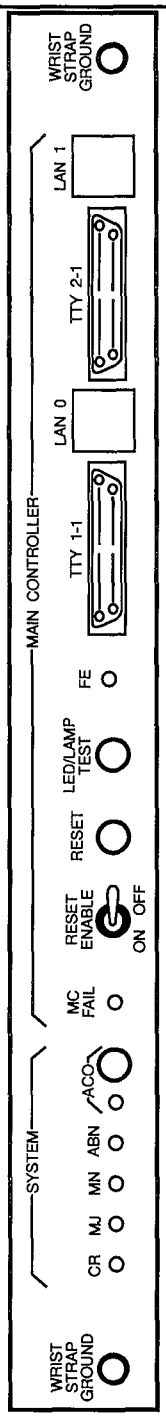


Figure 1-7. **Switch Complex Status Panel**

- RESET — resets the DACS IV-2000. The RESET switch starts the reset function when operated simultaneously with the RESET ENABLE switch. This combination allows the main controller to be booted manually. Requiring simultaneous operation of the RESET and RESET ENABLE switches helps prevent the reset function from being initiated accidentally. Any jacks connected to LAN 0 and LAN 1 on the status panel *must* be removed before executing the reset.
- RESET ENABLE — See RESET above.

The Switch Complex status panel also has two TTY connectors (TTY1-1 and TTY2-1) that allow the communications interface terminal (CIT) to be used from the front of the frame. Twelve administrative link connectors are located on the back of the Switch Complex. In addition, two connectors labelled LAN 0 and LAN 1 are reserved.

⚠ CAUTION:
Never connect terminals to the same TTY jack on the Status Panel and the TTY jack on the back of the Switch Bays (for example, never connect terminals to both jacks for TTY1-1 at the same time).

Remote Complex Status Panel

The Remote Complex status panel (Figure 1-8) in the Remote Unit Interface (RUI) Module has four momentary contact switches used for equipment control. They are:

- LOCAL ACO (alarm cutoff) — silences the audible alarms associated with the Remote Complex when pressed.
- LED/LAMP TEST — tests the operation of the LEDs/lamps in the Remote Complex. This function is performed on a per-shelf basis in sequential order. Pressing this switch is equivalent to entering the `EX-EQPT::RX-[1,2];` command. If the system is busy executing another command, there is a delay before the LEDs light. When this switch is pressed, the LEDs on the OPEX, RUI, RUI Power, OPEX Power, and AUX Power Module circuit packs, and provisioned interface modules are lit on a module by module basis. Fan Assembly LEDs are also exercised as part of the system LED test function.
- INTERRUPT — interrupts the Remote Complex. The INTERRUPT switch starts the interrupt function when operated simultaneously with the INTERRUPT ENABLE switch. This combination allows the Remote Unit Interface to be booted manually. Requiring simultaneous operation of the INTERRUPT and INTERRUPT ENABLE switches helps prevent the interrupt function from being initiated accidentally.
- INTERRUPT ENABLE — See INTERRUPT above.

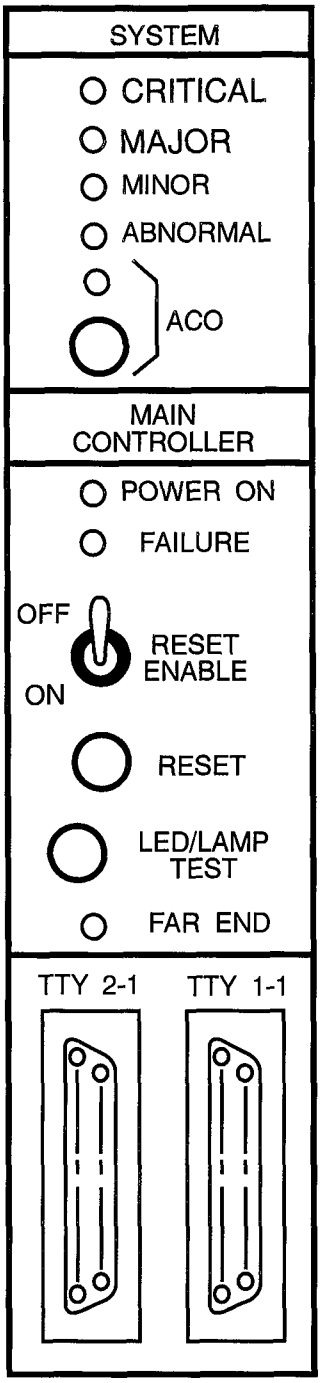


Figure 1-8. **Remote Complex Status Panel**

The Remote Complex status panel also has two TTY connectors (TTY1-7/8 and TTY2-7/8) that allow a communications interface terminal (CIT) to be used at the Remote Complex. CILINK-1-7 and CILINK-2-7 are used for Remote Complex 1 and CILINK-1-8 and CILINK-2-8 are used for Remote Complex 2.

⚠ CAUTION:
Never connect terminals to the same TTY jack on the Status Panel and the TTY jack at the rear of the RUI Module (for example, never connect terminals to both jacks for TTY1-7/8 at the same time).

Equipment Indicators

All circuit packs (except version 1 synchronizer, BXA, and BXC circuit packs) have a red LED indicator for trouble isolation. The LEDs flash on and off at one-second intervals on circuit packs that have input DS1, DS3, STS-1, and VT1.5 signal failures. The LEDs stay on for internal circuit pack failures. The normal LED condition is off. In addition to the LED alarm indication, `REPT ALM` messages are generated for all system circuit pack and facility failures.

Power circuit packs have green LEDs that indicate normal operation. They also have a red LED for trouble isolation as described above.

Switch Complex CLKGN circuit packs have green LEDs to indicate active CLKGN. All control complex circuit packs (CPU/MTC/SSC/SCI/UI) have green LEDs to indicate the on-line control complex.

The disk drives (PRI and SEC) have both green and red LEDs. The green LED indicates that the disk drive is operating and the red LED indicates that the disk has been manually removed from service or has failed.

The ECI circuit packs have green LEDs to indicate the ECI is in service.

The Switch Complex status panel (Figure 1-7) has seven equipment indicators. They are:

- CR (critical)— is red and signals a critical alarm condition.
- MJ (major) — is red and signals a major alarm condition.
- MN (minor) — is yellow and signals a minor alarm condition.
- ABN (abnormal) — reserved for future use.
- ACO — is green and shows that the audible alarms for the Switch Complex and collocated interface bays have been silenced (ACO switch activated).
- MC FAIL — is a red processor major alarm and signals a failure in the HCC module.
- FE (far end) — reserved for future use.

The Remote Complex status panel (Figure 1-8) has eight equipment indicators. They are:

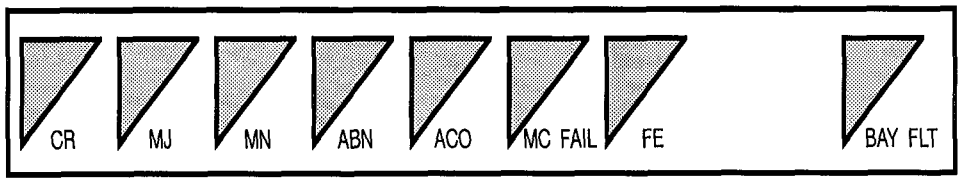
- CRITICAL — is red and signals a critical alarm condition.
- MAJOR — is red and signals a major alarm condition.
- MINOR — is yellow and signals a minor alarm condition.
- ABNORMAL — reserved for future use.
- LOCAL ACO — is green and shows that the audible alarms for the Remote Complex have been silenced (ACO switch activated).
- POWER ON — is green and signals that power is present at the status panel.
- FAIL — is a red processor major alarm and signals a failure in the Remote Unit Interface (RUI) Module.
- FAR END — reserved for future use.

When the main controller (MC) is in the OOS-MCOND state and if the MTC circuit pack of the active control complex (CC) is extracted, the MJ and MC FAIL alarm LEDs on the status panel and the header designation assembly (HDA) light, and remain lit until a system reset is performed.

EMC Enclosure Header Alarm Indicators

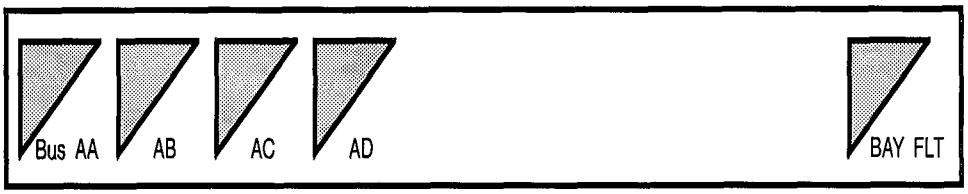
With the EMC option for the DACS IV-2000, the entire front of the system is covered with EMI doors to help eliminate electromagnetic interference. Because of this, the visual alarm indicators are only visible when viewed straight on. In addition to the EMI doors, this feature provides the following Header Designation Assemblies (HDA) [refer to Figure 1-9] to house the additional alarm indicators:

- Main Controller Bay HDA — duplicates MC FAIL, CR, MJ, MN, ABN, ACO, and FE alarm indicators from the status panel and provides a red Bay Fault (BAY FLT) LED indicator that indicates an equipment failure within the Main Controller Bay.
- Switch Bay HDA — contains four green power bus LED indicators for the -48V power feeds and a red BAY FLT LED indicator. The green LEDs, when lit, indicate power is available; when off, they indicate the associated power bus feed has failed. The BAY FLT indicator lights when any circuit pack within the bay has failed.
- Fuse and Alarm Bay HDA — contains eight green power bus LED indicators for the -48V power feeds and a red BAY FLT LED indicator. The green LEDs, when lit, indicate power is available; when off, they indicate the associated power bus feed has failed. The BAY FLT indicator lights when any fuse in the fuse panel is blown or any PWRE circuit pack in the associated interface bay has failed.
- Facility Interface Bay HDA — contains a red BAY FLT LED indicator. The BAY FLT indicator lights when any circuit pack within the bay fails.



Note: ABN and FE are reserved for future use.

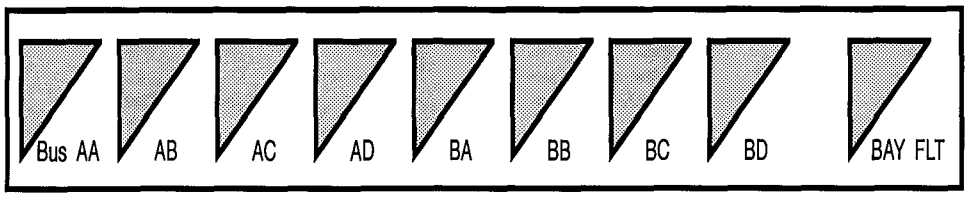
A. Main Controller Bay



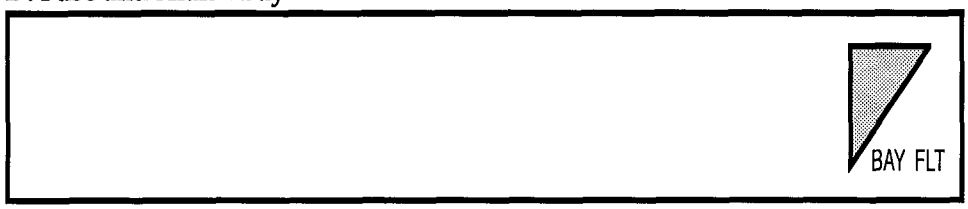
B. Switch Bay 1



C. Switch Bay 2



D. Fuse and Alarm Bay



E. Interface Bay

Figure 1-9. **Header Designation Assemblies**

Office and Telemetry Alarm Connectors

The DACS IV-2000 provides two connectors allowing access to the central office alarm system. This access provides for:

- Central office audible and visual alarms
- Remote monitoring of the system
- Timing reference signals for the Synchronizer Module

The connectors are located on the top panels (next to the TTY connectors) of the Switch Bays (one for local alarms and one for remote alarms). Under normal operations and in procedures contained in this manual, the connectors do not need to be accessed. For more details on this equipment, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

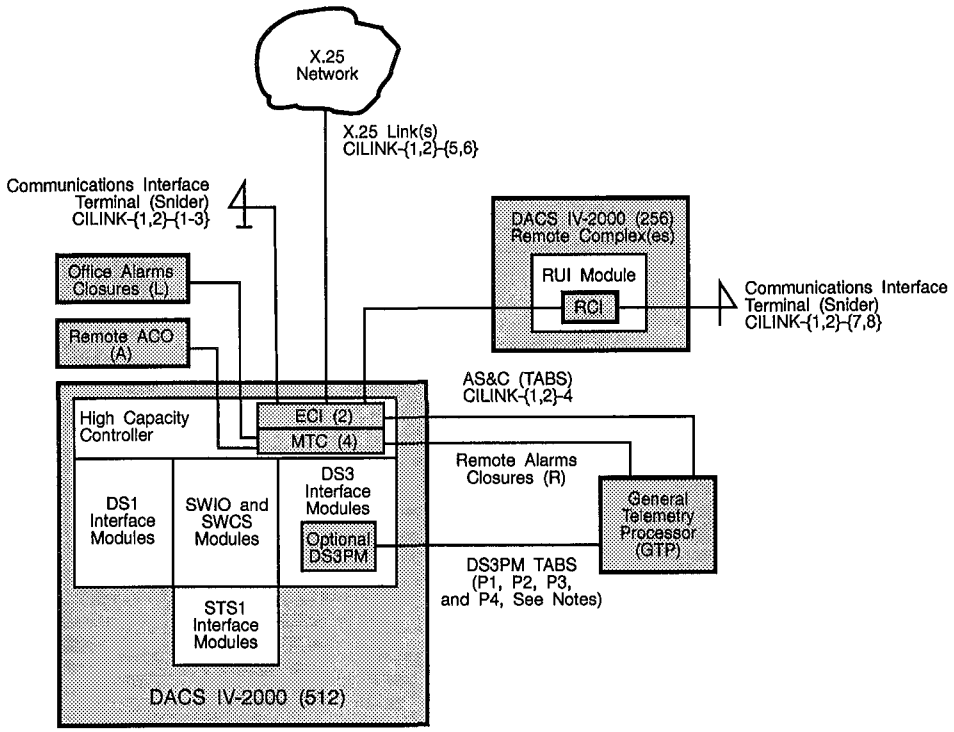
Interfaces

The DACS IV-2000 provides 16 administrative links (CILINKs) to interface with Operations Systems (OSs) using a X.25 network (CILINK-{1,2}-{5,6}) and communications interface terminals (CITs) using Snider protocol (CILINK-{1,2}-{1-3,7,8}). CILINK-{1,2}-{7,8} are used as CIT links at the Remote Complexes.

The administrative links are used to access all the features and functions of the system, both locally and remotely. It also provides alarm closures and a remote reset function to local and remote offices. In addition, a separate optional OS interface can be used to provide path performance monitoring information for DS3s that are provisioned with the C-bit parity format.

TABS links (CILINK-{1,2}-4) are provided for communications with a General Telemetry Processor (GTP). The system designates one ECI circuit pack as the master and the other ECI circuit pack as the slave (on a system reset ECI-1 is designated the master). For example, when using a GTP on a TABS link, the GTP must be connected to ECI-1 (CILINK-1-4) in the initial installation. ECI-1 becomes the slave only when it fails and is restored (`RST-EQPT` command) without resetting the frame. When ECI-1 fails, ECI-2 becomes the master and the GTP connection must be moved to ECI-2 (CILINK-2-4) if your office procedures do not require a system reset when ECI-1 fails; otherwise, the GTP connection remains on CILINK-1-4 and a system reset is performed after replacing ECI-1

Figure 1-10 and Table 1-8 summarize the interfaces provided by the DACS IV-2000.



Notes:
1. One to four P links (collocated interface bays only).
2. Up to eight DS3PMs per link.
3. Up to 32 DS3PMs per DACS IV-2000.

Figure 1-10. System Interfaces

Table 1-8. Interfaces

Interface (Figure 1-10)	Physical	Baud	Electrical	Functional
CILINK 1-1† and 2-1	EIA-232-D	1200, 2400, 4800, 9600, and 19200 Default: 9600*	EIA-232-D	Async. Snider
CILINK 1-2 and 2-2	EIA-449	1200, 2400, 4800, and 9600 Default: 2400*	EIA-423	Async. Snider

Footnotes are at the end of this table.

Table continued on next page.

Table 1-8. **Interfaces (Continued)**

Interface (Figure 1-10)	Physical	Baud	Electrical	Functional
CILINK 1-3 and 2-3	EIA-449	1200, 2400, 4800, 9600, and 19200 Default: 9600*	EIA-423	Async. Snider
CILINK 1-4 and 2-4	EIA-449	1200, 2400, 4800, and 9600 Default: 2400*	EIA-485	TABS point-to-point AS&C
CILINK 1-5, 1-6, 2-5, and 2-6	EIA-449	1200, 2400, 4800, and 9600 Default: 9600*	EIA-423	Sync. X.25 or Async. Terminal Interface with external PAD
CILINK 1-7, 1-8, 2-7, and 2-8	EIA-232-D	1200, 2400, 4800, 9600, and 19200 Default: 9600*	EIA-232-D	Async. Snider
P1, P2, P3, and P4 (optional)	Connector	2400	RS-485	TABS Async. multipoint DS3PM
Local Alarm Closures (L)	Wirewrap	-	Closures	Local alarms (Visual and Audible)
Remote Alarm Closures (R)	Wirewrap	-	Closures	Remote alarms (GTP)
Remote ACO (A)	Wirewrap	-	Closures	Remote ACO

Notes:

* When provisioning CILINKs, it is recommended that the baud rate default values be used.

† CILINK-1-1 can be hardware provisionable for a default of 1200 or 9600 baud.

1. All EIA-423 links are interoperable with EIA-232-D via the use of the suggested adapters. For Snider links DACS IV-2000-to-terminal communication, it is suggested the ED-2C646,G1 adapter be used. For Snider links DACS IV-2000-to-OS via modem communication, it is suggested the ED-2C646,G2 adapter be used.
2. Links 1-2 and 2-2 are electrically compatible with the EIA-232-D (see Note 1) standard up to 4800 baud. Links 1-3 and 2-3 are electrically compatible with the EIA-232-D standard up to 9600 baud. These links may operate with the EIA-232-D above these data rates; however; the 4-percent rise time specification of EIA-232-D is violated.
3. To supply internal timing for the X.25 links, the ED-2C646,G7 adapter must be used and the baud rate is fixed at 9600. All baud rates can be used with an external timing source.

Sixteen administrative links on two ECI6 circuit packs support the operations, administration, maintenance, and provisioning functions. They are:

- CILINKs 1-1 through 1-3, 1-7, 1-8, 2-1 through 2-3, 2-7, and 2-8 are asynchronous links (convertible to RS-232 with an optional passive adapter). CILINKs 1-1 and 2-1 supports the local communications interface terminal (CIT) for the switch complex and collocated interface bays, CILINKs 1-7, 2-7, 1-8, and 2-8 support the CIT for the remote complexes, and CILINKs 1-2, 1-3, 2-2, and 2-3 support remote terminals and OSs such as 2A Switching Control Center System (2ASCCS) or 2BSCCS using the SCCS AI (asynchronous interface, also called Snider) protocol. These Snider interfaces operate at 300, 1200, 2400, 4800, 9600, or 19200 (1-2, 2-1, 1-3, 2-3, 1-7, 2-7, 1-8, and 2-8 only) baud.
- CILINKs 1-4 and 2-4 can be provisioned as asynchronous TABS links operating at 2400 baud or Snider links.
- CILINKs 1-5, 1-6, 2-5, and 2-6 can be provisioned to use either the synchronous X.25 protocol or asynchronous Snider protocol with the addition of an external Packet Assembler and Disassembler (PAD) device. Each X.25 link supports CCITT MML on as many as four virtual circuits. The synchronous interfaces operate at up to 9600 baud as determined by the external devices.

Two additional links (labelled IAO at the rear of the Switch Bays and LAN on the Switch Complex status panel) are for DACSlink connections.

All CILINKs support the message set (TL1, Issue 4) for communication with Bellcore's, Operations Systems/Intelligent Network Elements (OPS/INE) and Network Monitoring and Analysis (NMA) OSs.

Message Set 1 Command Mappings

For Release 5.0, Message Set 1[1] is not supported. Therefore, Table 1-9 can be used to map Message Set 1 commands into their associated Release 5.0 commands. Table 1-9 shows only the Message Set 1 commands and associated Release 5.0 commands. Release 5.0 contains additional commands that are not listed.

1. Message Set 1 is not supported for Release 3.0 and later.

Table 1-9. **Message Set 1 to Release 5.0 Command Mappings**

Message Set 1 Commands	Release 5.0 Commands	Message Set 1 Commands	Release 5.0 Commands
ABT-CMD	ABT-CMD	ED-SECU-LINK	ED-SECU-LINK
ACT-ECHO-LINK	ACT-ECHO-LINK	ED-STATE-EQPT	ED-STATE-EQPT
ACT-USER	ACT-USER	ENT-AUTOCMPN-T1	ENT-AUTOCMPN-T1
ALW-LPBK-T1	ALW-LPBK-T1	ENT-EQPT	ENT-EQPT
ALW-LPBK-T3	ALW-LPBK-T3	ENT-TSTPT-T1	ENT-TSTPT-T1
ALW-PMREPT-T1	ALW-PMREPT-T1	EX-EQPT	EX-EQPT
ALW-PMREPT-T3	ALW-PMREPT-T3	INH-LPBK-T1	INH-LPBK-T1
ALW-SW-EQPT	ALW-SW-EQPT	INH-LPBK-T3	INH-LPBK-T3
CANC-ECHO-LINK	CANC-ECHO-LINK	INH-PMREPT-T1	INH-PMREPT-T1
CHG-ACCMD-T1	CHG-ACCMD-T1	INH-PMREPT-T3	INH-PMREPT-T3
CHG-LGN	ED-SECU-USER	INH-SW-EQPT	INH-SW-EQPT
CHG-TACC-T1	CHG-TACC-T1	INIT-REG-T1	INIT-REG-T1
CONN-BDCST-T1	ENT-CONF-T1	INIT-REG-T3	INIT-REG-T3
CONN-CRS-T1	ENT-CRS-T1	INIT-SYS	INIT-SYS
CONN-CRS1-T1	ENT-CRS-T1	LGN-USER	ACT-USER
CONN-PM-T1	CONN-PM-T1	LGT-USER	CANC-USER
CONN-ROLL-T1	ENT-ROLL-T1	OPR-ACO-ALL	OPR-ACO-ALL
CONN-TACC-T1	CONN-TACC-T1	OPR-LPBK-T1	OPR-LPBK-T1
CPY-MEM	CPY-MEM	OPR-LPBK-T3	OPR-LPBK-T3
CPY-TH-T1	CPY-TH-T1	RLS-LPBK-T1	RLS-LPBK-T1
CRTE-EQPT	ENT-EQPT	RLS-LPBK-T3	RLS-LPBK-T3
CRTE-LGN	ENT-SECU-USER	RLS-TSTPT-T1	RLS-TSTPT-T1
DGN-DET-EQPT	DGN-DET-EQPT	RMV-EQPT	RMV-EQPT
DISC-CRS-T1	DLT-CRS-T1	RMV-LINK	RMV-LINK
DISC-CRS1-T1	DLT-CRS-T1	RST-EQPT	RST-EQPT
DISC-EQPT	DLT-EQPT	RST-LINK	RST-LINK
DISC-PM-T1	DISC-PM-T1	RTRV-ALM-ALL	RTRV-ALM-ALL
DISC-TACC	DISC-TACC	RTRV-ALM-EQPT	RTRV-ALM-EQPT
DLT-EQPT	DLT-EQPT	RTRV-ALM-LINK	RTRV-ALM-LINK
DLT-LGN	DLT-SECU-USER	RTRV-ALM-NE	RTRV-ALM-COM
DLT-SECU-AUD	DLT-SECU-AUD	RTRV-ALM-T1	RTRV-ALM-T1
ED-ATTR-EQPT	SET-ATTR-EQPT	RTRV-ALM-T2	RTRV-ALM-T2
ED-ATTR-T1	SET-ATTR-T1	RTRV-ALM-T3	RTRV-ALM-T3
ED-ATTR-T2	SET-ATTR-T2	RTRV-ATTR-EQPT	RTRV-ATTR-EQPT
ED-ATTR-T3	SET-ATTR-T3	RTRV-ATTR-T1	RTRV-ATTR-T1
ED-DATE	ED-DATE	RTRV-ATTR-T2	RTRV-ATTR-T2
ED-PRMTR-EQPT	ED-EQPT	RTRV-ATTR-T3	RTRV-ATTR-T3
ED-PRMTR-LINK	ED-PRMTR-LINK	RTRV-CMD-STAT	RTRV-CMD-STAT
ED-PRMTR-NE	ED-NE	RTRV-COND-EQPT	RTRV-COND-EQPT
ED-PRMTR-T1	ED-T1	RTRV-COND-LINK	RTRV-COND-LINK
ED-PRMTR-T3	ED-T3	RTRV-COND-T1	RTRV-COND-T1

Table continued on next page.

Table 1-9. **Message Set 1 to Release 5.0 Command Mappings (Continued)**

Message Set 1 Commands	Release 5.0 Commands	Message Set 1 Commands	Release 5.0 Commands
RTRV-COND-T2	RTRV-COND-T2	SET-TH-T3	SET-TH-T3
RTRV-COND-T3	RTRV-COND-T3	STA-SCANPM-T1	STA-SCANPM-T1
RTRV-CRS	RTRV-CRS	STP-SCANPM-T1	STP-SCANPM-T1
RTRV-CRS-T1	RTRV-CRS-T1	SW-DX-EQPT	SW-DX-EQPT
RTRV-DROPCRS-T1	RTRV-DROPCRS-T1	SW-TOPROTN-EQPT	SW-TOPROTN-EQPT
RTRV-ECHO-LINK	RTRV-ECHO-LINK	SW-TOWKG-EQPT	SW-TOWKG-EQPT
RTRV-HDR	RTRV-HDR	TEST-CABLE	TEST-CABLE
RTRV-LPBK-T1	RTRV-LPBK-T1	TEST-TRMSN-T1	TEST-SW-CONTROL
RTRV-LPBK-T3	RTRV-LPBK-T3	TEST-SW-CONTROL	TEST-TRMSN-T1
RTRV-PATH-T1	RTRV-PATH-T1	TEST-UNIT-CABLE	TEST-UNIT-CABLE
RTRV-PM-T1	RTRV-PM-T1	REPT ALM EQPT	REPT ALM EQPT
RTRV-PM-T3	RTRV-PM-T3	REPT ALM LINK	REPT ALM LINK
RTRV-PMCNFGRN-T1	RTRV-PMCNFGRN-T1	REPT ALM NE	REPT ALM COM
RTRV-PMSCHED-T1	RTRV-PMSCHED-T1	REPT ALM T1	REPT ALM T1
RTRV-PMSCHED-T3	RTRV-PMSCHED-T3	REPT ALM T2	REPT ALM T2
RTRV-PRMTR-EQPT	RTRV-EQPT	REPT ALM T3	REPT ALM T3
RTRV-PRMTR-LINK	RTRV-PRMTR-LINK	REPT BKUP	REPT BKUP
RTRV-PRMTR-NE	RTRV-NE	REPT CMPR MEM	REPT CMPR MEM
RTRV-PRMTR-SFTWR	RTRV-PRMTR-SFTWR	REPT DBCHG	REPT DBCHG
RTRV-PRMTR-T1	RTRV-T1	REPT DGNDET EQPT	REPT DGNDET EQPT
RTRV-PRMTR-T3	RTRV-T3	REPT DISC TACC	REPT DISC TACC
RTRV-PRVG-USER	RTRV-SECU-USER	REPT DLTCRS T1	REPT DLTCRS T1
RTRV-SCANTH-NE	RTRV-SCANTH-NE	REPT DROPCRS T1	REPT DROPCRS T1
RTRV-SECU-AUD	RTRV-SECU-AUD	REPT EVT T1	REPT EVT T1
RTRV-SECU-LINK	RTRV-SECU-LINK	REPT EVT T3	REPT EVT T3
RTRV-STATE-EQPT	RTRV-STATE-EQPT	REPT EXCPTN SYS	REPT EXCPTN SYS
RTRV-STATE-T1	RTRV-STATE-T1	REPT LOCL IN	REPT LOCL IN
RTRV-SYSID	RTRV-SYSID	REPT PM T1	REPT PM T1
RTRV-T1ID	RTRV-T1ID	REPT PM T3	REPT PM T3
RTRV-TACC-T1	RTRV-TACC-T1	REPT RMV EQPT	REPT RMV EQPT
RTRV-TH-T1	RTRV-TH-T1	REPT RMV LINK	REPT RMV LINK
RTRV-TH-T3	RTRV-TH-T3	REPT RST EQPT	REPT RST EQPT
SCHED-PMREPT-T1	SCHED-PMREPT-T1	REPT RST LINK	REPT RST LINK
SCHED-PMREPT-T3	SCHED-PMREPT-T3	REPT RSTCRS T1	REPT RSTCRS T1
SET-SCANTH-NE	SET-SCANTH-NE	REPT SW EQPT	REPT SW
SET-SID	SET-SID	REPT T1ID	REPT T1ID
SET-TH-T1	SET-TH-T1	REPT TRMSN T1	REPT TRMSN T1

Safety Precautions

2

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Safety Precautions

2

This chapter gives general precautions about the frame, the proper method of installing and extracting circuit packs, and important information about system equipment (for example, disk drives).

Sensitivity to Electrical Discharges

The DACS IV-2000 contains integrated circuits and other electronic equipment that are sensitive to static electrical discharges.

⚠ CAUTION:
Before touching any part of the equipment frame (including the disk drives, any circuit pack, reset switches, ACO, or LED TEST buttons), always ground yourself to the frame with a wrist strap provided with the equipment.

DS1 Facility Continuity Checking

The 120V AC and the DC meter buzzers must **not** be used for continuity checking of the ring and tip leads because of the 100 ohms impedance. The two ways to verify the DS1 input and output leads are:

- If the power is not applied to the interface bay(s) and the circuit packs are unplugged, a continuity check using an ohmmeter can be performed.
- If the power is applied to the interface bay(s), circuit packs are installed, and the DS1 signals are wired to the DSX1, perform a one-way cross-connection (input to output) and use a DS1 test set to verify the DS1 leads at the DSX1.

Circuit Packs

Care must be taken when installing or extracting circuit packs and other hardware from the frame.

A suffix number after a circuit pack indicates a series version. Higher series versions can be substituted in slots labelled for a lower series version but not the reverse. For example, a PWRE3 circuit pack can be substituted in a slot labelled PWRE2 whereas a PWRE2 circuit pack cannot be substituted in a slot labelled PWRE3 or other higher series version.

⚠ CAUTION:
Before replacing any fuse, make sure its associated circuit pack is extracted.

⚠ CAUTION:
BXA circuit packs must never be inserted in any slot other than SWIF, DS1IF, MUX, or DS3PM circuit pack slots. For example, BXA circuit packs must never be inserted into a DS1RY circuit pack slot.

ECI Circuit Packs (CILINK States)

When an ECI circuit pack fails or a fuse associated with an ECI circuit pack blows, all of the CILINKs associated with the failed ECI circuit pack are put into the OOS-MTCE state and associated login sessions are terminated. After clearing the failure of the ECI circuit pack, CILINKs associated with the failed ECI circuit pack can be restored to service with `RST-LINK` commands from a CILINK (for example, link 1) associated with the ECI circuit pack that did not encounter a failure or by resetting the frame.

PWRE Circuit Packs

When installing PWRE circuit packs in interface modules or the Auxiliary Power Module, two of the same version circuit packs must be used (that is, two PWRE2 or two PWRE3). Mixing versions within the same module must not occur.

OPEX and AUX Power Module Power Circuit Pack Alarm Reporting

The equipage signal for both PWRE (RPOWERE-SW) circuit packs in the AUX Power Module and the four PWRA (RPWRA) circuit packs in the OPEX Power Module are tied together. Therefore, when one circuit pack in not equipped all six circuit packs are alerted as unequipped. For example, if you extract RPWRA-1-1, an IMPROPRMVL condition is set for all six power circuit packs regardless of the status of the other five power circuit packs.

The error detection signal for RPOWERE-SW-{1,2}-1 is tied together with the error detection signal of RPWRA-{1,2}-2 and the error detection signal for RPOWERE-SW-{1,2}-2 is tied together with the error detection signal of RPWRA-{1,2}-4. Therefor, when one of the RPOWERE-SW circuit packs fails the associated RPWRA circuit pack indicates the alarm condition and not the RPOWERE-SW circuit pack. For example, if RPOWERE-SW-1-1 fails, the associated alarm message indicates that RPWRA-1-2 has failed. When isolating RPOWERE-SW and PWRA circuit pack failures, the alarm LEDs and/or fuse blown indicators of the circuit packs must be used in addition to the alarm messages.

Extracting Circuit Packs

This procedure gives instructions on the proper extraction of circuit packs. Circuit packs must only be extracted when instructed to do so by other procedures or your system administrator.

⚠ CAUTION:
Never extract a circuit pack that is carrying service, as it affects traffic. First perform a manual protection switch (`SW-TOPROTN-EQPT`* command) on the circuit pack to be extracted.*

⚠ CAUTION:
Never extract more than one circuit pack at a time. This could cause damage to each circuit pack and/or the frame, could damage the integrity of the protection bus, or could cause loss of service.

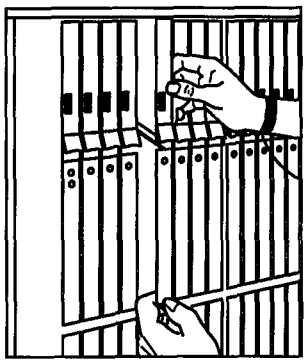
1. Carefully lift the latch(es).
2. Extract the circuit pack with one slow, continuous motion. (Do **not** rock the circuit pack back and forth.)

Installing Circuit Packs

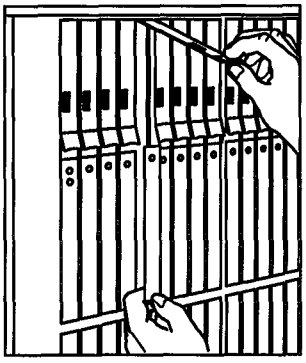
1. Remove the plastic shipping protector from the contacts of new circuit packs.
2. Insert the circuit pack into the slot (Figure 2-1A). (Do *not* rock the circuit pack back and forth.)
3. Raise the latch(es) [Figure 2-1B].
4. Push on the bottom (middle if there are two latches) part of the circuit pack until the latch(es) engage in the slot. (Do not push with the latches.)
5. After the latch(es) engage in the slot, push down to close the latch(es) [Figure 2-1C].
6. After closing the latch(es), with one thumb on the latch and the other thumb at the bottom of the circuit pack (on the other latch if there are two latches), press firmly to be sure the circuit pack is properly in place (Figure 2-1D).

Alarm and Diagnostic Reports

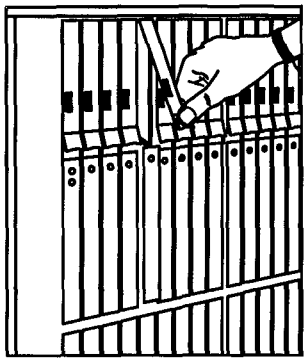
The procedures in this manual instruct you to attach reports to failed circuit packs. These reports are to be returned with failed circuit packs according to your local office procedures



A. Insert into Slot

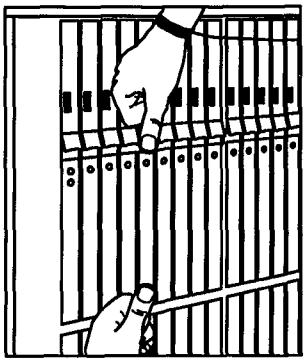


B. Engage Slot with Latch



C PUSH DOWN TO CLOSE LATCH

C. Push Down to Close Latch



D PRESS FIRMLY

D. Press Firmly

Note: Single latch circuit pack is shown, double latch circuit pack installation is similar.

Figure 2-1. **Installation of Circuit Packs**

Optical Fiber Cables

Care must be taken when working with optical fiber cables. The following warning must be followed to prevent physical harm.

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

Under normal operating conditions, lightwave transmission systems are completely enclosed; nonetheless, the following precautions must be observed:

⚠ WARNING:
Because of the potential for eye damage, technicians must neither disconnect any lightwave cable nor splice and stare into the optical connectors terminating the cables.

⚠ WARNING:
Under no circumstances can lightwave/lightguide operations be performed by a technician before satisfactorily completing an approved training course.

⚠ WARNING:
Since viewing lightwave emission directly with an optical instrument such as an eye loupe greatly increases the risk of eye damage, an appropriate label must appear in plain view on the front of the main frame or lightguide termination/interconnection equipment. The label must read as follows:

Unterminated optical connectors may emit laser radiation. Avoid direct exposure to the beam. Do not view this beam with optical instruments.

During service, maintenance, or restoration, a lightwave transmission system is considered unenclosed. Under these conditions, follow these practices:

⚠ WARNING:
Allow only authorized, trained personnel to do service, maintenance, and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Connectors associated with lightwave regenerators are recessed, which limits exposure distance. However, technicians removing or replacing regenerators must not stare or look directly into the vacant regenerator slot with optical instruments or magnifying lenses. (Normal eyewear or indirect viewing instruments are not considered magnifying lenses or optical instruments.)

⚠ WARNING:
Allow only authorized, trained personnel to use the lightwave test equipment during installation or servicing since this equipment contains semiconductor lasers. (Some examples of lightguide test equipment are OTDRs, Hand-Held Loss Sets, and Feature Finders.)

⚠ WARNING:
Under no circumstances allow any personnel to scan a fiber with an optical test set without verifying that all lightwave sources on the fiber are turned off.

⚠ WARNING:
Be certain that all unauthorized personnel are excluded from the immediate area of lightwave transmission systems during installation and service.

Consult ANSI Z136.1, *American National Standard for Safe Use of Lasers*, for guidance on the safe use of lasers in the workplace.

Disconnecting Optical Fiber Cables

The following sections contain procedures for disconnecting optical fiber cables from various system circuit packs.

OSWIO, OPEX, UIA, and UIB Circuit Packs

This procedure is used to disconnect optical fiber cables from OSWIO, OPEX, UIA, and UIB circuit packs.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Make sure there is some slack in the optical fiber cable you are disconnecting.
2. Hold the grip of the SC optical fiber cable connector firmly and pull the connector straight out. Refer to Figure 2-2 for the OSWIO and OPEX circuit pack optical fiber cable connector diagram; or Figure 2-3 for the UIA and UIB circuit pack optical fiber cable connector diagram.

⚠ CAUTION:
Do not stress the cable or pull the cable support at the tail end of the connector or cable and/or connector damage can occur.

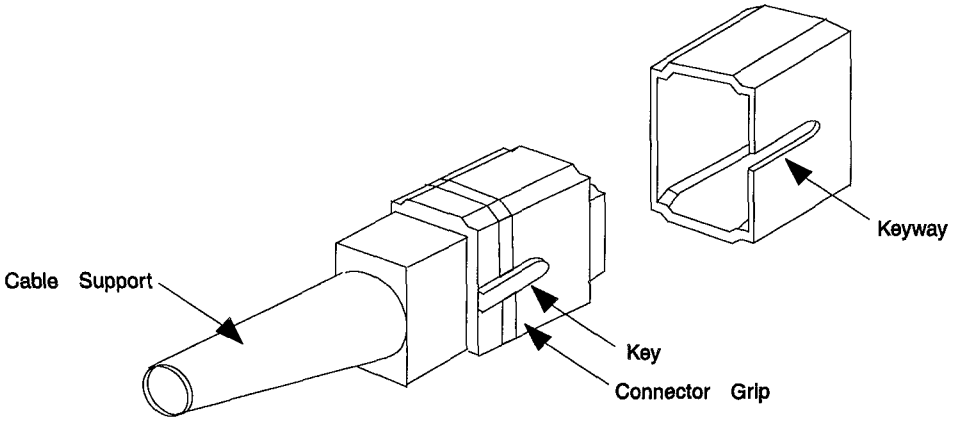


Figure 2-2. **OSWIO and OPEX Circuit Pack Optical Fiber Cable Connector**

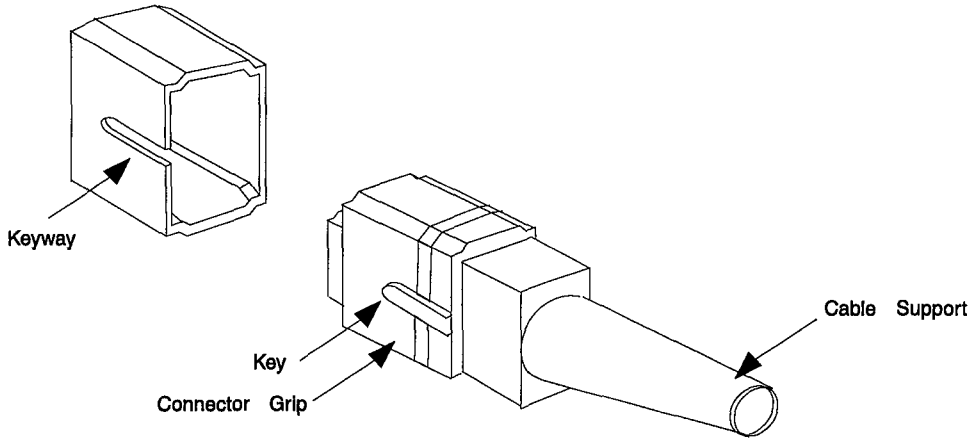


Figure 2-3. **UIA and UIB Circuit Pack Optical Fiber Cable Connector**

OUI Circuit Packs

This procedure is used to disconnect optical fiber cables from OUI circuit packs.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Make sure there is some slack in the optical fiber cable you are disconnecting.
2. Hold the ribbed sleeve (connector body) of the of the MT optical fiber connector and pull the connector straight out. Refer to Figure 2-4 for the OUI circuit pack optical fiber cable connector diagram.

⚠ CAUTION:
Do not stress the cable or pull the rubber boot (cable support) at the tail end of the connector or cable and/or connector damage can occur.

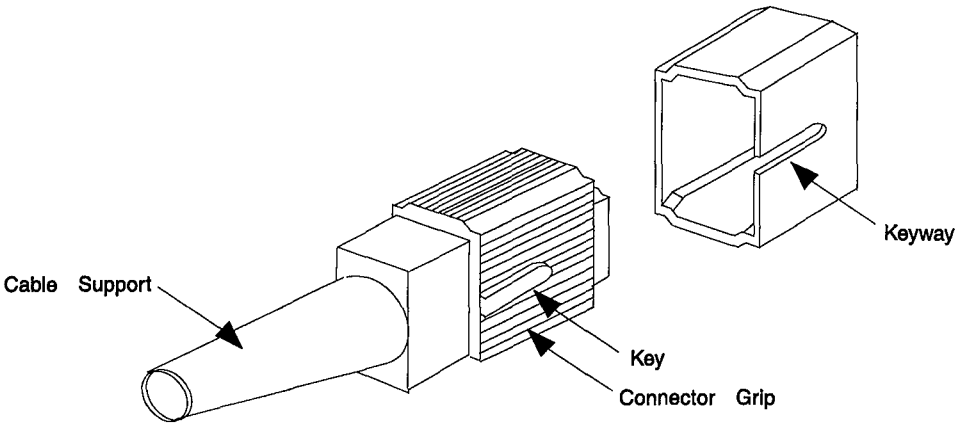


Figure 2-4. **OUI Circuit Pack Optical Fiber Cable Connector**

Connecting Optical Fiber Cables

The following sections contain procedures for connecting optical fiber cables from various system circuit packs.

OSWIO and OPEX Circuit Packs

This procedure is used to connect optical fiber cables to OSWIO and OPEX circuit packs.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Clean the optical fiber connector and the coupler on the OSWIO or OPEX circuit pack by referring to the section titled "Cleaning Optical Fiber Cable Connectors" (page 2-12).
2. Make sure that the label on the connector is pointing up and the keying is pointing to the right. Refer to Figure 2-2.
3. Insert the optical fiber cable connector into the coupler on the OSWIO or OPEX circuit pack until the connector is fully seated.

⚠ CAUTION:
Do not stress the cable or pull the cable support at the tail end of the connector or cable and/or connector damage can occur.

UIA and UIB Circuit Packs

This procedure is used to connect optical fiber cables to UIA and UIB circuit packs.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Clean the optical fiber connector and the coupler on the UIA or UIB circuit pack by referring to the section titled "Cleaning Optical Fiber Cable Connectors" (page 2-12).
2. Make sure that the label on the connector is pointing up and the keying is pointing to the left. Refer to Figure 2-3.

3. Insert the optical fiber cable connector into the coupler on the UIA or UIB circuit pack until the connector is fully seated.

CAUTION:
Do not stress the cable or pull the cable support at the tail end of the connector or cable and/or connector damage can occur.

OUI Circuit Packs

This procedure is used to connect optical fiber cables to OUI circuit packs.

WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Clean the optical fiber connector and the coupler on the OUI circuit pack by referring to the section titled "Cleaning Optical Fiber Cable Connectors" (page 2-12).
2. Position the optical fiber connector so that the white dot is pointing down and so that the keying of the connector is aligned with the one on the OUI circuit pack. Refer to Figure 2-4.
3. Hold the optical fiber connector at the ribbed sleeve (connector body) and insert the connector into the coupler on the OUI circuit pack until a click is heard, indicating the connector is fully seated.

CAUTION:
Do not stress the cable or pull the rubber boot at the tail end of the connector or cable and/or connector damage can occur.

Cleaning Optical Fiber Cable Connectors

This procedure is used to clean optical fiber connectors.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

1. Clean the end and sides of the connector ferrule with a wipe moistened with alcohol and blow dry with canned air.

⚠ CAUTION:
If the connector tip is not thoroughly cleaned, the signal performance is affected.

2. Clean the coupler on the circuit pack faceplate using air only. Hold air nozzle 3 inches from the faceplate. Refer to Figure 2-5.

⚠ CAUTION:
*Do **not** use any wipe on the faceplate socket.*

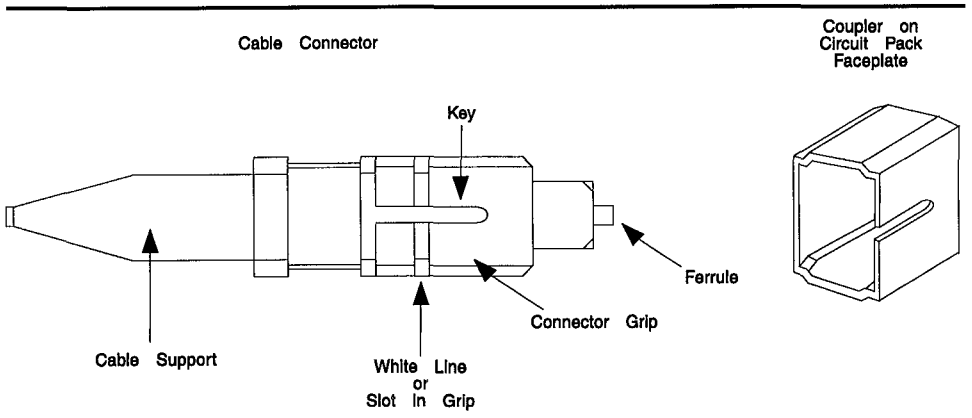


Figure 2-5. **Cleaning the Fiber-Optic Cable Connector and Circuit Pack Faceplate Coupler**

Fuses

Care must be taken when installing or extracting fuses and other hardware from the frame.

CAUTION:
Only blown fuses should be extracted. Extracting good fuses may cause loss of service.

WARNING:
Replace fuses only with the same type and amperage fuse as the blown fuse.

CAUTION:
Before replacing any fuse, make sure its associated circuit pack is extracted.

CAUTION:
If a blown fuse or dummy fuse exists in the ED-9C114-30 Fuse and Alarm Panel, and it is necessary to work on the backplane, it is recommended that the alarm lamp and fuse be removed prior to any work on the backplane.

Tables 2-1 and 2-2 list the different types of fuses used in the DACS IV-2000.

Table 2-1. **Switch Complex and Collocated Interface Bays**

Type	Location	Amperage	Comcode	Quantity
KS-19780,L4	Switch Bays Fuse Panels	20 (load)		18
KS-19780,L2	Switch and Fuse & Alarm Bays Fuse Panels	10 (load)	997964697	See Note 1.
70G	Switch and Fuse & Alarm Bays Fuse Panels	0.5 (indicator)	100203389	See Note 1.
77E	Switch Power Modules	15		See Note 2.
77J	Switch Power Modules	7.5		See Note 3.
77H	Switch Power Modules	4		See Note 4.
78E	Switch Power Modules	15		See Note 5.
78H	Switch Power Modules	4		See Note 6.
77C	Memory Module	5		1 on FBJ
77B	Memory Module	3		See Note 7.
77G	Memory Module	2		See Note 8.
77A	Memory Module	1.25		See Note 9.

See notes at end of table.

Table continued on next page.

Table 2-1. **Switch Complex and Collocated Interface Bays (Continued)**

Type	Location	Amperage	Comcode	Quantity
78G	Memory Module	2		See Note 10.
78A	Memory Module	1.25		See Note 11.

Notes:

1. Quantities depend on system configuration installed.
2. 5 on FBK-4 of Switch Power Modules 1 and 3.
3. 14 on FBK-1 and FBK-3 of Switch Power Modules 1 and 3;. 12 on FBK-2 of Switch Power Modules 1 and 3; 4 on FBK-4 of Switch Power Modules 1 and 3; 13 on FBK-1 of Switch Power Module 2; 10 on FBK-2 and FBK-4 of Switch Power Module 2; 9 on FBK-3 of Switch Power Module 2.
4. 3 on FBK-4 of Switch Power Modules 1 and 3; 1 on FBK-1 of Switch Power Module 2; 2 on FBK-2 and FBK-4 of Switch Power Module 2; 5 on FBK-3 of Switch Power Module 2.
5. 1 on FBM-1 and FBM-2 of Switch Power Module 2.
6. 14 on FBM-1 and FBM-2 of Switch Power Modules 1 and 3; 13 on FBM-1 and FBM-2 of Switch Power Module 2; 12 on FBM-3 of Switch Power Modules 1, 2, and 3.
7. 1 on FBJ; 1 on FBL.
8. 1 on FBJ; 1 on FBL.
9. 3 on FBJ; 4 on FBL.
10.1 on FBJ; 1 on FBL.
11.1 on FBJ; 1 on FBL.

Table 2-2. **Remote Complex Fuses**

Type	Location	Amperage	Comcode	Quantity
KS-19780,L8	ED-2C940-30 Fuse Panel	12 (load)	400848602	See Note 1.
KS-19780,L2	ED-2C940-30 Fuse Panel	10 (load)	997964697	See Note 1.
70D	ED-2C940-30 Fuse Panel	5 (indicator)	100203355	See Note 1.
70B	ED-2C940-30 Fuse Panel	2 (indicator)	100203330	See Note 1.
70G	ED-2C940-30 Fuse Panel	0.5 (indicator)	100203389	See Note 1.
WP91768,L115	ED-9C114-30 Fuse Panel	12	407749847	6
WP91768,L114	ED-9C114-30 Fuse Panel	10	405750431	See Note 1.

See notes at end of table.

Table continued on next page.

Table 2-2. **Remote Complex Fuses (Continued)**

Type	Location	Amperage	Comcode	Quantity
WP91768,L107	ED-9C114-30 Fuse Panel	2	406747527	1
77D	Switch Power Module	10	406547067	See Note 2.
78J	Switch Power Module	7.5	406547307	See Note 3.
WP90247,L314	Remote Unit Interface Power Module	7.5	406520833	4 on ED-9C055 (fuse board I)
WP90247,L313	Remote Unit Interface Power Module	5	406520825	See Note 4.
WP90247,L309	Remote Unit Interface Power Module	2	406520791	See Note 5.
WP90247,L306	Remote Unit Interface Power Module	1	406520783	See Note 6.
WP90247,L303	Remote Unit Interface Power Module	0.5	406520767	2 on ED-9C055 (fuse board I)

Notes:

1. Quantities depend on system configuration installed (see SD-96673-01).
2. 14 on ED-2C960 (fuse board B); 12 on ED-2C962 (fuse board A).
3. 14 on ED-2C961 (fuse board D); 12 on ED-2C963 (fuse board C).
4. 6 on ED-9C051 (fuse board F); 6 on ED-9C052 (fuse board G); 7 on ED-9C053 (fuse board H).
5. 1 on ED-9C052 (fuse board G); 2 on ED-9C055 (fuse board I).
6. 2 on ED-9C051 (fuse board F); 2 on ED-9C052 (fuse board G).

Replacing Fuse and Alarm Panel Fuses

These procedures give instructions on the proper extraction and installation of fuses in Fuse Panels that use load and indicator fuses and Fuse Panels that use fuses with alarm lamps. Fuses must only be extracted or installed when instructed to do so by other procedures or your system administrator.

⚠ CAUTION:
Never extract a good fuse (alarm lamp not lit), as it may affect traffic. Never extract more than one fuse at a time. This could cause damage to the associated circuit pack and/or the frame, could damage the integrity of the protection bus, or could cause loss of service

Extracting Indicator and Load Fuses

To extract fuses associated with Fuse and Alarm Panel that use indicator and load fuses, refer to the section titled "Primary Fuses" (page 15-78) to determine the order in which these fuses are replaced:

1. Partially extract the circuit pack associated with the blown indicator fuse. Refer to the section titled "Extracting Circuit Packs" (page 2-3), if necessary.
2. Grasp the fuse holder associated with the blown indicator fuse (blown fuse indicator extended), push inward and turn 1/4 turn counter clockwise to disengage the fuse holder.

   Alarm lamp extinguishes
3. Pull the fuse holder and blown indicator fuse out of its socket.
4. Remove blown indicator fuse from the fuse holder.
5. Remove the load fuse, if blown, following this procedure.

Extracting Fuses With Alarm Lamps

To extract fuses associated with Fuse and Alarm Panels that use fuses with alarm lamps:

1. Partially extract the circuit pack associated with the blown fuse. Refer to the section titled "Extracting Circuit Packs" (page 2-3), if necessary.
2. Carefully lift the fuse holder latch associated with the blown fuse (alarm lamp lit). Refer to Figure 2-6.
3. With one finger placed at the top of the fuse, push in and down to disengage the fuse.

   The alarm lamp extinguishes.

4. Pull the alarm lamp and blown fuse out of its socket.
5. Remove the blown fuse from the alarm lamp.

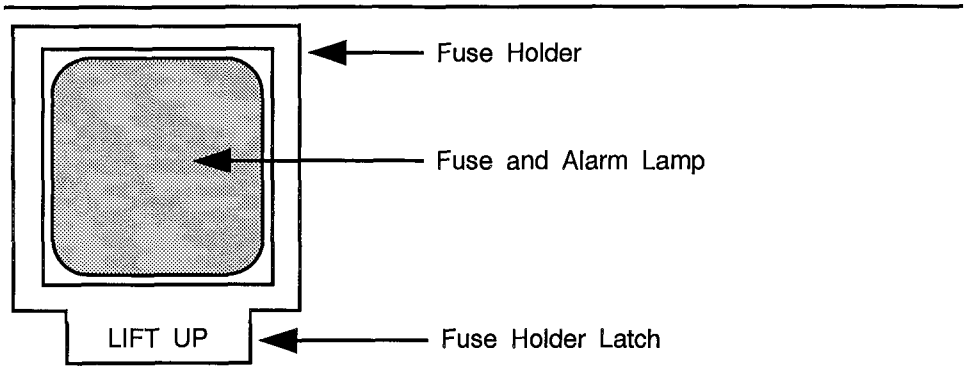


Figure 2-6. **ED-9C114-30 Fuse Panel Fuse and Holder Assembly**

Installing Indicator and Load Fuses

To install fuses associated with Fuse and Alarm Panel that use indicator and load fuses, refer to the section titled "Primary Fuses" (page 15-78) to determine the order in which these fuses are replaced:

1. Insert the new fuse (same amperage as the blown fuse) into the fuse holder.
2. Insert the fuse holder with fuse into the fuse socket of the Fuse and Alarm Panel and push inward while turning 1/4 turn clockwise to engage the fuse holder.
3. Replace the indicator fuse, if applicable, following this procedure.
4. Reinstall the circuit pack associated with the replaced fuse. Refer to the section titled "Installing Circuit Packs" (page 2-4), if necessary.

Installing Fuses With Alarm Lamps

To install fuses associated with Fuse and Alarm Panels that use fuses with alarm lamps:

1. Insert the new fuse (same amperage as the blown fuse) into the alarm lamp.
2. Insert the alarm lamp with fuse straight into the socket of the Fuse and Alarm Panel until it snaps into place.
3. Lower the fuse holder until it snaps into place.

4. Reinstall the circuit pack associated with the replaced fuse. Refer to the section titled "Installing Circuit Packs" (page 2-4), if necessary.

Disk Drives

Handle the PRI disk and SEC disk drives for the DACS IV-2000 with the same precautions used in handling other magnetic media.

- Do not subject any drive to shocks or vibrations. (Even a drop of 2 inches can damage a disk drive.)
- Store the disk drives away from strong magnetic fields, such as those produced by electric motors or large magnets.
- Do not store disk drives where the temperature can exceed 50° C (122° F), or where the relative humidity can exceed 80%.

In addition, before installing in a frame, allow the temperature of the disk drive to stabilize at room temperature. This is particularly important for PRI disk drives that are shipped during cold weather. In this case the PRI disk drive must be unpacked and left sitting for at least an hour before installing in the frame.

⚠ CAUTION:
Never extract a PRI or SEC disk drive from the frame when it is in service. Disk drives must be removed from service with the `RMV-EQPT` *command before they are extracted.*

Procedures for using the SEC disk drive are located in Chapter 8, procedures for maintenance of the SEC disk drive are in Chapter 3, and procedures for replacing one or both PRI disk and SEC disk drives are in Chapter 17.

⚠ CAUTION:
When formatting the PRI or SEC disks, it is preferable to use the `CPY-MEM` *command with the memory class of* `FORMAT`*. If time constraints exist where the normal format procedure cannot be used, then the memory class of* `HEADER` *may be used. Using* `FORMAT` *reformats the entire disk and using* `HEADER` *only reformats the disk header information.*

PRI Disk Drives

CAUTION:
A PRI disk drive that is removed from service with the `RMV-EQPT` *command must be extracted from the frame to prevent booting an "old database" if a failure occurs to the other PRI disk drive during a system reset.*

SEC Disk Drive

CAUTION:
Write-protected optical disk cartridges must be extracted from the SEC disk drive after their use. A writable optical disk cartridge can be left in the SEC disk drive for automatic database backups.

Optical Disk Cartridges

The optical disk cartridges for the DACS IV-2000 (Part number 406919084) were designed to handle the rigors of shipping. This optical disk cartridge, when enclosed in its plastic case and wrapped in one layer of bubble wrap, can be reliably mailed or shipped. However, the optical disk cartridge is sensitive to temperature. Store optical disk cartridges in their plastic cases in a cool place, away from strong magnetic fields. While handling the optical disk cartridge, avoid touching the disk surface itself.

The SEC disk drive for the DACS IV-2000 uses optical disks for backing up the operating software and the database. All optical disk operations must be performed with approved optical disk cartridges.

The following optical disk cartridges are the only types approved for use on the DACS IV-2000 (512) Release 5.0:

- J98786SL-3, List 1 — For new frame orders and upgrades from DACS IV-2000 (512) Release 3.0
- J98786SL-3, List 2 — Change notice applications only
- J98786SL-3, List 3 — Blank optical disk cartridge
- J98786SL-3, List 4 — Spare Release 5.0 optical disk cartridge
- J98786SL-3, List B — System start-up optical disk cartridge (new frame only)

CAUTION:
Use of an unapproved optical disk cartridges results in backup failure.

Once optical disk cartridges are removed from their plastic cases, they must be handled carefully and the following cautions observed:

- Keep magnets away from the optical disk cartridge.
- Store the optical disk cartridge away from strong magnetic fields, such as those produced by electric motors or large magnets.
- Store the optical disk cartridges in a dust-free environment.
- Avoid using the optical disk cartridges where there is likely to be a wide variation in temperature or high humidity. The condensation formed under these conditions can make it impossible for the optical drive to read or write from or to the optical disk cartridge.
- Do not store the optical disk where the temperature can exceed 50° C (122° F) or where the relative humidity can exceed 80%.

  In addition, allow the optical disk cartridges to stabilize at room temperature before installing them in an optical drive. This is particularly important for optical disk cartridges that are shipped during cold weather. If you receive optical disk cartridges during cold weather, they must be unpacked and left sitting at room temperature for at least an hour before installing them in the optical drive.
- Avoid dropping the optical disk cartridges.
- Refrain from touching the optical disk cartridge's disk surface.
- Never unscrew the back of the optical disk cartridge.

Fan Assemblies

Fan assemblies are provided to cool system bay circuit packs. In the event of fan failure, the following precaution applies:

⚠ CAUTION:
Fan assemblies must be replaced within 40 minutes from time of failure to prevent other system failures.

Routine Maintenance

3

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Contents

Routine Maintenance

3

This chapter provides routine maintenance procedures for the DACS IV-2000 (512) Release 5.0.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Routine Maintenance Checklist

Table 3-1 is a routine maintenance checklist that lists the routine maintenance activities and the recommended intervals. It is recommended that you make copies of Table 3-1, and use the checklist on a regular basis.

Table 3-1. **Routine Maintenance Checklist**

Activity	Recommended Frequency	Date Last Performed				
Database Backup	Daily					
Clean SEC Disk Drive Optical Lens	Once A Month (more frequently if the environment is particularly dusty*)					
Clean Optical Cartridges	Once A Month (more frequently if the environment is particularly dusty or you are experiencing problems with read/write activities†)					
Change Fan Filter For fan assemblies: ED-2C816-30,G1 ED-2C906-30 ["Changing the OPEX Bay Fan Filter" (page 3-20)] For fan assemblies: WP92310,L4 ED-9C130-30 ["Fan Filter Alarm" (page 15-171)]	Once Every 3 Months (or more often as required)					
Test Remote Alarm Surveillance Capability	Once Every Year					

* If the lens is cleaned on a regular basis and you are experiencing problems with read/write activities, try another optical disk cartridge and, if the problems persist, replace the SEC disk drive using the procedure titled "Replacing the SEC Disk Drive" (page 17-9).

† Try a second optical disk cartridge and, if you still experience the same problem, replace the SEC disk drive using the procedure titled "Replacing the SEC Disk Drive" (page 17-9).

Database Backup

The database can be backed up on a daily basis either manually or automatically (scheduled backups). Use the appropriate procedure to backup the database.

Manual Database Backup

The following procedure is used to make backup copies of the database onto the SEC disk. Daily backup of the database is essential. The recommended procedure for performing the backups is to use at least two disks with the current software release (preferably one disk for each day of the week you perform backups), and alternate the use of those disks so that the most recent backup is not overwritten. In addition, the date, time, and disk number of each backup should be recorded in a log.

The **ED-NE** command offers the option to enable automatic backups. Automatic backups can be scheduled to execute once in a 24-hour period on selected days, or on every day of the week. Refer to the section titled "Scheduled Database Backup" (page 3-6) for more information.

The main controller must be in the in-service (IS) state to perform both manual and automatic backups.

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 to the optical disk, make sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 8-27), if necessary]. The backup fails with an error code of ENRE *if the optical disk is write-protected.*

⚠ CAUTION:
Manual database backups must not be performed if there are any alarms or protection switches in effect on the DACS IV-2000 frame.

1. Make sure there are no alarms or protection switches active by entering the following command:

   RTRV-ALM-ALL:*[a]*;

   Where:

   a = Target ID (optional)

   If any alarms or protection switches (condition type of INHSWPR) are present, go to the section titled "Isolating Failures" (page 15-12) before performing this procedure.

2. Load a formatted disk into the SEC disk drive, if necessary. Refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29) if necessary.

3. Determine the software release and Target ID (TID) on the optical disk by entering the following command:

   RTRV-SYSID:[a];

   Where:

   a = Target ID

   The following output appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
   CALCK,HEADCK,INTEGCK */
   "SEC,PROG, ...,i,j,..."
;
```

   Where:

   i = System software release: `{ 5-00-{1-99}-m, NOT FOUND }`

   j = Target ID

   If the software release is not the latest and/or the TID does not match that of the DACS IV-2000 frame, obtain a copy of the latest release with a matching TID and redo this procedure.

4. Update the database on the PRI disks by entering the following command:

   CPY-MEM:*[a]*:::WKG,PRI,DBASE;**

   Where:

   a = Target ID (optional)

   This command takes up to 6 minutes to complete. *Wait for the* `COMPLD` *response before continuing with the next step.*

5. Backup the database to SEC disk by entering the following command:

   CPY-MEM:*[a]*:::PRI,SEC,DBASE;**

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete. *Wait for the* `COMPLD` *response before continuing with the next step.*

   If the database backup is aborted, redo this step, or if necessary, replace the optical disk cartridge with a new one [refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29) for replacing optical disk cartridges, if necessary] before redoing this step.

CAUTION:
If the database backup is aborted for any reason, do not use the optical disk cartridge with the aborted backup on it for restoring databases.

6. Retrieve the date and time of the backup by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

   The following output appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY_TYPE,ID_BLOCK,SYSTEM_TYPE,SYSTEM_RELEASE,
   TID,DATE,TIME */
   "..., h, i"
;
```

   Where:

   h = Date of backup: { {00-99}{01-12}{01-31}, NOT FOUND }

   i = Time of backup: { {00-23}{00-59}{00-59}, NOT FOUND }

7. Record the date, time, and optical disk number of the database backup in a log.
8. If your office procedures require you to remove the SEC disk drive from service, power down the SEC disk drive by entering the following command:

   RMV-EQPT:*[a]*:**SEC**;

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to com*plete. After completion, the green ON LED is extinguished.*
9. Eject the optical disk cartridge and store it in its protective case.

NOTE:
The optical disk cartridge cannot be removed from the SEC disk drive until the Disk in Use LED is extinguished.

Scheduled Database Backup

Use this procedure to schedule daily backups of the database onto the secondary disk drive. Daily backup of the database is essential.

The state of the main controller must be in-service (IS) to perform database backups.

1. Insert an optical disk cartridge to be used for the backup into the SEC disk drive by referring to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29). The optical disk cartridge used can be new or one that has been used before in the same frame (that is, the TID of the optical disk cartridge must match the TID of the system).
2. Verify that the TID on the optical disk cartridge matches the system TID or is `NOT FOUND` (if the disk has never been used for a database backup) by entering the following command.

   `RTRV-SYSID:`*`[a]`***`;`**

   Where:

   a = Target ID (optional)

   The following response appears (only pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* MEMORY_TYPE,ID_BLOCK,SYSTEM_TYPE,SYSTEM_RELEASE,
      TID,DATE,TIME */
      ...
      "SEC,DBASE,...,h,..."
      ...
   ;
   ```

   Where:

   h = Target ID

   If the TID shown in parameter *g* is `NOT FOUND` or is the same as the TID shown on the date and time header line, continue with the next step. Otherwise, eject the optical disk cartridge and redo this procedure from Step 1.
3. Schedule daily database backups by entering the following command:

   `ED-NE:`*`[a]`***`::::BKUP=ON,`***`[TMDAY=j]`***`,DAYWK=Su&&Sa;`**

   Where:

   a = Target ID (optional)

   j = Time of day: { **`0000-2359`**, **`CURVAL`** }
   The initial system value is **`0130`**.

Cleaning the SEC Optical Lens

The following procedure is used for cleaning the optical drive lens of the SEC disk drive, using the AT&T Optical Drive Lens Cleaning Kit (Part No. 406935346). This maintenance procedure should be performed at least once a month. It should be performed more often during periods of heavy usage (such as initial testing) to maintain reliability of optical drive operations.

After continued use, the bristles on the brush in the lens cleaning cartridge become splayed (see Figure 3-4B). When this occurs, the lens cleaning cartridge must be discarded. A splayed brush cannot clean the lens completely.

The lens cleaning cartridge is similar in size and shape to a regular optical cartridge. The difference is that when the silver shutter slides open, a cleaning brush moves into a vertical position for cleaning.

⚠ CAUTION:
Electrostatic discharge (ESD) can cause damage to the components of a DACS IV-2000. Wear an ESD wrist strap when working around the frame.

1. Determine where to begin this procedure by selecting the option that applies to your situation:
   - If you are uncertain as to whether there is pending system activity involving the optical drive (SEC), or if you are uncertain whether there is an optical disk cartridge in the SEC disk drive, continue this procedure at Step 2.
   - If you are certain there is no system activity involving the SEC disk drive, but there is an optical disk cartridge in the SEC disk drive, continue this procedure at Step 5.
   - If you are certain there is no system activity involving the SEC disk drive, and that there is not an optical disk cartridge in the SEC disk drive, continue this procedure at Step 10.

2. Retrieve automatic backup information by entering the following command:

   RTRV-NE;

   The system responds with the following message (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...:BKUP=k,TMDAY=l,DAYWK=m,..."
;
```

   Where:

   k = Automatic SEC disk drive backup: { ON, OFF }
   Specifies if automatic database backup feature is enabled.

   l = Time of day: 0000-2359
   Specifies time automatic database backup is to occur.

   m = Day of Week: { Su, Mo, Tu, We, Th, Fr, Sa }
   Specifies the day(s) automatic database backups are to occur.

3. Check the date (DAYWK) and time (TMDAY) parameters (*m* and *l*, respectively), looking for any automatic backups scheduled during the next 5 minutes. If date and time values do not appear in the message, no automatic backups are scheduled.

   - If no backups are scheduled for the next 5 minutes, continue this procedure at Step 4.
   - If backups are scheduled for the next half hour, you can either wait for the scheduled backup to complete or get permission from your system administrator or next level of support to cancel the scheduled backup (using the **ED-NE** command). When you know the system is ready, continue this procedure at Step 4.

4. Check for any pending **CPY-MEM** commands by entering the following command:

   RTRV-CMD-STAT:*[a]*::::ALL;**

   Where:

   a = Target ID (optional)

   The system responds with the following message:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CMDCTAG,INPUT_CMD,CMDSTAT */
   "c,d,e"
;
```

Where:

c = Command CTAG: <1-10 CTAG Legal Characters>

d = Input command: { <Valid Command Verb>, INTERNAL }

e = Command status: { IP, UNKN, WTRSCE }

- If you do **not** find any CPY-MEM commands, continue this procedure at Step 5.
- If you find any CPY-MEM commands, wait a minute or two and redo this step until no CPY-MEM commands appear in the output message.

5. Check to see if the SEC disk drive is in service by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SEC::ALL;

   Where:

   a = Target ID (optional)

   The system responds with the following message:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC,STATE */
   "SEC:f"
;
```

   Where:

   f = Equipment state: { IS, OOS }

   - If the SEC disk drive is in the OOS (out-of-service) state, continue with this procedure at Step 7.
   - If the SEC disk drive is in the IS (in-service) state, continue this procedure at Step 6.

6. Remove the SEC disk drive from service by entering the following command:

   RMV-EQPT:*[a]*:SEC;

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to com*plete. The green ON LED extinguishes.*

7. Press the eject button at the bottom of the SEC disk drive (refer to Figure 3-1).

   After approximately three seconds, the optical disk cartridge ejects from the SEC disk drive about one inch.

8. If the optical cartridge ejected, continue with the next step. Otherwise, perform the following procedure to eject the optical cartridge:

   a. Insert the emergency eject tool (Part No. 406923292) into the hole provided in the SEC disk drive (refer to Figure 3-1 for location of hole and required orientation for inserting the tool).

CAUTION:
Use of objects like a paper clip to force the optical cartridge to eject can damage the SEC disk drive. Use only the approved emergency eject tool.

   b. Insert the tool straight back into the hole, being careful not to tilt it towards the top, sides, or bottom of the SEC disk drive.

   c. Exert enough pressure on the tool until the optical cartridge pops out of the SEC disk drive approximately one inch.

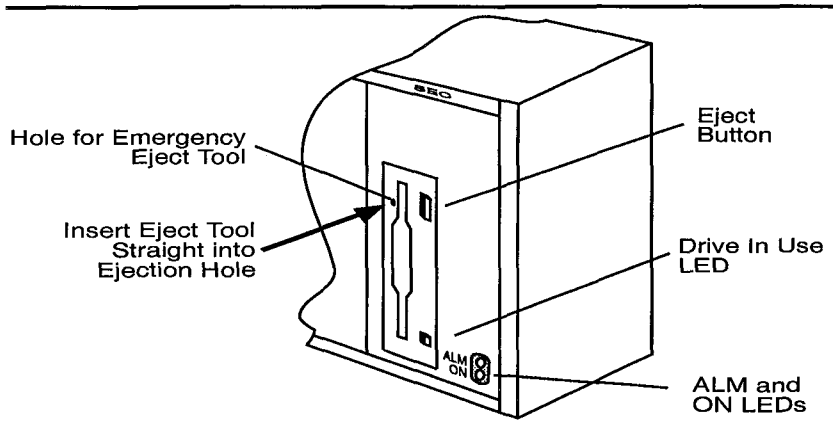


Figure 3-1. **Using the Emergency Eject Tool**

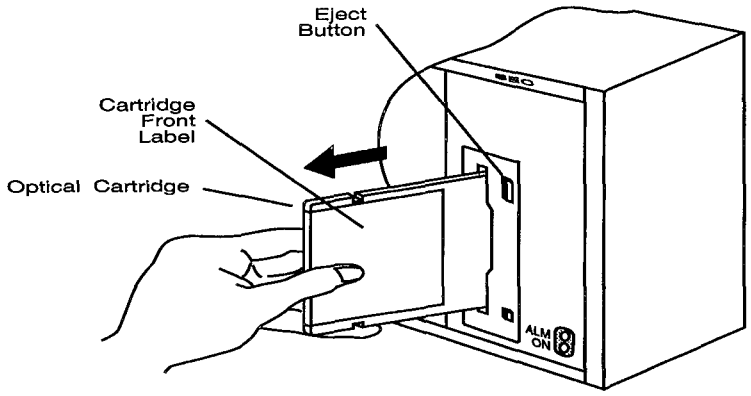


Figure 3-2. **Removing an Optical Cartridge**

9. Pull the optical cartridge out of the SEC disk drive (refer to FIgure 3-2) and mark it so that it can be reinserted in Step 17.
10. Open the shutter on the optical lens cleaning cartridge and check the cleaning brush (refer to Figure 3-3).

CAUTION:
Use of solvents can damage the SEC disk drive. Do not apply any solvents to the cleaning brush.

Figure 3-4 shows the optical lens cleaning cartridge with the shutter open and provides blowups of both a *normal* brush and a *splayed* brush. If the bristles are splayed, discard the used optical lens cleaning cartridge and get a new one. Figure 3-4B shows a brush with splayed bristles.

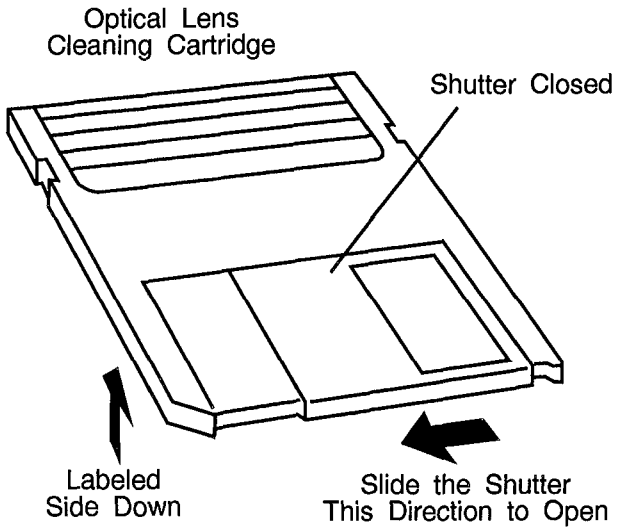


Figure 3-3. **Optical Lens Cleaning Cartridge — Shutter Closed**

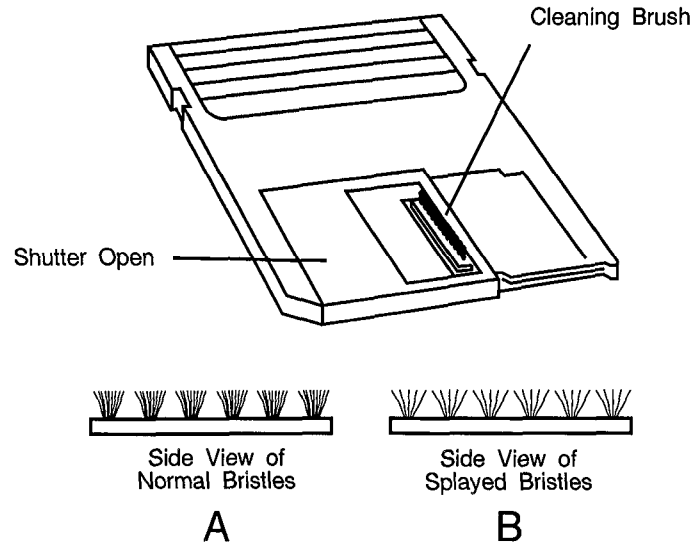


Figure 3-4. **Optical Lens Cleaning Cartridge — Shutter Open**

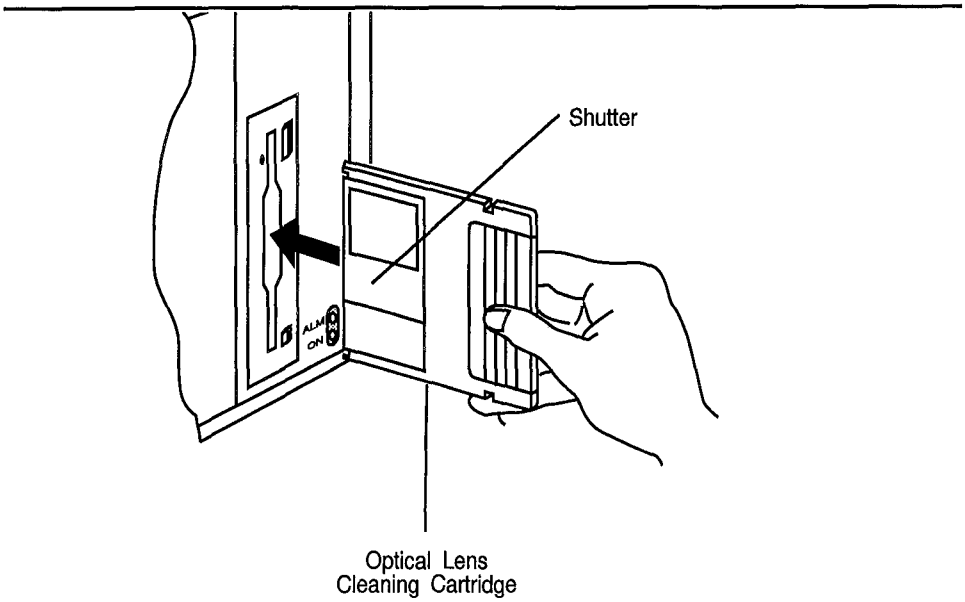


Figure 3-5. **Inserting a Cartridge into the SEC Disk Drive**

11. Insert the optical lens cleaning cartridge into the SEC disk drive with its labeled side facing to your left (refer to FIgure 3-5).

CAUTION:
Do not force the optical lens cleaning cartridge into the SEC disk drive.

12. Gently push the optical lens cleaning cartridge towards the back of the SEC disk drive until it is flush with the surface of the SEC disk drive.

    The cleaning cartridge does not lock into the SEC disk drive.

CAUTION:
Do not force the optical lens cleaning cartridge into the SEC disk drive.

13. While maintaining contact with the optical lens cleaning cartridge, slowly move your hand away from the SEC disk drive.

    After removing your hand, the optical lens cleaning cartridge protrudes approximately one inch out of the SEC disk drive.

14. Repeat Steps 12 and 13 four to five times. When the optical lens cleaning cartridge is pushed into the SEC disk drive, its flipping mechanism causes the brush inside to stand up. By repeating Steps 12 and 13, dust and particles on the lens are removed by the brush. Normally, you repeat Steps 12 and 13 four or five times to clean the optical lens completely.
15. After cleaning the optical lens, extract the optical lens cleaning cartridge from the SEC disk drive by pulling the cleaning cartridge straight out of the slot.
16. Store the optical lens cleaning cartridge in its case.
17. If you extracted an optical cartridge in Steps 7, 8, and 9, insert the optical cartridge marked in Step 9 into the slot of the SEC disk drive (refer to Figure 3-5). Otherwise, continue with Step 19.
18. If the SEC disk drive was in the IS state originally (Step 5), restore the SEC disk drive to service by entering the following command:

    `RST-EQPT:`*[a]*`:SEC;`

    Where:

    a = Target ID (optional)

    This command takes up to 2 minutes to complete. *The green ON LED lights.*
19. Using the "Routine Maintenance Checklist" form in the beginning of this chapter (Table 3-1), record the date that you performed this procedure.

Cleaning the SEC Optical Drive with *Ultra Jet* Duster

Use this procedure to clean the SEC optical disk drive using the canned Ultra Jet duster product manufactured by CHEMTRONICS, Inc. of Kennesaw, GA. To order the product from Lucent, use COMCODE # 407297910. The product name is *Ultra Jet* duster.

This procedure should be done once a month to maintain the reliability of optical drives. If the environment is very dusty, optical drives should be cleaned more often.

A single can of CHEMTRONICS Ultra Jet can be used for thirty to fifty cleanings. Discard the container when it is empty.

⚠ CAUTION:
Electrostatic discharge (ESD) can cause damage to the components of a DACS IV-2000. Wear an ESD wrist strap when working around the frame.

1. Determine where to begin by selecting the option that applies:

   - If you don't know whether there is pending system activity involving the optical drive or whether there is an optical cartridge in the drive, go to Step 2.
   - If you know there is no system activity involving the optical disk drive, and if there is an optical cartridge in the drive, go to Step 5.
   - If you know there is no system activity involving the drive, and if there is no optical cartridge in the drive, go to Step 7.

2. Enter this command to retrieve automatic backup information:

   RTRV-NE;

The system responds with the following information:

TID YY-MM-DD HH:MM:SS

M CTAG COMPLD

/* NETYPE,NESIZE,SFTWR-VRSN:<> */

"...:BKUP=*k*,TMDAY=*l*,DAYWK=*m*,..."

Where

k = Automatic optical disk drive backup: { ON, OFF }

Specifies if automatic database backup feature is enabled.

l = Time of day: 0000-2359

Specifies time automatic database backup is to occur.

m = Day of Week: { Su, Mo, Tu, We, Th, Fr, Sa }

Specifies the day(s) automatic database backups are to occur.

3. Check the date and time parameters (*m* and *l*, respectively), looking for any automatic backups scheduled during the next 5 minutes. If date and time values don't appear in the message, no automatic backups are scheduled.

   - If no backups are scheduled for the next 5 minutes, go to Step 4.
   - If backups are scheduled for the next half hour, you can either wait for the backup to complete or get permission to cancel the scheduled backup (using the `ED-NE` command). When you know the system is ready, go to Step 4.

4. Enter this command to check for any pending `CPY-MEM` commands:

   `RTRV-CMD-STAT:`*`[a]`*`::::ALL;`

   Where:

   a = Target ID (optional)

The system responds with the following information:

TID YY-MM-DD HH:MM:SS

M CTAG COMPLD

/* CMDCTAG,INPUT_CMD,CMDSTAT */

"c,d,e"

Where:

c = Command CTAG: <1-10 CTAG Legal Characters

d = Input command: { <Valid Command Verb>, INTERNAL

e = Command status: { `IP, UNKN, WTRSCE` }

- If you find any `CPY-MEM` commands, wait a minute or two and re-do this step until no `CPY-MEM` commands appear in the output message.
- If you don't find any `CPY-MEM` commands, proceed to Step 5.

5. Enter this command to verify that the optical drive is in service:

   `RTRV-STATE-EQPT:[a]:SEC::ALL;`

   Where:

   a = Target ID (optional)

The system responds with the following information:

TID YY-MM-DD HH:MM:SS

M CTAG COMPLD

/* LOC,STATE */

"SEC:*f*"

Where:

f = Equipment state: { `IS, OOS` }

- If the optical drive is in the OOS (out-of-service) state, go to Step 7.
- If the optical drive is in the IS (in-service) state, go to Step 6.

6. Enter this command to power down the optical drive:

   `RMV-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

This command takes up to one minute to complete. The green ON LED extinguishes.

7. Remove the optical cartridge from the drive: press the eject button at the bottom of the drive (refer to Figure 3-1).

After approximately three seconds, the optical disk cartridge ejects from the SEC disk drive about one inch.

⚠ CAUTION:
Before cleaning the SEC optical drive with Ultra Jet, put on a pair of safety glasses with side shields to protect your eyes.

8. If the optical cartridge ejected, go to Step 9. If it did not, perform the procedure described on page 3-10 to eject the optical cartridge.

9. Pull the cartridge out of the drive and mark it so it can be re-inserted (Step 17).

10. Holding the can of Ultra Jet duster, attach the extension tube to its nozzle.

11. Hold open the door to the optical drive.

12. Insert the extension tube approximately 3 inches into a corner of the drive. Point the extension tube toward the center of the drive, clearing the hub. Hold the can of Ultra Jet in an upright position. Do not tilt.

13. Squeeze the trigger of the Ultra Jet container about halfway for 1 or 2 seconds, spraying at half-strength.

14. Repeat Step 13 once more if the drive is contaminated.

15. Remove the extension tube from the optical drive and close the drive door.

16. Remove the extension tube from the Ultra Jet nozzle and re-attach it to the side of the container. Store the Ultra Jet container in its place.

17. If you extracted the optical cartridge from the drive in Steps 7, 8, and 9, re-insert it into the slot of the drive. Otherwise, continue with Step 19.

18. f the optical drive was in the IS state originally (Step 5), restore it to service by entering the following command:

    `RST-EQPT:[a]:SEC;`

    Where:

    a = Target ID (optional)

This command takes up to 2 minutes to complete. The green ON LED lights.

19. Using the "Routine Maintenance Checklist" form at the start of this chapter (Table 3-1), record the date that you performed this procedure.

Cleaning Optical Cartridges

This procedure is used to clean optical cartridges that are used in the SEC disk drive, using the AT&T Optical Cartridge Cleaning Kit (Part No. 406942102). To maintain the high performance and prolong the useful life of your optical cartridges, follow the cleaning recommendation that best fits your work environment:

- If an optical cartridge is left in the SEC disk drive for two weeks at a time, the optical cartridge should be removed for a biweekly cleaning.
- If the optical cartridge is stored in its case between uses, there is no need to clean the optical cartridge on a regular basis. If you notice dirt or dust accumulating, it should be cleaned.
- If the optical cartridge is **not** stored in its case between uses and is left exposed for two weeks, it must be cleaned before the next use.

⚠ CAUTION:
Use of cleaning cloths or fluids from cleaning kits other than those approved for your optical cartridge can cause damage to the optical cartridge's disk surface. Use only the cleaning materials supplied with your approved optical cartridge cleaning kit.

Figure 3-6 shows the components of the optical cartridge cleaning kit.

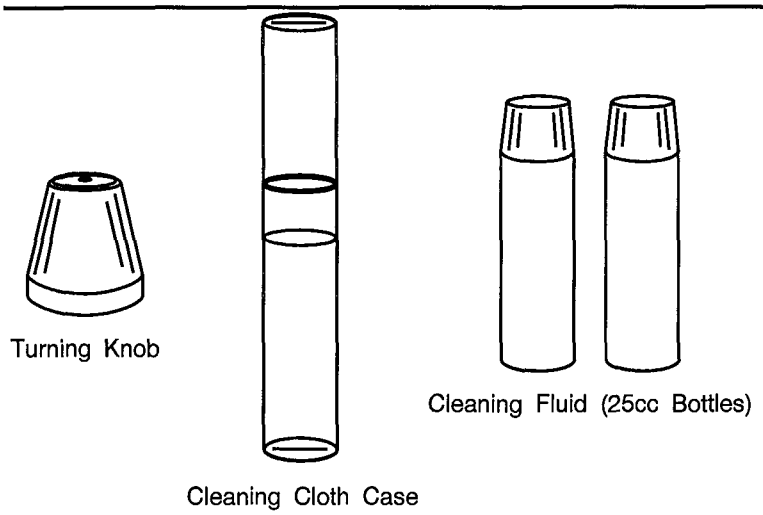


Figure 3-6. **Optical Cartridge Cleaning Kit Components**

1. If the optical cartridge to be cleaned is in the SEC disk drive, extract it by using the following procedure:
   a. Power down the SEC disk drive by entering the following command:

      `RMV-EQPT:[a]:SEC;`

      Where:

      a = Target ID (optional)

      This command takes up to 1 minute to complete. The green ON LED extinguishes.

   b. Extract the optical cartridge from the SEC disk drive.
2. With the back of the optical cartridge facing you, slide the shutter to the right to expose the disk surface inside the optical cartridge (refer to Figure 3-7).

⚠ CAUTION:
Fingerprints or small scratches on the disk surface can cause data errors. When cleaning the optical cartridge, touch the disk surface only with the supplied cleaning cloth.

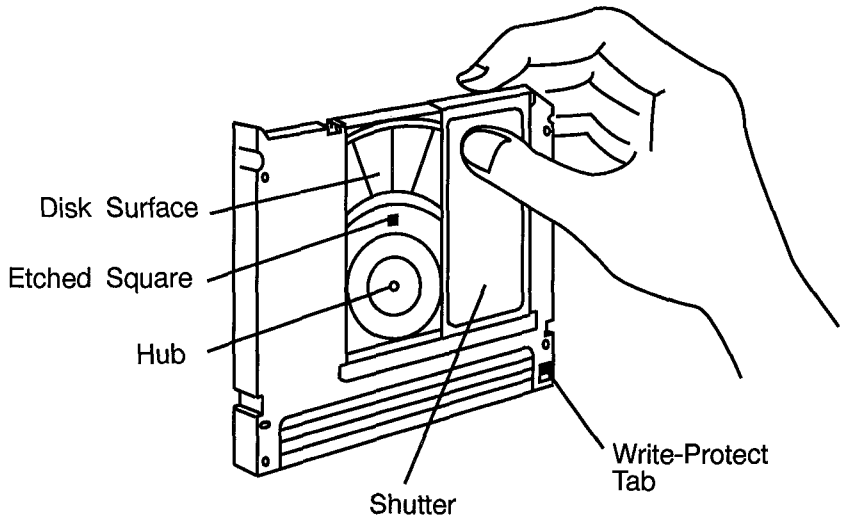


Figure 3-7. **Exposing the Optical Cartridge Disk Surface**

3. Attach the turning knob (supplied with the optical cartridge cleaning kit) to the hub at the center of the optical cartridge (refer to Figure 3-8).

⚠ CAUTION:
The turning knob can cause damage to the data on the disk surface if it makes contact with the disk surface. Do not make contact between the disk surface and the turning knob.

Once the turning knob is attached to the hub, you do not need to hold the shutter open. The shutter remains open until the turning knob is removed.

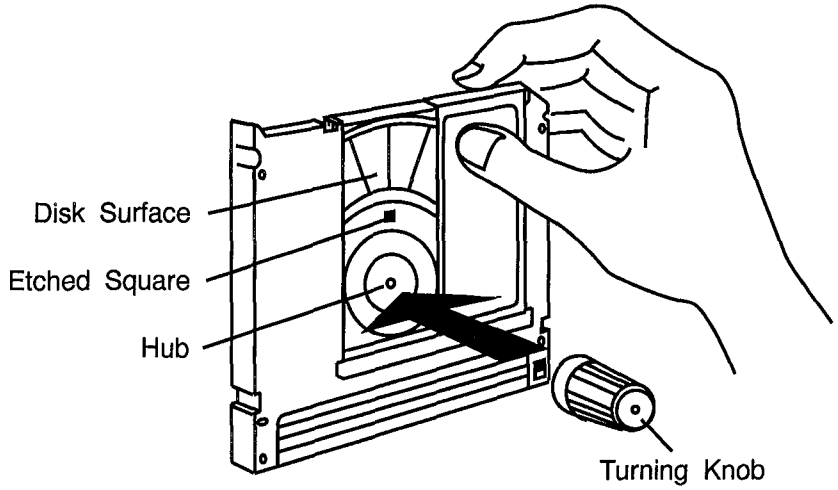


Figure 3-8. **Attaching the Turning Knob to the Optical Cartridge**

4. Rotate the turning knob until the etched square (see Figure 3-8) is centered above the turning knob. Figure 3-9 shows that the turning knob rotates in either direction.

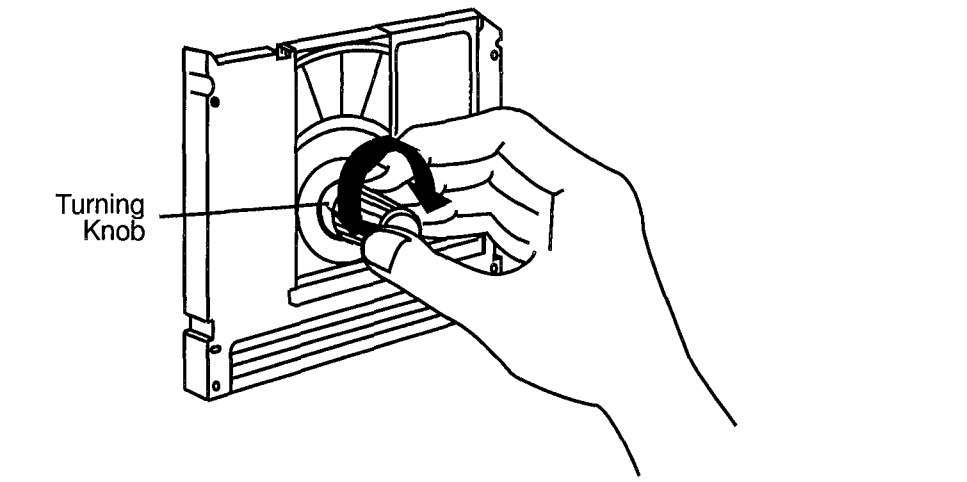


Figure 3-9. **Rotating the Turning Knob on an Optical Cartridge**

5. Apply a few drops of the cleaning fluid that came with the optical cartridge cleaning kit to the cleaning cloth.

⚠ WARNING:
Accidental contact of cleaning fluid to either the eyes or mouth can cause possible personal injury. Avoid any contact between the cleaning fluid and your eyes or mouth. If exposure occurs, wash the area immediately and consult a physician.

6. Gently wipe clean the exposed area of the disk surface, using the cleaning cloth containing the cleaning fluid starting at the hub and wiping towards the edge of the disk surface (refer to Figure 3-10). Only the one side of the disk surface, the side that has the turning knob attached to it, needs to be cleaned.

⚠ CAUTION:
It is important to move the cloth from the hub upward towards the edge of the disk surface; a side-to-side motion can damage the optical cartridge.

⚠ CAUTION:
Do not use any substitute cloth for the approved cleaning cloth.

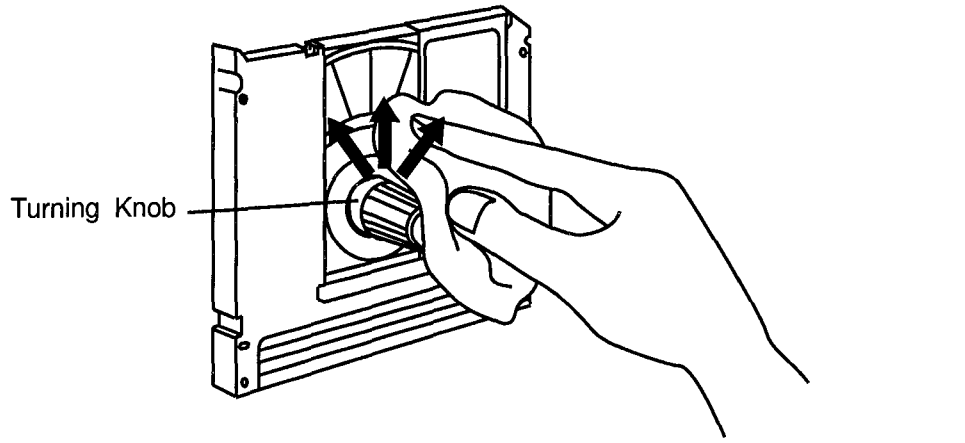


Figure 3-10. **Wiping the Disk Surface of an Optical Cartridge**

7. Repeat the following procedure until the entire disk surface has been cleaned:
    a. Expose the next area to be cleaned by rotating the disk surface approximately 3/4 inches, or two of the lines that appear on the disk surface.
    b. Clean the newly exposed disk surface as described in Step 6.
8. Once cleaning is complete, that is the etched square is again centered over the turning knob, rotate the turning knob 3/4 inches at a time one more complete revolution to insure any remaining cleaning fluid is dried. Use a dry part of the cleaning cloth to remove any remaining fluid by wiping the disk surface (starting at the hub and wiping towards the disk edge).
9. Pull the turning knob off the hub, exercising caution not to bring the turning knob in contact with the disk surface.

    When the turning knob is removed, the optical cartridge's built-in spring closes the shutter.
10. Store the cleaning cloth in the supplied case. If one of the following conditions occurs, remedy the condition before storing the cleaning cloth:
    - If the cloth is very dirty, wash it first with water and dry it before storing.
    - If the cloth surface is rough and pieces of thread remain on the disk surface after cleaning, or the cloth's color has changed as a result of numerous washings, replace the cleaning cloth before storing.
11. Using the "Routine Maintenance Checklist" form in the beginning of this chapter (Table 3-1), record the date that you performed this procedure.

Changing the OPEX Bay Fan Filter

NOTE:
This procedure is to be used on DACS IV-2000 Remote Complexes with fan assemblies: ED-2C816-30,G1 or ED-2C906-30. This procedure must not be used for fan assembly WP92310L4. The fan filter for fan assembly WP92310L4 and ED-9C130-30 is replaced when the yellow ALM LED on the fan assembly lights [refer to the section titled "Fan Filter Alarm" (page 15-171)].

This procedure is used to replace the ED-2C816-30 or ED2C906-30 fan assembly air filter and to test the fan assembly for proper operation. This fan assembly is located at the bottom of the OPEX Bay.

Under normal office conditions, replace the fan air filter every 3 months. You receive a system-generated message (`REPT FAN FILTER`) to remind you that it is time to replace the air filter. You must acknowledge and clear the message via the **`ENT-FAN-FILTER`** command to prevent it from being sent to you after you have replaced the air filter. If there is any construction being done in your office, or if the filter becomes dirty for any other reason, replace the fan air filter more often as required.

NOTE:
The **`REPT-FAN-FILTER`** and **`ENT-FAN-FILTER`** commands apply only to the Remote Complex fans.

You need a fan assembly air filter (COMCODE 405056078 for ED-2C816-30, G1 Fan Assembly or COMCODE 405470808 for ED-2C906-30 Fan Assembly). Fan assemblies part codes are located on the rear of the fan assembly.

CAUTION:
You must complete these procedures within 40 minutes to maintain proper temperature in the OPEX Bay.

1. Make sure no fan assembly alarms exist (Fan Assembly ALM LED not lit). If any fan assembly alarms exist, clear them before using this procedure.
2. Pull the main Fan Assembly Fuse on the OPEX Bay main fuse panel (Fuse E6 for ED-2C940-30 Fuse Panel; Fuse A17 for ED-9C114-30 Fuse Panel). Refer to Chapter 2 for information about extracting fuses, if necessary.
3. Check to see that the Fan Assembly ALM LED lights, indicating that main power has been removed.

   In about 10 seconds after removing the fuse, the system generates a `REPT ALM EQPT` *message. The red ALM LED is lit on the fan assembly and the fans start to operate at high speed.*

4. Pull the AUX Fan Assembly fuse on the OPEX Bay main fuse panel (Fuse B13-2 for ED-2C940-30 Fuse Panel; Fuse C17 for ED-9C114-30 Fuse Panel). Refer to Chapter 2 for information about extracting fuses, if necessary.
5. Check to see that the red ALM LED goes out, indicating there is no power to the fan assembly.
6. Before performing any maintenance function on the fan assembly, check that the fans are no longer spinning by listening for noise and feeling for vibrations.

⚠ CAUTION:
The fan assembly contains no protection guard from the fan blades. Use caution when removing and inserting the air filter.

7. Extract the air filter. (If necessary, gently pry on the sides of the filter with a screw driver.)
8. Clean visible dirt from the air filter slot.
9. Make sure the new air filter is flat. If it is warped or bowed, obtain a new one.
10. Insert the air filter, making sure it agrees with the directed air flow as marked on the metal edge of the air filter. (Leave approximately 1/4 inch of the filter protruding from the fan assembly. This helps you extract the filter in the future.)
11. Be sure the air inlet below the fan assembly is unobstructed (Figure 3-11).
12. Reinsert the AUX Fan Assembly Fuse (Fuse B13-2 for ED-2C940-30 Fuse Panel; Fuse C17 for ED-9C114-30 Fuse Panel). Refer to Chapter 2 for information about installing fuses, if necessary.
13. Be sure the red ALM LED is on and the fans are operating at *high* speed.
14. Reinsert the Main Fan Assembly Fuse (Fuse E6 for ED-2C940-30 Fuse Panel; Fuse A17 for ED-9C114-30 Fuse Panel). Refer to Chapter 2 for installing fuses, if necessary.
15. Be sure the green MAIN PWR LED is on, the red ALM LED is off, the major alarm (MJ) is cleared, and the fans are operating at its reduced speed (switch in AUTO position).
16. Be sure the fan assembly operates in both the AUTO and HI speed positions (refer to Figure 3-12). Place the switch in the AUTO position, then the HI position, and return the switch to the AUTO position.

    When the switch is in the AUTO position, the fans operate at a reduced speed if the air temperature is 90° F or below. When the switch is in the HI position, the fans operate at maximum speed continuously.

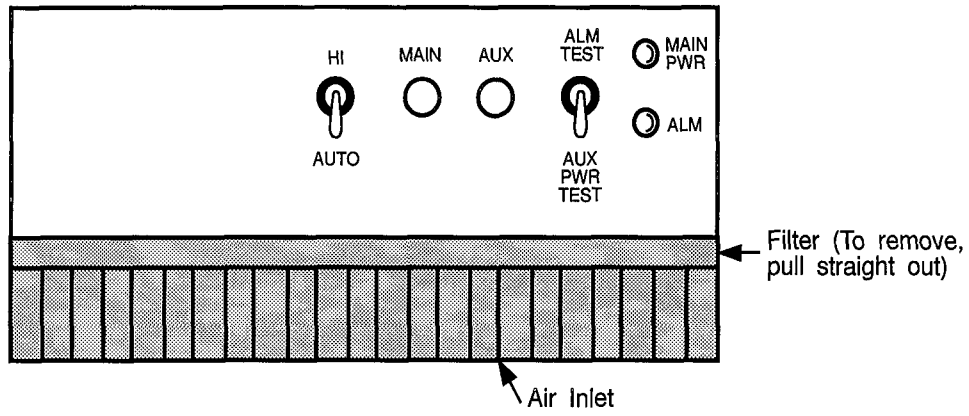


Figure 3-11. **ED-2C816-30,G1 and ED-2C906-30 OPEX Bay Fan Assembly — Air Filter Location**

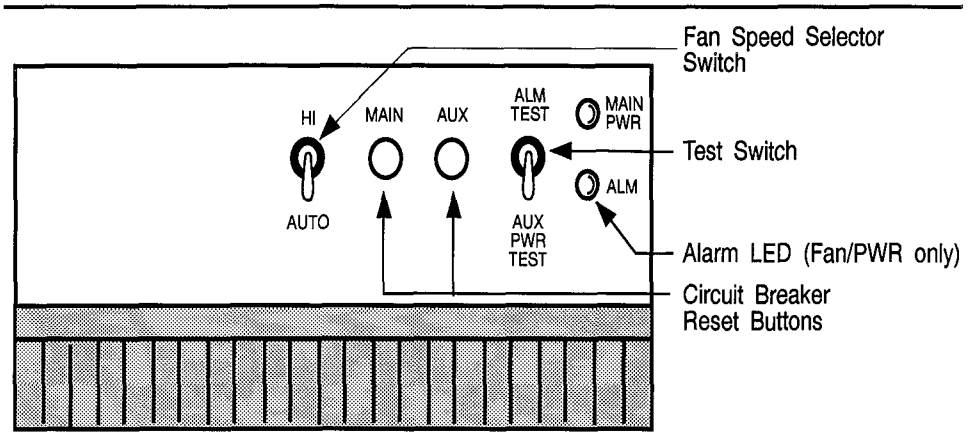


Figure 3-12. **ED-2C816-30,G1 and ED-2C906-30 OPEX Bay Fan Assembly — Switch and LED Locations**

17. Perform the alarm failure test by placing the test switch (refer to Figure 3-12) in the ALM TEST position and holding it (approximately 20 seconds) while observing the following:

    - After approximately 10 seconds:
        - — The fan assembly red ALM LED turns on.
        - — The fan assembly green MAIN PWR LED remains lit.
        - — The fans start operating at high speed.
        - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE */
    "CPU-{0,1}: INT,
    RFAN,
    (0 - 512 bytes of hexadecimal data)
;
```

        Where:

        a = Autonomous sequence number: `001-999`

    - After approximately 20 seconds:
        - — The red MAJOR alarm LED on the status panel turns on.
        - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "RFAN:MJ,INT,NSA,,,NEND::,NIMAN"
;
```

        Where:

        b = Autonomous sequence number: `001-999`

- Approximately 5 seconds after the switch is released:
  - — The red MAJOR alarm LED on the status panel turns off.
  - — The fans return to the reduced speed (fan speed selector switch set to AUTO position).
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "RFAN:CL,INT,NSA,,,NEND::,NIMAN"
;
```

Where:

b = Autonomous sequence number: `001-999`

18. Perform the auxiliary power test by placing the test switch (refer to Figure 3-12) in the AUX PWR TEST position and holding it (approximately 15 seconds) while observing the following:

- Immediately:
  - — The fan assembly red ALM LED turns on.
  - — The fan assembly green MAIN PWR LED turns off.
  - — The fans start operating at high speed.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE */
    "CPU-{0,1}:INT,
    RFAN,
    (0 - 512 bytes of hexadecimal data)
;
```

Where:

a = Autonomous sequence number: `001-999`

- After approximately 10 seconds:
  - — The red MAJOR alarm LED on the status panel turns on.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "RFAN:MJ,INT,NSA,,,NEND::,NIMAN"
;
```

    Where:

    b = Autonomous sequence number: 001-999

- Approximately 5 seconds after the switch is released:
  - — The red MAJOR alarm LED on the status panel turns off.
  - — The fans return to the reduced speed (fan selector switch set to AUTO position).
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "RFAN:CL,INT,NSA,,,NEND::,NIMAN"
;
```

    Where:

    b = Autonomous sequence number: 001-999

19. Reset the automatic fan filter notification message by entering the following command:

    ENT-FAN-FILTER:*[a]*;

    Where:

    a = Target ID (optional)

20. Using the "Routine Maintenance Checklist" form in the beginning of this chapter (Table 3-1), record the date you performed this procedure.

Testing Remote Alarm Surveillance

Use this procedure to test the remote alarm surveillance capability. This procedure is non-service affecting and is not intended to verify every alarm command but is intended to ensure that the DACS IV-2000 alarms are remotely monitored.

⚠ CAUTION:
Alarm conditions unrelated to this test procedure can appear while performing this test on the in-service frame and must be investigated and corrected before completing this procedure.

1. Contact the center that is providing remote alarm surveillance for the frame and inform them that you are conducting this test.
2. Verify that there are no alarms on the frame by entering the following command:

   `RTRV-ALM-COM:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following output response appears (pertinent parameter shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* :NTFCNCDE,CTYPE,SRVEFF */
      ": c, ..."
   ;
   ```

   Where:

   c = Notification code: `{ CR, MJ, MN }`

   If there are any alarms (a value shown for parameter *c*), refer to the section titled "Isolating Failures" (page 15-12) for clearing alarms before performing this procedure.
3. Identify six DS1 ports that are not in service (IDLE-REL [idle-released] state) by entering the following command for six DS1 ports:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`

The following output response appears (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "e:< ISTATE=o OSTATE=p...>"
;
```

Where:

e = DS1 port location: `{1-64}-{1-31}-{1-28}`

o = Input port state

p = Output port state

The ports that have an input and output state of IDLE-REL can be used for this procedure.

4. Verify that the T1 circuits selected in Step 3 are set to generate an alarm in the event of a failure by entering the following command:

   RTRV-ATTR-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-64}-{1-31}-{1-28}**
   DS1GRP-{1-64}-{1-31},UNIT-{1-64},
   SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,..."
;
```

   Where:

   g = DS1 port location: `{1-64}-{1-31}-{1-28}`

   h = Alarm notification code: `{ MJ, MN, NA }`

   If parameter *h* is set to `MJ`, continue with Step 6. Otherwise, continue with Step 5.

5. Set the attribute to generate a major (MJ) alarm of the T1 circuits selected in Step 3 that are not set to MJ by entering the following command:

   ED-ATTR-T1:*[a]*:*b*::MJ;

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31},UNIT-{1-64}, SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }

6. Verify that the DS1 failure type parameter is set to BOTH and the DS1 failure threshold parameter is set to 6 by entering the following command:

   RTRV-NE:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...:FAILTYPE=n,FAILTHRES=o,..."
;
```

   Where:

   n = Failure type: { FAC, EQPT, BOTH, NONE }

   o = Failure threshold: {0-500}

   If the DS1 failure type (parameter *r*) is set to BOTH and the DS1 failure threshold (parameter *s*) is set to 6, continue with Step 8. Otherwise, continue with Step 7.

7. Change the DS1 failure parameters to their default values by entering the following command:

   ED-NE:*[a]*::::FAILTYPE=BOTH,FAILTHRES=6;

   Where:

   a = Target ID (optional)

8. Change the input status of the DS1 ports selected in Step 3 (one at a time) by entering the following command for each DS1 port:

   `ED-T1:`*[a]*`:`*b*`::::ISTAT=DRVN;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `[[1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`

   After changing the input status for the first DS1 port, a major alarm should be generated. After changing the input status of the sixth DS1 port, a critical alarm should be generated (the DS1 threshold value is set to 6).

9. Verify that the surveillance center recognizes each of the alarms caused in Step 8. Verify that the local audible and visual alarms have been raised. If the frame is also monitored via E2A, verify that these alarm points also appear. Specifically verify the following:

   - System-generated autonomous message `REPT ALM T1` is received locally (terminal/printer) and remotely.
   - MJ (first through fifth DS1 alarms) or CR (sixth DS1 alarm) LED is lit on the status panel in the Main Controller Bay.
   - Red major alarm aisle light is lit, the office audible alarm sounds and the ACO silences the audible alarm.

   If any of the above conditions does not occur, contact your system administrator for assistance in reestablishing the remote alarm surveillance capability after finishing this procedure.

10. Restore the input status of the DS1 ports selected in Step 3 to the INIT state by entering the following command:

    `ED-T1:`*[a]*`:`*b*`::::ISTAT=INIT;`

    Where:

    a = Target ID (optional)

    b = DS1 port location: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`

11. Verify that no alarms remain in the system by entering the following command:

    `RTRV-ALM-COM:[a];`

    Where:

    a = Target ID (optional)

    The following output response appears (only pertinent parameters are shown):

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
       /* :NTFCNCDE,CTYPE,SRVEFF */
       ":c,..."
    ;
    ```

    Where:

    c = Notification code: `{ CR, MJ, MN }`

    If there are any alarms (a value shown for parameter *c*), refer to the section titled "Isolating Failures" (page 15-12) for clearing alarms before performing this procedure.

12. Notify the center providing remote alarm surveillance for the frame that the test is complete.

13. Using the "Routine Maintenance Checklist" form in the beginning of this chapter (Table 3-1), record the date that you performed this procedure.

Logging In and Out

4

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Logging In and Out

4

This chapter contains procedures for logging into and out of the DACS IV-2000. Login procedures are given for both the Snider and X.25 links.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

NOTE:
Logins used on 256 frames that are capacity expanded are no longer valid.

Logging In

Before performing any login procedure, you must have a login and password. If you do not, obtain a login and password from your system administrator.

If it is necessary to change the link and terminal speed before you can log in, refer to the appropriate section in Chapter 9 for changing link parameters.

Using Snider Links

If the system response is garbled or if the `login:` prompt does not appear, change the speed of your terminal according to the owner's manual provided with the terminal and press the <ENTER> or <RETURN> key until a `login:` prompt appears. The DACS IV-2000 is capable of operating at the following speeds:

- 1200
- 2400
- 4800
- 9600
- 19200 (except for CILINKs 1-2 and 2-2)

If the `login:` prompt does not appear after changing your terminal speed, refer to the section titled "Link Communication Failures" (page 15-33) for further assistance.

NOTE:
For more information on user logins and passwords, refer to the section titled "Interface Security" (page 1-25) of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

1. At the `login:` prompt, enter your login (a login name is 1 to 10 legal characters long).
2. At the `password:` prompt, enter your password (a password is 6 to 8 legal characters long).

   The password is not echoed on the screen.

Using X.25 Links

This procedure is used to log in to an X.25 link (CILINKs 1-5, 1-6, 2-5, and 2-6).

1. From a terminal connected to a Snider link, determine whether the X.25 link is in service by entering the following command:

   `RTRV-PRMTR-LINK:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = X.25 link location: `CILINK-{1,2}-{5,6}` (optional)

   The following output response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/
TLMTRY,POLL,FLOW, */
   /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
   "d:e,..."
   "..."
;
```

   Where:

   d = Link location: `CILINK-{1,2}-{5,6}`

   e = Link state: `{ IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }`

   Check that the X.25 link is in-service (IS). If it is, go to Step 3, otherwise go to Step 2.

2. From a terminal connected to a Snider link, restore the X.25 link by entering the following command:

   `RST-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = X.25 link location: `CILINK-{1,2}-{5,6}`

   This command takes up to 1 minute to complete.

3. From a terminal interfaced to your X.25 network and connected to the desired X.25 link, log in by entering the following command:

   `ACT-USER:`*[a]*`:`*b*`:::`*d*`;`

   or

   `LGN-USER:`*[a]*`:`*b*`:::`*d*`;`

   Where:

   a = Target ID (optional)

   b = User ID (login name): <1-10 legal characters>

   d = Password: <6-8 legal characters>

NOTE:
For more information on user logins and passwords, refer to the section titled "Interface Security" in Chapter 1 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Logging Out

This procedure is used to log out of the DACS IV-2000. It can be used for both Snider (CILINKs 1-1, 1-2, 1-3, 1-7, 1-8, 2-1, 2-2, 2-3, 2-7, and 2-8) and X.25 (CILINKs 1-5, 1-6, 2-5, and 2-6) links.

1. Check to see that all test access sessions and loopbacks are complete.

NOTE:
Using this procedure releases all test access sessions and loopbacks that were set up with the link association parameter set to `Y`.

2. Log out of the DACS IV-2000 by entering the following command:

   `CANC-USER:`*[a]*`:`*[b]*`;`

   or

   `LGT-USER:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = User ID (login name): <1 to 10 legal characters> (optional)

Link Lock-Out

Link lock-out is a condition where your link appears to be locked. This can be caused by exceeding the number of unsuccessful login attempts in a given interval, having an out-of-service (OOS) link, having a blown ECI fuse, or having a terminal/link parameter mismatch.

Unsuccessful Login Attempts

Links are locked if the number of unsuccessful login attempts exceeds the provisioned number for the provisioned interval. The link lock-out is released when the provisioned lock-out interval has elapsed. Information regarding security link parameters can be retrieved using the `RTRV-SECU-LINK` command. Security link parameters can only be changed by superusers with the `ED-SECU-LINK` command. Refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for more information on security link parameters and superusers and the section titled "Changing Link Security Parameters" (page 9-16) for information on changing security link parameters.

This procedure is used to check if a link has been locked out due to unsuccessful login attempts.

1. From another link, determine if the link in question is locked out by entering the following command:

   `RTRV-COND-LINK:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{1-8}` (optional)

   If the condition type of `FRD` is output, the link is locked out. A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN */
    "f:NA,FRD,NSA,,,NEND"
;
```

   Where:

   f = Administrative link location: `CILINK-{1,2}-{1-8}`

2. Determine how long the link is locked out by entering the following command:

   `RTRV-SECU-LINK:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{1-8}` (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC,LGN:INACTV:NUMBR,INTRVL,TM:LCKD-OUT */
    "d,...,i:..."
;
```

   Where:

   d = Link location: `CILINK-{1,2}-{1-8}`

   i = Lock-out time: `1-30`

   The value of the time lockout (parameter *i*) specifies the interval in minutes that the CILINK is locked out from being allowed to establish a login. When this time has expired, the link lock-out is released.

Out-of-Service Links

This procedure is used to restore a link that does not respond because the link is in the out-of-service (OOS-MTCE) state.

1. From another link, determine the state of the locked-out link by entering the following command:

   `RTRV-PRMTR-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{1-8}` (optional)

   The following output response appears (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,..."
    "..."
;
```

   Where:

   d = Link location: `CILINK-{1,2}-{1-8}`

   e = Link state: `{ IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }`

   If the state of the link is OOS-FLT or OOS-PRTCL (parameter *e*), go to the section titled "Link Communication Failures" (page 15-33) to clear link failures.

   If the state of the link is OOS-MTCE (parameter *e*), go to Step 2. Otherwise, refer to the section titled "Terminal/Link Parameter Mismatch" (page 4-8).

2. Restore the link in the OOS-MTCE state by entering the following command:

   `RST-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-[1,2]-[1-8]`

   This command takes up to 1 minute to complete.

Terminal/Link Parameter Mismatch

If your terminal does not respond or the response is garbled, your terminal options may not match the provisioned link values. To correct this condition, perform the following procedure:

1. From another link, determine the parameters of the locked-out link by entering the following command:

   `RTRV-PRMTR-LINK:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-[1,2]-[1-8]` (optional)

   The following output response appears (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:...,g,...,k,..."
    "..."
;
```

   Where:

   d = Link location: `CILINK-{1,2}-{1-8}`

   g = Baud rate: `{ 1200, 2400, 4800, 9600, 19200 }`

   k = Flow control: `{ DC3, ACK }`

2. Set the options of the terminal to the following:

   Baud: (same value as the baud rate [parameter *g*] in Step 1)
   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Answerback: ACK (cntrl-F) (only if the flow control [parameter *k*] in Step 1 is also `ACK`)

NOTE:
Some terminal models do not allow you to set every option listed above. Only set the available options for those terminals.

Provisioning Equipment

5

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Contents

Provisioning Equipment

5

This chapter contains procedures to provision DACS IV-2000 equipment. If you are changing equipment from earlier versions, refer to Chapter 19.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

This chapter consists of procedures for the following:

- Provisioning the Network Element:
  - — Target ID
  - — Alarm Delay (equipment and non-SONET facilities terminating on DS1IF and MUX circuit packs)
  - — Protection Switching Autolock
  - — Automatic Database Backup
  - — Critical Alarm Reporting
  - — Network Element Performance Monitoring Parameters
  - — Database Change Report Messages for manual input commands
  - — Identification of manually protected circuit packs

  - — Identifying CILINK associated with output messages in message headers
  - — Activate alarm for failures of backups to secondary memory
  - — Activate the output of a carriage return every 15 minutes
- Provisioning the Remote Complex
  - — Audible alarm state (active or inactive)
  - — Power feeder distribution (standard or duplex battery distribution feeder boards [BDFBs])
- Provisioning Equipment:
  - — Interface Modules (Units)
  - — MUX circuit packs
  - — Line Build Out (LBO)
  - — SMUX circuit packs
  - — SWIF and DS1IF circuit packs
  - — EQL and DS1 Code Type (Linecode)
  - — PMGR1 circuit packs
- Provisioning PMGR1 Circuit Packs for DS1 Performance Monitoring
  - — SWIF/MUX circuit pack slot designation
  - — Network Element parameters

These procedures are used to provision the DACS IV-2000. Provisioning the DACS IV-2000 consists of the following functions:

- Setting up the Network Element (NE) — provide information for target ID (TID); alarm delay; protection switching autolock; automatic database backup; critical alarm reporting; DS1, DS3, VT1.5, and STS-1 performance monitoring; database change reports; protection identification (that is, signal an alarm on a traffic carrying circuit pack when it is being protected); and Transport Self Identification (TRANSID) information to support the DS1 Path Identification (PATHID) and TSGR features.
- Equipment — provide information of available interface modules, interface circuit packs, and other optional equipment. The recommended provisioning sequence for equipment is listed in Tables 5-1 (Switch Complex and collocated interface bays) and 5-2 (Remote Complex). Repeat the necessary steps for each entity you want to provision manually that is not provisioned automatically. You must provision a DS1 Interface-Protection Module before its associated DS1 Interface Module, and it is recommended that you begin with the lowest unit number. Each `ENT-EQPT` command must be followed by a `RST-EQPT` command.

Table 5-1. **Provisioning Sequence for Switch Complex and Collocated Interface Bays**

Entity	Number of Circuit Packs Required	Supporting Entity
CC*	2	none
PRI†	2	none
SEC	1	none
SYNC	2	none
CLKGN (Auto provisionable)	2	none or SYNC‡‡
ECI†	2	CC
SWCS††	32	CLKGN, CC
SWIO/OSWIO‡	2	SWCS
UNIT¶	1	SWIO
DS3PM	1	UNIT
CLKDR‡	2 or 4§	UNIT, SWIO
PMGR§§	1	CLKDR
MUXP	1	CLKDR
MUX	1	MUXP
SMUXP	1	CLKDR
SMUX	1	SMUXP
DS1RY	1	UNIT
SWIF-P	1	CLKDR
SWIF	1	SWIF-P
DS1IP	1	SWIF-P, DS1RY
DS1IF	2	SWIF, DS1IP**

* Must be in-service as a group (CPU, MTC (slot 1), MTC (slot 2), SCI (slot 1), SCI (slot 2), SSC, UI/OUI). If a remote complex is to be provisioned, the circuit pack occupying the UI slot(s) must be an OUI circuit pack. If both controller sides are not in-service, an alarm is raised.

† If one or both ECI circuit packs, one or both PRI disk drives, or the SEC are not in-service, one or more alarms are raised.

‡ Must be provisioned in pairs. If a remote complex is to be provisioned, the circuit packs occupying the SWIO slots must be OSWIO circuit packs.

§ Depending on the type of interface module.

¶ DS1 Interface Module requires supporting DS1 Interface-Protection Module.

** The supporting DS1IP circuit pack can be in another DS1 Interface Module.

†† Thirty-two SWCS circuit packs are assumed to be present and are therefore required before any interface module provisioning can take place.

‡‡ SYNC is required if SMUX circuit pack is present or if MUX3 circuit pack is provisioned for gateway cross-connect.

§§ PMGR is not supported in Enhanced DS3-16, Enhanced DS3-32, DS3-16 Clear-Channel, and DS3-32 Clear-Channel Interface Modules.

Table 5-2. **Provisioning Sequence for Remote Complexes**

Entity	Number of Circuit Packs Required	Supporting Entity
RX*	1	Switch Complex Dependency
RUI†	1	RX
OPEX‡	2	OSWIO
UNIT¶	1	OPEX
CLKDR‡	2 or 4§	UNIT, OSWIO/OPEX
PMGR††	1	CLKDR
MUXP	1	CLKDR
MUX	1	MUXP
SMUXP	1	CLKDR
SMUX	1	SMUXP
DS1RY	1	UNIT
SWIF-P	1	CLKDR
SWIF	1	SWIF-P
DS1IP	1	SWIF-P, DS1RY
DS1IF	2	SWIF, DS1IP**

* The RX can be provisioned into the database only if the following Switch Complex criteria have been met: OUI circuit packs in place of UI circuit packs and new PWRJ (568B) circuit packs in place of PWRJ (568A) circuit packs in Switch Power Modules 1 and 3. Also the circuit packs occupying the SWIO slots must be OSWIO circuit packs.

† Must be provisioned as a group (RUIA, RUIB, RSCI, RCLKGN).

‡ Must be provisioned in pairs.

§ Depending on the type of interface module.

¶ DS1 Interface Module requires supporting DS1 Interface-Protection Module.

** The supporting DS1IP circuit pack can be in another DS1 Interface Module.

†† PMGR is not supported in Enhanced DS3-16, Enhanced DS3-32, DS3-16 Clear-Channel, and DS3-32 Clear-Channel Interface Modules.

Provisioning the Network Element

The Network Element is provisioned using the ED-NE command. This command allows you to configure the DACS IV-2000 for the following functions:

- Target ID (TID) — provides the unique identifier for the DACS IV-2000 frame.
- Alarm Delay and Clear Alarm Delay — sets the delay for an alarm indication after the system software has detected an alarm condition. Alarms are issued for conditions that do not autonomously clear within the set delay time. The clear delay indicates the minimum amount of time an alarm must be clear before clearing the indicators.
- Protection Switching Autolock — sets values for preventing circuit packs from switching back to working. This feature prevents excessive switching caused by an intermittent problem. After a threshold of switches has been detected, a circuit pack is locked in protection. Refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) for more information on protection switching.
- Automatic Database Backup — provides a mechanism for performing automatic database backups. Refer to "Database Backup" (page 3-3) for more information on performing database backups.
- Critical Alarm Reporting Setup — activates a critical alarm when a specified number of EC-1/VT1.5/DS1 facility failures (FAC failure type), equipment failure (EQPT failure type), or a combination of both (BOTH failure type) has been detected. Critical alarms are indicated by a red LED on the status panel marked CR, an audible alarm, and a remote critical alarm. Also, a REPT ALM COM message is issued by the frame indicating a *C in the alarm code field, and either FAC (facility) or INT (equipment) in the condition type field indicating whether it was a facility- or equipment-generated alarm.
- DS1 Performance Monitoring — sets system values for DS1 performance monitoring. Refer to Chapter 14 for detailed information on using the DS1 performance monitoring feature.
- DS3 Performance Monitoring — sets system values for DS3 performance monitoring. Refer to Chapter 14 for detailed information on using the DS3 performance monitoring feature.
- Database Report Messages — allow or disallow REPT DBCHG messages to be output.
- Protection Identification — specifies whether the system illuminates the alarm LED for SWIF, SWCS, SWIO, MUX, and SMUX circuit packs when they are in the protected state.
- CILINK number identification — activates the output of CILINK information in the message headers of all output messages.

- Backup alarm feature — activates (when set to ON) an alarm when a failure of a backup to secondary memory occurs. This feature deactivates (when set to OFF) and the alarm clears when a successful backup is complete.
- Carriage Return — activates (when set to ON) the output of a carriage return on the CILINKs every 15 minutes
- Transport Self Identification (TRANSID) — specifies information to support the DS1 Test Signal Identification (TSID) and DS3 Path Identification (PID) features.
- Auto release of link association — disables/enables link association for loopback and test access connections.

The following procedure is used to provision the network element:

1. Retrieve current provisioning information by entering the following command:

   RTRV-NE: *[a]*;

   Where:

   a = Target ID (optional)

   A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...:ALMDLY=f,CLRDLY=g,NUMSW=h,SWINTVL=i,RLSTM=j,BKUP=k,TMDAY=l,
   DAYWK=m,CLEI=n,CLLI=o,FIC=p,EQTYPE=q,FAILTYPE=r,FAILTHRES=s,
   APPL=t,SHACCUM=u,PMTYPE=v,ACCUM=w,DBCHG=x,BKUPALM=y,
   MANPROT=z,LINKNUM=aa,AUTOREL=ab,AUTORET=ac"
;
```

   Where:

   f = Alarm delay: {1-30}

   g = Alarm clear delay: {1-20}

   h = Autolock number of switches: {1-10}

   i = Autolock switching interval: {1-60}

   j = Autolock release time: {1-24}

   k = Automatic secondary disk backup: { ON, OFF }

   l = Time of day: 0000-2359

   m = Day of week: { Su, Mo, Tu, We, Th, Fr, Sa }

   n = Common Language Equipment Identification (CLEI): #<1-10 TRANSID Legal Characters>

   o = Common Language Location Identification (CLLI): #<1-11 TRANSID Legal Characters>

p = Frame Identification Code (FIC):
#<1-10 TRANSID Legal Characters>

q = Equipment type: { CPE, NET }
This parameter is part of the TRANSID information.

r = Failure type: { FAC, EQPT, BOTH, NONE }

s = Failure threshold: {0-500}

t = Application: { TRANSID, OTHER }

u = DS1 Short accumulation period: { 15-MIN, 1-HR }

v = DS3 performance monitoring type: { PSET#1, PSET#2, NONE }

w = DS3 accumulation period: { 15-MIN, 1-HR }

x = Database change messages: { OFF, ON }

y = Backup alarm feature: { ON, OFF }

z = Protection identification: { CKTLED-ON, CKTLED-OFF }

aa = Link number: { ON, OFF }

ab = Auto release of link association: { ON, OFF }

ac = Automatic carriage return: { ON, OFF }

From the above response, note the values for the parameters given.

2. Change the necessary network element parameters by entering the following command:

ED-NE:*[a]*:::::*[*NEWTID=*c*,ALMDLY=*d*,CLRDLY=*e*,NUMSW=*f*,
SWINTVL=*g*,RLSTM=*h*,BKUP=*i*,TMDAY=*j*,DAYWK=*k*,CLEI=*l*,
CLLI=*m*,FIC=*n*,EQTYPE=*o*,FAILTYPE=*p*,FAILTHRES=*q*,
APPL=*r*,SHACCUM=*s*,PMTYPE=*t*,ACCUM=*u*,DBCHG=*v*,
MANPROT=*w*,LINKNUM=*x*,BKUPALM=*y*,AUTORET=*z*,AUTOREL=*aa]*;

Where:

a = Target ID (optional)

c = New target ID of the DACS IV-2000: <1 to 18 TID legal characters>

d = Alarm delay: [{1-30}, CURVAL]
Alarm delay in seconds for all equipment and facilities.
Initial system value: 10

e = Alarm clear delay: [{1-20}, CURVAL]
Alarm clear delay in seconds for all equipment and facilities.
Initial system value: 10

f = Autolock number of switches: [[1-10], CURVAL]
Number of auto-restorations (transition from the protected state to the unprotected state) that can occur before an autolock occurs on a protectable circuit pack.
Initial system value: 4

g = Autolock switching interval: [[1-60], CURVAL]
Interval in minutes in which the value given by parameter *e* of auto-restorations can take place before an autolock occurs on a protectable circuit pack.
Initial system value: 10

h = Autolock release time: [[1-24], CURVAL]
Interval in minutes in which the value given by parameter *e* of auto-restorations can take place before an autolock occurs on a protectable circuit pack.
Initial system value: 24

i = Automatic secondary disk backup: [ON, OFF, CURVAL]
Enables (ON) or disables (OFF) the automatic database backup. When set to ON, the database is copied from PRI to SEC at the specified time [parameter *j*] and day(s) (parameter *k*). When enabled, the SEC disk drive must be in-service.
Initial system value: OFF

j = Time of day: [0000-2359, CURVAL]
Specifies the time of day the automatic database backup occurs.
Initial system value: 0130

k = Day of week: [Su, Mo, Tu, We, Th, Fr, Sa, CURVAL]
Specifies the day of the week the automatic database backup occurs. For all days, use the range address Su&&Sa.
Initial system value: Su

l = Common Language Equipment Identification (CLEI):
[<1-10 TRANSID Legal Characters>, CURVAL, NOVAL]
Specifies the network element level CLEI code.
Initial system value: NOVAL

m = Common Language Location Identification (CLLI):
[<1-11 TRANSID Legal Characters>, CURVAL, NOVAL]
Specifies the network element level CLLI code.
Initial system value: NOVAL

n = Frame Identification Code (FIC):
[<1-10 TRANSID Legal Characters>, CURVAL, NOVAL]
Specifies the network element level FIC.
Initial system value: NOVAL

o = Equipment type: { CPE, NET, CURVAL }
Sets the value of the carrier/response (CR) flag in the message that is sent in the data channel of the C-bit parity signal. CPE is customer premise equipment and NET is network equipment.
Initial system value: NET

p = DS1 Failure type: { FAC, EQPT, BOTH, NONE, CURVAL }
Specifies the method for counting failures for activating the critical alarm. This parameter is used in conjunction with parameter *l* when set to BOTH or FAC.
Initial system value: NONE

q = DS1 Failure threshold: { [0-500], CURVAL }
Specifies the number of DS1 facility failures which constitute a critical alarm. If zero (0) is specified no critical alarm is ever triggered. This parameter is used in conjunction with parameter *q* when parameter *q* is set to BOTH or FAC.
Initial system value: 6

r = Application: { TRANSID, OTHER, CURVAL }
Specifies the application for which the DACS IV-2000 is intended. This parameter determines the default for DS3 format and what is transmitted in the terminal-to-terminal path maintenance data link.
Initial system value: OTHER

s = DS1 Short accumulation period: { 15-MIN, 1-HR, CURVAL }
Specifies the short accumulation period of performance monitoring parameters. Refer to Chapter 14 for more information on DS1 performance monitoring.
Initial system value: 15-MIN

t = DS3 performance monitoring type: { PSET#1, PSET#2, NONE, CURVAL }
Specifies the type of performance monitoring parameters that the frame monitors. Refer to Chapter 14 for more information on DS3 performance monitoring.
Initial system value: NONE

u = DS3 accumulation period: { 15-MIN, 1-HR, CURVAL }
Specifies the accumulation period of performance monitoring parameters. Refer to Chapter 14 for more information on DS3 performance monitoring.
Default value: 15-MIN if PSET#1 or PSET#2 is specified for parameter *u*; CURVAL if CURVAL is specified for parameter *u*.

v = Database change reporting: { OFF, ON, CURVAL }
Specifies whether REPT DBCHG messages are generated. ON indicates REPT DBCHG messages are generated. To receive REPT DBCHG messages, the UID's message screening parameter must be set to DBAUTO or DBALL.
Initial system value: OFF

w = Protection identification: { CKTLED-ON, CKTLED-OFF, CURVAL }
Specifies whether the system indicates a SWIF, SWCS, SWIO, MUX, or SMUX circuit pack is being protected by illuminating the protected circuit pack's alarm LED.
Initial system value: CKTLED-ON

x = Link number: { ON, OFF, CURVAL }
Specifies whether the message headers contain the CILINK number associated with the message.
Initial system value: OFF

y = Backup alarm feature: { ON, OFF, CURVAL }
Specifies whether the alarm for a failure of a backup to secondary memory is activated.
Initial system value: OFF

z = Automatic carriage return: { ON, OFF, CURVAL }
Specifies whether an automatic carriage return is sent every fifteen minutes.
Initial system value: ON

aa = Auto release of link association: { ON, OFF, CURVAL }
Specifies whether the system allows link association for loopback and test access connections. Specifying OFF, preserves all loopback and test access connections.

3. Verify the settings using the RTRV-NE command as shown in Step 1.

   If any parameters are not set to the desired values, reenter the ED-NE command and change the necessary parameters.

4. If you changed the short accumulation period, DS3 performance monitoring type, or DS3 accumulation period parameters in Steps 2 or 3, a system reset needs to be performed by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

INIT-SYS:*[a]*::::9;

Where:

a = Target ID (optional)

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

5. Update office records to indicate the current configuration of the network element.

Provisioning Remote Complexes

Common parameters associated with a Remote Complex are provisioned using the **ENT-EQPT** command. In addition, using the **ENT-EQPT** command, enters the specified Remote Complex (RX) into the system database. The **ENT-EQPT** command also allows you to configure the Remote Complex for the following functions:

- Power feeder configuration — The DACS IV-2000 (256) frames before Release 4.0 were wired in the standard configuration (that is, one Battery Distribution Feeder Board (BDFB). New DACS IV-2000 (256) frame orders for Release 4.0 and later are wired to accept one (standard) or two (duplex) BDFBs.
- Audible alarm — The Remote Complex can be provisioned to activate or deactivate audible alarms associated with the specified Remote Complex.

The following procedure is used to provision a Remote Complex:

1. Verify that the PWRJ circuit packs equipped are the 568B versions rather than the 568 versions by checking the label on the front of the circuit pack. If you have 568 versions, see Chapter 19 for the appropriate procedure for upgrading to a 568B version.
2. Retrieve current provisioning information by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Remote Complex location: **RX-{1,2}**

   A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE:<> */
   "d:...:AUDIBLE=z,EQPWR=ab, ... "
;
```

   Where:

   d = Remote Complex location: RX-{1,2}

   z = Audible alarm state: { ON, OFF }

   ab = Equipment power configuration: { SPLX, DPLX }

3. Change the necessary Remote Complex parameters by entering the following command:

   ENT-EQPT:*[a]*:*b*:::::AUDIBLE=*q*,EQPWR=*s*;

   Where:

   a = Target ID (optional)

   b = Remote Complex location: RX-[1,2]

   q = Audible alarm state: [ON, OFF, CURVAL]
   Specifies whether or not audible alarms associated with the specified Remote Complex are activated.
   Default: CURVAL
   Initial system value: ON

   s = Equipment power configuration: [SPLX, DPLX, CURVAL]
   Specifies the power feeder configuration used for the specified Remote Complex (SPLX, wired for one BDFB or DPLX, wired for two BDFBs)
   Default: CURVAL
   Initial system value: SPLX

4. Verify the settings using the RTRV-EQPT command as shown in Step 2.

   If any parameters are not set to the desired values, re-enter the ENT-EQPT command and change the necessary parameters.

5. Restore the Remote Complex to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Remote Complex location: RX-[1,2]

   This command takes up to 5 minutes to complete.

6. Update office records to indicate the current configuration of the specified Remote Complex.

Provisioning Interface Modules (Units)

This procedure is used to provision all or some of the interface modules installed in the DACS IV-2000 (512) frame. It is recommended that interface modules to be provisioned contain all the necessary circuit packs (including BXA circuit packs in all unused SWIF, DS1IF, MUX, SMUX, and DS3PM circuit pack slots) before performing this procedure. BXA circuit packs can only be inserted into unused interface circuit pack (SWIF, DS1IF, MUX, SMUX, or DS3PM) slots, and must not be inserted in any other circuit pack slot (that is, DS1RY, MUXPS, CLKDR, and interface protection).

1. Make a copy of Figure 5-1 (Sheets 1 through 4) for collocated interface modules and of Figure 5-2 (Sheets 1 and 2) for remote complex interface modules.
2. Retrieve the unit number, interface module type, control cable identification (J1-J64), SWIO location, protection equipment location (DS1 Interface Modules only), and telemetry display number from office records and fill in the information shown in the worksheet copied in Step 1 by using the following procedure:
    a. Enter the Target ID (TID) in the space provided on the top of each worksheet.
    b. Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) for unit numbering conventions and enter the unit number (`Unit #`) for each equipment shelf containing an interface module.
    c. Enter the interface module type (`INTFC Mod Type`) for each unit identified in Step 2b. Interface module types are:
        - **32DS3** — DS3 Interface-32 Module.
        - **16DS3** — DS3 Interface-16 Module.
        - **16EDS3** — Enhanced DS3 Interface-16 Module.
        - **16DS3CC** — DS3 Clear-Channel Interface-16 Module.
        - **DS1** — DS1 Interface Module.
        - **DS1P** — DS1 Interface-Protection Module.
        - **16STS1** — STS1 Interface-16 Module.
    d. Enter the SWIO circuit pack numbers (`SWIO #`) for all interface modules identified in Step 2b. One SWIO circuit pack is associated with each DS1 Interface or DS1 Interface-Protection Module, two SWIO circuit packs are associated with each DS3 or STS1 Interface-16 Module, and four SWIO circuit packs are associated with each DS3 Interface-32 Module.

e. Enter the control cable ID (`Cntl Cab ID`) associated with the shelf position of the interface modules identified in Step 2b. Control cables numbered J-1 to J-32 are for interface modules located to the left of the switch complex, starting with Unit 1 at the bottom of Bay 1 and proceeding up and out to the right. Control cables numbered J-33 to J-64 are for interface modules located to the right of the switch complex, starting with Unit 33 at the bottom of Bay 15 and proceeding up and out to the right. Control cable IDs can also be identified in Figure 2 or 3 of the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

f. For any DS3PM2 circuit pack located in an collocated DS3 Interface-16 or DS3 Interface-32 Module, enter the DS3PM control cable ID (`DS3PM Cntl Cab ID`). Valid values for DS3PM control cables are J-17 to J-32 (to the left of the switch complex) and J-49 to J-64 (to the right of the switch complex). DS3PM2 circuit packs can not be located in Remote Complex interface modules.

NOTE:
DS3PM circuit packs can only be used in collocated Interface Bays.

g. For all DS1 Interface Modules, enter the shelf position (`DS1P Mod Loc`) containing the DS1 Interface-Protection Module providing interface protection. For DS1 Interface Bays, the DS1 Interface-Protection Module is in the bottom shelf position of the bay and protects itself and the three DS1 Interface Modules above it (for example, a DS1 Interface-Protection Module in shelf position 13 protects the DS1 Interface Modules in shelf positions 16, 15, and 14). For STS1/DS3/DS1 Interface Bays, the DS1 Interface-Protection Module is in the shelf position second from the top of the bay and is used to protect the DS1 Interface Module in the top shelf position (for example, a DS1 Interface-Protection Module in shelf position 19 protects the DS1 Interface Module in shelf position 20).

h. Enter the telemetry display number (`Telmtry Display`) for each interface module identified in Step 2b. For DS1 Interface Modules, the telemetry display number defaults to the Unit Number minus one (for example, a DS1 Interface Module in shelf position 26 defaults to a telemetry display number of 25). You can either use the default value or assign a value between 0 and 63. For DS3 and STS1 Interface Modules, a value between 0 and 31 must be assigned since there are no default values.

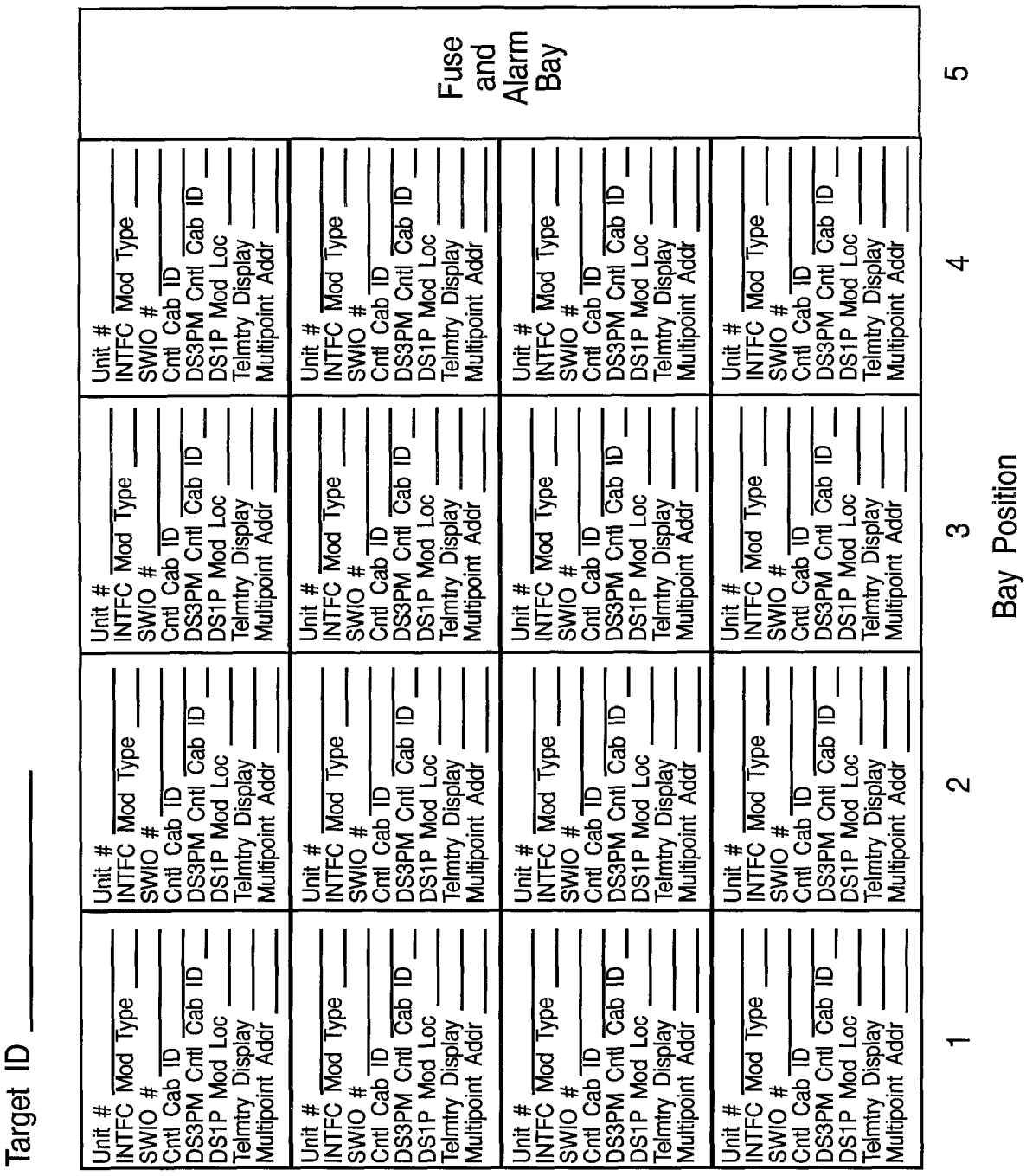


Figure 5-1. **Collocated Interface Modules Provisioning Worksheet (Sheet 1 of 4)**

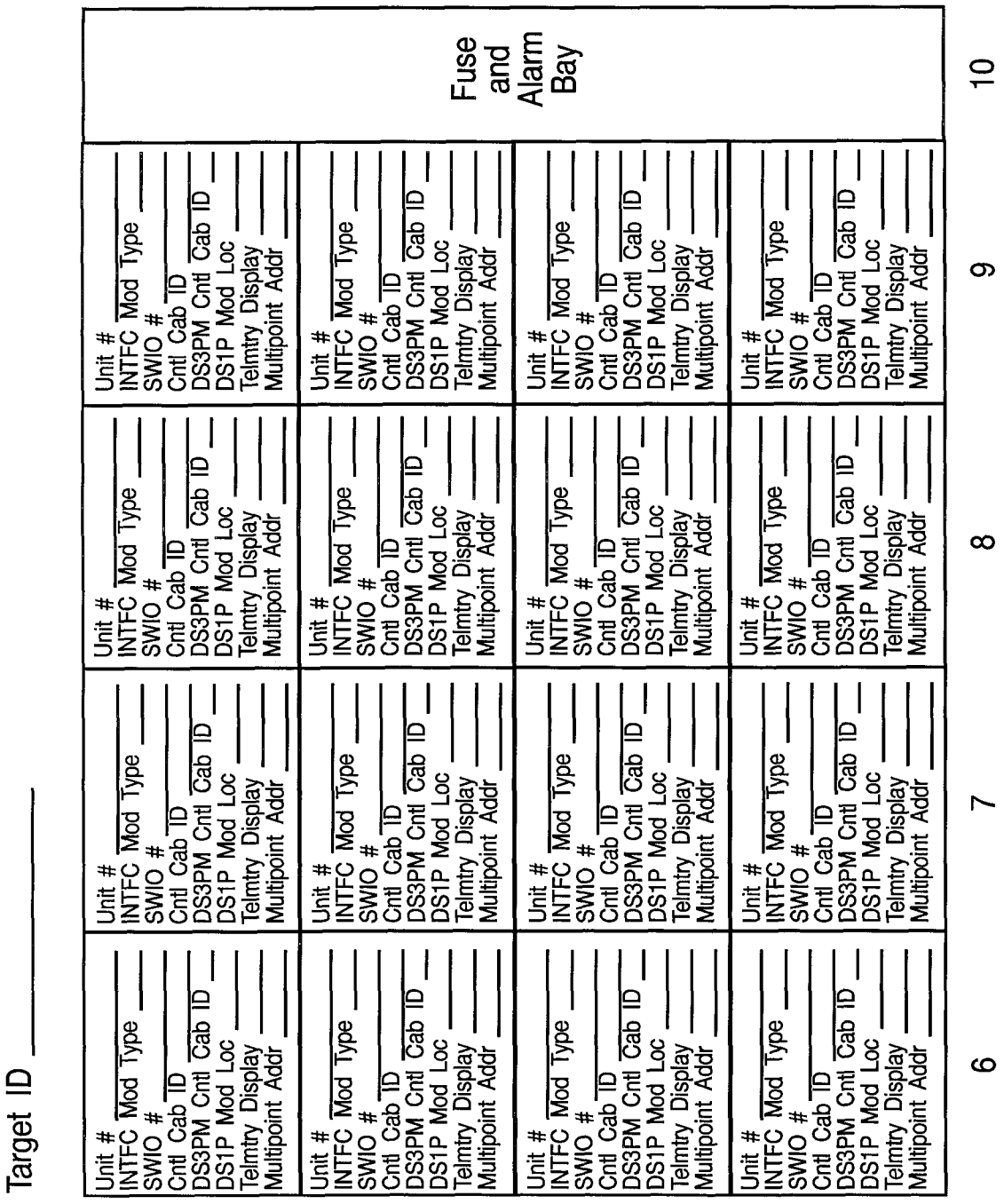


Figure 5-1. **Collocated Interface Modules Provisioning Worksheet (Sheet 2 of 4)**

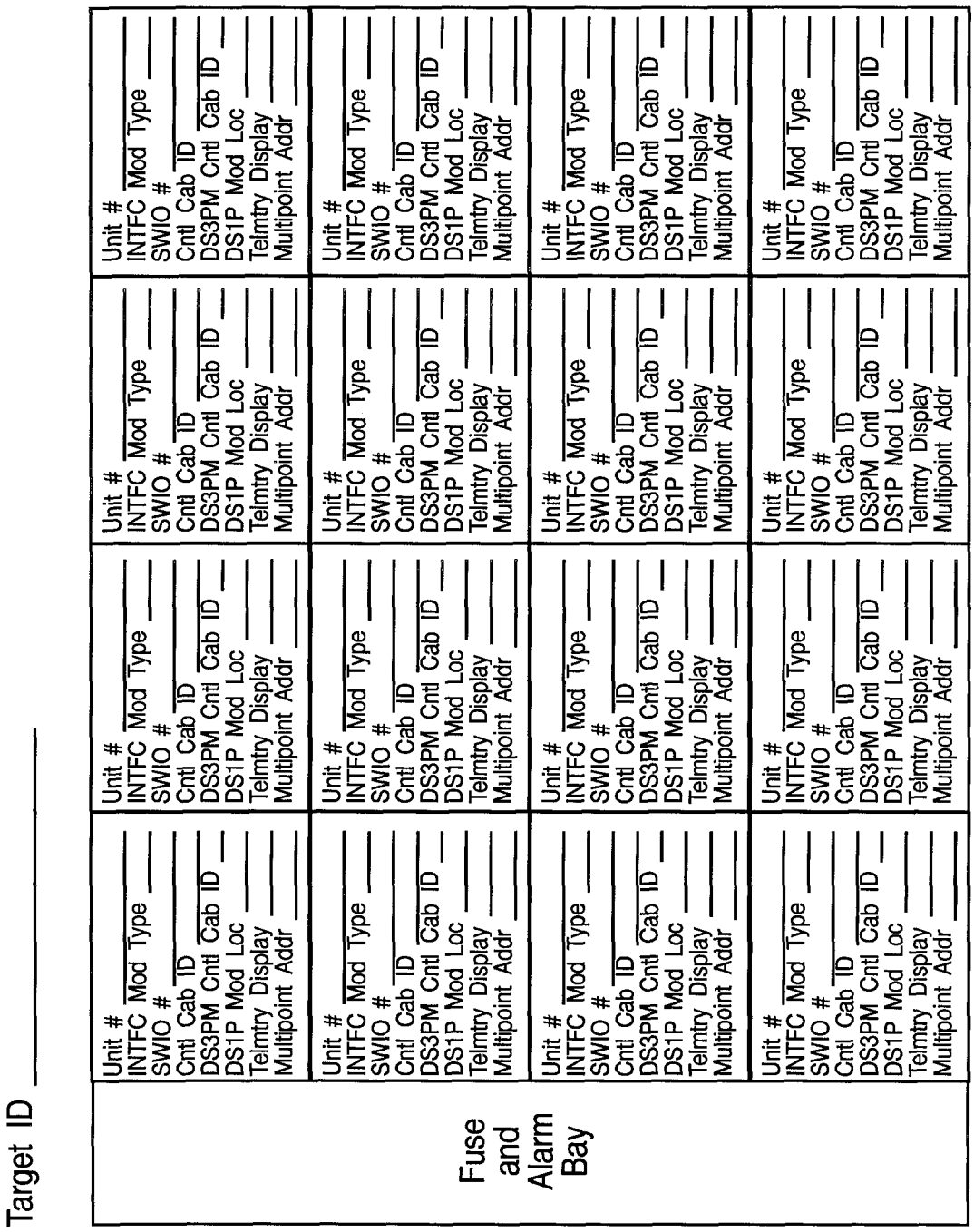


Figure 5-1. **Collocated Interface Modules Provisioning Worksheet (Sheet 3 of 4)**

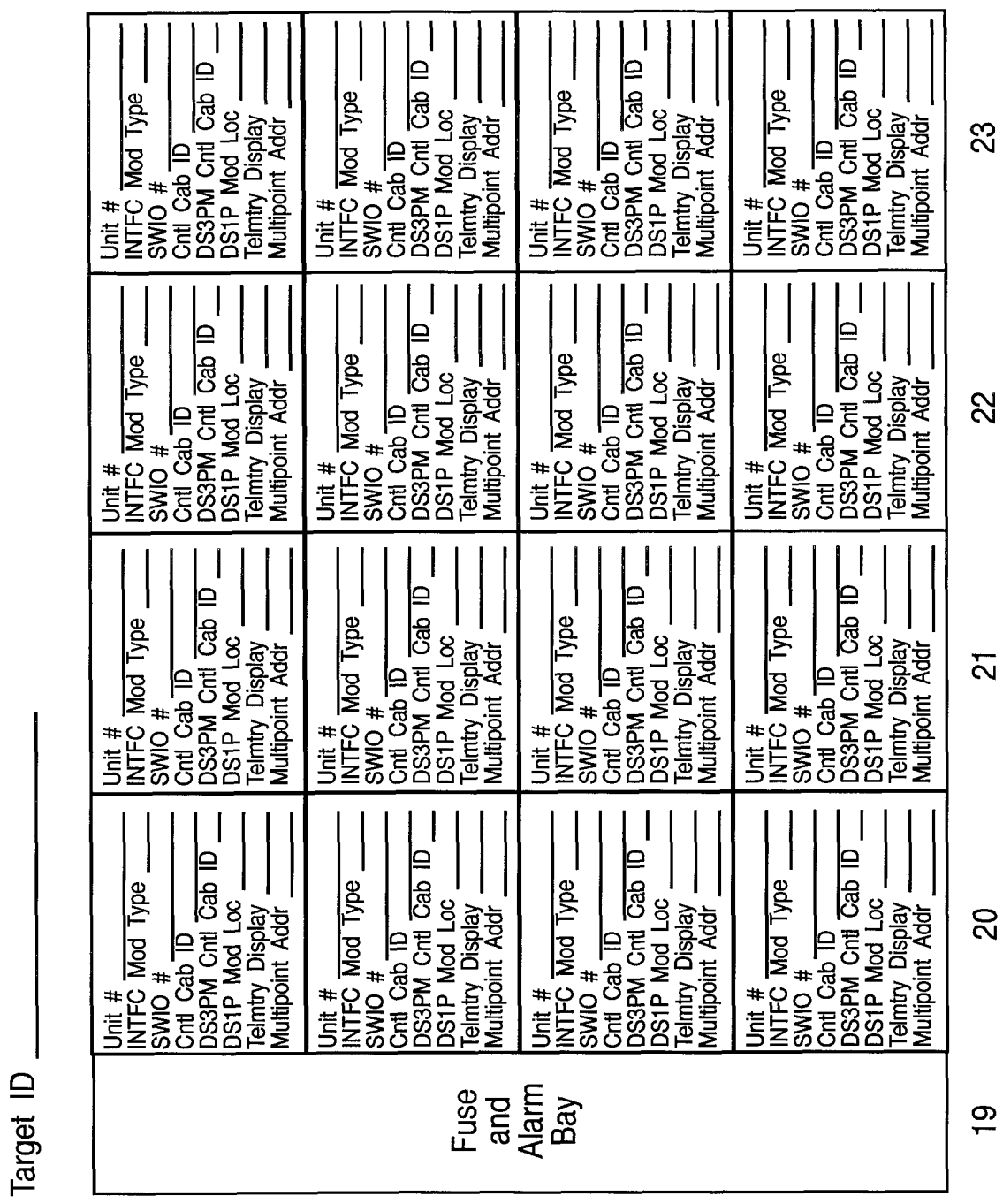


Figure 5-1. **Collocated Interface Modules Provisioning Worksheet (Sheet 4 of 4)**

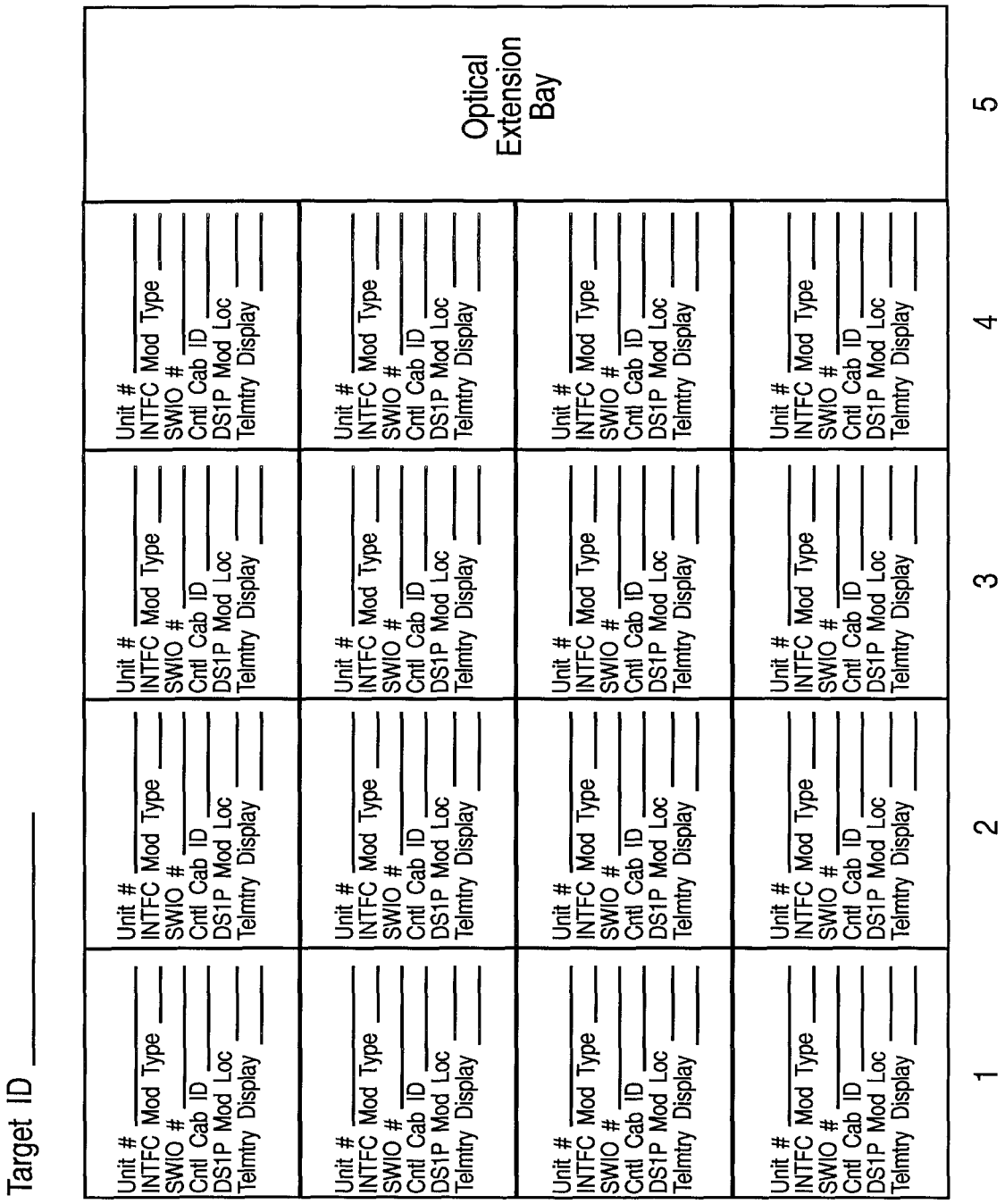


Figure 5-2. **Remote Complex Interface Modules Provisioning Worksheet (Sheet 1 of 2)**

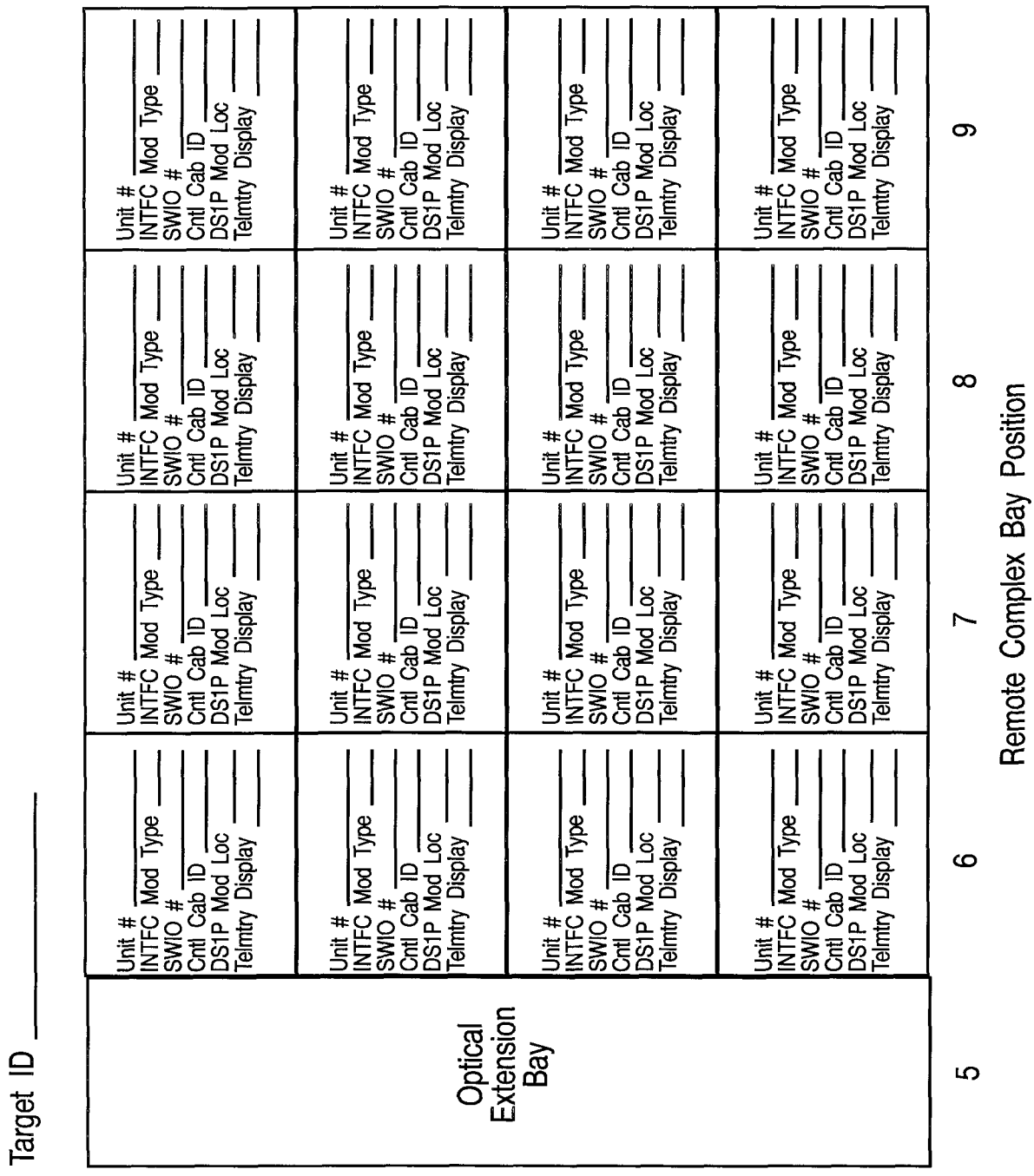


Figure 5-2. **Remote Complex Interface Modules Provisioning Worksheet (Sheet 2 of 2)**

i. For each DS3PM2 circuit pack, enter the multipoint address (`Multipoint Addr`). The multipoint address defaults to the Unit Number minus one (for example, a DS3PM2 circuit pack in a DS3 Interface Module in shelf position 14 defaults to a multipoint address of 13). You can either use the default value or assign a value between 0 and 63.

After completing the above procedure, the provisioning worksheets in Figures 5-1 and 5-2 must be completed for every shelf position containing an interface module. The complete worksheet is used to aid you in performing the remaining procedures contained in this chapter.

3. Make sure all DS1 Interface Modules contain DS1IF, SWIF, PMGR, or BXA circuit packs in DS1 Interface bays that are precabled for Digital System Access Bays (DSABs).

NOTE:
It is recommend that all DS1IF/SWIF circuit pack slots be equipped with DS1IF, SWIF, PMGR, or BXA circuit packs regardless if the DS1 Interface Module is provisioned or not. If a DS1 Interface Module is cabled, all DS1IF/SWIF circuit pack slots must be equipped. DS1 Interface Modules that are not cabled can be left empty. BXA circuit packs can only be inserted into unused interface circuit pack (SWIF and DS1IF) slots, and must not be inserted in any other circuit pack slot (that is, DS1RY, CLKDR, and interface protection).

4. Retrieve the current equipment state by entering the following command:

`RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = SWIO circuit pack location: `SWIO-{1-4}-{1-16}`

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = SWIO circuit pack location: `SWIO-{1-4}-{1-16}`

f = Equipment state: basic states are `AVAIL`, `EQPD`, or `POS`

If the basic state is EQPD, continue with Step 5. If the basic state is AVAIL, go to Step 7. If the basic state is POS, go to Step 9.

5. Install the mate SWIO/OSWIO of the SWIO location identified in Step 4. Refer to Chapter 2 for installing circuit packs, if necessary.
6. If you installed a OSWIO circuit pack in Step 5, connect the associated fiber-optic cable to the OSWIO circuit pack faceplate. Refer to Chapter 2 for installing fiber-optic cables, if necessary.

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

7. Create the SWIO/OSWIO circuit pack slot by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIO circuit pack location: `SWIO-[1-4]-[1-16]`

8. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

   a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

   b. Check to see if the Synchronizer Module is provisioned properly by entering the following command:

      `RTRV-EQPT:`*[a]*`:`*b*`;`

      Where:

      a = Target ID (optional)

      b = CLKGN circuit pack location: `CLKGN-[0,1]`

      A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: : ...CLKMODE=w ..."
;
```

Where:

d = CLKGN circuit pack location: `CLKGN-[0,1]`

w = Clock mode: `[ ASYNC, SYNC ]`

If both CLKGN circuit packs do not have a clock mode of SYNC, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

9. Provision the interface module (refer to the completed provisioning worksheet where necessary) by entering the following command:

`ENT-EQPT:`*[a]*`:`*b*`:::`*d*`:SWLOC=`*e*`,CABLEID=`*f*`,PROTLOC=`*g*`,`
`TELDISP=`*h*`,RX=`*r*`;`

Where:

a = Target ID (optional)

b = Interface module (unit number) location: `UNIT-[1-64]`

d = Interface module type:
DS3 Interface-32 Module: `32DS3`
DS3 Interface-16 Module: `16DS3`
Enhanced DS3 Interface-16 Module: `16EDS3`
DS3 Clear-Channel Interface-16 Module: `16DS3CC`
DS1 Interface Module: `DS1`
DS1 Interface-Protection Module: `DS1P`
STS1 Interface-16 Module: `16STS1`

e = Switch connection equipment location: `SWIO-[1-4]-[1-16]`

f = Control cable ID: `J-[1-64]`

g = Protection equipment location (DS1 Interface Modules [`DS1`] only): `UNIT-[1-64]`

h = Telemetry display number: `[0-63]`
For DS1 Interface and DS1 Interface-Protection Modules, the domain is `0-63` and the default is the Unit Number minus 1. For DS3 Interface-32, DS3 Interface-16, and STS1 Interface-16 Modules, the domain is `0-31` and there is no default.

r = Remote Complex location: `[ 1, 2, NOVAL ]`
For collocated interface modules, this parameter must be `NOVAL`.

10. Restore the Unit Controller (UC) by entering the following command:

    `RST-EQPT:[a]:b;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-[1-64]`
    (Must be the Unit Number entered in Step 9.)

    As unit controllers are restored, `REPT DBCHG` *messages for all automatic provisioned equipment are generated (if provisioned to do so) indicating that the database is being updated. The* `RST-EQPT` *command takes up to 10 minutes to complete.*

11. Repeat this procedure from Step 9 for each interface module that needs to be provisioned.

12. When all equipment has been provisioned (all `REPT DBCHG` messages have been received, if provisioned), press the LED/LAMP TEST button on the status panel at the front of the frame.

⚠ CAUTION:
When performing an LED TEST operation (or `EX-EQPT` *command) on the DACS IV-2000, the LED TEST complete message is outputted before the test sequence completes. You must* ***never*** *perform a* `RMV-EQPT::MC;` *operation until the LED TEST has fully completed. This test can take up to 20 minutes on a fully configured system which contains two Remote Complexes configured with all DS1 Interface Bays.*

⇒ NOTE:
The ACO LED lights for as long as the LED/LAMP TEST button is depressed. Fan indicators are cycled on and off (on for two seconds, off for two seconds) during the entire LED test sequence. The bay fault indicators on the header strips are turned on at the beginning of the LED test sequence and remain on until the end of the test.

13. Check to see that the LEDs on the circuit packs light in the order shown in Tables 5-3 and 5-4.

⇒ NOTE:
If the LED test sequence does not begin immediately, the system may be executing another command (for example, autonomous database backup). If the LEDs do not light in the order given, an input command in one of the preceding steps was entered incorrectly. You must deprovision the interface module that was entered (refer to Chapter 7) and repeat this procedure with the correct information.

Table 5-3. **Switch Complex and Collocated Interface Bays — LED Test Sequence**

Order	Module
1	Switch Power 1
2	Memory and Synchronizer *
3	High Capacity Controller †
4	Switch Power 2
5	Switch Power 3
6	Switch Input/Output (SWIO) 1
7	Switch Center Stage (SWCS) 1
8	SWIO 2
9	SWIO 3
10	SWCS 2
11	SWIO 4
12	Interface module (left to right)‡

* Version 1 Synchronizer Module circuit packs do not contain LEDs. Therefore, these circuit packs are not included as part of the LED Test function.

† When the High Capacity Controller Module circuit pack indicators are lit, the status panel (except FE LED) and the header strip indicators (except FE indicator) for the Main Controller Bay are lit at the same time.

‡ Interface modules contained in interface bays are exercised from left to right, bottom to top, assuming they are provisioned consistent with the recommended interface number numbering scheme provided in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Table 5-4. **Remote Complex — LED Test Sequence**

Order	Module
1	Optical Extension (OPEX) (lower and upper at the same time)
2	Remote Unit Interface (RUI), RUI Power, Auxiliary (AUX) Power, and OPEX Power*
3	Interface Bays (Left to Right)†

* The RUI, RUI PWR, AUX PWR, and OPEX PWR Modules are exercised at the same time.

† Interface modules contained in interface bays are exercised from left to right, bottom to top, assuming they are provisioned consistent with the recommended interface number numbering scheme provided in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Provisioning Synchronizer Module Circuit Packs and Timing References

This procedure is used to provision the Synchronizer Module circuit packs and to assign the DS1 reference clocks from the Building Integrated Timing Supply (BITS) source to the DS1TX circuit packs.

NOTE:
In this procedure, provisioning side 0 circuit packs of the Synchronizer Module automatically provisions side 1 circuit packs.

1. Check the Synchronizer Module to make sure the DPLL, TBS3, and DS1TX circuit packs are of the same version (version 1 or 2). If different versions exist, contact your system administrator or next level of support for assistance and do not continue this procedure until instructed.
   - The equipment codes for version 1 Synchronizer Module circuit packs are:
     - — DPLL1 (AWP9)
     - — TBS31 (AWS3)
     - — DS1TX1 (AWS5)
   - The equipment codes for version 2 Synchronizer Module circuit packs are:
     - — DPLL2 (AWP15)
     - — TBS32 (AWS8)
     - — DS1TX2 (AWS9)
2. Provision the side 0 DPLL circuit pack by entering the following command:

   `ENT-EQPT:`*[a]*`:DPLL-0::::CODE=`*j*`;`

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: `{ AWP9, AWP15 }`
   DPLL1 circuit packs are `AWP9` and DPLL2 circuit packs are `AWP15`.
3. Provision the side 0 TBS3 circuit pack by entering the following command:

   `ENT-EQPT:`*[a]*`:TB-0::::CODE=`*j*`;`

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: `{ AWS3, AWS8 }`
   TBS31 circuit packs are `AWS3` and TBS32 circuit packs are `AWS8`.

4. Provision the side 0 DS1TX circuit pack, and provision and assign DS1 reference by entering the following command:

   ENT-EQPT:*[a]*:TX-0::::CODE=*j*,SYNCPRI=*k*,SYNCSEC=*l*,
   TLIP1FF=*m*,TLIP2FF=*n*,TLIP1LC=*o*,TLIP2LC=*p*;

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: { AWS5, AWS9 }
   DS1TX1 circuit packs are AWS5 and DS1TX2 circuit packs are AWS9.

   k = Primary timing reference location: { 1, 2 }
   Specifies which primary synchronization reference is connected to.

   l = Secondary timing reference location: { 1, 2 }
   Specifies secondary synchronization reference is connected to. The value specified for this parameter must be the other TXPT from the one assigned in parameter *k*.

   m = Timing link interface port 1 framing format: { ESF, SF }
   Specifies the framing format of the DS1 reference clock 1.

   n = Timing link interface port 2 framing format: { ESF, SF }
   Specifies the framing format of the DS1 reference clock 2.

   o = Timing link interface port 1 line code: { AMI, B8ZS }
   Specifies the line code of the DS1 reference clock 1.

   p = Timing link interface port 2 line code: { AMI, B8ZS }
   Specifies the line code of the DS1 reference clock 2.

5. Retrieve the state of the CLKGN circuit packs to determine which side is active (ACT) and which side is standby (STBY) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:CLKGN-0&&-1;

   Where:

   a = Target ID (optional)

   The following output response appears:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:STATE */
      "CLKGN-0:f"
      "CLKGN-1:f"
   ;
   ```

   Where:

   f = State of CLKGN circuit packs: { ACT, STBY }

6. Restore the synchronizer side associated with the active CLKGN circuit pack to service by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `{ SYNC-0, SYNC-1 }`

   This command takes up to 3 minutes to complete. For version 2 synchronizer circuit packs, the green ACT LED on the DPLL and TBS3 circuit packs light once the synchronizer side is restored.

   The following message appears only when the DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

   Where:

   a = Autonomous sequence number: `001-999`

7. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 6 (active side) by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: `TX-{0,1}`

   This command takes up to 1 minute to complete. For version 2 DS1TX circuit packs, the green ACT LED lights after the DS1TX circuit pack is restored. After the DS1TX circuit pack is restored, the synchronizer is in the normal operating mode.

8. Restore the synchronizer side associated with the standby CLKGN circuit pack to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Synchronizer location: **{ SYNC-0, SYNC-1 }**

   This command takes up to 3 minute to complete.

   The following message appears only when the DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

   Where:

   a = Autonomous sequence number: 001-999

9. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 8 (standby side) by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: **TX-{0,1}**

   This command takes up to 1 minute to complete.

   If either synchronizer side does not restore, contact your system administrator or next level of support for assistance.

10. Change the clock mode of the standby CLKGN circuit pack to SYNC by entering the following command:

    ED-EQPT:*[a]*:*b*:::**CLKMODE=SYNC**;

    Where:

    a = Target ID (optional)

    b = Standby CLKGN circuit pack location: **CLKGN-{0,1}**

    A major (MJ) alarm is issued due to the two CLKGN circuit packs operating with different clock modes. Diagnostics for the CLKGN circuit pack fail until both CLKGN circuit packs are provisioned with the same clock mode.

11. Verify the clock modes of the CLKGN circuit packs by entering the following command:

    RTRV-EQPT:*[a]*:CLKGN-0&&-1;**

    Where:

    a = Target ID (optional)

    The following output response appears (only the pertinent parameters are shown):

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
       /* LOC:UTYPE:<>:CLEI:STATE */
       "CLKGN-0:: ... CLKMODE=y ... "
       "CLKGN-1:: ... CLKMODE=y ... "
    ;
    ```

    Where:

    y = Clock mode of CLKGN circuit packs: { ASYNC, SYNC}

    The standby CLKGN circuit pack must be in the SYNC mode and the active CLKGN circuit pack must be in the ASYNC mode. If this is not the case go back to Step 10 to change the clock mode of the standby CLKGN circuit pack.

12. Switch the standby CLKGN circuit pack to active by entering the following command:

    SW-DX-EQPT:*[a]*:*b*:::FRCD;**

    Where:

    a = Target ID (optional)

    b = Standby CLKGN circuit pack location: **CLKGN-{0,1}**

    Enhanced diagnostics are run to detect upstream clock failures between the SYNC/CLKGN interface. These diagnostics run only when switching from the ASYNC to the SYNC clock mode. The specified CLKGN circuit pack automatically transitions to the ACT state upon successful completion of diagnostics. A REPT ALM EQPT *message indicating the state of the CLKGN circuit packs is output upon completion of this command.*

CAUTION:
Manual switching of CLKGN circuit packs can cause random 2 ms timing hits on DS1 signals in the system. The alarms which are raised clear in a matter of seconds.

13. Change the clock mode of the new standby CLKGN circuit pack to SYNC by entering the following command:

    ED-EQPT:*[a]*:*b*::::**CLKMODE=SYNC;**

    Where:

    a = Target ID (optional)

    b = Standby CLKGN circuit pack location: **CLKGN-{0,1}**

    A major alarm clears (CL) due to the two CLKGN circuit packs operating in the same clock modes. Auto-diagnostics for the CLKGN circuit packs are performed.

    At this point, the Synchronizer Module and CLKGN circuit packs are available for providing clock for STS1 interfaces. If your office procedures require that the CLKGN circuit pack that was active at the start of this procedure be active, go to Step 14 to switch CLKGN circuit packs. Otherwise, you are done with this procedure.

14. Switch the standby CLKGN circuit pack to active by entering the following command:

    SW-DX-EQPT:*[a]*:*b;*

    Where:

    a = Target ID (optional)

    b = Standby CLKGN circuit pack location: **CLKGN-{0,1}**

    This command takes up to 1 minute to complete.

CAUTION:
Manual switching of CLKGN circuit packs can cause random 2 ms timing hits on DS1 signals in the system. The alarms which are raised clear in a matter of seconds.

Provisioning MUX and SMUX Circuit Packs

This procedure allows you to provision a MUX/SMUX circuit pack in a DS3 Interface/STS1 Interface Module. This procedure must **not** be used to change a MUX1 (AKM52) to a MUX2 (AKM68B) circuit pack or a MUX2 (AKM68B) to a MUX3 (AKM91). Refer to the sections titled "Changing Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)" (page 19-25) or "Changing Multiplexer From MUX2 (AKM68B) to MUX3 (AKM91)" (page 19-27) for changing MUX circuit packs.

After provisioning an SMUX circuit pack, the SMUX is configured to accept VT1.5 (DS1) signals (that is, only DS1 cross-connections can be established). To configure SMUX circuit packs to handle other types of terminating equipment and facility types refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/ DS1/DS3 Operation" (page 6-32).

NOTE:
All MUX/SMUX circuit packs that are provisioned but do not carry service must be looped back by either operating a DS3/STS-1 line loopback or creating a loopback at the DS3X/STS-1X connection to avoid transient alarms.

CAUTION:
Before performing this procedure, clear any protection switches involving the DS3/STS1 Interface Module for which you are provisioning a MUX/SMUX circuit pack.

1. Retrieve the state of the MUX/SMUX circuit pack slot you are provisioning by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: { **MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}** }

2. Determine the basic state of the MUX/SMUX from the output of the `RTRV-STATE-EQPT` command. A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   f = Equipment state: basic states are `ACT`, `POS`, `EQPD`, `AVAIL`, or `PNDG`

   If the basic state of the MUX/SMUX slot is ACT, POS, EQPD, or PNDG, the MUX/SMUX slot must be deprovisioned. Refer to the section titled "Deprovisioning MUX or SMUX Circuit Packs" (page 7-22) before continuing this procedure.

3. If a MUX/SMUX circuit pack is currently installed in the MUX/SMUX slot, go to Step 8. If a bus extender (BXA) circuit pack is currently inserted in the MUX/SMUX slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the MUX/SMUX slot when you extract the BXA circuit pack.

4. Set the LBO of the MUX/SMUX circuit pack to be installed by performing Steps 1 and 2 of the section titled "Setting Line Build Out (LBO)" (page 5-34). After setting the LBO, continue with this procedure.

5. Install the MUX/SMUX circuit pack into the MUX/SMUX circuit pack slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the MUX/SMUX slot when you install the MUX/SMUX circuit pack.

6. Verify that the provisioned (PR-LBO) and circuit pack (CP-LBO) LBO settings match by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: { MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PLBO=h,CLBO=i:..."
;
```

   Where:

   d = MUX/SMUX circuit pack location: { MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }

   h = Provisioned LBO setting: { INIT, OUT, IN }.

   i = Circuit pack LBO setting: { OUT, IN }

7. If the LBO settings match (the value INIT indicates an unset value and the setting of the circuit pack is used), continue with the next step. Otherwise, change the provisioned LBO setting to match the setting from Step 4 by entering the following command:

   ED-EQPT:*[a]*:*b*::::*[*LBO=*e]*;

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: { MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }

   e = LBO setting: { IN, OUT }

8. Retrieve the state of the MUX/SMUX circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   f = Equipment state: basic states are `AVAIL` or `POS`

   If the basic states of the MUX/SMUX circuit pack is AVAIL, go to Step 9 to manually provision the MUX/SMUX circuit pack. If the basic states of the MUX/SMUX circuit pack is POS, you are done with this procedure.

9. Provision the MUX/SMUX circuit pack by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

Setting Line Build Out (LBO)

This procedure is used to initially set the Line Build Out (LBO) for MUX/SMUX circuit packs.

1. Determine the length and type of the cable connected to the working MUX or SMUX circuit packs from office records.
2. Determine whether LBO must be set to `IN` or `OUT` (refer to Table 5-5), and set saddle switches for MUX2 (AKM68B) circuit packs (refer to Figure 5-3), MUX1 (AKM52/52B) circuit packs (refer to Figure 5-4), or SMUX (AKM84) circuit packs (refer to Figure 5-5). All three saddle switches must be set on the circuit packs. MUX3 circuit packs do not contain saddle switches for LBO settings. The LBO for MUX3 circuit packs are set with the `ED-EQPT` command.
3. If you are setting the LBO for a MUX3 circuit pack or are changing the LBO setting on MUX1, MUX2, or SMUX circuit packs that have already been provisioned, update the LBO software to match the hardware by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`:::LBO=`*e*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15] }`

   e = LBO setting
   MUX1, MUX2, and SMUX circuit packs: `{ INIT }`
   MUX3 circuit packs: `{ IN, OUT }`

   If the circuit pack value and the provisioned value do not match, the MUX/SMUX circuit pack indicates a minor alarm. Entering the `ED-EQPT` *command clears the minor alarm.*

4. Verify the LBO setting by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PLBO=h,CLBO=i:..."
;
```

   Where:

   d = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   h = Provisioned LBO setting: `{ INIT, OUT, IN }`.

   i = Circuit pack LBO setting: `{ OUT, IN }`

   If the desired setting does not appear in the output response, go to Step 2. Otherwise, you are done with this procedure.

Table 5-5. **DS3 Cable Length (Feet) Supported for LBO Setting**

LBO Setting	To DSX-3 or STSX-1				To Network Element			
	KS19224, List 2 Cable	734A Cable	735A Cable	735A/ 734A Cable Combi-nation	KS19224, List 2 Cable	734A Cable	735A Cable	735A/ 734A Cable Combi-nation
IN	0-75	0-225	0-125	0-225*	0-150	0-450	0-250	0-450*
OUT	>75-150	>225-450	>125-250	>225-450	>150-300	>450-900	>250-500	>450-900

* This cable combination is not preferred.

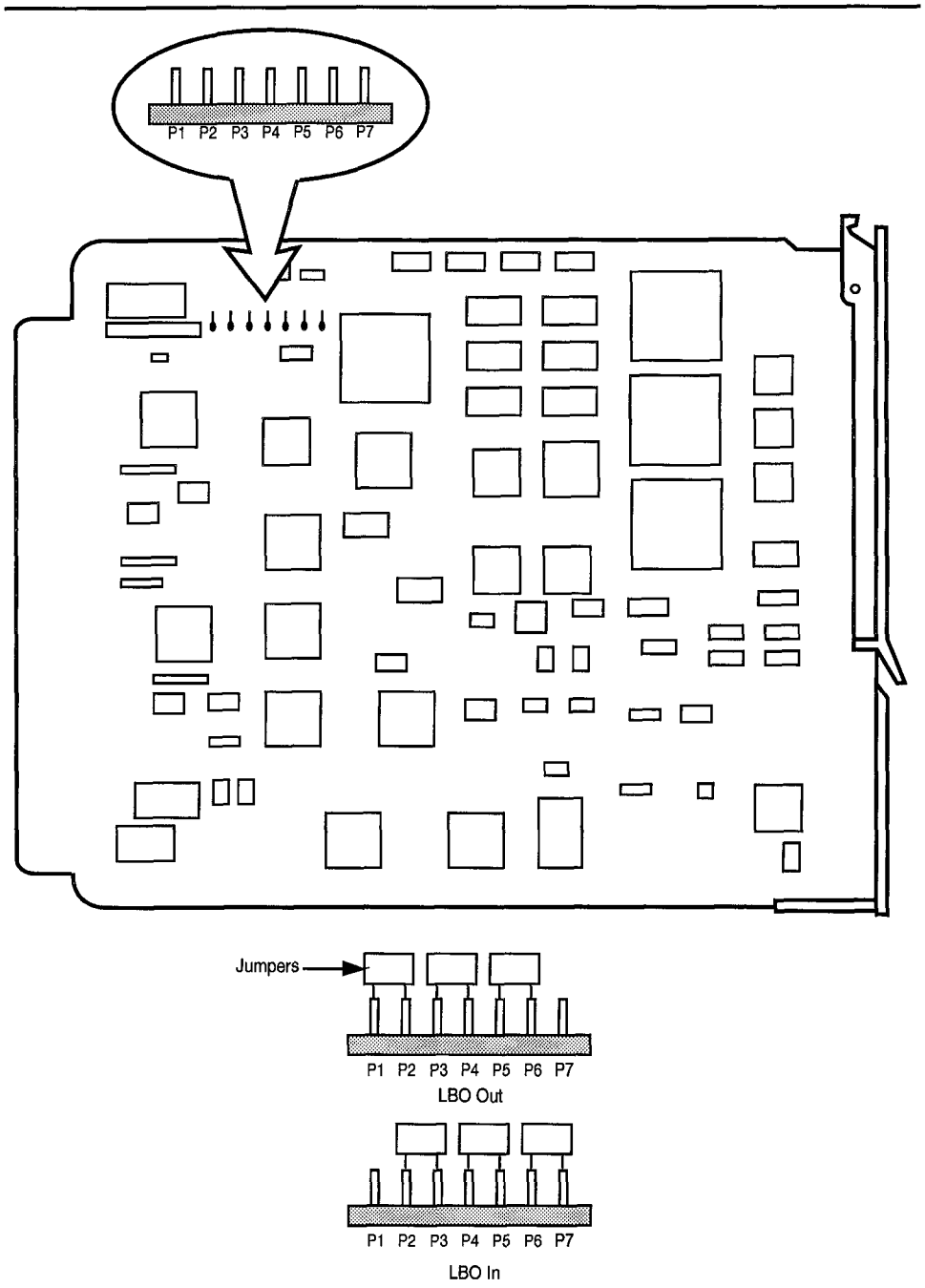


Figure 5-3. **LBO Saddle Switches on MUX2 (AKM68B) Circuit Packs**

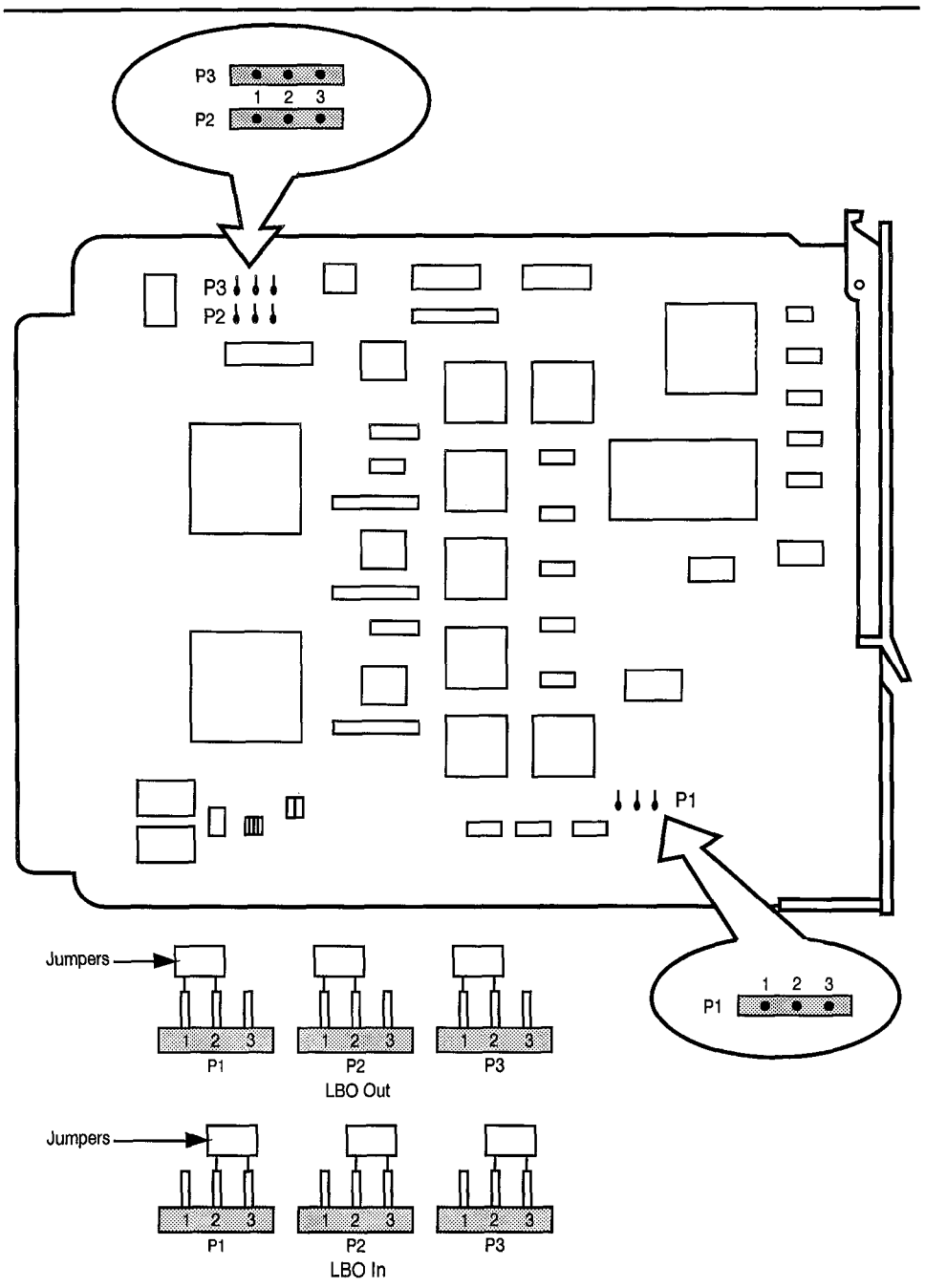


Figure 5-4. **LBO Saddle Switches on MUX1 (AKM52/52B) Circuit Packs**

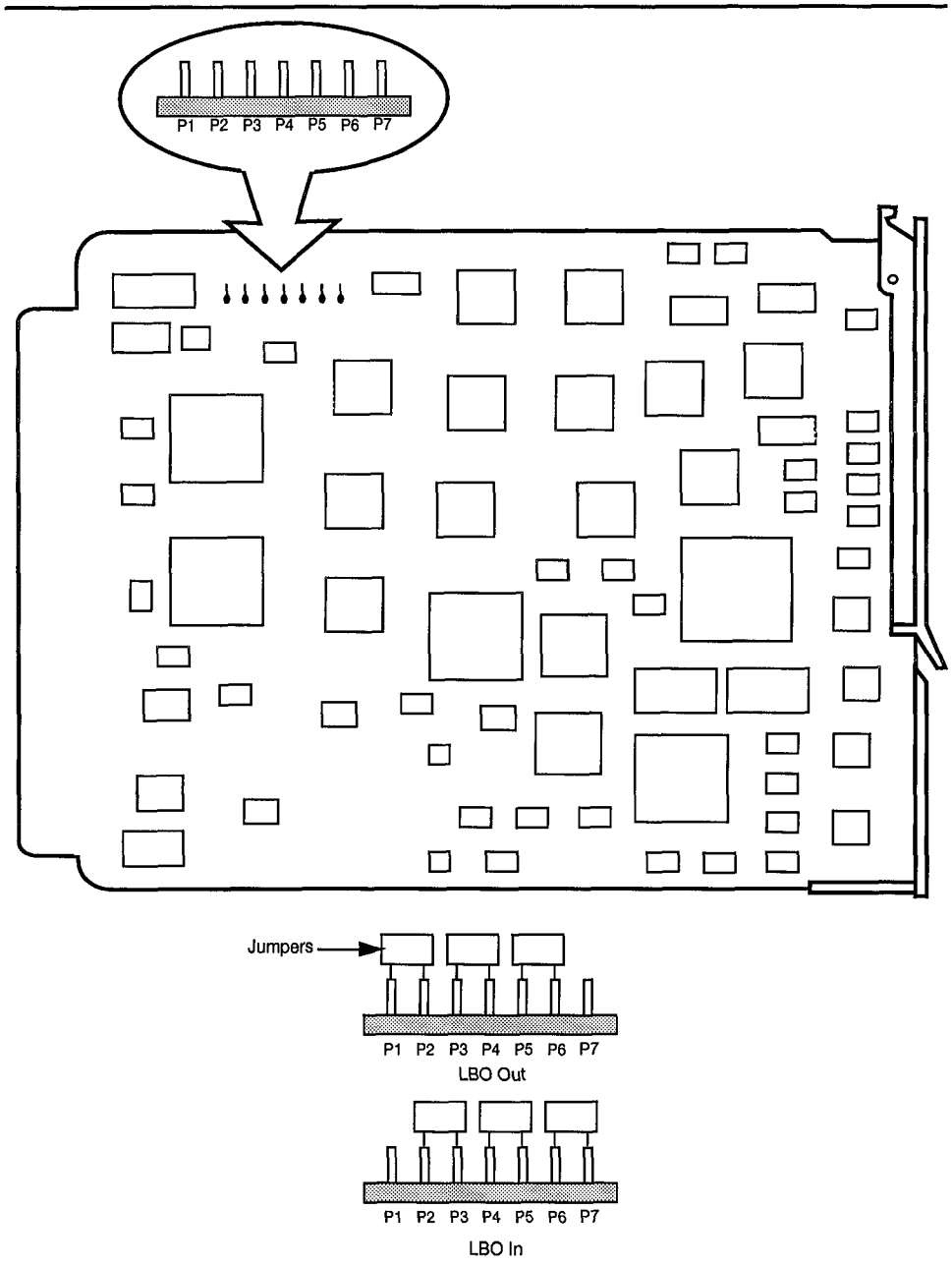


Figure 5-5. **LBO Saddle Switches on SMUX1 (AKM84) Circuit Packs**

Provisioning SWIF and DS1IF Circuit Packs

This procedure allows you to provision a SWIF circuit pack and its DS1IF circuit packs in a DS1 Interface Module. This procedure must **not** be used to change a SWIF1 (AKM49) to a SWIF2 (AKM50) circuit pack. Refer to the section titled "Changing Switch Interface From SWIF1 (AKM49) to SWIF2 (AKM50)" (page 19-22) for changing SWIF circuit packs.

CAUTION:
Before performing this procedure, clear any alarms and protection switches involving the DS1 interface protection group for which you are provisioning a SWIF and two DS1IF circuit packs.

1. Retrieve the state of the DS1IF slots you are provisioning by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`
   You can retrieve the circuit packs one at a time or you can specify a list of circuit packs (for example, `-1A&-1B`) to retrieve both circuit packs at once.

2. Determine the basic state of the DS1 interface circuit packs from the output of the `RTRV-STATE-EQPT` command. A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

   f = Equipment state: basic states are `ACT`, `POS`, `EQPD`, `AVAIL`, or `PNDG`

   If the basic states of the DS1IF slots are ACT, POS, EQPD, or PNDG, the DS1IF slots must be deprovisioned. Refer to the section titled "Deprovisioning DS1 Interface (DS1IF) Circuit Packs" (page 7-19) before continuing this procedure.

3. Retrieve the state of the SWIF slot you are provisioning by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   f = Equipment state: basic states are `ACT`, `POS`, `EQPD`, `AVAIL`, or `PNDG`

   If the basic state of the SWIF slot is ACT, POS, EQPD, or PNDG, the SWIF slot must be deprovisioned. Refer to the section titled "Deprovisioning SWIF Circuit Packs" (page 7-21) before continuing this procedure.

4. If a DS1IF circuit pack is currently installed in the DS1IF *A* slot, go to Step 6. If a bus extender (BXA) circuit pack is currently inserted in the DS1IF *A* slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the DS1IF slot when you extract the BXA circuit pack.

5. Install a DS1IF circuit pack into the DS1IF *A* slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the DS1IF slot when you install the DS1IF circuit pack.

6. If a DS1IF circuit pack is currently installed in the DS1IF *B* slot, go to Step 8. If a bus extender (BXA) circuit pack is currently inserted in the DS1IF *B* slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the DS1IF slot when you extract the BXA circuit pack.

7. Install a DS1IF circuit pack into the DS1IF *B* slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the DS1IF slot when you install the DS1IF circuit pack.

8. If a SWIF circuit pack is currently installed in the SWIF slot, go to Step 10. If a bus extender (BXA) circuit pack is currently inserted in the SWIF slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the SWIF slot when you extract the BXA circuit pack.

9. Install a SWIF circuit pack into the SWIF slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the SWIF slot when you install the DS1IF circuit pack.

10. If you installed any DS1IF circuit packs in previous steps, for the DS1IF circuit packs installed, set the equalizer and DS1 code type (linecode) by referring to the next section titled "Setting Equalizer (EQL) and DS1 Code Type" (page 5-43) (use the software method, where possible). After setting the equalizer and DS1 code type continue with this procedure.

11. Retrieve the state of the DS1IF circuit packs by entering the following command:

    `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`
    You can retrieve the circuit packs one at a time or you can specify a list of circuit packs (for example, `-1A&-2B`) to retrieve both circuit packs at once.

    A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

    Where:

    e = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

    f = Equipment state: basic states are `AVAIL` or `POS`

    If the basic states of the DS1IF circuit packs are AVAIL, go to Step 12 to manually provision the DS1IF circuit packs. If the basic states of the DS1IF circuit packs are POS, go to Step 13.

12. Provision the DS1IF circuit packs by entering the following command:

    `ENT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`
    You can create the circuit packs one at a time or you can specify a list of circuit packs (for example, `-1A&-2B`) to retrieve both circuit packs at once.

13. Retrieve the state of the SWIF circuit pack by entering the following command:

    `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

    A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

    Where:

    e = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

    f = Equipment state: basic states are `AVAIL` or `POS`

    If the basic state of the SWIF circuit pack is AVAIL, go to Step 14 to manually provision the SWIF circuit pack. If the basic state of the SWIF circuit pack is POS, you are done with this procedure.

14. Provision the SWIF circuit pack by entering the following command:

    `ENT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

Setting Equalizer (EQL) and DS1 Code Type

When provisioning a DS1IF circuit pack, the equalizer (EQL) settings can be done via software by using the `ED-EQPT` command (software method), or by setting hardware switches on the circuit pack and using the `ED-EQPT` command (hardware method).

The recommended method is the software method since the software overrides the hardware settings except in the case where the switches have been set to invalid combinations.

The following section addresses the software method. If you prefer to use the hardware method, skip to the section titled "Hardware Method" (page 5-46).

Software Method

1. Determine if a Digital System Access Bay (DSAB) is used, and the length and type of the cable connected to the DS1IF circuit packs from office records. For more information on a DSAB, refer to *Digital Systems Access Bay (DSAB) System Reference Guide* (AT&T 365-301-135).
2. Determine proper EQL setting (refer to Table 5-6 for settings when not using a DSAB or Table 5-7 for setting when using DSABs) and set the equalization by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`::::[EQL=`*e*`];`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-[1-64]-[1A-8B]` (A range of DS1IFs cannot be specified.)

   e = Equalizer setting: `[ 20, 40, 60, 80, 100 ]`

Table 5-6. DS1 Cable Length (Feet) Supported for EQL Setting — No DSABs

Equalizer Setting	To DSX-1		To Network Element	
	1249-Type Cable (26GA)	600-Type Cable (22GA)	1249-Type Cable (26GA)	600-Type Cable (22GA)
20	0-90	0-133	0-540	0-788
40	>90-180	>133-267	>90-630	>133-922
60	>180-270	>267-400	>180-720	>267-1055
80	>270-360	>400-533	>270-810	>400-1188
100	>360-450	>533-655	>360-900	>533-1310

Note: In DSX runs, it is assumed that the distance from the other side of the patch to the next network element is at the maximum of 450/655 feet (one-half the total allowable distance between network elements). For runs between network elements, an additional 450/655 feet can be added to the upper limit, thereby causing overlapping ranges in the **To Network Element** column.

Table 5-7. DS1 600-Type Cable (22GA) Length (Feet) Supported for EQL Setting — DSABs Using 50 feet of 1249-Type Cable (26GA) to the DACS IV-2000 Frame

Equalizer Setting	To DSX-1 (1 DSAB)	To Network Element (1 DSAB)	To Network Element (2 DSAB)
20	0-63	0-718	0-648
40	>63-197	>63-852	0-782
60	>197-330	>197-985	>127-915
80	>330-463	>330-1118	>260-1048
100	>463-585	>463-1240	>393-1170

Note: In DSX runs, it is assumed that the distance from the other side of the patch to the next network element is at the maximum of 585 feet (one-half the total allowable distance between network elements using two DSAB Bays). For runs between network elements, an additional 585 feet can be added to the upper limit, thereby causing overlapping ranges in the **To Network Element** columns.

3. Verify the EQL settings by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PEQL=j,CEQL=k,..."
;
```

   Where:

   d = SWIF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

   j = Provisioned EQL setting: `{ INIT, 20, 40, 60, 80, 100, 20*, 40*, 60*, 80*, 100* }`
   The value `INIT` indicates unprovisioned state. An asterisk (*) indicates the EQL setting is provisioned through circuit pack insertion.

   k = Circuit pack EQL setting: `{ INIT, 20, 40, 60, 80, 100, INVALID }`
   The value `INVALID` indicates the switches on the DS1IF circuit pack are set improperly.

   If the desired setting does not appear or the value `INIT` appears, repeat Step 2 of this procedure. If the value `INVALID` appears do not continue this procedure but refer to the section titled "Hardware Method" (page 5-46) to continue setting the EQL.

4. Using office records, determine the DS1 code type (B8ZS or AMI) for each of the 14 channels of the DS1IF circuit pack.

5. Set the DS1 code type (linecode) by entering the following command:

   `ED-T1:`*[a]*`:`*b*`::::`*[LINECDE=k]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {1-64}-{1-8}-{1-28}, DS1GRP-{1-64}-{1-8}, UNIT-{1-64} }`

   k = Linecode setting: `{ B8ZS, AMI, INIT, CURVAL }`

6. Verify the DS1 code type (linecode) setting by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {1-64}-{1-8}-{1-28}, DS1GRP-{1-64}-{1-8}, UNIT-{1-64} }`

   The following output response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:...:<LINECDE=u>"
;
```

   Where:

   e = DS1 port location: `{1-64}-{1-31}-{1-28}`

   u = DS1 code type: `{ AMI, B8ZS, AMI*, B8ZS*, INIT }`
   An asterisk (*) indicates the signal is provisioned through circuit pack insertion rather than through a command.

   If the desired setting does not appear, repeat this procedure beginning with Step 5. Otherwise, you are done with this procedure.

Hardware Method

1. Determine the length and type of the cable connected to the DS1IF circuit packs from office records.
2. Determine proper EQL setting (refer to Table 5-6 or 5-7).
3. Extract the DS1IF circuit pack (refer to Chapter 2 if necessary), and set the EQL switches using Tables 5-6 or 5-7 and 5-8, and Figure 5-6.

Table 5-8. EQL Switch Positions

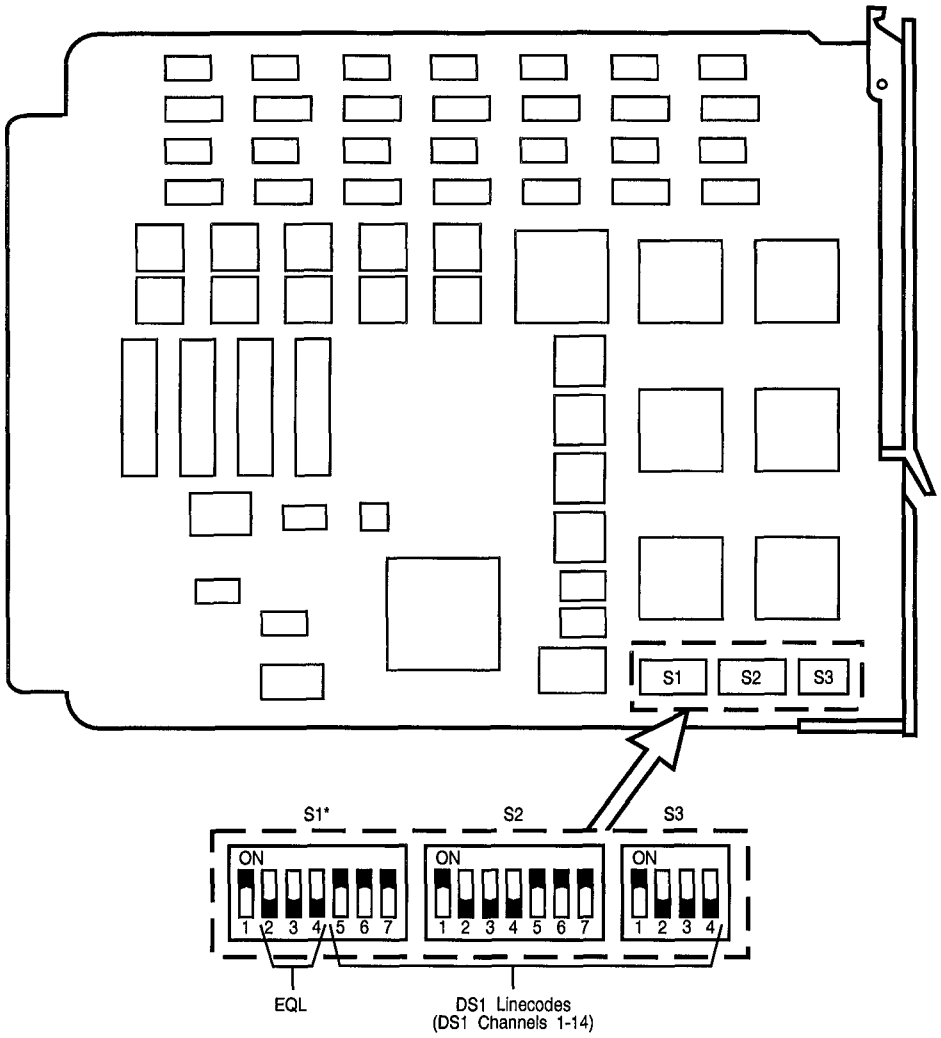
Equalizer Setting	S1 Switch Positions*		
	2	3	4
20	OFF	OFF	OFF
40	OFF	OFF	ON
60	OFF	ON	OFF
80	OFF	ON	ON
100	ON	OFF	OFF

* All 14 DS1 channels of a DS1IF are controlled by these switches; per-channel equalization is not available. If switches are set to values other than those shown, the circuit pack does not operate properly.

4. Using office records, determine the DS1 code type (B8ZS or AMI) for each of the 14 channels of the DS1IF circuit pack.
5. Set the DS1 code type (linecode) switches as shown in Figure 5-6 and Table 5-9.

Table 5-9. DS1 Code Type (Linecode) Switch Setting

DS1 Channel (14 per DS1IF)	Switch Position	Settings	
		for AMI	for B8ZS
1	S1,5	ON	OFF
2	S1,6	ON	OFF
3	S1,7	ON	OFF
4	S2,1	ON	OFF
5	S2,2	ON	OFF
6	S2,3	ON	OFF
7	S2,4	ON	OFF
8	S2,5	ON	OFF
9	S2,6	ON	OFF
10	S2,7	ON	OFF
11	S3,1	ON	OFF
12	S3,2	ON	OFF
13	S3,3	ON	OFF
14	S3,4	ON	OFF



* Switch S1, Position 1 must be set to "ON" for proper operation.

Figure 5-6. **EQL and DS1 Code Type (Linecode) Switches on DS1IF Circuit Packs**

6. Initialize the EQL parameter by entering the following command:

   `ED-EQPT:[a]:b::::EQL=INIT;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

7. Initialize the DS1 Code Type (linecode) parameter by entering the following command:

   `ED-T1:[a]:b::::LINECDE=INIT;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {1-64}-{1-8}-{1-28}, DS1GRP-{1-64}-{1-8}, UNIT-{1-64} }`

8. Reinstall the DS1IF circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

Provisioning DS3PM2 Circuit Packs

NOTE:
DS3PM2 circuit packs are not supported in Enhanced DS3 Interface-16, DS3 Clear-Channel Interface-16, STS1 Interface-16 Modules. In addition, DS3PM2 circuit packs are not supported in Remote Complex interface modules.

The DS3PM2 circuit pack reports alarm and control data to the General Telemetry Processor (GTP) through a TABS link (P link). In order for the TABS link to receive the alarm and control data, the DS3PM2 circuit pack must be optioned by setting the two option switches on the DS3PM2 circuit pack.

There are two P links for bays on the left side of the Switch Complex and two P links for bays on the right side of the Switch Complex. Each P link can accommodate eight DS3PM2 circuit packs. The P links must be terminated by a resistor on the DS3PM2 circuit pack. The resistor is optioned IN or OUT with the two option switches on the DS3PM2 circuit pack.

On each side of the Switch Complex only one DS3PM2 circuit pack can have its terminating resistor set to the IN position, while all others must be set to OUT.

The DS3PM2 circuit packs are wired serially, so the last one in the series is set to IN. Figure 5-7 shows a typical P link arrangement for a maximum configuration of DS3PM2 circuit packs. In Figure 5-7, the DS3PM2 circuit packs in units 20, 28, 40, and 48 have the terminating resistor set to the IN position and all other DS3PM2 circuit packs are set to OUT.

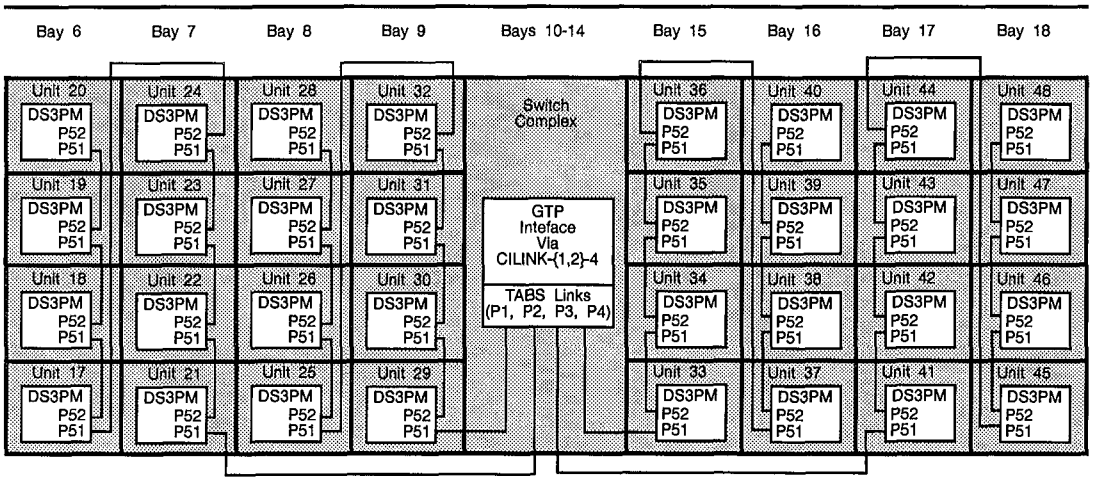


Figure 5-7. **Typical Maximum Configuration of TABS Link (P Links) for DS3PM2 Circuit Packs**

There are three ways to determine which DS3PM2 circuit pack must have its terminating resistor set to IN:

- Check with the installation group.
- Check office wiring records.
- Check the wiring at the back of the frame.

The P link connections to the DS3PM2 circuit pack are made by 2-wire pair cables that are connectorized and connect to pins P51 and P52 on the backplane. The last DS3PM2 circuit pack in the series has only one cable connected to it, and it is connected on pin P51. P52 is not connected. This is the DS3PM2 circuit pack that must have two option switches set to the IN position. All others in the series must be set to the OUT position.

NOTE:
If you are rearranging the frame or adding DS3PM2 circuit packs, you must maintain the wiring arrangement for the DS3PM2 circuit packs and be sure that the last one in the series is set to IN, with all others set to OUT.

1. Determine the interface module (Unit Number), the multipoint address (which is the Unit Number minus one), and control cable identification (J17-J32 for left of switch complex DS3PM2 circuit packs and J49-J64 for right of switch complex DS3PM2 circuit packs) from office drawings or the completed provisioning worksheet (Figure 5-1) and determine the DS3PM2 circuit pack(s) to be optioned for the terminating resistor for the TABS link.

2. To provision the DS3PM2 circuit pack TABS LINK IN, place a jumper to cover Pins 1 and 2 on both option switches. To provision the DS3PM2 circuit pack TABS LINK OUT, place a jumper to cover Pins 2 and 3 on both option switches. Refer to Figure 5-8 for location of the option switches.
3. Provision a DS3PM2 circuit pack by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`::::[CABLEID=`*f*`,MULPTADD=`*i*`];`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-[1-64]`

   f = Control cable ID (J-cable): `J[1-16, 49-64]`

   i = DS3PM2 multipoint address: `[0-63]`
   Default: is the DS3PM2 circuit pack location minus 1.
4. Restore the DS3PM2 circuit pack by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-[1-64]`

   The DS3PM2 circuit pack takes up to 2 minutes to be restored. A `REPT RST EQPT` *message appears when the DS3PM2 circuit pack is restored.*

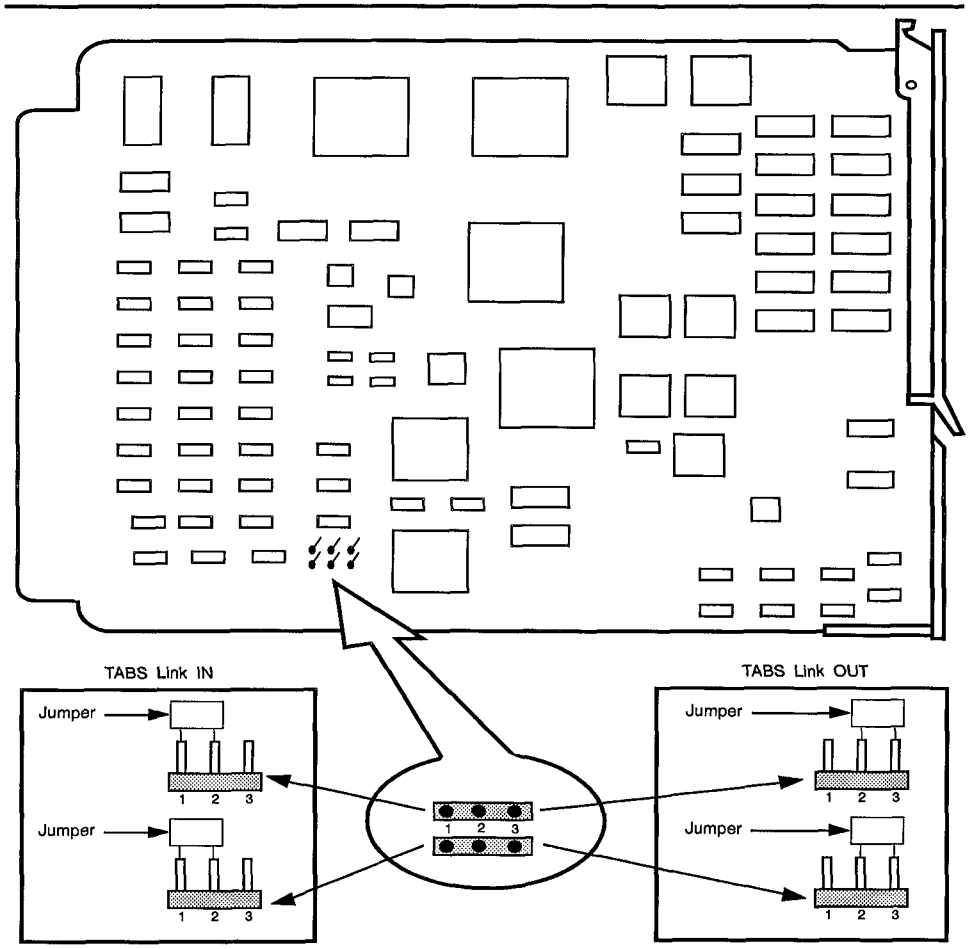


Figure 5-8. **Location of Option Switches on DS3PM2 (AKM89) TABS Link**

Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID

NOTE:
PMGR1 circuit packs are not supported in STS1 Interface-16, Enhanced DS3 Interface-16, and DS3 Clear-Channel Interface-16 Modules.

This procedure is used to provision a PMGR1 circuit pack. The PMGR1 is required for Full-Time/Camp-On and Scan Performance Monitoring and the DS1 Test Signal Identification (TSID) feature.

The PMGR1 can be provisioned to occupy a SWIF slot in DS1 Interface Module or a MUX slot in a DS3 Interface Module. This does not include a SWIF or MUX protection slot. The PMGR1 circuit pack can replace any MUX circuit pack in the DS3 Interface Module and/or any SWIF circuit pack in the DS1 Interface Module except the MUXP and the protection SWIF, respectively. Due to interface module configuration constraints, the number of PMGR1 circuit packs per interface module is limited.

- UC4 circuit pack memory (scan performance monitoring has a higher demand on memory than full-time/camp-on performance monitoring).
- Only one PMGR1 circuit pack can be provisioned to perform scan performance monitoring per SWIO circuit pack pair.

Table 5-10 lists the maximum number of PMGR1 circuit packs in each interface module type for given performance monitoring mode combinations.

If you are going to use the DS1 Test Signal Identification (TSID) feature, there are two parts to provisioning the system for TSID: setting the network element and provisioning the PMGR circuit packs. For information on using the TSID feature, refer to the section titled "DS1 Test Signal Identification (TSID)" (page 12-2).

1. Take down or roll over any cross-connections, disconnect any test access, and remove any loopbacks involving the interface circuit pack to be replaced with a PMGR circuit pack.

CAUTION:
This step must be completed before you proceed.

Table 5-10. **Maximum Allowable PMGR1 Circuit Packs per Interface Module**

Interface Module Type	Performance Monitoring Mode	
	Scan	Full-Time/Camp-On
DS3 Interface-32	0	16
	1	8
	2	2
DS3 Interface-16	0	15
	1	8
DS1 Interface	7	8
	1/0*	7
DS1 Interface-Protection	0	7
	1/0†	6

* Zero if there is a scan performance monitoring PMGR1 circuit pack in the associated DS1 Interface-Protection Module.

† Zero if there is a scan performance monitoring PMGR1 circuit pack in the associated DS1 Interface Module.

2. Verify that each DS1 port on the MUX or SWIF to be replaced is in the IDLE-REL state by entering the following command:

   `RTRV-STATE-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `DS1GRP-{1-64}-{1-31}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = DS1 port location: `{1-64}-{1-31}-{1-28}`

   f = DS1 input port state

   g = DS1 output port state

   All DS1 ports associated with the selected DS1 interface group must be in the IDLE-REL state (parameters *f* and *g*) before continuing.

3. Retrieve the state of the MUX or SWIF to be replaced by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX or SWIF circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX or SWIF circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned, go to Step 5.

4. Delete the DS1IF and SWIF circuit pack slots or MUX circuit pack slot from the database by entering the following command for each circuit pack:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Interface circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8}, DS1IF-{1-64}-{1A-8B} }`

5. Extract the SWIF or MUX circuit pack deleted in Step 4 from its slot. Refer to Chapter 2 for information about extracting circuit packs, if necessary.

   A minor (MN) alarm occurs when a SWIF or MUX circuit pack is extracted.

NOTE:
If a DS1 interface group is involved and DS1IF circuit packs are present, they can be left in place or replaced by blank circuit packs (BXA). Refer to the section titled "Deprovisioning DS1 Interface (DS1IF) Circuit Packs" (page 7-19) for replacing DS1IF circuit packs with BXA circuit packs, if necessary.

6. Create the PMGR1 circuit pack in the database by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `[ MUX-[1-64]-[1-31], SWIF-[1-64]-[1-8] ]`

7. Install a PMGR1 circuit pack in the MUX or SWIF slot. Refer to Chapter 2 for installing a circuit pack, if necessary.

   The minor alarm clears (CL) for the MUX or SWIF slot when the PMGR1 circuit pack is created.

8. Provision the PMGR1 circuit pack by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`:::AKM66:`*[*`FNCT=`*h]*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `[ MUX-[1-64]-[1-31], SWIF-[1-64]-[1-8] ]`

   h = Function mode: `[ PM, PM-SCAN, TSGR ]`

9. Verify the PMGR1 circuit pack's provisioned parameters by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `[ MUX-[1-64]-[1-31], SWIF-[1-64]-[1-8] ]`

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PCODE=f,CCODE=g,FNCT=q,...:x"
;
```

Where:

d = SWIF or MUX circuit pack location: { SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }

f = Provisioned circuit pack code: AKM66 is setting for PMGR1 circuit packs

g = Circuit pack code: AKM66 is setting for PMGR1 circuit packs

q = Circuit pack function: { PM, PM-SCAN, TSGR }

x = Equipment state: basic states are AVAIL, ACT, EQPD, PNDG, or POS

If the state of the MUX or SWIF slot is not POS, go to Step 5. If any of the other parameters do not contain the desired values, go to Step 8. If you are provisioning the PMGR1 circuit pack for DS1 TSID, continue with Step 10. Otherwise, you are done with this procedure.

10. Provision the TSID network element parameters by entering the following command:

    ED-NE:*[a]*::::*[*CLEI=*l*,CLLI=*m*,FIC=*n*,EQTYPE=*o*]*;

    Where:

    a = Target ID (optional)

    l = CLEI code: [#<1-10 TRANSID Legal Characters>, CURVAL]
    Specifies the network element level Common Language Equipment Identification (CLEI) code.

    m = CLLI code: [#<1-11 TRANSID Legal Characters>, CURVAL]
    Specifies the network element level Common Language Location Identification (CLLI) code.

    n = FIC code: [#<1-10 TRANSID Legal Characters>, CURVAL]
    Specifies the network element level Frame Identification Code (FIC).

    o = Equipment type: [CPE, NET, CURVAL]
    Specifies the type of equipment. This parameter is used to set the value of the carrier/response (CR) flag in the message that is sent in the data channel of the C-bit parity signal and in the data link of the TSGR signal. CPE is Customer Premises Equipment (sets CR flag to 0), and NET is Network Equipment (sets CR flag to 1).

11. Verify the current TSID provisioning information by entering the following command:

    RTRV-NE: *[a]*;

    Where:

    a = Target ID (optional)

    A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...:CLEI=n,CLLI=o,FIC=p,EQTYPE=q"
;
```

    Where:

    n = CLEI code: <1-10 TRANSID Legal Characters>

    o = CLLI code: <1-11 TRANSID Legal Characters>

    p = FIC code: <1-10 TRANSID Legal Characters>

    q = Equipment type: { CPE, NET, CURVAL }

    If any of the parameters do not contain the desired values, repeat Step 10.

Provisioning Facilities

6

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Contents

Provisioning Facilities

6

This chapter contains procedures to provision facilities on the DACS IV-2000.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

This chapter consists of procedures for the following:

- Provisioning DS1 Facilities
  - — Framing
  - — DS1 Code Type (Linecode)
  - — Alarm Level
  - — Disabling AIS for unterminated DS1 ports
  - — Checking for non-driven (NDRVN) and framed DS1 ports
- Provisioning DS3 Facilities
  - — DS3 Clear-Channel (cc) or DS1 mode
  - — Signal Format
  - — Enable/Disable DS3 IDLE signal

  - — Remote multiplex communications
  - — Alarm Level
- Provisioning STS-1 Signals on EC-1 Facilities
  - — Transmit Path Trace
  - — SONET Alarm Soak Times (Set and Clear)
  - — Alarm Level
- Provisioning VT1.5 Signals on EC-1 Facilities
  - — Alarm Level
- Configuring EC-1 Ports for Various Terminating Equipment (STS-1, VT1.5, DS1, and DS3)

Provisioning DS1, DS3, EC-1, and VT1.5 facilities is necessary to provide information associated with DS1, DS3, STS-1, and VT1.5 signals including signal format, DS1 code type (linecode), remote multiplexers (DS3), alarm levels, STS-1 transmit path ID, and SONET alarm soak times (STS-1).

Provisioning DS1 Facilities

T1 circuits are provisioned into service using the `ED-T1` and the `SET-ATTR-T1` commands. T1 circuits are configured for the following functions:

- Input and Output States — specifies the expected signal to a DS1 port and the type of signal transmitted from a DS1 port.
- DS1 Code Type and Signal Format — specifies if the DS1 port uses AMI or B8ZS line coding and if the DS1 signal is formatted for ESF, SF, or UNF.
- Alarm Notification — specifies what level of alarm (MJ, MN, or NA) to transmit when the DS1 signal encounters trouble.

NOTE:
T1 circuits that are part of EC-1 facilities are also monitored according to the facility provisioning of the STS-1 and VT1.5 signals the DS1 signal is contained in. To set up a T1 circuit within an EC-1 facility, refer to the sections titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 6-25), "*Provisioning VT1.5 Facilities*" (page 6-29), and "*Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation*" (page 6-32) for provisioning EC-1 and VT1.5 facilities before performing this procedure.

1. From office records determine the DS1 code type (linecode) and DS1 signal format for the T1 facilities to be provisioned.

2. Retrieve current provisioning information by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:T1:<BER=h,ISTAT=k,FMT=l,OMODE=s,
      LINECDE=u,FENDNTE=w>"
;
```

   Where:

   e = DS1 port location: `{1-64}-{1-31}-{1-28}`

   h = BER threshold value: `3-9`

   k = Input status: `{ INIT, DRVN, NDRVN, QRSS, DRVN*, NDRVN* }`
   An asterisk (*) indicates the DS3 or STS-1 signal the DS1 is contained in is set to `NDRVN` or `INIT` and the DS1 is not monitored.

   l = Signal format: `{ ESF, SF, UNFR }`

   s = Output mode: `{ NORM, TERM, AIS, QRSS }`

   u = DS1 code type: `{ AMI, B8ZS, AMI*, B8ZS*, INIT }`
   An asterisk (*) indicates the signal is provisioned through circuit pack insertion rather than through a command.

   w = Far-end notification: `{ ANSI, NOT-ANSI }`

   From the above response, note the values for the parameters given.

3. Change the necessary T1 parameters by entering the following command:

   `ED-T1:[a]:b::::[BER=d,ISTAT=g,FMT=h,OMODE=j, LINECDE=k,FENDNTE=l];`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`

   d = BER threshold: `{ 3-9, CURVAL }`
   Initial system value: `3`

g = Input status: { DRVN, NDRVN, INIT, QRSS, CURVAL }
Initial system value: INIT for DS1 ports or DRVN for DS1 signals within DS3 ports

h = DS1 signal format: { ESF, SF, UNF, CURVAL }
Initial system value: UNF

j = Output mode: { NORM, TERM, AIS, QRSS, CURVAL }
To provision for traffic, set to NORM.

k = DS1 code type: { AMI, B8ZS, INIT, CURVAL }
Initial system value: INIT

l = Far-end notification: { ANSI, NOT-ANSI, CURVAL }
Initial system value: NOT-ANSI
Set to ANSI if parameter *h* is set to ESF. Otherwise, set to NOT-ANSI.

4. Verify the settings using the RTRV-T1 command as shown in Step 2.

NOTE:
If the input status is set to INIT, the RTRV-T1 command outputs input status as INIT only if a valid input signal is not being received by the DS1 port. When a valid signal is received, the input status parameter changes to DRVN.

If any parameters are not set to the desired values, reenter the ED-T1 command and change the necessary parameters.

5. Retrieve current alarm level information by entering the following command:

RTRV-ATTR-T1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = DS1 port location: { {1-64}-{1-31}-{1-28}, SWIF-{1-64}-{1-8}, UNIT-{1-64}, MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,i,j"
;
```

Where:

g = DS1 port location: {1-64}-{1-31}-{1-28}

h = Alarm notification code: { MJ, MN, NA }

i = Condition Type: { LOS, T-BER, DS1-AIS, YEL, LOF, INC, MINC }
INC and MINC are far-end conditions, all others are near-end conditions.

j = Location: { NEND, FEND }

From the above response, note the values for the parameters given.

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the RTRV-ALM-T1 command is issued for that T1. The RTRV-COND-T1 command can be used to retrieve alarm conditions with an NA alarm level.

6. Change current alarm level information by entering the following command:

   SET-ATTR-T1:*[a]*:*b*:::*d*:,*[f]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: { [1-64]-[1-31]-[1-28], SWIF-[1-64]-[1-8], UNIT-[1-64], MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15] }

   d = Notification code: { MJ, MN, NA }
   Initial system value: NA for no alarm.
   It is recommended that this parameter is set to MJ for each DS1 signal to be put into service to aid in any future troubleshooting of DS1 facilities.

   f = Location: { NEND, FEND }
   Default value: NEND
   When NEND is specified, only the notification code for near-end conditions (LOS, T-BER, DS1-AIS, YEL, and LOF) are set. When FEND is specified, only the notification code for far-end conditions (INC and MINC) are set. FEND can only be specified for DS1 signals within DS3s (that is, only if MUX-[1-64]-[1-31] is specified for parameter *b*).

7. Verify the settings using the RTRV-ATTR-T1 command as shown in Step 5.

NOTE:
If an alarm condition is currently active on a DS1 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the SET-ATTR-T1 command and change the necessary parameters.

8. Notify the appropriate personnel, according to office procedures, when T1 circuits have been put into service and update your office records.

Disabling AIS for Unprovisioned DS1 Ports

This procedure is used to disable AIS signals associated with unprovisioned and/or unterminated DS1 ports. Performing this procedure eliminates the sending of AIS signals associated with unterminated DS1 ports within the DACS IV-2000.

1. Obtain circuit provisioning information from office records.
2. For all DS1 ports that are to have AIS disabled, create a line loopback by entering the following command:

   `OPR-LPBK-T1:`*[a]*`:`*b*`:::NEND:LPBKL:N;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-644}-{1-31}, UNIT-{1-64} }`
   VT1.5 group number (STS1 Interface Module):
   `{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }`
   The DS1 port can be associated with an STS1 Interface Module (that is, a VT1.5 [DS1] signal).

NOTE:
Before you can use any of the DS1 ports used in this command, you must release the line loopback using the `RLS-LPBK-T1` command.

3. Notify the appropriate personnel, according to office procedures, that the DS1 loopbacks have been established and update your office records.

Checking for Non-driven (NDRVN) and Framed DS1 Ports

This procedure identifies DS1 ports in the DACS IV-2000, running Release 5.0, that are set to NDRVN and have a framing format set (SF or ESF). The procedure sets those ports to unframed (UNF). The six phases of this procedure and approximate implementation times are given below:

- Phase I - Preconditioning (30 minutes)
- Phase II - System Setup (10 minutes)
- Phase III - Database Backup (30 minutes)
- Phase IV - Format Check and Update (2 hours)
- Phase V - Database Backup (30 minutes)
- Phase VI - Clean Up (20 minutes)

If your office procedure requires you to set ports to unframed, continue with this procedure. Otherwise, do not perform this procedure. If this procedure is performed, all alarms on DS1 ports are suppressed.

NOTE:
The following notes and precautions must be understood before using this procedure.

- Coordinate this procedure with the alarm monitoring group, if applicable.
- The person(s) performing this procedure must be trained and have an understanding of the DACS IV-2000.
- Read each step completely before performing the action specified.
- Do not enter a second command until the first command has completed. Wait for the appropriate response before continuing to the next step.
- Do not proceed if a command does not successfully complete; contact your next level of support.
- Autonomous log out occurs when the link's inactivity timer is exceeded. You are required to log back into the system.
- Perform this procedure in the sequence provided beginning with Step 1.
- Monitor the system for alarms or trouble reports for a period of 48 hours prior to implementing this procedure.
- If any problems or service loss occur, contact your next level of support immediately.
- Monitor the system for alarms or trouble reports for a period of 48 hours prior to implementing this procedure.
- If any problems or service loss occur, contact your next level of support immediately.

Phase I - Preconditioning

This phase ensures that you have reviewed this procedure to ensure that all required materials are available.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example, wrist strap or grounded shoes, must be worn) at all times.

1. Contact your next level of support to verify that the procedure to be used is the current version.

⚠ CAUTION:
If the procedure to be used is not the current version, do not continue. Contact your next level of support.

2. Verify the presence of the following materials and documents:
   - Two (2) Release 5.0 optical disks (latest version)
   - One (1) Terminal (for DACS IV-2000 frame)
   - One (1) Printer with ample supply of paper (for DACS IV-2000 frame)
   - One (1) RS-232 (25-pin) cable (for DACS IV-2000 frame)
   - *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902)

⇒ NOTE:
If all the material and documents are not available, do not continue; contact your next level of support.

3. Synchronize the office clock, the DACS IV-2000 time, and all watches to the Customer Network (that is, ADTSS, etc.) time.

⇒ NOTE:
Call the Maintenance Center to verify the time.

4. Notify the alarm monitoring system that this procedure is being implemented on the system.

5. Obtain a User ID and password for the DACS IV-2000 from the System Administrator with the following parameter values:
   - UCFC/UCAL: P5&M5&T5&S5&PM5 (any order)
   - UCPL: 5
   - Message Screening: DBALL
   - Dialogue Mode: MENU
   - User Type: HUMAN
6. Carefully read the Notes (precautions and recommendations for this procedure) listed in the section titled "Checking for Non-driven (NDRVN) and Framed DS1 Ports" (page 6-6) before continuing.
7. If a communication line not going through the DACS IV-2000 is required, verify it is present and functional (that is, phone attached and working).

⚠ CAUTION:
Do NOT test the cellular phone inside the central office.

8. This completes the Preconditioning Phase of this procedure.

Phase II - System Setup

This phase ensures the printer is properly equipped to keep a record of the change procedure, all test access (TACC) connections are removed, all equipment alarms are removed, and all remote links are removed from service.

⚠ CAUTION:
After entering an input command into the DACS IV-2000, you must wait for its associated output message response (COMPLD) before entering another command.

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example, wrist strap, or grounded shoes, must be worn) at all times.

9. Connect a terminal to CILINK-1-1 at the rear of the Switch Bay of the DACS IV-2000. Refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary.

⚠ CAUTION:
There must be no connection on CILINK-1-1 at the front of the Status Panel.

10. Connect a printer to the terminal and verify that the printer is ready (power on) and properly equipped (paper, ribbon, etc.). If the printer is not properly equipped, clear the problem before continuing. Refer to the section titled "Adding a Printer Directly to a Snider Link" (page 9-24), if necessary.
11. Log in on CILINK-1-1 with the temporary login and password. Refer to the section titled "Logging In" (page 4-1), if necessary.
12. Verify that you have the values listed in Step 5 by entering the following command:

    RTRV-SECU-USER: *[a]*;

    Where:

    a = Target ID (optional)

    A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* UID:,UCFC/UCAL:<> */
   "... :,e:UCPL=f,SCREEN=g,DMODE=h,UTYPE=i, ... "
;
```

    Where:

    e = UCFC/UCAL: {P, M, T, S, PM}{1-5}

    f = UCPL: 1-5

    g = Message screening: { INPUT, AUTO, ALL, DBAUTO, DBALL }

    h = Dialog mode: { MENU, COMMAND }

    i = User type: { HUMAN, MACHINE }

    If any of the parameters do not match the ones in Step 5, contact your system administrator to have the values changed before continuing.

13. Determine the software currently operating in the system with the following command:

    RTRV-NE: *[a]*;

    Where:

    a = Target ID (optional)

    A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "... ,e: ... "
;
```

Where:

e = Software version: `5-00-{1-99}-m`

Verify the `SFTWR-VRSN` is `5-00-1-m` or higher. If it is not, contact your system administrator or next level of support for further assistance. Do not continue this procedure until instructed to do so.

14. Determine if there are any current equipment alarms by entering the following command:

    `RTRV-ALM-EQPT:`*`[a]`***`:ALL;`**

    Where:

    a = Target ID

    If no alarms exist, the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If the above message does not appear, refer to the section titled "Isolating Failures" (page 15-12) to clear your alarms before continuing this procedure.

15. This completes the System Setup Phase of this procedure.

Phase III - Database Backup

This phase ensures that a current database backup to optical disk is made. If problems arise during this procedure, this database backup may be necessary for restoration.

⚠ CAUTION:
After entering an input command into the DACS IV-2000, you must wait for its associated output message response (`COMPLD`*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example, wrist strap or grounded shoes, must be worn) at all times.

16. Place a blank label on the appropriate backup optical disk in order to record the date and time of the database backup.
17. Back up to the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Phase IV - Format Check and Update

This phase finds all ports set for NDRVN and SF or ESF. The procedure sets all the ports that are in one of these two conditions to have the framing format of UNF.

⚠ CAUTION:
After entering an input command into the DACS IV-2000, you must wait for its associated output message response (COMPLD) before entering another command.

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example, wrist strap or grounded shoes, must be worn) at all times.

18. Determine if any DS1 ports are set to SF and NDRVN by entering the following command:

⚠ CAUTION:
This command must be performed during an "off-shift."

```
RTRV-T1:[a]:UNIT-1&&-64::::ISTAT=NDRVN,FMT=SF;
```

Where:

a = Target ID (optional)

If no DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of SF, the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

If one or more DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of SF, the following message appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "b: ... ISTAT=NDRVN,FMT=SF"
;
```

Where:

b = DS1 port: {1-64}-{1-31}-{1-28}

If any ports have input status (ISTAT) of NDRVN and DS1 signal format (FMT) of SF, then continue with Step 19. Otherwise, continue with Step 20.

19. Change the DS1 ports set to SF and NDRVN to UNF by entering the following command:

    `ED-T1:`*[a]*`:`*b*`::::::FMT=UNFR;`

    Where:

    a = Target ID (optional)

    b = DS1 port: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`

    All ports determined from the previous Step 18.

20. Determine if any DS1 ports are set to ESF and NDRVN by entering the following command:

    `RTRV-T1:`*[a]*`:UNIT-1&&-64::::ISTAT=NDRVN,FMT=ESF;`

    Where:

    a = Target ID (optional)

    If no DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of ESF, the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If one or more DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of ESF, the following message appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "b: ... ISTAT=NDRVN,FMT=ESF"
;
```

    Where:

    b = DS1 port: `[1-64]-[1-31]-[1-28]`

    If any ports have an ISTAT of NDRVN and DS1 Signal Format (FMT) of ESF, then continue with the Step 21. Otherwise, continue with Step 22.

21. Change the DS1 ports set to ESF and NDRVN to UNF by entering the following command:

    `ED-T1:`*[a]*`:`*b*`::::FMT=UNFR;`

    Where:

    a = Target ID (optional)

    b = DS1 port: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`

    All ports determined from Step 20.

22. This completes the Format Check and Update Phase of this procedure.

Phase V - Database Backup

This phase ensures that a current database backup to optical disk is made. If problems arise after this procedure, this database backup may be necessary for restoration.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command. When working on the DACS IV-2000, ESD grounding procedures must be followed (for example, wrist strap or grounded shoes, must be worn) at all times.*

23. Obtain the optical disk used in "Phase III - Database Backup" (page 6-11).
24. Back up database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).
25. This completes the Database Backup Phase of this procedure.

Phase VI - Clean Up

This phase checks the current system status. All alarms can be cleared to leave the system in a stable state.

26. Determine if there are any current equipment alarms by entering the following command:

    ```
    RTRV-ALM-EQPT:[a]:ALL;
    ```

    Where:

    a = Target ID

    If no alarms exist, the following message appears:

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
    ;
    ```

    If the above message does not appear, refer to the section titled "Isolating Failures" (page 15-12) to clear your alarms before continuing this procedure.
27. Notify the alarm monitoring center that this procedure has been completed on this system.
28. If a communication line was established in Step 7, it can be removed now.
29. This completes the Clean Up Phase of this procedure.

Provisioning DS3 Facilities

T3 circuits are provisioned into service using the ED-T3 and the SET-ATTR-T3 commands. For MUX3 circuit packs for DS3 Clear-Channel (cc) cross-connections, the mode of the MUX3 circuit pack is changed by the ED-PORT command. T3 circuits are configured for the following functions:

- Input Status — specifies the expected signal to a DS3 port.
- Signal Format — specifies whether the DS3 signal is formatted for ASYNC or CBIT. If a DS3 port is communicating with a FEAC type of remote multiplexer, the CBIT signal format must be specified.
- DS3 IDLE Signal — specifies (when enabled) whether the DS3 IDLE signal is transmitted when all 28 DS1 tributaries in a DS3 are in the IDLE-REL (idle-released) state.
- Remote Multiplexer — specifies whether the selected DS3 signal is to communicate with a remote multiplexer (for example, a DDM-1000 multiplexer using SBIT communications). The DACS IV-2000 has the capability of communicating with a variety of remote multiplexers at the far end. In order to communicate with the far-end multiplexer, the system must be properly provisioned to match the far end. When attempting to provision the system for a far-end multiplexer, consider the mandatory parameter of the ED-T3 command for the far-end alarm and control (FEAC) type of remote multiplexer communication. For FEAC, the mandatory DS3FORMAT parameter value is CBIT. In addition, alarm notification levels can be set for far-end facility and equipment failures with the SET-ATTR-{T1|T2|T3} and SET-ATTR-EQPT commands.

NOTE:
Remote multiplexer communication is supported by the MUX2 (AKM68B) and MUX3 (AKM91) circuit packs only.

- Alarm Notification — specifies what level of alarm (MJ, MN, or NA) to transmit for an associated condition group (FAULT, AIS, or IDLE) and location (NEND or FEND) when the DS3 signal encounters trouble
- DS3 Mode — specifies how MUX3 circuit packs process its associated DS3 signal. The DS1 mode is used to process DS3 signals associated with MUX3 circuit packs as 28 DS1 tributaries. The CC mode is used to process DS3 signals as a clear-channel signal.

NOTE:
T3 circuits that are part of EC-1 facilities are also monitored according to the facility provisioning of the STS-1 signal the DS3 signal is contained in. To set up a T3 circuit within an EC-1 facility, refer to the sections titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 6-25) and "Configuring

EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for provisioning EC-1 facilities before performing this procedure.

1. From office records, determine the DS3 signal format and, if communicating with remote multiplexers, what type of far-end multiplexer (FEAC, TR9, or SBIT) associated with a given DS3 interface port for the DS3 facilities is to be provisioned.

2. If you are provisioning DS3 facilities associated with MUX3 circuit packs, retrieve the current DS3 mode by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Port location:
   DS3 port: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:EC1MAP=,RCVEC1MAP=,VTMAP=,RCVVTMAP=:,DS3MODE=j"
;
```

   Where:

   d = Port location:
   DS3 port: `[1-64]-[1-15]`

   j = DS3 mode: `[ CC, DS1, NOVAL ]`
   `NOVAL` indicates a circuit pack slot not occupied by a MUX3 circuit pack. The DS3 mode can only be changed for MUX3 circuit packs.

   From the above response, note the value for the DS3 mode.

3. For MUX3 circuit packs, if necessary, change the DS3 mode by entering the following command:

   `ED-PORT:`*[a]*`:`*b*`:::DS3MODE=`*f*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   f = DS3 mode: `[ CC, DS1 ]`
   Initial system value: `DS1`
   Setting this parameter to `CC` provisions the MUX3 circuit pack for clear-channel operation (that is, DS3 operations). Setting this parameter to `DS1` provisions the MUX3 circuit pack for DS1 operation (that is, processes the DS3 signal into its 28 DS1 tributaries).

4. Verify the DS3 mode setting using the **RTRV-PORT** command as shown in Step 2.

5. Retrieve current provisioning information by entering the following command:

   RTRV-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { {1-64}-{1-31}, UNIT-{1-64} }

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<> */
   "e::<BER=h,BERM=j,ISTAT=k,DS3FORMAT=l,IDLE=x,
       RMTMUXC=z,XPOL=aa,XBITRCV=ab,DS2XTR=ac,
       DS2XRCV=ad>"
;
```

   Where:

   e = DS3 port location: {1-64}-{1-31}

   h = BER threshold value: 3-9

   j = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }

   k = Input status: { INIT, DRVN, NDRVN }

   l = Signal format: { ASYNC, CBIT }

   x = DS3 IDLE signal: { ON, OFF }

   z = Remote multiplexer communications: { SBIT, FEAC, TR9, NONE }

   aa = DS3 X-bits transmit: { 0, 1, ALM0, ALM1 }

   ab = DS3 X-bits receive: { ALM0, ALM1, IGNORE }

   ac = DS2 X-bits transmit: { 0, 1, ALM0, ALM1 }

   ad = DS2 X-bits receive: { ALM0, ALM1, IGNORE }

   From the above response, note the values for the parameters given.

6. Change the necessary T3 parameters by entering the following command:

   ED-T3:*[a]*:*b*:::::*[*BER=*d*,BERM=*f*,ISTAT=*g*,DS3FORMAT=*h*,
   IDLE=*m*,RMTMUXC=*n*,XPOL=*o*,XBITRCV=*p*,DS2XTR=*q*,
   DS2XRCV=*r]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { [1-64]-[1-31], UNIT-[1-64] }

   d = BER threshold: { 3-9, CURVAL }
   Initial system value: 3

   f = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS, CURVAL }
   Initial system value: BPV

   g = Input status: { DRVN, NDRVN, INIT, CURVAL }
   Initial system value: DRVN

   h = DS3 signal format: { ASYNC, CBIT, CURVAL }
   Initial system value: ASYNC

   m = DS3 IDLE signal: { ON, OFF, CURVAL } (optional)
   Initial system value: OFF

   - ON — indicates the DS3 IDLE signal is transmitted if all 28 DS1 tributaries are transmitted as DS1 IDLE.
   - OFF — indicates that a DS3 signal (composed of 28 DS1 signals) is transmitted.

   n = Remote multiplexer type: { SBIT, FEAC, TR9, NONE, CURVAL }
   Initial system value: NONE

   - SBIT — indicates DS3 stuff bit protocol communications (such as that used for the DDM-1000 multiplexer).
   - FEAC — indicates use of the Far-End Alarm and Control channel for DS1/DS3 loopback operations and reporting alarm/status. CBIT must be specified for parameter g.
   - TR9 — indicates use of the DS2 C-Bits for DS1 loopback operations.
   - NONE — indicates the MUX2/MUX3 circuit pack is provisioned for none of the listed remote multiplexer types.

o = DS3 X-bit transmit: [0, 1, ALM0, ALM1] (optional)
Default value: ALM0
Specifies alarm condition to be reported by DS3X-bits to the far-end multiplexer.

- 0 — indicates that the X-bits are fixed at 0.
- 1 — indicates that the X-bits are fixed at 1 regardless of active OOF condition.
- ALM0 — indicates the DS3 X-bits are zeros for an active DS3 alarm condition (the X-bits are ones for no conditions).
- ALM1 — indicates the DS3 X-bits are ones for an active DS3 alarm condition (the X-bits are zeros for no conditions).

p = DS3 X-bit receive: [ALM0, ALM1, IGNORE] (optional)
Default value: IGNORE
Specifies how an alarm condition reported by DS3X-bits from the far-end multiplexer is interpreted.

- ALM0 — indicates that the X-bits are 0 for an active OOF condition (or 1 for no condition)
- ALM1 — indicates the x-bits are 1 for an active OOF condition (or 0 for no condition).
- IGNORE — indicates the X-bits are ignored for an active OOF condition.

q = DS2 X-bit transmit: [0, 1, ALM0, ALM1] (optional)
Default value: ALM0
Specifies alarm condition to be reported by DS2X-bits to the far-end multiplexer.

- 0 — indicates that the X-bits are fixed at 0.
- 1 — indicates that the X-bits are fixed at 1 regardless of active OOF condition.
- ALM0 — indicates the DS2 X-bits are zeros for an active DS2 OOF condition (the X-bits are ones for no conditions).
- ALM1 — indicates the DS2 X-bits are ones for an active DS2 OOF condition (the X-bits are zeros for no conditions).

r = DS2 X-bit receive: `{ ALM0, ALM1, IGNORE }` (optional)
Default value: `IGNORE`
Specifies how an alarm condition reported by DS2X-bits from the far-end multiplexer is interpreted.

- `ALM0` — indicates that the X-bits are 0 for an active OOF condition (or 1 for no condition)
- `ALM1` — indicates the x-bits are 1 for an active OOF condition (or 0 for no condition).
- `IGNORE` — indicates the X-bits are ignored for an active OOF condition.

7. Verify the settings using the `RTRV-T3` command as shown in Step 5.

NOTE:
If the input status is set to `INIT`, the `RTRV-T3` command outputs input status as `INIT` only if a valid input signal is not being received by the DS3 port. When a valid signal is received, the input status parameter changes to `DRVN`.

If any parameters are not set to the desired values, reenter the `ED-T3` command and change the necessary parameters.

8. Retrieve current alarm level information by entering the following command:

`RTRV-ATTR-T3:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,i,j"
;
```

Where:

g = DS3 port location: `{1-64}-{1-31}`

h = Alarm notification code: `{ MJ, MN, NA }`

i = Condition Type: { T-BER, LOS, OOF, AIS, AISFRAMED, AISUNFRAMED, IDLE, ALLDS2SOOF, DS3FRMTMISMTCH, INC, YEL, SBITFAIL }
For MUX1 circuit packs, the only valid conditions are the near-end conditions: T-BER, LOS, OOF, and AIS. For MUX2 circuit packs, the near end-end conditions are: T-BER, LOS, OOF, AISFRAMED, AISUNFRAMED, IDLE, ALLDS2SOOF, and DS3FRMTMISMTCH and the far-end conditions are: INC, OOF, AIS, IDLE, YEL, and SBITFAIL.

j = Location: { NEND, FEND }

From the above response, note the values for the parameters given.

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the RTRV-ALM-T3 command is issued for that T3. The RTRV-COND-T3 command can be used to retrieve alarm conditions with an NA alarm level.

9. Change current alarm level information by entering the following command:

   SET-ATTR-T3:*[a]*:*b*:::*d*:*e*,*[f]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { [1-64]-[1-31], UNIT-[1-64] }

   d = Notification code: { MJ, MN, NA }
   Initial system value: MJ (for the FAULT condition group) or NA (for the AIS and IDLE condition groups and far-end conditions)
   It is recommended that this parameter is set to MJ (major) for the condition group FAULT, to MN (minor) for the condition group AIS and far-end conditions, and to NA (no alarm) for the condition group IDLE for each DS3 signal to be put into service to aid in any future troubleshooting of DS3 facilities.

NOTE:
If there is an alarm active on a DS3 port, that alarm must be cleared. Using the SET-ATTR-T3 command sets the alarm level for future alarms.

e = Condition group: { FAULT, AIS, IDLE, ALL }
If FEND is specified for parameter *f*, this parameter must be set to ALL.

- FAULT — indicates the condition types: LOS, T+BER, and OOF.
- AIS — indicates the condition types: AIS, AISFRAMED, and AISUNFRAMED.
- IDLE — indicates the condition types: IDLE and ALLDS2SOOF.
- ALL — for parameter *f* set to NEND, indicates all condition groups (FAULT, AIS, and IDLE); for parameter f set to FEND, indicates all far-end conditions (INC, OOF, AIS, IDLE, YEL, and SBITFAIL).

f = Location: { NEND, FEND }
Default value: NEND
FEND can only be specified for DS3 signals associated with a MUX2/MUX3 circuit pack.

10. Verify the settings using the RTRV-ATTR-T3 command as shown in Step 8.

NOTE:
If an alarm condition is currently active on a DS3 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the SET-ATTR-T3 command and change the necessary parameters.

11. If the DS3 facility you are provisioning is to be communicating with a remote multiplexer, verify and set alarm notification levels for the associated DS1, DS2, and far-end equipment by performing the following procedure:

    a. Retrieve current alarm level information for DS2 tributaries by entering the following command:

    RTRV-ATTR-T2:*[a]*:*b*;

    Where:

    a = Target ID (optional)

    b = DS3 port location: { {1-64}-{1-31}, UNIT-{1-64} }

A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:NTFCNCDE,CTYPE */
    "g:h,i"
;
```

Where:

g = DS3 port location: {1-64}-{1-31}

h = Alarm notification code: { MJ, MN, NA }

i = Condition Type: OOF

From the above response, note the values for the parameters given.

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-T2** command is issued for that T2. The **RTRV-COND-T2** command can be used to retrieve alarm conditions with an NA alarm level.

b. Change current alarm level DS2 tributary information by entering the following command:

SET-ATTR-T2:*[a]*:*b*:::*d*;

Where:

a = Target ID (optional)

b = DS3 port location: { {1-64}-{1-31}, UNIT-{1-64} }

d = Notification code: { MJ, MN, NA }
Initial system value: NA

c. Verify the settings using the **RTRV-ATTR-T2** command as shown in Step 11a.

NOTE:
If an alarm condition is currently active on a DS3 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the **SET-ATTR-T3** command and change the necessary parameters.

d. Verify and set alarm level information for DS1 tributaries by performing Steps 5, 6, and 7 of the section titled "Provisioning DS1 Facilities" (page 6-2).

e. Retrieve current alarm level information for far-end equipment by entering the following command:

`RTRV-ATTR-EQPT:[a]:b:::,,FEND;`

Where:

a = Target ID (optional)

b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,i,FEND"
;
```

Where:

g = DS3 port location: `{1-64}-{1-31}`

h = Alarm notification code: `{ MJ, MN, NA }`

i = Condition Type: `{ MUX, DS1IF, COM, ACFAIL }`

From the above response, note the values for the parameters given.

NOTE:

If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-EQPT** command is issued for far-end equipment. The **RTRV-COND-EQPT** command can be used to retrieve alarm conditions with an NA alarm level.

f. Change current alarm level far-end equipment information by entering the following command:

`SET-ATTR-EQPT:[a]:b:::d;`

Where:

a = Target ID (optional)

b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

d = Notification code: `{ MJ, MN, NA }`
Initial system value: `MJ`

g. Verify the settings using the `RTRV-ATTR-EQPT` command as shown in Step 11e.

NOTE:
If an alarm condition is currently active on a DS3 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the `SET-ATTR-EQPT` command and change the necessary parameters.

12. Notify the appropriate personnel, according to office procedures, when T3 circuits have been put into service and update your office records.

Provisioning EC-1 Facilities (STS-1 Signals)

EC-1 circuits are provisioned into service using the `ED-EC1` and the `SET-ATTR-EC1` commands. EC-1 circuits are configured for the following functions:

- Input and Output States — specifies the expected signal to a EC-1 port and the type of signal transmitted from a EC-1 port.
- Alarm Notification — specifies what type of alarm to transmit when the STS-1 signal encounters trouble.
- SONET Alarm Soak Times — specifies the time period before an SMUX circuit pack declares a failure or declares a clear condition.
- Transmit Path ID — specifies the 64-byte Common Language Location Identifier (CLLI) string used to allow receiving path transmitting equipment to verify continued connection of an STS-1 signal.

1. From office records, determine the provisioning information for the EC-1 facilities to be provisioned.
2. Retrieve current provisioning information by entering the following command:

   `RTRV-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:<BERL=i,ISTAT=k,TRC=m,OMODE=s,SOAKON=ae,
      SOAKCLR=af>"
;
```

Where:

e = EC-1 port location: `{1-64}-{1-15}`

f = Active signal type: `{ EC1, T1, VT1 }`

i = Line BER threshold value: `{ 3, 5-9 }`

k = Input status: `{ INIT, DRVN, NDRVN }`

m = Transmit path trace: CLLI 62-character message

s = Output mode: `{ NORM, TERM, AIS }`

ae = SONET condition onset soak time: `1-30`

af = SONET condition clear soak time: `1-20`

From the above response, note the values for the parameters given. If the value given for the Active Signal Type (parameter *f*) does not match the value that needs to be provisioned, go to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) to change the signal type before continuing with this procedure.

3. Change the necessary EC-1 parameters by entering the following command:

```
ED-EC1:[a]:b::::[BERL=e,ISTAT=g,TRC=i,OMODE=j,
   SOAKON=s,SOAKCLR=t];
```

Where:

a = Target ID (optional)

b = EC-1 port location: `{ {1-64}-{1-15}, UNIT-{1-64} }`

e = Line BER threshold: `{ 3, 5-9, CURVAL }`
Initial system value: `3`

g = Input status: `{ DRVN, NDRVN, INIT, CURVAL }`
Initial system value: `DRVN`

i = STS-1 transmit path trace: <CLLI 62-character message>
Initial system value: `NOVAL` (62-byte string contains all null characters)

j = Output mode: `{ NORM, TERM, AIS, CURVAL }`
To provision for traffic, set to `NORM`.

s = SONET condition onset soak time: { 1-30, CURVAL }
Initial system value: 2 (seconds)

t = SONET condition clear soak time: { 1-20, CURVAL }
Initial system value: 10 (seconds)

4. Verify the settings using the RTRV-EC1 command as shown in Step 2.

NOTE:
If the input status is set to INIT, the RTRV-EC1 command displays the input status as INIT only if a valid input signal is not being received by the EC-1 port. When a valid signal is received, the input status parameter changes to DRVN.

If any parameters are not set to the desired values, reenter the ED-EC1 command and change the necessary parameters.

5. Retrieve current alarm-level information by entering the following command:

RTRV-ATTR-EC1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,i"
;
```

Where:

g = EC-1 port location: [1-64]-[1-15]

h = Alarm notification code: { MJ, MN, NA }

i = Condition Type: { LOS, LOF, LOP, AISL, AISP, YEL, T-BERL, SLMF, FERF }

From the above response, note the values for the parameters given.

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the RTRV-ALM-EC1 command is issued for that EC-1. The RTRV-COND-EC1 command can be used to retrieve alarm conditions with an NA alarm level.

6. Change current alarm level information by entering the following command:

   SET-ATTR-EC1:*[a]*:*b*:::*d*:,*e*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { {1-64}-{1-15}, UNIT-{1-64} }

   d = Notification code: { MJ, MN, NA }
   Initial system value: MJ (for the FAULT condition group) or NA (for the AIS-YEL and FERF condition groups)
   It is recommended that this parameter is set to MJ for each STS-1 signal to be put into service to aid in any future troubleshooting of EC-1 facilities.

NOTE:
If there is an alarm active on an EC-1 port, that alarm must be cleared. Using the SET-ATTR-EC1 command sets the alarm level for future alarms.

   e = Condition group: { FAULT, AIS-YEL, FERF, ALL }

   - FAULT — indicates the condition types: LOS, T+BERL, LOF, LOP, and SLMF.
   - AIS-TEL — indicates the condition types: AISL, AISP, and YEL.
   - FERF — indicates the condition type: FERF.
   - ALL — indicates all condition groups (FAULT, AIS-YEL, and FERF).

7. Verify the settings using the RTRV-ATTR-EC1 command as shown in Step 5.

NOTE:
If an alarm condition is currently active on an EC-1 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the SET-ATTR-EC1 command and change the necessary parameters.

8. Notify the appropriate personnel, according to office procedures, when EC-1 circuits have been put into service and update your office records.

Provisioning VT1.5 Facilities

VT1.5 circuits are provisioned into service using the `ED-VT1` and the `SET-ATTR-VT1` commands. VT1.5 circuits are configured for the following functions:

- Input and Output States — specifies the expected signal to a VT1.5 port and the type of signal transmitted from a VT1.5 port.
- Alarm Notification — specifies what type of alarm to transmit when the VT1.5 signal encounters trouble.

NOTE:
VT1.5 circuits that are part of EC-1 facilities are also monitored according to the facility provisioning of the STS-1 signal of which the VT1.5 signal is a part of. To set up a VT1.5 facility within an EC-1 facility, refer to the sections titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 6-25) and "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for provisioning EC-1 facilities before performing this procedure.

1. From office records, determine the provisioning information for the VT1.5 facilities to be provisioned.
2. Retrieve current provisioning information by entering the following command:

   `RTRV-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location
   VT1.5 port number: `[ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} ]`
   VT1.5 group number: `[ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} ]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:VT1:<ISTAT=k,OMODE=s>"
;
```

   Where:

   e = VT1.5 port location
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

k = Input status: { DRVN, NDRVN, DRVN*, NDRVN* }
An asterisk (*) indicates the STS-1 signal the VT1.5 tributary is contained in is set to NDRVN or INIT and the VT1.5 is not monitored.

s = Output mode: { NORM, TERM, AIS }

From the above response, note the values for the parameters given.

3. Change the necessary VT1.5 parameters by entering the following command:

ED-VT1:*[a]*:*b*::::*[*ISTAT=*g*,OMODE=*j]*;

Where:

a = Target ID (optional)

b = VT1.5 port location
VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
VT1.5 group number: { {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }

g = Input status: { DRVN, NDRVN, CURVAL }
Initial system value: DRVN

j = Output mode: { NORM, TERM, AIS, CURVAL }
To provision for traffic, set to NORM.

4. Verify the settings using the RTRV-VT1 command as shown in Step 2.

If any parameters are not set to the desired values, reenter the ED-VT1 command and change the necessary parameters.

5. Retrieve current alarm level information by entering the following command:

RTRV-ATTR-VT1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = VT1.5 port location
VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
VT1.5 group number: { {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE */
   "g:h,i"
;
```

Where:

g = VT1.5 port location
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

h = Alarm notification code: { MJ, MN, NA }

i = Condition Type: { LOP, AISP, YEL }

From the above response, note the values for the parameters given.

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the RTRV-ALM-VT1 command is issued for that VT1.5. The RTRV-COND-VT1 command can be used to retrieve alarm conditions with an NA alarm level.

6. Change current alarm level information by entering the following command:

SET-ATTR-VT1:*[a]*:*b*:::*d*:,*e*;

Where:

a = Target ID (optional)

b = VT1.5 port location
VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
VT1.5 group number: { {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }

d = Notification code: { MJ, MN, NA }
Initial system value: NA for no alarm.
It is recommended that this parameter is set to MJ for each VT1.5 signal to be put into service to aid in any future troubleshooting of VT1.5 facilities.

e = Condition group: { FAULT, AIS-YEL, ALL }

- FAULT — indicates the condition type: LOP.
- AIS-TEL — indicates the condition types: AISP and YEL.
- ALL — indicates all condition groups (FAULT and AIS-YEL).

7. Verify the settings using the RTRV-ATTR-VT1 command as shown in Step 5.

NOTE:
If an alarm condition is currently active on a VT1.5 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, reenter the SET-ATTR-VT1 command and change the necessary parameters.

8. Notify the appropriate personnel, according to office procedures, when VT1.5 circuits have been put into service and update your office records.

Configuring EC-1 Ports for STS-1/ VT1.5/DS1/DS3 Operation

This procedure is used to match STS-1 signals with the type of terminating equipment connected to the DACS IV-2000 SMUX circuit packs. Since the DACS IV-2000 can cross-connect STS-1, VT1.5, and DS1 signals, you must match the signal type of SMUX circuit packs with the type of signal to be cross-connected.

NOTE:
When SMUX circuit packs are initially provisioned, the Active Signal Type defaults to DS1. If STS-1, VT1.5 and DS3 cross-connections are needed, you must perform this procedure to configure EC-1 ports for STS-1, VT1.5, or DS3 signals.

Only ports that are in the IDLE state can be changed to a different signal type. If you attempt to change a port that is not in the IDLE state, the ED-PORT command used in this procedure is denied with the error code SNVS.

1. From office records, determine the equipment connected to the SMUX circuit pack port that is being changed (for example, for VT1.5 mappings, bit or byte synchronous DS1 mapping, or asynchronous DS1 mapping).

2. Retrieve current provisioning information for the EC-1 port that you are changing by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Port location:
   EC-1 port location: `{ {1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:<EC1MAP=e,RCVEC1MAP=f,VTMAP=g,RCVVTMAP=h>:i"
;
```

   Where:

   d = Port location:
   EC-1 port: `{1-64}-{1-15}`
   VT1.5 port location
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   e = Provisioned EC-1 format: `{ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }`
   This parameter is omitted if values for `VTMAP` and `RCVVTMAP` are given.

   f = Received EC-1 format: `{ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }`
   This parameter is omitted if values for `VTMAP` and `RCVVTMAP` are given.

   g = Provisioned VT1.5 format: `{ UNSPEC, ASYN, BIT, BYTE }`
   This parameter is omitted if values for `EC1MAP` and `RCVEC1MAP` are given.

   h = Received VT1.5 format: `{ UNSPEC, ASYN, BIT, BYTE }`
   This parameter is omitted if values for `EC1MAP` and `RCVEC1MAP` are given.

   i = Active signal type: `{ EC1, T1, VT1 }`

   From the above response, note the values for the parameters given.

3. If you are reconfiguring an EC-1 port, change the EC-1 port format by entering the following command:

   ED-PORT:*[a]*:*b*:::*[*EC1MAP=*d]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

   d = EC-1 port format: { UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK, NOVAL }
   Initial system value: VTFLOAT
   One of the modes UNSPEC, ASYN, SYNC, VTFLOAT, or VTLOCK must be selected according to the signal format of the far-end equipment. To allow DS3 gateway cross-connections, this parameter is set to ASYN. To configure an EC-1 port for VT1.5 or DS1 cross-connections, this parameter is set to VTFLOAT and the VT1.5 port format (parameter *e*) is set to the desired value.

   The definitions of the options are:

   - UNSPEC — specifies an STS-1(cc-SPE) signal of unspecified format.
   - ASYN — specifies an STS-1(cc-SPE) signal of a DS3 mapped to STS-1 asynchronous.
   - SYNC — specifies an STS-1(cc-SPE) signal of an STS-1 mapping for DS3 byte observable syntran.
   - VTFLOAT — specifies an STS-1(VT1.5) signal for floating virtual tributary mode.
   - VTLOCK — specifies an STS-1(VT1.5) signal for locked virtual tributary mode (cannot transport asynchronously mapped SPE).

4. If you are configuring an EC-1 port for VT1.5 or DS1 cross-connections, change the VT1.5 port format by entering the following command:

   `ED-PORT:`*[a]*`:`*b*`:::EC1MAP=NOVAL,`*[*`VTMAP=`*e]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 Port location:
   VT1.5 port number: `[ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] ]`
   VT1.5 group number: `[ [1-64]-[1-15]-[1-7]-[1-4], UNIT-[1-64] ]`

   e = VT1.5 port format: `[ UNSPEC, ASYN, BIT, BYTE, NOVAL ]`
   Initial system value: `ASYN`
   The Active Signal Type becomes `VT1` (indicating a VT1.5 signal) if `UNSPEC`, `BIT`, or `BYTE` is specified or `T1` (indicating an DS1 signal) if `ASYN` is specified. For VT1.5 signals, one of the modes `UNSPEC`, `BIT`, or `BYTE` is selected according to the signal format of the far-end equipment. For DS1 signals, `ASYN` is selected. For this step, the value `NOVAL` cannot be used. The definitions of the options are:

   - `UNSPEC` — specifies a VT1.5 (cc-SPE) signal of unspecified format.
   - `ASYN` — specifies a DS1 signal of the VT1.5 mapping (that is, the VT1.5 tributary is defined as a VT1.5 [DS1] signal).
   - `BIT` — specifies a VT1.5 (cc-SPE) signal of a bit synchronous DS1 mapping.
   - `BYTE` — specifies a VT1.5 (cc-SPE) signal.of a byte synchronous DS1 mapping.

5. Verify the settings using the `RTRV-PORT` command as shown in Step 2.

   If any parameters are not set to the desired values, reenter the `ED-PORT` command and change the necessary parameters.

6. Notify the appropriate personnel, according to office procedures, when EC-1 ports are reconfigured and update your office records.

Deprovisioning Equipment

7

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Contents

Deprovisioning Equipment

7

This chapter contains procedures to deprovision DACS IV-2000 equipment.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

This chapter contains information on deprovisioning:

- Remote Complexes
- DS1 Interface Modules
- DS3 Interface Modules
- STS1 Interface Modules
- DS1F/SWIF circuit packs
- MUX circuit packs
- SMUX circuit packs
- PMGR1 circuit packs.

These procedures are used to deprovision Remote Complexes and DS1, DS3, and STS1 Interface Modules when it is necessary to take these modules out of service before rearranging or changing the DACS IV-2000. In addition, procedures are provided to deprovision individual interface circuit packs (DS1IF, SWIF, MUX, and SMUX) and replace them with BXA circuit packs.

⚠ CAUTION:
BXA circuit packs must never be inserted in any slot other than SWIF, DS1IF, MUX, SMUX, or DS3PM circuit pack slots. For example, BXA circuit packs must never be inserted into a DS1RY circuit pack slot.

Deprovisioning Remote Complexes

This procedure is used to deprovision Remote Complexes. All interface modules associated with the Remote Complex to be deprovisioned must be deprovisioned *first.* After deprovisioning the interface modules, the associated Remote Complex can be deprovisioned using this procedure.

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, release any test ports, and disconnect any performance monitoring connections involving the Interface circuit pack(s) to be deprovisioned. Refer to Chapters 10 through 14 for proper procedures for moving traffic.
2. Deprovision the Interface Modules, following the instructions in the appropriate section "Deprovisioning DS1 Interface Modules" (page 7-5), "Deprovisioning DS1 Interface-Protection Modules" (page 7-9), and/or "Deprovisioning DS3 or STS1 Interface Modules" (page 7-15).
3. Retrieve the state of the OPEX circuit packs by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = OPEX circuit pack location: `OPEX-[1-4]-[1-16]`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = OPEX circuit pack location: `OPEX-{1-4}-{1-16}`

f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL for all OPEX circuit packs, the selected equipment is already deprovisioned; go to Step 7. Otherwise, continue with Step 4.

4. Delete the OPEX circuit packs (basic state of EQPD, PNDG, or POS) from the database by entering the following command:

   `DLT-EQPT:`*`[a]`***`:`***`b`***`;`**

   Where:

   a = Target ID (optional)

   b = OPEX circuit pack location: **`OPEX-{1-4}-{1-16}`**

5. Retrieve the state of the OSWIO circuit packs by entering the following command:

   `RTRV-STATE-EQPT:`*`[a]`***`:`***`b`***`;`**

   Where:

   a = Target ID (optional)

   b = OSWIO circuit pack location: **`SWIO-{1-4}-{1-16}`**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = OSWIO circuit pack location: `SWIO-{1-4}-{1-16}`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL for all OPEX circuit packs, the selected equipment is already deprovisioned; go to step 7. Otherwise, continue with Step 6.

6. Delete the OSWIO circuit packs from the database by entering the following command:

   DLT-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = OSWIO circuit pack location: SWIO-{1-4}-{1-16}

7. Retrieve the state of the Remote Unit Interface by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Remote Unit Interface location: RUI-{1-2}

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = Remote Unit Interface location: RUI-{1-2}

   f = Equipment state: basic states are AVAIL, IS, or OSS

   If the basic state is IS, the selected Remote Unit Interface must be removed from service; go to Step 8. If the basic state is AVAIL, the selected Remote Unit Interface is already deprovisioned; go to Step 5. Otherwise, continue with Step 9.

8. Remove the Remote Unit Interface from service by entering the following command:

   RMV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Remote Unit Interface location: RUI-{1-2}

9. Delete the Remote Complex from the database by entering the following command:

   DLT-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Remote Complex location: RX-{1-2}

Deprovisioning DS1 Interface Modules

This procedure is used to deprovision DS1 Interface Modules. DS1 Interface Modules must be deprovisioned *before* the associated DS1 Interface-Protection Module. After deprovisioning DS1 Interface Modules, the associated DS1 Interface-Protection Module can be deprovisioned using the next section titled "Deprovisioning DS1 Interface-Protection Modules" (page 7-9).

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, release any test ports, and disconnect any DS1 performance monitoring connections involving the DS1IF circuit pack(s) to be deprovisioned. Refer to Chapters 10 through 14 for proper procedures for moving traffic.

2. Retrieve the state of the DS1IF circuit pack(s) to be deprovisioned by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-64}-{1A-8B}**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-64}-{1A-8B}

   f = Equipment state: basic states are AVAIL, ACT, EQPD, PNDG, or POS

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 4.

3. Delete the DS1IF circuit pack(s) from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`
   You can delete the circuit packs one at a time or in a range (for example, `-1A&&-2B`).

NOTE:
The `DLT-EQPT` command is denied if the selected circuit pack is being scanned by DS1 performance monitoring or any of the ports is provisioned as a test port.

4. Retrieve the state of the SWIF circuit pack to be deprovisioned by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   f = Equipment state: basic states are `AVAIL`, `ACT`, `EQPD`, `PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 6.

5. Delete the SWIF circuit pack from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

6. Retrieve the state of the DS1RY circuit packs in the DS1 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1RY circuit pack location: `DS1RY-[1-64]-1&&-4`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS1RY circuit pack location: `DS1RY-[1-64]-[1-4]`

   f = Equipment state: basic states are `IS` or `OOS`

   If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 8.

7. Delete the DS1RY circuit packs from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1RY circuit pack location: `DS1RY-[1-64]-[1-4]`
   You can delete the circuit packs one at a time or you can specify a range of circuit packs (for example, `-1&&-4`) to disconnect/delete all circuit packs at once.

8. Retrieve the state of the CLKDR circuit packs in the DS1 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location: `CLKDR-[1-64]-1&-2`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = CLKDR circuit pack location: `CLKDR-{1-64}-{1-2}`

f = Equipment state: basic states are `IS` or `OOS`

If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 10.

9. Delete the CLKDR circuit packs from the database by entering the following command:

   `DLT-EQPT:`*`[a]`*`:`*`b`*`;`

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location: `CLKDR-{1-64}-1`

NOTE:
CLKDR circuit packs are provisioned/deprovisioned in pairs. You only need to enter one member of the pair.

10. Remove the UC circuit pack from service by entering the following command:

    `RMV-EQPT:`*`[a]`*`:`*`b`*`;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-{1-64}`

    A major (MJ) alarm occurs for the UC slot (status panel LED does not turn on) when you remove the UC from service. This alarm indicates that the UC is initialized, but not provisioned.

11. Delete the DS1 Interface Module from the database by entering the following command:

    `DLT-EQPT:`*`[a]`*`:`*`b`*`;`

    Where:

    a = Target ID (optional)

    b = DS1 Interface Module location: `UNIT-{1-64}`

    The major alarm clears (CL) for the UC slot when you remove the DS1 Interface Module from the database. After the alarm clears, you are done with this procedure.

Deprovisioning DS1 Interface-Protection Modules

This procedure is used to deprovision DS1 Interface-Protection Modules. DS1 Interface Modules associated with the DS1 Interface-Protection Module to be deprovisioned must be deprovisioned *first*. If there are any DS1 Interface Modules associated with the selected DS1 Interface-Protection Module that is not deprovisioned, refer to the previous section titled "Deprovisioning DS1 Interface Modules" (page 7-5) before performing this procedure.

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any DS1 performance monitoring connections involving the DS1 interface circuit pack(s) to be deprovisioned. Refer to Chapters 10 through 14 for proper procedures for moving traffic.
2. Retrieve the state of the DS1 interface circuit pack(s) to be deprovisioned by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-1A&&-7B`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-7B}`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned, go to Step 4.

3. Delete the DS1IF circuit pack(s) from the database by entering the following command:

   `DLT-EQPT:` *[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-7B}`
   You can delete the circuit packs one at a time or in a range (for example, `-1A&&-1B`).

NOTE:
The `DLT-EQPT` command is denied if the selected circuit pack is being scanned by DS1 performance monitoring or any of the ports are provisioned as a test port.

4. Retrieve the state of the SWIF circuit pack to be deprovisioned by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-7}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: `SWIF-{1-64}-{1-7}`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 6.

5. Delete the SWIF circuit pack from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-7}`

6. Retrieve the state of the DS1IP circuit pack(s) to be deprovisioned by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IP circuit pack location: **DS1IP-{1-64}-PA&-PB**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS1IP circuit pack location: DS1IP-{1-64}-{PA,PB}

   f = Equipment state: basic states are AVAIL, ACT, EQPD, PNDG, STBY, or OOS

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 8.

7. Delete the DS1IP circuit pack(s) from the database by entering the following command:

   DLT-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IP circuit pack location: **DS1IP-{1-64}-{PA-PB}**
   You can delete the circuit packs one at a time or in a range (for example, **-PA&-PB**).

NOTE:
The **DLT-EQPT** command is denied if the selected circuit pack is being scanned by DS1 performance monitoring.

8. Retrieve the state of the protection SWIF circuit pack to be deprovisioned by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-64}-P**

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG,` or `POS`

If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 10.

9. Delete the protection SWIF circuit pack from the database by entering the following command:

   DLT-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = SWIF protection circuit pack location: **SWIF-{1-64}-P**

10. Retrieve the state of the DS1RY circuit packs in the DS1 Interface-Protection Module by entering the following command:

    RTRV-STATE-EQPT:*[a]*:*b*;

    Where:

    a = Target ID (optional)

    b = DS1 relay circuit pack location: **DS1RY-{1-64}-1&&-4**

    A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

    Where:

    e = DS1RY circuit pack location: `DS1RY-{1-64}-{1-4}`

    f = Equipment state: basic states are `IS` or `OOS`

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 12.

11. Delete the DS1RY circuit packs from the database by entering the following command:

    `DLT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS1RY circuit pack location: `DS1RY-{1-64}-{1-4}`
    You can delete the circuit packs one at a time or you can specify a range of circuit packs (for example, `-1&&-4`) to disconnect/delete all circuit packs at once.

12. Retrieve the state of the CLKDR circuit packs in the DS1 Interface Module by entering the following command:

    `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = CLKDR circuit pack location: `CLKDR-{1-64}-1&-2`

    A sample output is:

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
       /* LOC:STATE */
       "e:f"
    ;
    ```

    Where:

    e = CLKDR circuit pack location: `CLKDR-{1-64}-{1-2}`

    f = Equipment state: basic states are `IS` or `OOS`

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 14.

13. Delete the CLKDR circuit packs from the database by entering the following command:

    `DLT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = CLKDR circuit pack location: `CLKDR-{1-64}-1`

NOTE:
CLKDR circuit packs are provisioned/deprovisioned in pairs. You only need to enter one member of the pair.

14. Remove the UC circuit pack from service by entering the following command:

    `RMV-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-[1-64]`

    A major (MJ) alarm occurs for the UC slot (status panel LED does not turn on) when you remove the UC from service. This alarm indicates that the UC is initialized, but not provisioned.

15. Delete the DS1 Interface-Protection Module from the database by entering the following command:

    `DLT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS1 Interface-Protection Module location: `UNIT-[1-64]`

    The major alarm for the UC slot clears (CL) when you remove the DS1 Interface-Protection Module from the database. After the alarm clears, you are done with this procedure.

Deprovisioning DS3 or STS1 Interface Modules

This procedure is used to deprovision DS3 Interface-16, DS3 Interface-32, Enhanced DS3 Interface-16, DS3 Clear-Channel Interface-16, or STS1 Interface-16 Modules.

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any performance monitoring connections involving the DS3 or STS1 Interface Module to be deprovisioned. Refer to Chapters 10 through 14 for proper procedures for moving traffic.

2. Retrieve the states of the MUX circuit packs in the DS3 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location:
   DS3 Interface-32 Modules: `MUX-{1-64}-1&&-31`
   DS3 Interface-16 Modules: `MUX-{1-64}-1&&-15`
   STS1 Interface-16 Modules: `SMUX-{1-64}-1&&-15`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. Do not proceed any further using the currently selected module. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 4.

3. Delete the MUX/SMUX circuit packs from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location:
   DS3 Interface-32 Modules: `MUX-[1-64]-1&&-31`
   DS3 Interface-16 Modules: `MUX-[1-64]-1&&-15`
   STS1 Interface-16 Modules: `SMUX-[1-64]-1&&-15`
   You can delete the circuit packs one at a time or in a range (for example, `-1&&-31`).

NOTE:
The `DLT-EQPT` command is denied if the selected equipment is being scanned by DS1 performance monitoring.

4. Retrieve the state of the MUXP/SMUXP circuit pack in the DS3/STS1 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUXP/SMUXP circuit pack location: `[ MUXP-[1-64], SMUXP-[1-64] ]`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUXP/SMUXP circuit pack location: `[ MUXP-[1-64], SMUXP-[1-64] ]`

   f = Equipment state: basic states are `AVAIL, EQPD, PNDG, STBY`, or `OOS`

   If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 6.

5. Delete the MUXP/SMUXP circuit pack from the database by entering the following command:

   `DLT-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = MUXP/SMUXP circuit pack location: `[ MUXP-[1-64], SMUXP-[1-64] ]`

6. Retrieve the states of the CLKDR circuit packs in the DS3/STS1 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location:
   DS3 Interface-32 Modules: `CLKDR-[1-64]-1&&-4`
   DS3/STS1 Interface-16 Modules: `CLKDR-[1-64]-1&&-2`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = CLKDR circuit pack location: `CLKDR-[1-64]-[1-4]`

   f = Equipment state: basic states are `IS` or `OOS`

   If the basic state is OOS, the selected equipment is already deprovisioned; go to Step 8.

7. Delete the CLKDR circuit packs from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location:
   DS3 Interface-32 Modules: `CLKDR-{1-64}-1&&-4`
   DS3 Interface-16 Modules: `CLKDR-{1-64}-1`
   Enhanced DS3 Interface-16 Modules: `CLKDR-{1-64}-1`
   DS3 Clear-Channel Interface-16 Modules: `CLKDR-{1-64}-1`
   STS1 Interface-16 Modules: `CLKDR-{1-64}-1`

NOTE:
CLKDR circuit packs are provisioned/deprovisioned in pairs (pairs consist of 1/2 and 3/4). You only need to enter one member of a pair.

8. If you are deprovisioning an STS1 Interface-16 Module or the DS3 Interface Module being deprovisioned does not have a DS3PM2 circuit pack installed, go to Step 11. Otherwise, continue with this step.

   Retrieve the state of the DS3PM2 circuit pack in the DS3 Interface Module by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-{1-64}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = DS3PM2 circuit pack location: `DS3PM-{1-64}`

   f = Equipment state: basic states are `IS`, `OOS`, or `AVAIL`

   If the basic state is IS, continue with Step 9. If the basic state is OOS, continue with Step 10. If the basic state is AVAIL, continue with Step 11.

9. Remove the DS3PM circuit pack from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-[1-64]`

   After removing the DS3PM circuit pack from service, continue with Step 10.

10. Delete the DS3PM2 circuit pack (in OOS state) from the database by entering the following command:

    `DLT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS3PM2 circuit pack location: `DS3PM-[1-64]`

    After disconnecting the DS3PM circuit pack from the database, continue with Step 11.

11. Remove the UC circuit pack from service by entering the following command:

    `RMV-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-[1-64]`

    A major (MJ) alarm occurs for the UC slot (status panel LED does not turn on) when you remove the UC from service. This alarm indicates that the UC is initialized, but not provisioned.

12. Delete the DS3/STS1 Interface Module from the database by entering the following command:

    `DLT-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DS3/STS1 Interface Module location: `UNIT-[1-64]`

    The major alarm for the UC slot clears (CL) when you remove the DS3/STS1 Interface Module from the database. After the alarm clears, you are done with this procedure.

Deprovisioning DS1 Interface (DS1IF) Circuit Packs

This procedure is used to deprovision DS1IF circuit packs. DS1IF circuit packs must be deprovisioned *before* the associated SWIF circuit pack. After deprovisioning DS1IF circuit packs, the associated SWIF circuit pack can be deprovisioned using the next section titled "Deprovisioning SWIF Circuit Packs" (page 7-22).

1. Retrieve the state of the DS1IF circuit pack(s) to be deprovisioned by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-[1-64]-[1A-8B]**

   A sample output is:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:STATE */
      "e:f"
   ;
   ```

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-64}-{1A-8B}

   f = Equipment state: basic states are AVAIL, ACT, EQPD, PNDG, or POS

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 3.

2. Delete the DS1IF circuit pack(s) from the database by entering the following command:

   DLT-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-[1-64]-[1A-8B]**
   You can delete the circuit packs one at a time or in a range (for example, **-1A&&-2B**).

NOTE:
The **DLT-EQPT** command is denied if the selected circuit pack is being scanned by DS1 performance monitoring.

3. If you are replacing DS1IF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 4, 5, and 6 for each DS1IF circuit pack you are replacing. Otherwise, you are done with this procedure.
4. Extract the DS1IF circuit pack. Refer to Chapter 2 for information about extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the DS1IF slot when you extract the DS1IF circuit pack.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

5. Install the BXA circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the DS1IF slot when you install the BXA circuit pack.
6. Create the DS1IF circuit pack slot(s) in the database so that auto-provisioning can occur if the slot(s) is equipped with a DS1IF circuit pack(s) at a later date by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = BXA circuit pack location: `DS1IF-{1-64}-{1A-8B}`
   You can create the circuit packs one at a time or in a range (for example, `-1A&&-1B`).

Deprovisioning SWIF Circuit Packs

This procedure is used to deprovision SWIF circuit packs. DS1IF circuit packs associated with the SWIF circuit pack to be deprovisioned must be deprovisioned *first*. If there are any DS1IF circuit packs associated with the selected SWIF circuit pack that is not deprovisioned, refer to the previous section titled "Deprovisioning DS1 Interface (DS1IF) Circuit Packs" (page 7-20) before performing this procedure.

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any performance monitoring connections involving the SWIF circuit pack to be deprovisioned.

2. Retrieve the state of the SWIF circuit pack to be deprovisioned by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 4.

3. Delete the SWIF circuit pack from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

4. If you are replacing SWIF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 5, 6, and 7 for each SWIF circuit pack you are replacing. Otherwise, you are done with this procedure.

5. Extract the SWIF circuit pack. Refer to Chapter 2 for information about extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the SWIF slot when you extract the SWIF circuit pack.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

6. Install a BXA circuit pack. Refer to Chapter 2 for information about installing circuit packs, if necessary.

   The minor alarm clears (CL) for the SWIF slot when you install the BXA circuit pack.

7. Create the SWIF circuit pack slot in the database so that auto-provisioning can occur if the slot is equipped with a SWIF circuit pack at a later date by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = BXA circuit pack location: `SWIF-[1-64]-[1-8]`

Deprovisioning MUX or SMUX Circuit Packs

This procedure is used to deprovision MUX or SMUX circuit packs.

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any performance monitoring connections involving the MUX/SMUX circuit pack being deprovisioned.
2. Retrieve the state of the MUX/SMUX circuit pack to be deprovisioned by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `[ MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15] ]`

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG`, or `POS`

If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 4.

3. Delete the MUX/SMUX circuit pack from the database by entering the following command:

   `DLT-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

4. If you are replacing MUX/SMUX circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 5, 6, and 7 for each MUX/SMUX circuit pack you are replacing. Otherwise, you are done with this procedure.

5. Extract the MUX/SMUX circuit pack. Refer to Chapter 2 for information about extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the MUX/SMUX circuit pack slot when you extract the MUX/SMUX circuit pack.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

6. Install a BXA circuit pack. Refer to Chapter 2 for information about installing circuit packs, if necessary.

   The minor alarm clears (CL) for the MUX/SMUX circuit pack slot when you install the BXA circuit pack.

7. Create the MUX/SMUX circuit pack slot in the database so that auto-provisioning can occur if the slot is equipped with a MUX/SMUX circuit pack at a later date by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

Deprovisioning DS3PM2 Circuit Packs

This procedure is used to deprovision DS3PM2 circuit packs.

1. Remove the DS3PM2 circuit pack from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-{1-64}`

2. Delete the DS3PM2 circuit pack from the database by entering the following command:

   `DLT-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM2 circuit pack location: `DS3PM-{1-64}`

3. Obtain a BXA1 circuit pack.
4. Extract the DS3PM2 circuit pack. Refer to Chapter 2 for information about extracting circuit packs, if necessary.
5. Install the BXA circuit pack. Refer to Chapter 2 for information about installing circuit packs, if necessary.

NOTE:
The BXA circuit pack is needed for proper air flow through the DS3 Interface Module.

6. Adjust the TABS link for the remainder of the DS3PM2 circuit packs associated with the side of the switch complex the DS3PM2 circuit pack removed in this procedure. Refer to the section titled "Provisioning DS3PM2 Circuit Packs" (page 5-49) for information on the TABS link. Before extracting a DS3PM2 circuit pack to adjust the TABS link jumper, use the `RMV-EQPT` command to remove the DS3PM2 circuit pack from service. After you reinstall a DS3PM2 circuit pack, use the `RST-EQPT` command to restore the DS3PM2 circuit pack to service.

Deprovisioning PMGR Circuit Packs

This procedure is used to deprovision PMGR circuit packs that occupy SWIF or MUX circuit pack slots.

1. Disconnect any DS1 performance monitoring connections, test access and loopbacks involving the PMGR circuit pack being deprovisioned. Refer to Chapters 9 through 11 for proper procedures for disconnecting test access, loopbacks, and performance monitoring connections.

2. Retrieve the state of the PMGR circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `[ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} ]`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX or SWIF circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, PNDG,` or `POS`

   If the basic state is ACT, the selected equipment cannot be deprovisioned until DS1 performance monitoring, test access, or loopback connections are disconnected. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 5.

3. If the basic state of the PMGR1 is POS, determine if the PMGR1 is performing SCAN DS1 performance monitoring by entering the following command:

   `RTRV-PMCNFGRN-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `DS1GRP-{1-64}-{1-31}`

   If there is no performance monitoring taking place for the specified PMGR1 circuit pack, the following response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If there is performance monitoring taking place for the specified PMGR1 circuit pack, the following response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MONPORT:PORT,STATE */
   "d:e,f"
;
```

   Where:

   d = Monitored DS1 port location: `{1-64}-{1-31)-{1-28}`

   e = Monitoring DS1 port location: `{1-64}-{1-31)-{1-28}`

   f = Monitored DS1 port state: `{ PM-REL, PM-CMPN, PM-AUTOCMPN-IDLE, PM-AUTOCMPN, PM-SCAN, PM-SCAN-IDLE }`

   If the PMGR is performing Camp-on DS1 performance monitoring (parameter *f* indicates a state of `PM-CMPN`, `PM-AUTOCMPN`, or `PM-AUTOCMPN-IDLE`), check with your system administrator before disconnecting the camp-on monitoring. If monitoring is to be stopped and moved to another PMGR circuit pack (if available), refer to the section titled "Disconnecting DS1 Camp-on Performance Monitoring" (page 14-23) [to disconnect camp-on monitoring] and "Establishing DS1 Manual Camp-on Performance Monitoring" (page 14-19) or "Provisioning Automatic Camp-on Performance Monitoring DS1 Ports" (page 14-20) [to reestablish camp-on monitoring on another PMGR circuit pack] before continuing this procedure. Otherwise, the selected PMGR circuit pack cannot be deprovisioned and this procedure must not be performed for the selected PMGR circuit pack.

   If the PMGR1 is performing SCAN DS1 performance monitoring (parameter *f* indicates a state of `PM-SCAN` or `PM-SCAN-IDLE`), check with your system administrator before stopping the scanning. If scanning is to be stopped, refer to the section titled "Stopping DS1 Scan Performance Moni-

toring" (page 14-22) before continuing this procedure. Otherwise, the selected PMGR1 circuit pack cannot be deprovisioned and this procedure must not be performed for the selected PMGR1 circuit pack.

4. Delete the PMGR1 circuit pack from the database by entering the following command:

   `DLT-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`

5. If you are replacing PMGR1 circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 6, 7, and 8 for each PMGR1 circuit pack you are replacing.

6. Extract the PMGR1 circuit pack. Refer to Chapter 2 for information about extracting circuit packs, if necessary.

   A minor (MN) alarm occurs for the MUX slot when you extract a PMGR1 circuit pack from a DS3 Interface Module.

CAUTION:
Do not extract more than one circuit pack at a time.

7. Install the BXA circuit pack. Refer to Chapter 2 for information about installing circuit packs, if necessary.

   The minor alarm clears (CL) for the MUX slot when you install the BXA circuit pack into the DS3 Interface Module.

8. Create the BXA slot(s) in the database so that auto-provisioning can occur if the slot(s) is equipped with SWIF or MUX circuit pack(s) at a later date by entering the following command:

   `ENT-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = BXA circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`

Frame Administration

8

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Frame Administration

8

This chapter consists of procedures required for the administration of the DACS IV-2000. Included are procedures for creating, changing, and removing logins; using the SEC disk drive; and managing the database.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Upgrading with New Software Release

Procedures for upgrading from previous releases of the DACS IV-2000 (512) system are located in the *DACS IV-2000 (512) Release 5.0 Software Release Description* (AT&T 365-340-905) that accompanies the new software release. Refer to that document, and follow the procedures for upgrading hardware and software.

Memory Entities

Frame administration consists of maintaining the integrity among the different memory entities within the DACS IV-2000 and login access to the frame (login administration). The memory structure of the DACS IV-2000 consists of:

- Main Controller RAM (Working Memory or WKG) — stores the DACS IV-2000 database. The database is stored in RAM on the main controller's active central processing unit (CPU) circuit pack (CPU with green LED lit). When the main controller is in the in-service (IS) state, the system database in the CPUs' RAM (working memory) is equivalent to the data in the switch matrix hardware. When the main controller is not in service (OOS-FLT, OOS-MTCE, or OOS-MCOND), the working memory is not guaranteed to be the same as the memory in the switch matrix hardware.
- Primary Disk (Primary Storage or PRI) — provides primary nonvolatile backup of the DACS IV-2000 database. There are two copies of the system database stored on each PRI disk. During a system boot or a restore of the main controller, the most recent copy of the system database is read from disk into working memory. After the system is booted, as long as the main controller is in the in-service (IS) state, the two copies of the system database on the PRI disks are kept up to date with changes made to the cross-connect map and provisioning information by placing entries in a journal file on the selected PRI disk. Every fifteen minutes, the PRI disk copies of the database are brought in sync with the working memory (WKG) database (sequentially, the first copy is completed before the second copy is started) and the journal file is deleted.
- Secondary Disk (Secondary Storage or SEC) — provides four functions:
  - — Mechanism for software distribution
  - — Secondary nonvolatile backup of the DACS IV-2000 database
  - — Out-of-system (off-line) storage of the system database
  - — Initialization of database with *System Start-up* disk

  The initial software release and future software release upgrades are distributed on optical disk cartridges. The optical disk cartridges offer an economical way to distribute large amounts of data (up to 128 Mbytes) to the field reliably. Backups of the PRI disk (primary storage) can be made to the SEC disk to ensure a backup of the database is available in case of database corruption or failure of the PRI disk drive. It is recommended that one system database backup be made on the SEC disk each day the system is in service.

Memory Interactions

Memory interactions are ways in which the programs and database move among the various memory entities (WKG, PRI, and SEC). Figure 8-1 illustrates the memory interactions.

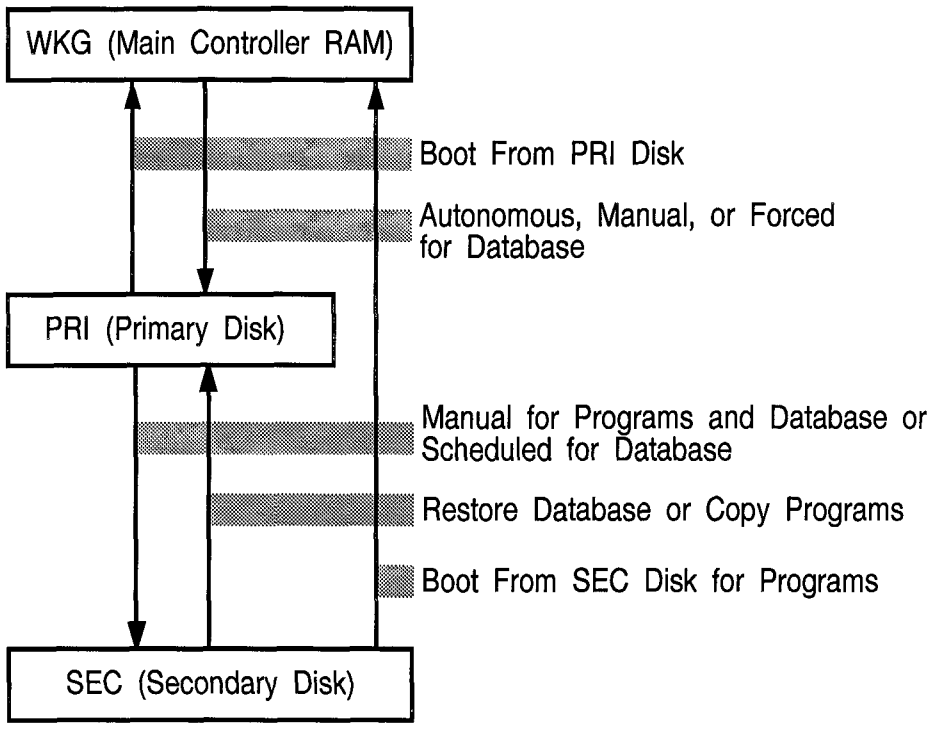


Figure 8-1. **Data Transfers Between Memory Entities**

Memory Integrity Defensiveness Features

With the DACS IV-2000, there are several operational activities that could result in loss of service or otherwise compromise the integrity of the system. The following list outlines these activities and describes the defensiveness measures in place to ensure system integrity:

- Protection Against System Database Corruption — If during the boot of the DACS IV-2000, the system database is not successfully loaded or it is determined to be corrupted, or if the CPU journal file is not successfully applied, the switch maps in the switch matrix hardware remain unchanged causing no loss-of-service. The DACS IV-2000 remains in the OOS-MCOND (out-of-service maintenance condition) state, allowing you to resolve the problem without losing service.

  If the system database is determined to be corrupted when the system is in service, the system enters the OOS-MCOND state to prevent any effect on the switch matrix hardware and any loss of customer traffic.

NOTE:
To warn you of database corruption, the DACS IV-2000 outputs either `CAN'T BOOT DB` or `CAN'T BOOT JOURNALS` messages.

- Protection Against Backing Up an Initialized Database — It is very dangerous to have an initialized system database on the PRI disk, especially if you are unaware the database is in such a state. The danger lies in booting the system when the system is carrying traffic. The result of such an action is loss of service for the entire DACS IV-2000.

  To prevent generating an initialized system database on PRI disk, the system does not allow database backups to PRI disk or SEC disk if the working memory (WKG) is empty.

- Protection Against Booting an Initialized System Database — If the system database to be booted is initialized, the DACS IV-2000 outputs the following warning message stating that the database on the PRI disks has no units provisioned and that the main controller (MC) is being brought to the OOS-MCOND state:

  ```
  DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO OOS-MCOND
  ```

- Protection Against Inserting a PRI or SEC Disk Drive From a Different Frame — This is a potentially dangerous situation. If a system database from a different frame is booted, the switch matrix hardware is remapped using the wrong system database, causing a loss of service for the entire DACS IV-2000.

  The Media Validation feature was created to prevent such an occurrence. When a PRI or SEC disk drive is formatted (with the `CPY-MEM` command), System Identifiers (System Type and System Release) are saved on the PRI or SEC disk. The Target ID is saved on the PRI or SEC disk when the

first copy is made to the disk. In addition, the Target ID is stored in EEPROM on the SSC circuit pack for preservation across system resets and power outages. The Media Validation feature consists of checking in three major functional areas, as follows:

— System Boot — When the system is booted, the Target ID stored in the on-line SSC is transferred to working (WKG) memory. This WKG memory Target ID is compared against the Target ID saved on each PRI or SEC disk to be brought into service. If there is any mismatch, the system boots into the OOS-MCOND state and the following message is output:

```
/* WARNING: TID MISMATCH! USE RTRV-SYSID TO CHECK TID VALUES */
```

— PRI and SEC Disk Restoration — When a PRI disk drive is restored (with the **RST-EQPT** command), Media Validation compares the WKG memory against the System Identifiers saved on the PRI disk. If there is any mismatch, the command is denied with the error code SMVF and the following message is output:

```
/* This command was denied because the System Identifiers */
/* (System_Type, System_Release, and TID) stored on the (FROM) MEMORY */
/* TYPE and System Identifiers stored on the (TO) MEMORY TYPE of the */
/* DACS IV-2000 (512) are different. Use the RTRV-SYSID command to retrieve */
/* the System Identifiers stored in memory for comparison. /*
```

When the SEC disk drive is restored, Media Validation compares the WKG memory against only the Target ID saved on the SEC disk. SEC disks that come from the factory with the TID set to DEFAULT match any TID set in WKG memory (that is, the SEC disk is always bootable until the value DEFAULT is changed by copying data to the SEC disk). The system allows an SEC disk drive to be restored if the System Type or System Release is different, since software release upgrades necessitates this.

— **CPY-MEM** Program and Database Transfers — When programs and databases are transferred between the PRI and SEC disks, Media Validation verifies the System Identifiers saved on the SEC disk are valid. All transfers to the SEC disk, program transfers from the SEC disk, and database transfer from the SEC disk with the **YES** option verifies the System Type and System Release match. Database transfer from the SEC disk with the **UPGRADE** option does not verify System Type and System Release (they are verified after Media Validation passes, and the command is denied with the error code SMUF if invalid).

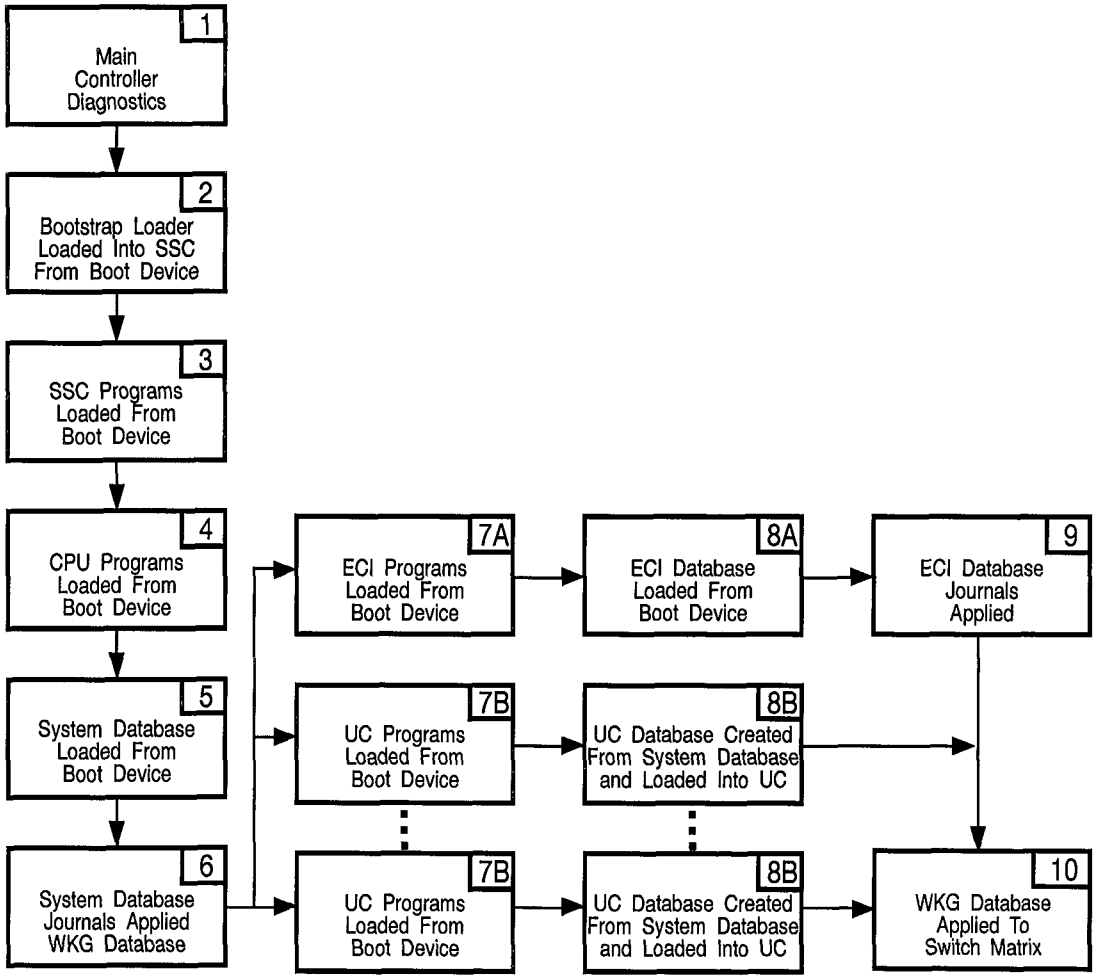
Table 8-1 lists defensiveness features of the DACS IV-2000 and their associated software releases.

Table 8-1. **Defensiveness Features**

Defensibility Feature	Software Release Available							
	256 Redundant Controller					512		
	R2.1	R2.2	R3.0	R4.0	R5.0	R2.2	R3.0	R5.0
Two copies of the database stored on PRI and SEC	X	X	X	X	X	X	X	X
No change to switch matrix if database is corrupted	X	X	X	X	X	X	X	X
No change to switch matrix if boot from SEC	X	X	X	X	X	X	X	X
SEC validation	X	X	X	X	X	X	X	X
Eliminated the command `CPY-MEM:::INIT,PRI,DBASE;`		X	X	X	X	X	X	X
Prevent saving an initialized database on SEC	X	X	X	X	X	X	X	X
Eliminated the command `CPY-MEM:::WKG,SEC,DBASE;`	X	X	X	X	X	X	X	X
Added the command `CPY-MEM:::WKG,PRI,DBASE,FORCED;`	X	X	X	X	X	X	X	X
Halt booting an initialized database		X	X	X	X	X	X	X
Media Validation (enhanced boot, restore, and copy defensibility)			X	X	X	X	X	X
Database TID Verification				X	X	X	X	X
Prevent the insertion of older versions of PRI disk drives				X	X			X
Limit performance monitoring reports to 3600 lines per hour				X	X	X	X	X
Automatic backup failure alarm				X	X			X

Reset and Boot

This section provides information on the actions of the DACS IV-2000 during full and partial system boots (reset/restore). Figure 8-2 provides a flowchart of the boot process followed for full and partial system boots. Table 8-2 lists all of the messages that can output to the ECI links during a reset of the DACS IV-2000.



Boot From PRI Disk — Steps 1 through 10*
`INIT-SYS:::::9;` — Steps 1 through 10*
`RST-EQPT::MC;` — Steps 1 through 6, 8A, 8B, 9, and 10
Boot From SEC Disk — Steps 1 through 4, and 7A
`RST-EQPT::MC:,SEC;` — Steps 1 through 4
`INIT-SYS:::::5;` — Steps 5, 6, 8A, 8B, 9, and 10

* Step 7B is executed only if *release query fails*, or if the UC circuit pack(s) are booted from firmware.

Figure 8-2. **System Boot and Reset Process**

Table 8-2. **Firmware Reset Status/Error Messages**

BOOT IN PROGRESS DACSIV-2000(512) LINK{1,2}-{1-3};
CPU{0,1}: Offline, Going to Standby; CPU{0,1}: Online, Startup Pass; CPU{0,1}: Transferring Boot to SSC (UNIT PLUS MODE) CPU{0,1}: Mate Side offline, restarting this side CPU{0,1}: Timeout waiting for SSC to release semaphore (1) CPU{0,1}: SSC SRAM diagnostics failed CPU{0,1}: Timeout waiting for SSC to diagnose PRI/SECs CPU{0,1}: Timeout waiting for SSC to release semaphore (2) CPU{0,1}: CPU/SSC SRAM not valid CPU{0,1}: PC UNIT MODE CPU{0,1}: Failure to send CONTROL packet to ECI CPU{0,1}: Failure to receive RSPNS packet from ECI CPU{0,1}: Timeout waiting for SSC to clear SWERT CPU{0,1}: Failure to send CONTROL packet to SSC CPU{0,1}: Failure to receive RSPNS packet from SSC CPU{0,1}: FW FAILED TO BOOT CPU{0,1}: Boot failed - timeout waiting for EXEC CPU{0,1}: Boot failed - timeout waiting for DOWNLOAD CPU{0,1}: MTC{1,2} not equipped CPU{0,1}: SCI{1,2} not equipped CPU{0,1}: SSC not equipped CPU{0,1}: MTC{1,2} not powered CPU{0,1}: SCI{1,2} not powered CPU{0,1}: SSC not powered CPU{0,1}: PRI1, PRI2 & SEC unavailable CPU{0,1}: SEC unavailable CPU{0,1}: SSC in ERROR CPU{0,1}: BUS-ADDRESS ERROR PC=0xXXXXXXXX ADDR=0xXXXXXXXX (Note: in above message, XXXXXXXX will be real data) CPU{0,1}: FW DIAGNOSTIC FAILURE (one or more of the following messages can appear with this message) ROM diagnostic failure flag=0xXXXX SRAM diagnostic failure flag=0xXXXX DRAM SHORT DATA diagnostic failure DRAM LONG DATA diagnostic failure DRAM ADDRESS diagnostic failure DRAM REFRESH diagnostic failure DRAM EDAC diagnostic failure DRAM diagnostic failure flag=0xXXXX EEPROM diagnostic failure flag=0xXXXX FLASH diagnostic failure flag=0xXXXX SONIC REGISTER diagnostic failure SONIC BUSERROR diagnostic failure SONIC LOOPBACK diagnostic failure SONIC LINK INTEGRITY diagnostic failure SONIC diagnostic failure flag=0xXXXX INTERRUPT diagnostic failure flag=0xXXXX CALENDAR diagnostic failure flag=0xXXXX

Table continued on next page

Table 8-2. **Firmware Reset Status/Error Messages (Continued)**

QUART{0,1} Device failure
QUART{0,1} Link {0-3} failure
QUART{0,1} diagnostic failure flag=0xXXXX
FPGA{0,1} diagnostic failure, flag=0xXXXX
MTC{1,2} EQUIPPAGE failure
MTC{1,2} LOSS OF POWER failure
MTC{1,2} BUS ERROR
MTC{1,2} failure, flag=0xXXXX
UI EQUIPPAGE failure
UI LOSS OF POWER failure
UI BUS ERROR
UI failure, flag=0xXXXX
SCI{1,2} EQUIPPAGE failure
SCI{1,2} LOSS OF POWER failure
SCI{1,2} BUS ERROR
SCI{1,2} failure, flag=0xXXXX
SSC EQUIPPAGE failure
SSC LOSS OF POWER failure
SSC BUS PARITY failure
SSC BUS SRAM failure
SSC BUS ERROR
SSC BUS failure, flag=0xXXXX
ALL PRI/SEC MEDIA UNAVAILABLE: flag=0xXXXX
PRI/SEC MEDIA failure, flag=0xXXXX
(Note: flag = 0xXXXX will be real data)
SSC{0,1}: Offline, Going to Standby;
SSC{0,1}: Online, Startup Pass;
SSC{0,1}: Attempting boot from PRI{1,2};
SSC{0,1}: Attempting boot from SEC;
SSC{0,1}: Boot Failed Sending Interrupt to CPU
SSC{0,1}: Boot Failed Waiting for CPU to send boot message
SSC{0,1}: Boot Failed - Transmitting ACK to CPU
SSC{0,1}: Boot Failed - during BOOTCMD handshake
SSC{0,1}: Boot Failed - Soft Error
SSC{0,1}: FW FAILED TO BOOT
SSC{0,1}: PC UNIT MODE
SSC{0,1}: Transferring Control to Bootstrap Loader
SSC{0,1}: No boot device available - ERROR {1-5}
SSC{0,1}: BUS-ADDRESS ERROR PC=0xXXXXXXXX ADDR=0xXXXXXXXX
(Note: in above message, XXXXXXXX will be real data)
SSC{0,1}: FW DIAGNOSTIC FAILURE (one or more of the following messages can appear with this message)
ROM diagnostic failure flag=0xXXXX
SRAM diagnostic failure flag=0xXXXX
DRAM SHORT DATA diagnostic failure
DRAM LONG DATA diagnostic failure
DRAM ADDRESS diagnostic failure
DRAM REFRESH diagnostic failure
DRAM EDAC diagnostic failure
DRAM diagnostic failure flag=0xXXXX
EEPROM diagnostic failure flag=0xXXXX
FLASH diagnostic failure flag=0xXXXX

Table continued on next page

Table 8-2. **Firmware Reset Status/Error Messages (Continued)**

SONIC REGISTER diagnostic failure
SONIC BUSERROR diagnostic failure
SONIC LOOPBACK diagnostic failure
SONIC LINK INTEGRITY diagnostic failure
SONIC diagnostic failure flag=0xXXXX
INTERRUPT diagnostic failure flag=0xXXXX
CALENDER diagnostic failure flag=0xXXXX
QUART{0,1} Device failure
QUART{0,1} Link {0-3} failure
IHR diagnostic failure: flag=0xXXXX
CPUBUS diagnostic failure: flag=0xXXXX
PRI{1,2} failure: flag=0xXXXX
SEC failure: flag=0xXXXX
(Note: flag = 0xXXXX will be real data)
ECI{1,2}: RESET;
ECI{1,2}: STARTUP PASS;
ECI{1,2}: UNIT MODE;
ECI{1,2}: STARTUP FAILED
ECI{1,2}: FW FAILED TO BOOT
ECI{1,2}: BUS-ADDRESS ERROR PC=0xXXXXXXXX ADDR=0xXXXXXXXX
(Note: in above message, XXXXXXXX will be real data)
ECI{1,2}: FW DIAGNOSTIC FAILURE (one or more of the following messages can appear with this message)
ROM diagnostic failure flag=0xXXXX
SRAM diagnostic failure flag=0xXXXX
DRAM SHORT DATA diagnostic failure
DRAM LONG DATA diagnostic failure
DRAM ADDRESS diagnostic failure
DRAM REFRESH diagnostic failure
DRAM EDAC diagnostic failure
DRAM diagnostic failure flag=0xXXXX
EEPROM diagnostic failure flag=0xXXXX
FLASH diagnostic failure flag=0xXXXX
SONIC REGISTER diagnostic failure
SONIC BUSERROR diagnostic failure
SONIC LOOPBACK diagnostic failure
SONIC LINK INTEGRITY diagnostic failure
SONIC diagnostic failure flag=0xXXXX
INTERRUPT diagnostic failure flag=0xXXXX
CALENDAR diagnostic failure flag=0xXXXX
QUART{0,1} Device failure
QUART{0,1} Link {0-3} failure
IAO SONIC REGISTER diagnostic failure
IAO SONIC BUSERROR diagnostic failure
IAO SONIC LOOPBACK diagnostic failure
XPC{0,1} DEVICE diagnostic failure
XPC{0,1} INTERNAL LOOPBACK diagnostic failure
XPC{0,1} diagnostic failure: flag=0xXXXX
QUART{0,1} IO Bit diagnostic failure: flag=0xXXXX
IHR diagnostic failure: flag=0xXXXX
(Note: In above messages, (flag = 0xXXXX will be real data)

Table continued on next page

Table 8-2. **Firmware Reset Status/Error Messages (Continued)**

```
MCOND Alert -- PRI not available
MCOND Alert -- CI Database Boot Failed
MCOND Alert -- CI Journalling Failed
MCOND Alert -- MP Diagnostics Failed
MCOND Alert -- Boot Failed
```

Full System Boot (Reset)

This procedure is used to reset the DACS IV-2000. Messages ending in a semicolon (;) and the `BOOT IN PROGRESS` message are normal reset status messages. All other messages are error messages. `FW DIAGNOSTIC FAILURE` messages are followed by one or more lines indicating the possible areas of failure.

CAUTION:
This procedure must only be performed when instructed to do so by another procedure or by the system administrator.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing this procedure.

NOTE:
If the baud rate of the CILINK that your terminal is connected to is not set to the initial system value, system response messages will not be displayed until the reset is complete (that is, the ECI database is applied overriding the initial system value).

1. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. During a system reset, ECI-1 becomes the master and ECI-2 becomes the slave for the TABS link.
2. If the frame is connected to a DACSmate PC, disconnect the cable connected to the LAN interface adapter.

NOTE:

xxx: PC UNIT MODE messages appear during a reset if the DACS IV-2000 is connected to a DACSmate PC. If you receive these messages the DACS IV-2000 is connected to a DACSmate PC. Disconnect the DACSmate and reset the frame.

3. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button at the frame or by entering the following command (if possible):

   INIT-SYS:*[a]*::::9;

   Where:

   a = Target ID (optional)

NOTE:

During the boot sequence, the LEDs on the faceplate of the SSC circuit packs should be ignored until the boot sequence has completed.

The system takes up to 15 minutes to reset. During a reset the system does the following:

a. The main controller circuit packs are reset, causing each of the circuit packs to *drop into* their own firmware stored in on-board Read Only Memory (ROM). Each circuit pack runs its own ROM-based diagnostics.

   The following red ALM LEDs turn on:

   - *SSC, CPU, and ECI circuit pack ALM LEDs*
   - *Standby MTC, SCI, and UI circuit pack ALM LEDs*
   - *MJ and MC FAIL ALM LEDs on the status panel and HDA*

   If no equipment alarms existed before the reset, the following messages are output, not necessarily in the order shown (some of the messages can also appear during the BOOT IN PROGRESS *messages):*

```
ECI{1,2}: RESET
ECI{1,2}: STARTUP Pass
CPU{0,1}: STARTUP Pass
SSC{0,1}: STARTUP Pass
BOOT FROM {PRI{0,1}, SEC}
```

   When the system is booting from the SEC disk and there is a formatted and initialized optical disk (no programs) or a bad SEC disk drive, or from the PRI disks and the PRI disk drives do not contain the programs or are bad, the system outputs the above RESET *and* STARTUP *messages along with any error messages indicating what*

caused the boot failure. The system also continues to attempt to boot alternating control complexes. If you get any boot failure messages, replace the optical disk with a Release 5.0 software optical disk and reset the system using the RESET ENABLE and RESET switches.

b. After successful completion of the CPU on-board diagnostics, the green LED on the active CPU circuit pack lights.

c. After the MTC circuit packs associated with the active control complex are initialized, the following red ALM LEDs are turned off:

   - SSC and CPU circuit pack ALM LEDs
   - MJ and MC FAIL ALM LEDs on the status panel

d. After successful completion of the ROM-based diagnostics, the SSC firmware tries to locate a boot device. First, the SSC powers up the selected PRI disk drive and attempts to read its SSC programs. If successful, the PRI disk drive becomes the boot device and booting continues. Otherwise, the same action is attempted with the other PRI disk drive. If the second PRI disk drive is also not bootable, the SSC tries the SEC disk drive.

e. Once the active CPU detects that the SSC has booted its SSC programs, the bootstrap loader is read from the boot device.

   During the remainder of the reset process, `BOOT IN PROGRESS` *and/or* `SSC BOOT IN PROGRESS` *messages are output periodically. These messages appear for timing purposes only and do not indicate failure.*

f. The active CPU loads its CPU programs from the boot device and executes them.

g. If the boot device is the PRI disk drive, the boot process in the active CPU reads the system database from the PRI disk drive, and applies any journal files associated with that database.

h. If no valid system database is found on the PRI disk drive, if the boot device is the SEC disk drive, if Media Validation fails, or if the database has no units provisioned, the boot continues, but the system is not put in-service (IS). The system remains in the OOS-MCOND state, and the state of the switch matrix hardware is unchanged.

i. Programs are downloaded into the ECIs and the UCs which are provisioned in the system database now resident on the CPU (if no system database was loaded into the CPU, then only the ECI programs are transferred).

j. If the boot device is the PRI disk drive, the ECI database is downloaded to the ECIs (any journal files on the PRI disk drive are applied to the ECI database) and the UC databases are constructed from the system database and downloaded to the specific UCs.

k. After the ECI and all UC circuit packs are finished booting and a valid database is loaded, the system database is applied to the switch matrix hardware.

If power was not lost to both ECI circuit packs, the red ALM LEDs of the ECI circuit packs turn off. If the red ALM LEDs for both ECI circuit packs remain lit, the time-of-day clock needs to be reset (you are directed to do this later in this procedure, if necessary).

l. After the reset is complete, the following messages are output:

- If the boot device is the PRI disk drive:

  `REPT RST EQPT` (MC in the IS state)
  `REPT ALM EQPT` (MC alarm cleared)

- If the boot device is the SEC disk drive:

  `REPT RMV EQPT` (MC in the OOS-MCOND state)
  `REPT ALM EQPT` (disk drive [PRI] major alarm)

- If the time-of-day clock needs to be reset, the following two messages appear (Step 7 instructs you to set the time-of-day clock):

```
   TID YY-MM-DD HH:MM:SS
A  a REPT EXCPTN SYS
   /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
   /* EIDDET, */
   /* MEASURED (MULTI-LINE) */
   "ECI-1:INT,\"ECASE=TODC RC= SEQ= PROC=
   FILE= DP=1\",
   TODC,
   \"00 00 00 00\""
;
   TID YY-MM-DD HH:MM:SS
A  a REPT EXCPTN SYS
   /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
   /* EIDDET, */
   /* MEASURED (MULTI-LINE) */
   "ECI-2:INT,\"ECASE=TODC RC= SEQ= PROC=
   FILE= DP=1\",
   TODC,
   \"00 00 00 00\""
;
```

Where:

a = Autonomous sequence number: `001-999`

4. Log into the DACS IV-2000 (refer to logging in procedures in Chapter 4, if necessary).

5. Determine the state of the MC by either:

   - Checking the `REPT RST EQPT/REPT RMV EQPT` and/or `REPT ALM EQPT` messages.
   - Entering the following command:

     `RTRV-STATE-EQPT:`*`[a]`*`:MC;`**

     Where:

     a = Target ID (optional)

     A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

     Where:

     e = Equipment location: `{ MC, CC-{0,1}, CPU-{0,1}, MTC-{0,1}, SSC-{0,1}, SCI-{1,2}, PRI-{1,2}, ECI-{1,2}, UI }`

     f = Equipment state: `{ IS, OOS-MCOND, OOS-FLT }`

   If the state of the MC is in-service (IS), go to Step 7. If the state of the MC is out-of-service maintenance condition (OOS-MCOND), go to Step 6. If the state of the MC is out-of-service fault condition (OOS-FLT), refer to the procedure titled "High Capacity Controller Failure" (page 15-143).

6. If the system boots in the OOS-MCOND state, the reason is determined from the boot messages. At this point, there is an initialized system database in working memory and many system services are unavailable since the system is not in-service.

   For the listed condition, do the following:

   - If you received the following message:

     `DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO OOS-MCOND`

     an initialized database was copied from the PRI disk to WKG memory.

     If your frame is carrying traffic, obtain the most recent optical disk backup of the system database and refer to the section titled "Restoring Databases From SEC Disk to PRI Disk" (page 8-38).

⚠ CAUTION:
If the optical disk backup is not up to date, there can be a loss of service. If the most recent optical disk backup is not up to date, refer to office records and manually update the lost information (using the appropriate procedures) after performing the rest of this procedure.

If your frame is **not** carrying traffic and you want an initialized database booted (check with your system administrator before booting an initialized database), restore the main controller by entering the following command:

`RST-EQPT:[a]:MC:,::FRCD;`

Where:

a = Target ID (optional)

The MC takes up to 5 minutes to restore.

- If during the boot process you received the following message:

  `BOOT FROM TAPE`

  both PRI disk drives are either failed or extracted from the Memory Storage Module.

NOTE:
The term `TAPE` is functionally equivalent to the optical disk cartridge.

If the PRI disk drives are extracted from the system, make sure the PRI disk drives associated with the frame are installed properly.

If or when the PRI disk drives are installed properly, perform the following procedure:

a. Determine the state of the PRI disk drives by entering the following command:

`RTRV-STATE-EQPT:[a]:MC;`

Where:

a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "..."
   "e:f"
   "..."
;
```

Where:

e = Disk drive location: `PRI-{1,2}`

f = Equipment state: `{ IS, OOS-MTCE, OOS-FLT }`

If the state of one PRI disk drive is OOS-FLT, replace the PRI disk drive by referring to the section titled "Replacing One PRI Disk Drive" (page 17-5). If both PRI disk drives are

OOS-FLT, replace both PRI disk drives by referring to the section titled "Replacing Both PRI Disk Drives" (page 17-7). Otherwise continue with the next step.

b. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = PRI disk drive location: `PRI-[1,2]`

This command takes up to 20 minutes to complete.

- If the system booted in the OOS-MCOND state because of system database corruption (for example, you received `CAN'T BOOT DB` or `CAN'T BOOT JOURNALS` messages), you must retrieve the most recent optical disk backup of the system database and go to the section titled "Restoring Databases From SEC Disk to PRI Disk" (page 8-38).
- If the system booted in the OOS-MCOND state because of TID mismatch, perform the following procedure:

a. Determine the content of the System Identifiers by entering the following command:

`RTRV-SYSID:`*[a]*`;`

Where:

a = Target ID (optional)

The following output appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY_TYPE,ID_BLOCK,SYSTEM_TYPE,
   SYSTEM_RELEASE,TID,DATE,TIME */
   "c,d,e,f,g,h,i"
;
```

Where:

c = Memory type: `{ WKG, PRI-{1,2}, SEC }`

d = Data transfer ID block: `{ PROG, DBASE, WKG }`

e = System type: `{` <1-20 Legal Characters>, `NOT FOUND }`

f = System software release: `{ 5.0.{0-99}.m, NOT FOUND }`

g = Target ID: `{` <1-18 TID Legal Characters>, `NOT FOUND }`

h = Date of backup: { {00-99}{01-12}{01-31}, NOT FOUND }

i = Time of backup: { {00-23}{00-59}{00-59}, NOT FOUND }

NOTE:

The date and time stamp (parameters *h* and *i*) associated with the SEC disk is the date and time of the last CPY-MEM command from PRI to SEC was executed. The data and time stamp associated with the PRI disks is the data and time when the last manual or autonomous (for example, applying journal files) transfer from WKG to PRI occurred.

b. From the output of the RTRV-SYSID command, determine the TIDs of the two PRI disk drives and WKG memory.

c. Extract the PRI disk drive that does not belong, and reboot the system. If you need to replace the wrong PRI disk drive with a new one, refer to the section titled "Replacing One PRI Disk Drive" (page 17-5).

d. If the PRI disk drives are good, and WKG memory has the wrong TID, correct the WKG memory TID by entering the following command:

SET-SID:*[a]*:::*c*;

Where:

a = Target ID (optional)

c = WKG memory target ID: { <1-18 TID Legal Characters>, CURVAL }

7. If you received the two REPT EXCPTN SYS messages indicating the time-of-day clock needs to be reset and the red ALM LEDs of the ECI circuit packs are lit, edit the time-of-day clock by entering the following command:

ED-DATE:*[a]*:::*[c]*,*[d]*;

Where:

a = Target ID (optional)

c = Date: {00-39, 81-99}{01-12}{01-31} (optional)

d = Time: {00-23}{00-59}{00-59} (optional)

8. If you disconnected a DACSmate PC in Step 2, reconnect it to the LAN interface adapter on the frame.

Manual Control Complex Side Switch

This procedure is used when you need to manually switch the standby control complex (CC) to the active control complex.

1. Make sure there are no alarms active by entering the following command:

   RTRV-ALM-ALL:*[a]*;

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 15-12) before performing this procedure.

2. Put the main controller (MC) in the OOS-MCOND state by entering the following command:

   ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

   Where:

   a = Target ID (optional)

3. Perform a control complex side switch so that the standby control complex (control complex without the green LED lit) becomes the active control complex by entering the following command:

   RST-EQPT:*[a]*:MC::::*[e]*;

   Where:

   a = Target ID (optional)

   e = Control complex (to become active) location: CC-{0,1}

This command takes up to 5 minutes to complete.

Manual Synchronizer Side Switch

This procedure is used when you need to manually switch the standby synchronizer side to the active synchronizer side (for example, during maintenance of the external timing reference connections to a synchronizer side). This procedure must only by performed when instructed to do so by the system administrator or another procedure.

1. Retrieve the state of the synchronizer sides to determine which one is in the standby state (STBY) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SYNC-0&SYNC-1;

   Where:

   a = Target ID (optional)

The following output response appears:

```
TID YY-MM-DD HH:MM:SS
M    CTAG COMPLD
/* LOC:STATE "/
"SYNC-0:f"
"SYNC-1:f";
```

Where:

f = State of synchronizer side: { ACT, STBY, OOS-FLT }

If either synchronizer side is in the OOS-FLT state, clear the failure before performing this procedure by referring to the section titled "Prioritizing Alarms" (page 15-12).

2. If either synchronizer side is in the OOS or OOS-MTCE state, restore it to service by entering the following command:

   RST-EQPT:*[a]:b*;

   Where:

   a = Target ID (optional)

   b = Synchronizer location: SYNC-{0,1}

This command takes up to 3 minutes to complete. The synchronizer side restored to service becomes the STBY synchronizer side.

3. Retrieve the state of the DS1TX circuit pack (TX) of the standby synchronizer to determine if it is in the IS (in-service) state by entering the following command for both DS1TX circuit packs:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: TX-{0,1}

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "b:f"
;
```

   Where:

   b = DS1TX circuit pack location: TX-{0,1}

   f = State of DS1TX circuit pack: { ACT, AVAIL, IS, OOS, OOS-MTCE, OOS-MTCELIM, OOS-FLT, OOS-FEF }

   If the standby DS1TX circuit pack is in the OOS-FLT or OOS-FEF state, clear the failure before performing this procedure by referring to the section titled "Prioritizing Alarms" (page 15-12).

4. If the DS1TX circuit pack of the standby synchronizer side is in the OOS or OOS-MTCE state, restore the DS1TX circuit pack to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: TX-{0,1}

   This command takes less than 1 minute to complete.

5. Switch the standby synchronizer side to the active state by entering the following command:

   `SW-DX-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Standby synchronizer location: `SYNC-[0,1]`

   This command takes less than 1 minute to complete.

   After the switch is complete, all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs. For version 2 synchronizer circuit packs, the green ACT LEDs of the active synchronizer side light while the green ACT LEDs of the standby synchronizer side turn off, and the synchronizer mode changes to FST, then changes to NORM.

   Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

Manual Timing Reference Side Switch

This procedure is used to manually switch the primary and secondary timing references that are received by the DS1TX circuit packs from standby to active and from active to standby (for example, during maintenance of one of the external timing references).

NOTE:
The timing reference can only be switched on the active synchronizer side.

Perform this procedure only when instructed to do so by the system administrator or by another procedure.

1. Determine the active timing reference by entering the following command:

   `RTRV-SYNCN:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SMODE,ACTIVE_REF */
   "NORM,d"
;
```

Where:

d = Active timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

The synchronizer side associated with the active timing reference is the active synchronizer side. For version 2 synchronizer circuit packs, the green ACT LEDs are also lit to indicate the active side.

NOTE:
The synchronizer mode must be NORM to switch the timing reference side.

2. Make sure no alarms are active on the standby timing reference associated with the active DS1TX circuit pack by entering the following command:

RTRV-ALM-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Standby timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

If there are no alarms, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

If there is an active alarm, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
   "h:i,j,k,,,NEND"
;
```

Where:

h = Standby timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

i = Notification code: { MJ, MN }

j = Condition type: { EOR, EXJIT, FRQOF, LOS, OOF, PHSTP, TRBER, TRMNBER }

k = Service affecting: { SA, NSA }

If there is an active alarm, note the alarm condition (parameter *j*) and clear the failure before performing this procedure by referring to the section titled "External Timing Reference (BITS) Failure" (page 15-173).

3. Switch the standby timing reference (SYNCPRI-{0,1} or SYNCSEC-{0,1} associated with the active synchronizer side) to the active timing reference by entering the following command:

   `SW-DX-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Standby timing reference location: `{ SYNCPRI-[0,1], SYNCSEC-[0,1] }`
   Specifies the location of the standby timing reference associated with the active synchronizer side.

   This command takes less than 1 minute to complete.

   Executing the `SW-DX-EQPT` command on the timing reference causes the synchronizer mode to change to FST, then to NORM for the version 2 circuit packs.

Changing Synchronizer Mode

This procedure is used when you need to manually change the synchronizer mode of operation (for example, during maintenance of both of the external timing references and/or connections to the Synchronizer Module). This procedure must only by performed when instructed to do so by the system administrator. When performing maintenance on the external timing references, you only need to switch between the NORM and HLDOVR synchronizer modes.

1. Retrieve the synchronizer mode of operation by entering the following command:

   `RTRV-SYNCN:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following output response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SMODE,ACTIVE_REF */
   "c:..."
   ;
```

   Where:

   c = Synchronizer mode: `{ NORM, HLDOVR, FST, FRNG }`

2. Change the synchronizer mode of operation by entering the following command:

   SET-SYNCN:*[a]*:SYNCN:::*d*;

   Where:

   a = Target ID (optional)

   d = Synchronizer mode: { NORM, HLDOVR, FST }
   The available modes of operation of concern for this procedure are:

   - NORM (phase-locked mode) — used when switching to normal operation after external maintenance is done. This mode can only be specified if the synchronizer side was previously switched manually to the HLDOVR mode. Otherwise, this command is denied.
   - HLDOVR (holdover mode) — used to maintain output frequency during external maintenance. Clock reference is tied to the internal Stratum 3 clock (TBS3 circuit pack).
   - FST (fast mode) — used to provide loop time constraints that allow fast lock to the reference input(s). If continuous autonomous switching (oscillation) occurs between timing references on a single SYNC side, this mode is used to lock to a known good DS1 timing reference. Locking to the DS1 timing reference must only be done if the DS1 timing reference is good.

   This command takes less than 1 minute to complete. When changing to holdover mode, the following happens:

   - A REPT ALM EQPT message (minor alarm) appears indicating the Synchronizer is in holdover mode.
   - A REPT ALM EQPT message appears on each DS1TX circuit pack indicating an OOS-MTCELIN state (major alarm).
   - All LEDs on version 2 DS1TX circuit packs extinguish.
   - All timing references for version 2 Synchronizer circuit packs continue to be monitored.

   When changing to normal mode, a REPT ALM EQPT *message appears indicating the* SYNCHLDOVR *alarm condition has cleared.*

   - A REPT ALM EQPT message appears, indicating the holdover has cleared. Major alarms are retired and the Synchronizer goes to FST before it goes to NORM.
   - The green ACT LED on the version 2 DS1TX circuit pack on the active side lights.

Software Release and Databases

This section contains procedures for retrieving software release information, using and formatting an optical disk cartridge, backing up and restoring the system database, and backing up the software release.

Be sure you have an optical disk cartridge that has been formatted for the current software release. You can format optical disk cartridges on the DACS IV-2000; they must be formatted before restoring an SEC disk drive. Chapter 2 contains information on the approved optical disks supported by the DACS IV-2000 (512).

Retrieving Software Release Information

This procedure is used to retrieve software release information, including software patches that may have been made to the DACS IV-2000 frame. This procedure contains information for interpreting the data retrieved.

1. Retrieve the software release information by entering the following command:

   RTRV-PRMTR-SFTWR: *[a]*;

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* REFERENCE_#,DATE,COMMENT,PATCH_# */
   "c,d,
    AT&T Proprietary Copyright (c) 1996 AT&T All Rights Reserved"
;
```

   Where:

   c = Reference number: `5-00-{1-99}-m-{0-99}.{0-99}.{0-99}`
   The first four components indicate the software release, point release, issue of the point release, and the load indicator (`m` indicates a DACS IV-2000 [512] software load). The last three components are used by AT&T for the purpose of identifying the software running on a DACS IV-2000.

   d = Date: `{00-99}{01-12}{01-31}`
   The first component is the last two digits of the year, the second component is the month, and the last component is the day associated with the reference number in parameter *c*.

   The data retrieved from this command is used to identify the version of the software release. This information is needed for AT&T technical support.

Optical Disk Cartridge Description

The front of the optical disk cartridge is the side with the manufacturer's label on the silver shutter. Figure 8-3 shows the front of an optical disk cartridge. At the bottom of the optical disk cartridge is a label put on during software manufacturing identifying the contents. In addition, space is provided on the identification label for customer information labeling.

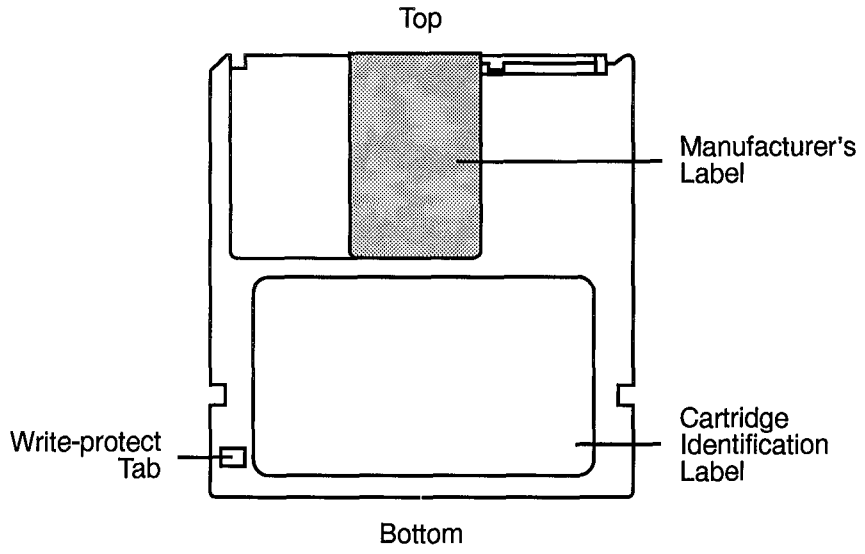


Figure 8-3. **Optical Disk Cartridge (Front View)**

The back of the optical disk cartridge is the side with the silver shutter and the write-protect tab in the lower right-hand corner (refer to Figure 8-4). The write-protect tab has two positions as follows:

- With the black square positioned towards the top of the optical disk cartridge, the write-protect window is closed and writing is possible; write-protection is OFF. See Figure 8-4, left side.
- With the black square positioned towards the bottom of the optical disk cartridge, the write-protect window is open and writing is impossible; write-protection is ON. See Figure 8-4, right side.

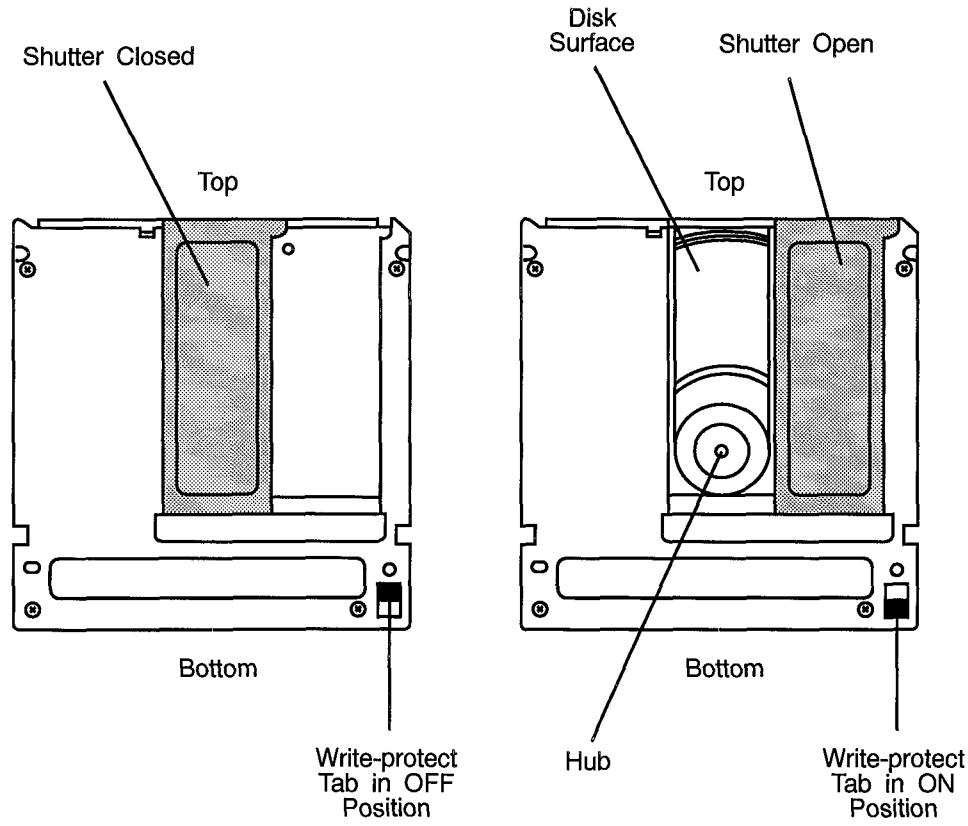


Figure 8-4. **Optical Disk Cartridge (Rear Views)**

Extracting/Installing Optical Disk Cartridge

This procedure is used to extract an optical disk cartridge from the SEC disk drive and/or install an optical disk cartridge into the SEC disk drive.

1. If your office procedure require you to remove the SEC disk drive from service, power down the SEC disk drive by entering the following command:

   `RMV-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to co*mplete. After completion, the green ON LED is extinguished and a minor (MN) alarm is present on the frame.*

2. If there is an optical disk cartridge in the SEC disk drive, press the eject button at the top of the SEC disk drive (refer to Figure 8-5).

NOTE:
The optical disk cartridge cannot be removed from the SEC disk drive until the Drive in Use LED (refer to Figure 8-6) is extinguished.

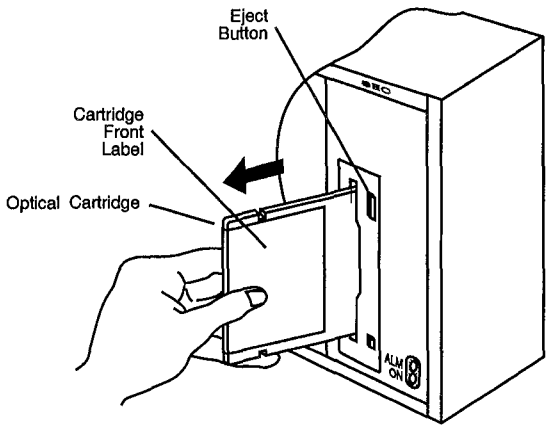


Figure 8-5. **Removing an Optical Disk Cartridge**

3. If the optical disk cartridge ejected, continue with the next step. Otherwise, perform the following procedure to eject the optical disk cartridge:

    a. Insert the emergency eject tool (Part No. 406923292) into the hole provided in the SEC disk drive (refer to Figure 8-6 for location of hole and required orientation for inserting the tool).

⚠ CAUTION:
Use of objects like a paper clip to force the optical disk cartridge to eject can damage the SEC disk drive. Use only the approved emergency eject tool.

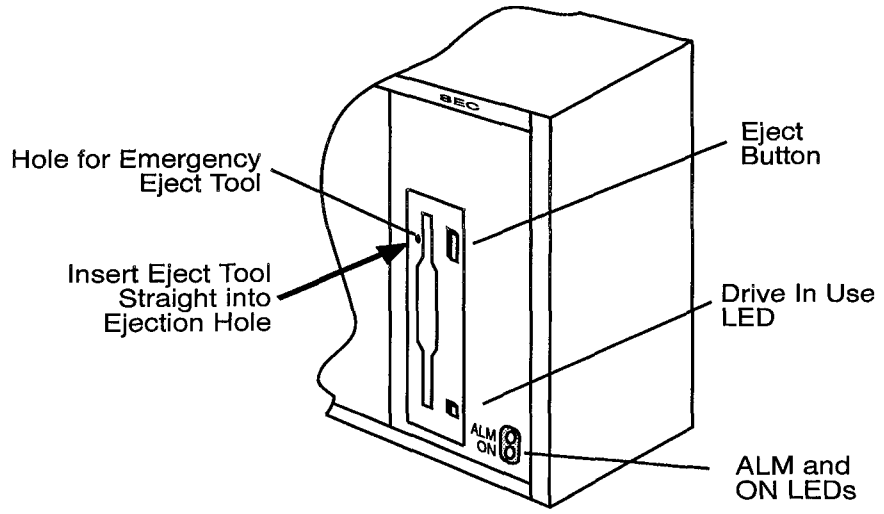


Figure 8-6. **Using the Emergency Eject Tool**

    b. Insert the tool straight back into the hole, being careful not to tilt it towards the top, sides, or bottom of the SEC disk drive.

    c. Exert enough pressure on the tool until the optical disk cartridge pops out of the SEC disk drive approximately one inch.

4. Pull the optical disk cartridge out of the SEC disk drive (refer to Figure 8-5) and store it in its container.

5. If you are restoring the latest database copy or loading the software release, obtain the optical disk cartridge containing the necessary data. Otherwise, obtain a formatted optical disk cartridge.

6. Take the optical disk cartridge obtained in Step 5 from its container and insert it in the SEC disk drive and push it in until it is flush with the SEC disk drive face.
7. If you removed the SEC disk drive from service in Step 1, power up the SEC disk drive by entering the following command:

   `RST-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion, the green ON LED lights.

   If the optical disk cartridge is installed incorrectly or unformatted, this command is denied with the error code ENMD. Install the optical disk cartridge properly or format the optical disk cartridge [refer to the section titled "Formatting a Blank Optical Disk Cartridge" (page 8-31) for information about formatting an optical disk cartridge].

   If the SEC disk drive is installed incorrectly or has failed, this command is denied with the error code ENEQ. Install the SEC disk drive properly or replace the SEC disk drive [refer to the section titled "Replacing the SEC Disk Drive" (page 17-11) for information about replacing the SEC disk drive].

Formatting a Blank Optical Disk Cartridge

This procedure must only be used to format a J98786SL-3 List 3 DACS IV-2000 (512) Release 5.0 Blank Optical Cartridge that has never been used before.

CAUTION:
Do not use this procedure on an optical disk cartridge containing the software release and/or a database.

1. Insert the new J98786SL-3 List 3 DACS IV-2000 (512) Release 5.0 Blank Optical Cartridge into the SEC disk drive making sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 8-27), if necessary].

2. Attempt to restore the SEC disk drive to service by entering the following command:

   `RST-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   If this command fails, continue with Step 3.

   If this command completes (the green ON LED lights), the optical disk in the SEC disk drive has already been formatted. Perform the following procedure to remove the optical disk cartridge:

   a. If your office procedures require you to remove the SEC disk drive from service, remove the SEC disk drive from service by entering the following command:

      `RMV-EQPT:[a]:SEC;`

      Where:

      a = Target ID (optional)

      This command takes up to 1 minute to complete. After completion, the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

   b. Eject the optical disk cartridge and go back to Step 1.

3. Determine the contents of the optical disk cartridge by entering the following command:

   `RTRV-SYSID:[a];`

   Where:

   a = Target ID (optional)

   The following response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY TYPE,ID BLOCK,SYSTEM TYPE,SYSTEM RELEASE,TID,DATE,TIME */
   ...
   "SEC,PROG,NOT FOUND,NOT FOUND,,,"
   "SEC,DBASE,NOT FOUND,NOT FOUND,NOT FOUND,NOT FOUND,NOT FOUND"
   ...
;
```

   If the above message appears with the `NOT FOUND` values, continue with Step 4.

If the parameters in the SEC,PROG and SEC,DBASE data lines are anything other than NOT FOUND, the optical disk cartridge in the SEC disk drive has already been formatted. Perform the following procedure to remove the optical disk cartridge:

a. If your office procedures require you to remove the SEC disk drive from service, remove the SEC disk drive from service by entering the following command:

   RMV-EQPT:*[a]*:SEC;**

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion, the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

b. Eject the optical disk cartridge and go back to Step 1.

4. Format the J98786SL-3 List 3 DACS IV-2000 (512) Release 5.0 Blank Optical Cartridge by entering the following command:

   CPY-MEM:*[a]*:::INIT,SEC,FORMAT;**

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes using **FORMAT** *and up to 2 minutes using* **HEADER** *to complete.*

Backing Up Software Release to SEC Disk

The following procedure is used to make backup copies of the software release on the SEC disk. There is no reason to use this procedure with the J98786SL-3, List 1 or List 4 optical disk cartridges. (A copy of the software is already on these optical disks.) The main controller must be in the in-service (IS) state to perform this procedure.

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 to the optical disk, make sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 8-27), if necessary]. The backup fails with the error code ENRE *if the optical disk is write-protected.*

1. Load a formatted optical disk in the SEC disk drive. If necessary, refer to the previous section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29).

2. Copy the software release from the PRI disk to the SEC disk by entering the following command:

   `CPY-MEM:[a]:::PRI,SEC,PROG;`

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete. *Wait for the* `COMPLD` *response before continuing with the next step.*

   If the software backup is aborted, redo this step or if necessary, replace the optical disk cartridge with a new one [re*fer to the section titled "Extracting/ Installing Optical Disk Cartridge" (page 8-29) for replacing* optical disk cartridges, if necessary] before redoing this step.

⚠ CAUTION:
If the software backup is aborted for any reason, do not use the optical disk cartridge with the aborted backup on it for loading software.

3. If your office procedures require you to remove the SEC disk drive from service, power down the SEC disk drive by entering the following command:

   `RMV-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to com*plete. After completion, the green ON LED is extinguished.*

4. If your office procedures require, eject the optical disk cartridge (label it as necessary) and store it in its protective case.

NOTE:
The optical disk cartridge cannot be removed from the SEC disk drive until the green ON LED is extinguished.

Backing Up Database to SEC Disk

The following procedure is used to make backup copies of the database onto the SEC disk. Daily backup of the database is essential. The recommended procedure for performing the backups is to use at least two disks with the current software release (preferably one disk for each day of the week you perform backups), and alternate the use of those disks so that the most recent backup is not overwritten. In addition, the date, time, and disk number of each backup should be recorded in a log.

The **ED-NE** command offers the option to enable automatic backups. Automatic backups can be scheduled to execute once in a 24-hour period on selected days, or on every day of the week. Refer to the section titled "Scheduled Database Backup" (page 3-6) for more information.

The main controller must be in the in-service (IS) state to perform both manual and automatic backups.

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 to the optical disk, make sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 8-27), if necessary]. The backup fails with an error code of ENRE *if the optical disk is write-protected.*

⚠ CAUTION:
Manual database backups must not be performed if there are any alarms or protection switches in effect on the DACS IV-2000 frame.

1. Make sure there are no alarms or protection switches active by entering the following command:

   RTRV-ALM-ALL:*[a]*;

   Where:

   a = Target ID (optional)

   If any alarms or protection switches (condition type of INHSWPR) are present, go to the section titled "Isolating Failures" (page 15-12) before performing this procedure.

2. Load a formatted disk into the SEC disk drive, if necessary. Refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29) if necessary.

3. Determine the software release and Target ID (TID) on the optical disk by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID

   The following output appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
   CALCK,HEADCK,INTEGCK */
   "SEC,PROG, ...,g,h,..."
;
```

   Where:

   g = System software release: { 5-00-{1-99}-m, NOT FOUND }

   h = Target ID

   If the software release is not the latest and/or the TID does not match that of the DACS IV-2000 frame, obtain a copy of the latest release with a matching TID and redo this procedure.

4. Update the database on the PRI disks by entering the following command:

   CPY-MEM:*[a]*::**:WKG,PRI,DBASE;**

   Where:

   a = Target ID (optional)

   This command takes up to 6 minutes to complete. *Wait for the* COMPLD *response before continuing with the next step.*

5. Backup the database to SEC disk by entering the following command:

   CPY-MEM:*[a]*::**:PRI,SEC,DBASE;**

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete. *Wait for the* COMPLD *response before continuing with the next step.*

   If the database backup is aborted, redo this step, or if necessary, replace the optical disk cartridge with a new one [re*fer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29) for replacing* optical disk cartridges, if necessary] before redoing this step.

⚠ CAUTION:
If the database backup is aborted for any reason, do not use the optical disk cartridge with the aborted backup on it for restoring databases.

6. Retrieve the date and time of the backup by entering the following command:

   `RTRV-SYSID:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following output appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY_TYPE,ID_BLOCK,SYSTEM_TYPE,SYSTEM_RELEASE,
   TID,DATE,TIME */
   "..., h, i"
;
```

   Where:

   h = Date of backup: `{ {00-99}{01-12}{01-31}, NOT FOUND }`

   i = Time of backup: `{ {00-23}{00-59}{00-59}, NOT FOUND }`

7. Record the date, time, and optical disk number of the database backup in a log.

8. If your office procedures require you to remove the SEC disk drive from service, power down the SEC disk drive by entering the following command:

   `RMV-EQPT:`*[a]*`:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to com*plete. After completion, the green ON LED is extinguished.*

9. Eject the optical disk cartridge and store it in its protective case.

NOTE:
The optical disk cartridge cannot be removed from the SEC disk drive until the Disk in Use LED is extinguished.

Restoring Databases From SEC Disk to PRI Disk

This procedure is used to restore the database from a backup disk to the PRI disk if the PRI disk drive is in-service (IS). This procedure **must** only be used when instructed to do so by another procedure (after consulting with the system administrator or next level of support) or by the system administrator.

CAUTION:
*This procedure overwrites the database on the PRI disk drive if the PRI disk drive is in-service (IS). This is **not** a daily operation, and must only be performed after consulting your system administrator or next level of support.*

NOTE:
The write-protect tab must be in the ON (not-writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 8-27), if necessary] during this procedure.

1. Place the main controller in the out-of-service maintenance condition (OOS-MCOND) state using the command:

   `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

   Where:

   a = Target ID (optional)

   The MJ and MC FAIL alarm LEDs on the status panel turn on.

2. Load the disk with the latest database backup in the SEC disk drive. If necessary, refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29).

3. Check the date and time of the database backup, the software release of the optical disk database, and the TID associated with the stored database information by entering the following command:

   `RTRV-SYSID:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY TYPE,ID BLOCK,SYSTEM TYPE,SYSTEM RELEASE,
   TID,DATE,TIME */
   ...
   "SEC,DBASE,...,f,g,h,i"
   ...
;
```

Where:

f = System software release: { 5.0.{0-99}.m, NOT FOUND }

g = Target ID: { <1-18 TID legal characters>, NOT FOUND }

h = Date: { {00-99}{00-12}{00-31}, NOT FOUND }

i = Time: { {00-23}{00-59}{00-59}, NOT FOUND }

From the output response, verify the time and date of the backup corresponds with the time and date in the database backup log, the software release is the same as that currently in working memory, and the TID of the disk matches the TID of the frame. If any of the information is not correct, get the correct optical disk and go back to Step 2.

4. Power up the SEC disk drive by entering the following command:

   RST-EQPT:*[a]*:SEC;**

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion, the green ON LED lights.

   If this command fails, check and/or replace the SEC disk and/or SEC disk drive, as necessary.

5. Copy the database from the SEC disk to the PRI disk drive by entering the following command:

   CPY-MEM:*[a]*:::SEC,PRI,DBASE:Y;**

   Where:

   a = Target ID (optional)

   This command takes up to 12.5 minutes to complete.

   If REPT EXCPTN SYS messages appear during the **CPY-MEM** command, refer to the section titled "CPY-MEM Command Failure" (page 16-9) to clear the problem before continuing with this procedure.

6. Remove the optical disk cartridge from the SEC disk drive by referring to the section titled "Extracting/Installing Optical Disk Cartridge" (page 8-29).

   If your office procedures require that an optical disk cartridge be used for automatic database backups, install that optical disk cartridge into the SEC disk drive after extracting the optical disk cartridge used in this procedure.

7. Reset the system by entering the following command:

   `INIT-SYS:[a]::::9;`

   Where:

   a = Target ID (optional)

   The system takes up to 20 minutes to reset. For more information on booting the DACS IV-2000, see the section titled "Reset and Boot" (page 8-7).

   If during the system reset you receive the following message:

   `DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO OOS-MCOND`

   contact your system administrator or next level of support immediately for further assistance in loading the system database.

Login Administration

These procedures involve activities that are normally performed by a system administrator. It consists of creating a new user of the DACS IV-2000, changing the parameters associated with a user's login, and deleting a user from the system.

To perform any of the following procedures, you must be a system administrator or have received privileges from your system administrator.

Valid User IDs (UID)/Passwords

To allow access to the DACS IV-2000, the system administrator creates valid UIDs (logins) and their associated passwords. These UID/password pairs allow users to access the DACS IV-2000 to perform administrative, operational, provisioning, and maintenance functions.

Valid UIDs consist of one to ten characters. Allowable characters are letters (A-Z, a-z), decimal digits (0-9), and *special legal characters* (- . # % +). The first character of a UID must be a letter. Valid passwords consist of six to eight characters. At least two of the characters must be nonalphabetic characters with at least one character being a *special legal character.* Password characters are letters (A-Z, a-z), decimal digits (0-9), and *special legal characters* (# % +). The first character of a password must be a letter.

The DACS IV-2000 (512) allows the current set of UIDs and their associated passwords even if they do not adhere to the above rules. However, when creating new passwords, they must follow the above rules.

NOTE:
Logins used on 256 frames that are capacity expanded are no longer valid.

Creating Logins

1. Create a user login by entering the following command:

   ENT-SECU-USER:*[a]*:*b*:::*d*,,*e*:*[*UCPL=*f*,SCREEN=*g*,DMODE=*h*,
   UTYPE=*i*,ECHO=*j*,VTNUM=*k]*;

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 UID legal characters>

   d = Password: <6 to 8 PSWD legal characters>

   e = User Privilege Code (UCFC/UCAL pair): [P[1-5], M[1-5], T[1-5], S[1-5], PM[1-5]]

   f = User Community Priority Level (UCPL): [1-5]
   Default value: 5 for superuser, 1 for all other users

   g = Message Screening: [INPUT, AUTO, ALL, DBAUTO, DBALL]
   Default value: DBALL

   h = Dialog Mode: [MENU, COMMAND]
   Default value: COMMAND

   i = User Type: [HUMAN, MACHINE]
   Default value: MACHINE

   j = Message Echo: [ON, OFF]
   Default value: OFF
   For more information on using the input command routing feature, refer to the section titled "Using the Input Command Routing Feature (Message Echo)" (page 9-26).

   k = VT1.5 signal numbering scheme: [VT1.5NUM, VTGROUP, CURVAL]
   Default value: CURVAL
   Initial system value: VT1.5NUM
   Specifies the addressing scheme to use when referring to DS1 or VT1.5 tributaries within STS-1 signals. VT1.5NUM indicates that the DS1 or VT1.5 is addressed as the number (1-28) within the STS-1. VTGROUP indicates that the DS1 or VT1.5 is addressed as the VT group (1-7)-VT number (1-4). Refer to Chapter 2 of the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) for more information of DS1 and VT1.5 mappings.

2. Repeat this procedure for each user login you need to create.

Changing Logins

1. Change a user login by entering the following command:

   To change login parameters other than password:

   ED-SECU-USER:*[a]*:*[b]*:::*[d]*,*[e]*,,*[f]*:[UCPL=*g*,SCREEN=*h*,DMODE=*i*, UTYPE=*j*,ECHO=*k*,VTNUM=*l*];

   Where:

   a = Target ID (optional)

   b = Current User ID: <1 to 10 UID legal characters>

   d = New User ID: <1 to 10 UID legal characters>

   e = Current Password: <6 to 8 PSWD legal characters>

   f = User Privilege Code (UCFC/UCAL pair): [P[1-5], M[1-5], T[1-5], S[1-5], PM[1-5], CURVAL]
   Default value: CURVAL

   g = User Community Priority Level (UCPL): [[1-5], CURVAL]
   Default value: CURVAL

   h = Message Screening: [INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL]
   Default value: CURVAL

   i = Dialog Mode: [MENU, COMMAND, CURVAL]
   Default value: CURVAL

   j = User Type: [HUMAN, MACHINE, CURVAL]
   Default value: CURVAL

   k = Message Echo: [ON, OFF, CURVAL]
   Default value: CURVAL
   For more information on using the input command routing feature, refer to the section titled "Using the Input Command Routing Feature (Message Echo)" (page 9-26).

   l = VT1.5 signal numbering scheme: [VT1.5NUM, VTGROUP, CURVAL]
   Default value: CURVAL
   Initial system value: VT1.5NUM
   Specifies the addressing scheme to use when referring to DS1 or VT1.5 tributaries within STS-1 signals. VT1.5NUM indicates that the DS1 or VT1.5 is addressed as the number (1-28) within the STS-1. VTGROUP indicates that the DS1 or VT1.5 is addressed as the VT group (1-7)-VT number (1-4). Refer to Chapter 2 of the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) for more information of DS1 and VT1.5 mappings.

To change password parameter only:

`ED-SECU-PID:`*[a]*`:`*b*`:::`*d*`,`*e*`;`

Where:

a = Target ID (optional)

b = Current User ID: <1 to 10 UID legal characters>

d = Current Password <6 to 8 PSWD legal characters>

e = New password: <6 to 8 PSWD legal characters>

2. Repeat this procedure for each user login/password you need to change.

Removing Logins

1. Remove a user login by entering the following command:

   `DLT-SECU-USER:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = User ID to be deleted

2. Repeat this procedure for each user login you need to remove.

Security Audit Feature

To help system administrators determine if the security of the system has been compromised, the DACS IV-2000 (512) Release 5.0 provides the Security Audit feature to maintain a record of the following security-related events:

- User logins and all autonomous and manual user logouts
- Login creations, deletions, and changes
- Failed login attempts that result in a link lockout
- Input commands issued by a user with the incorrect security level
- Changes of the system time or date
- Edit link security parameters
- Delete security audit records

The security audit log maintains the most recent 100 security-related events in nonvolatile memory. Table 8-3 lists the events that are entered into the security audit log.

Table 8-3. **Security Audit Log Events**

Security-Related Event	Command Format (Output Response)	Status
ACT-USER	ACT USER::*b*:*c*: **Where:** *b* = UID, *c* = CTAG	COMPLD
ACT-USER	ACT USER	DENY
CANC-USER	CANC USER::*b*:*c* **Where:** *b* = UID, *c* = CTAG	COMPLD
CANC-USER	CANC USER	DENY
Autonomous Logout	CANC USER	AUTO
DLT-SECU-AUD	DLT SECU AUD:::*b* **Where:** *b* = CTAG	COMPLD
DLT-SECU-AUD	DLT SECU AUD	DENY
DLT-SECU-USER	DLT SECU USER::*b*:*c* **Where:** *b* = UID, *c* = CTAG	COMPLD
DLT-SECU-USER	DLT SECU USER	DENY
ED-SECU-PID	ED SECU PID::*b*:*c*::, **Where:** *b* = UID, *c* = CTAG	COMPLD

Table continued on next page.

Table 8-3. Security Audit Log Events (Continued)

Security-Related Event	Command Format (Output Response)	Status
ED-SECU-PID	ED SECU PID	DENY
ED-SECU-LINK	ED SECU LINK::*b*:*c*:*d*:*e*,*f*,*g* **Where:** *b* = Link ID, *c* = CTAG, *d* = Inactivity *e* = Number Lock-Out, *f* = Interval Lock-Out *g* = Time Lock-Out	COMPLD
ED-SECU-LINK	ED SECU LINK	DENY
Number Lock-Out Value Exceeded	REPT ALM LINK:*c*:*d*,*e*,*f*::,*g* **Where:** *c* = Link ID, *d* = Notification Code *d* = Condition Type, *f* = Service Affecting *g* = Trouble List	AUTO
ED-DATE	ED DATE:::*b*:*c*,*d* **Where:** *b* = CTAG, *c* = Date *d* = Time	COMPLD
ED-DATE	ED DATE	DENY
ED-SECU-USER	ED SECU USER::*b*:*c*::*d*,,,*f*:<*g h i j k*> **Where:** *b* = Old User ID, *c* = CTAG *d* = New User ID, *f* = UCFC/UCAL, *g* = UCPL *h* = Message Screening, *i* = Dialog Mode *j* = User Type, *k*= Message Echo	COMPLD
ED-SECU-USER	ED SECU USER	DENY
ENT-SECU-USER	ENT SECU USER::*b*:*c*::,,*e*:<*f g h i j j*> **Where:** *b* = UID, *c* = CTAG, *e* = UCFC/UCAL *f* = UCPL, *g* = Message Screening, *h* = Dialog Mode, *i* = User Type, *j* = Message Echo	COMPLD
ENT-SECU-USER	ENT SECU USER	DENY
INIT-SYS	INIT SYS::MC:*c*:5 **Where:** *c* = CTAG	COMPLD
INIT-SYS	INIT SYS	DENY

Retrieving Security Audit Events

This procedure is used to retrieve security-related events that are stored in the DACS IV-2000 security audit database. This procedure is restricted to system administrators with a user privilege code (UCFC/UCAL pair) of S5.

1. Retrieve security-related events by entering the following command:

   `RTRV-SECU-AUD:`*[a]*`:::`*[c]*`:`*[d]*`;`

   Where:

   a = Target ID (optional)

   c = Date: `[ [00-39,86-99][01-12][01-31], ALL ]`
   Default: `ALL` (retrieve the entire security audit log)
   Specifies the date to begin retrieving recorded security-related events from.

   d = Time: `[ [00-23][00-59][00-59], ALL ]`
   Default: `ALL` (retrieve the entire security audit log)
   Specifies the time to begin retrieving recorded security-related events from. This parameter must be `ALL` if the date (parameter *c*) is `ALL`.

   The output response of this command has the following formats:

   - If no security-related events are recorded or all events are before the specified date and time, the output response is:

     ```
        TID YY-MM-DD HH:MM:SS
     M  CTAG COMPLD
     ;
     ```

   - If security-related events have been recorded after the specified date and time, the output response is:

     ```
        TID YY-MM-DD HH:MM:SS
     M  CTAG COMPLD
        /* STATUS,DATE,TIME,LINKID,UID,COMMAND */
        "e,f,g,h,i,j"
     ;
     ```

     Where:

     e = Status of recorded event: `{ COMPLD, DENY, AUTO }`

     - `COMPLD` — indicates the recorded event (command) was successfully completed.
     - `DENY` — indicates the recorded event (command) was denied.
     - `AUTO` — indicates the recorded event is due to an autonomous DACS IV-2000 action.

f = Date of recorded event: `{00-39,86-99}{01-12}{01-31}`

g = Time of recorded event: `{00-23}{00-59}{00-59}`

h = Link location of recorded event: `CILINK-{1,2}-{1-6}`

i = User ID used for recorded event

j = Command and modifiers or autonomous event recorded. Refer to page 8-3 for a list of commands and autonomous events.

Deleting Security Audit Events

This procedure is used to delete security-related events that are stored in the DACS IV-2000 security audit database. This procedure is restricted to system administrators with a user privilege code (UCFC/UCAL pair) of S5.

1. Delete all security-related events by entering the following command:

   DLT-SECU-AUD:*[a]*;

   Where:

   a = Target ID (optional)

   The output response of this command has the following format:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* STATUS,DATE,TIME,LINKID,UID,COMMAND */
   "c,d,e,f,g,h"
;
```

   Where:

   c = Status of deleted recorded event: `{ COMPLD, DENY, AUTO }`

   — `COMPLD` — indicates the recorded event (command) successfully completed.

   — `DENY` — indicates the recorded event (command) was denied.

   — `AUTO` — indicates the recorded event is due to an autonomous DACS IV-2000 action.

   d = Date of deleted recorded event: `{00-39,86-99}{01-12}{01-31}`

   e = Time of deleted recorded event: `{00-23}{00-59}{00-59}`

   f = Link location of deleted recorded event: `CILINK-{1,2}-{1-6}`

   g = User ID used for deleted recorded event

h = Command and modifiers or autonomous event deleted. Refer to Table 8-3 for a list of commands and autonomous events.

After execution of this command, the security audit database stored on the DACS IV-2000 only contains the DLT-SECU-AUD command.

Retrieving Command Status

This procedure is used to retrieve the current status of previously entered commands. The RTRV-CMD-STAT command can be entered when the main controller (MC) is out-of-service (OOS).

1. Retrieve command status by entering the following command:

   RTRV-CMD-STAT:*[a]*::::*[c]*;

   Where:

   a = Target ID (optional)

   c = Command correlation tag (CTAG):
   [<1-10 CTAG legal characters>, ALL]
   Default: ALL
   Specifying ALL retrieves all commands waiting to be executed.
   Specifying any other valid string retrieves all commands that match the entered command CTAG.

   If no commands match the specified command CTAG or no commands are waiting to execute when ALL is specified, the following is the output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If there are commands waiting to execute, the following is the output response (first command listed is the next to be executed):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CMDCTAG,INPUT_CMD,CMDSTAT */
   "c,d,e,"
       .
       .
       .
   "c,d,e,"
;
```

   Where:

   c = Command CTAG: <1-10 CTAG legal characters>
   Specifies the CTAG entered for the listed command.

d = Input command: { <Valid command verb>, INTERNAL, INTERNAL-{000-999} }
Specifies the input command to be executed. The value INTERNAL (with or without a string of digits) indicates a command generated by the system.

e = Command status: { IP, UNKN, WTRSCE }
Specifies the status of the associated command.

- IP — indicates the associated command is currently being executed.
- UNKN — indicates the associated command is unknown (that is, the system cannot find the command).
- WTRSCE — indicates the associated command is waiting for resources (that is, the command is in the command queue).

Aborting Commands

This procedure is used to abort the execution of the last command that you entered. The ABT-CMD command can only be entered when the main controller (MC) is in-service (IS). The command that is aborted returns an error response indicating (through the error code) that execution was aborted. The following is a list of abortable commands.

DGN-DET-EQPT
RTRV-ALM-{EC1|T1|T3|VT1}
RTRV-ALM-COM
RTRV-ALM-LINK
RTRV-ATTR-COM
RTRV-COND-{EC1|T1|T2|T3|VT1}
RTRV-COND-LINK
RTRV-CRS
RTRV-DROPCRS-{STS1|T1|T3|VT1}
RTRV-EQPT
RTRV-LPBK-{EC1|T1|T3|VT1}
RTRV-NE
RTRV-PM-{EC1|T1|T3|VT1}
RTRV-PMMODE-{EC1|VT1}
RTRV-PORT
RTRV-SCANTH-NE
RTRV-SECU-USER
RTRV-STATE-EQPT
RTRV-TACC-{EC1|T1|T3|VT1}
RTRV-TH-NE
TEST-SW-CONTROL
TEST-UNIT-CABLE
RTRV-{EC1|T1|T3|VT1}
RTRV-ALM-ALL
RTRV-ALM-EQPT
RTRV-ATTR-{EC1|T1|T2|T3|VT1}
RTRV-ATTR-EQPT
RTRV-COND-EQPT
RTRV-CONF-{STS1|T1|T3|VT1}
RTRV-CRS-{STS1|T1|T3|VT1}
RTRV-ECHO-LINK
RTRV-HDR
RTRV-MSG-{EC1|VT1}
RTRV-PATH-{STS1|T1|T3|VT1}
RTRV-PMCNFGRN-T1
RTRV-PMSCHED-{EC1|T1|T3|VT1}
RTRV-PRMTR-LINK
RTRV-SECU-AUD
RTRV-STATE-{EC1|T1|T3|VT1}
RTRV-SYNCN
RTRV-TH-{EC1|T1|T3|VT1}
TEST-CABLE
TEST-TRMSN-T1

1. Abort the last entered command by entering the following command:

   `ABT-CMD:` *[a]*`;`

   Where:

   a = Target ID (optional)

   The following output response indicates successful completion of the abort command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   The aborted command returns an error response indicating the command is aborted.

Link Administration

9

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Contents

Link Administration

9

This chapter contains procedures for the DACS IV-2000 administrative links. CILINK-{1,2}-{1-3,7,8} are provisioned for Snider protocol. CILINK-{1,2}-4 are provisioned for TABS protocol. CILINK-{1,2}-{5,6} are provisioned for X.25 protocol. The TTY1-1 and TTY2-1 (CILINK-1-1 and CILINK-2-1, respectively) connectors on the back of the Switch Bays access the same CILINK as the TTY1-1 and TTY2-1 connectors on the High-Capacity Controller Module status panel. The TTY1-7/8 and TTY2-7/8 (CILINK-1-{7,8} and CILINK-2-{7,8}, respectively) connectors on the back of the Remote Unit Interface (RUI) Module access the same CILINK as the TTY1-7/8 and TTY2-7/8 connectors on the RUI Module status panel.

⚠ CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors, both TTY2-1 connectors, both TTY1-7/8 connectors, or both TTY2-7/8 connectors at the same time.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Changing Snider Link Parameters

Before performing this procedure, determine if there is another terminal other than the one you are using connected to a Snider link. If one is available, use the section titled "Using Two Terminals to Change Snider Link Parameters" (page 9-2). If another terminal is not available, determine if there is an unterminated Snider link (an unconnected TTY1-1, TTY1-2, TTY1-3, TTY1-7, TTY1-8, TTY2-1, TTY2-2, TTY2-3, TTY2-7, or TTY2-8). If so, use the section titled "Using One Terminal to Change Snider Link Parameters" (page 9-4).

NOTE:
The parameters of a user logged in to a link always override the parameters of the link itself.

Using Two Terminals to Change Snider Link Parameters

This procedure is used to change parameters associated with a Snider link using two terminals:

1. Log off the link you are using by entering the following command:

   `CANC-USER:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 legal characters> (optional)

2. Log in to the other terminal by entering the user identification (UID) at the `login:` prompt.

NOTE:
If the other terminal is at a remote location, contact the appropriate personnel to assist you with these procedures.

3. At the `password:` prompt, enter your password.

   Your password is not echoed back.

   If the login is successful, the following response is output:

```
/* Unauthorized access, use, or modification */
/* of the DACS IV-2000 (512) system is a criminal */
/* violation of Federal and State laws */

>
```

4. Remove the link you are changing from service by entering the following command:

   `RMV-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

5. Edit the desired Snider link parameter(s) of the link you are changing by entering the following command:

   `ED-PRMTR-LINK:`*[a]*`:`*b*`::,`*[e]*`,`*[f]*`,`*[g]*`,,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

   e = Baud rate: `{ 1200, 2400, 4800, 9600, 19200, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `1200` or `9600` for `CILINK-1-1`, `9600` for `CILINK-2-1` and `CILINK-{1,2}-{3,7,8}` and `2400` for `CILINK-{1,2}-2`
   CILINK-1-1 can be set by a hardware strap to a baud rate of 1200 or 9600 (check with office records to determine initial system baud rate value). CILINKs 1-2 and 2-2 support baud rates up to 9600 only. It is recommended that you use the initial system value for the baud rate.

   f = Message screening: `{ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `ALL`

   g = Dialog mode: `{ MENU, COMMAND, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `COMMAND`

   i = Flow control: `{ DC3, ACK, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `DC3`

6. Restore the link by entering the following command:

   `RST-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

   This command takes up to 1 minute to complete.

7. Log off the link by entering one of the following commands:

   `CANC-USER:[a]:[b];`

   or

   `LGT-USER:[a]:[b];`

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 legal characters> (optional)

8. If the Snider link's baud rate and/or flow control parameters were changed in Step 5, change the speed and/or flow control of the terminal to match them.

9. Log in to the terminal connected to the link with the newly changed parameters by entering your user ID at the *login:* prompt.

   If you do not receive the `login:` prompt, press the **<RETURN>** or **<ENTER>** key on the terminal. If the `login:` prompt still does not appear, the terminal may be set to the incorrect speed.

10. At the `password:` prompt, enter your password.

    Your password is not echoed back.

    If the login is successful, the following response is output:

```
/* Unauthorized access, use, or modification */
/* of the DACS IV-2000 (512) system is a criminal */
/* violation of Federal and State laws */
>
```

Using One Terminal to Change Snider Link Parameters

This procedure is used to change parameters associated with a Snider link using one terminal.

1. Select one of the unterminated Snider links to change the parameter(s) of the link you are using.

2. Determine the baud and flow control parameters of the unterminated Snider link and the link you are using by entering the following command:

   `RTRV-PRMTR-LINK:[a]:[b];`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}` (optional)

The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:...,g,...,k,."
    "..."
;
```

Where:

d = Link location: `CILINK-{1,2}-{1-3,7,8}`

g = Baud rate: `{ 1200, 2400, 4800, 9600, 19200 }`

k = Flow control: `{ DC3, ACK }`

3. Restore the unterminated Snider link you selected by entering the following command:

   RST-LINK: *[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Snider link location: **CILINK-{1,2}-{1-3,7,8}**

   This command takes up to 1 minute to complete.

4. Log off the link you are using by entering one of the following commands:

   CANC-USER: *[a]*:*[b]*;

   or

   LGT-USER: *[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 legal characters> (optional)

5. If the speed or flow control of the unterminated link is different from the speed and flow control of the link from which you just logged off, change the speed and flow control of your terminal to match the speed and flow control of the unterminated link according to the owner's manual.

6. Move the connector cable of your terminal to the TTY connector of the unterminated link. Figure 9-1 shows the location of the CILINK TTY connectors at the rear of the Switch Bays and Figure 9-2 shows the location of the CILINK TTY connectors at the rear of the Remote Unit Interface (RUI) Module.

NOTE:
CILINK 1-1, 1-7/8, 2-1, and 2-7/8 use EIA-232-D connectors; all other CILINKs use EIA-449 connectors. CILINKs 1-2, 1-3, 2-2, and 2-3 are interoperable with EIA-232-D via the use of the suggested adapters. For DACS IV-2000-to-terminal communication, it is suggested the ED-2C646,G2 adapter be used. For DACS IV-2000-to-OS via modem communication, it is suggested the ED-2C646,G1 adapter be used.

Links 1-2 and 2-2 are electrically compatible with the EIA-232-D (with the suggested adapters) standard up to 9600 baud. Links 1-3 and 2-3 are electrically compatible with the EIA-232-D (with the suggested adapters) standard up to 9600 baud. These links may operate above these data rates. However, the four percent rise time specification of EIA-232-D is violated.

7. Enter your user ID at the `login:` prompt.

   If you do not receive the `login:` prompt, press the <RETURN> or <ENTER> key on your terminal. If you still do not receive the `login:` prompt, your terminal may not be set to the correct speed.

8. Enter the password at the `password:` prompt.

   Your password is not echoed back.

   If the login is successful, the following response is output:

```
/* Unauthorized access, use, or modification */
/* of the DACS IV-2000 (512) system is a criminal */
/* violation of Federal and State laws */
```

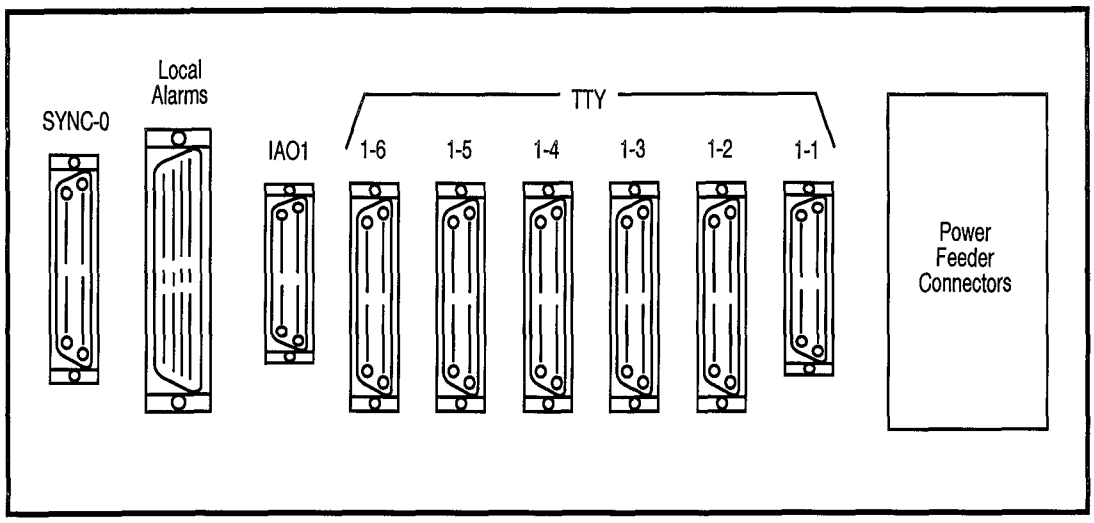
9. Remove the link you are changing from service by entering the following command:

   `RMV-LINK:`*[a]*`:`*b*`;`

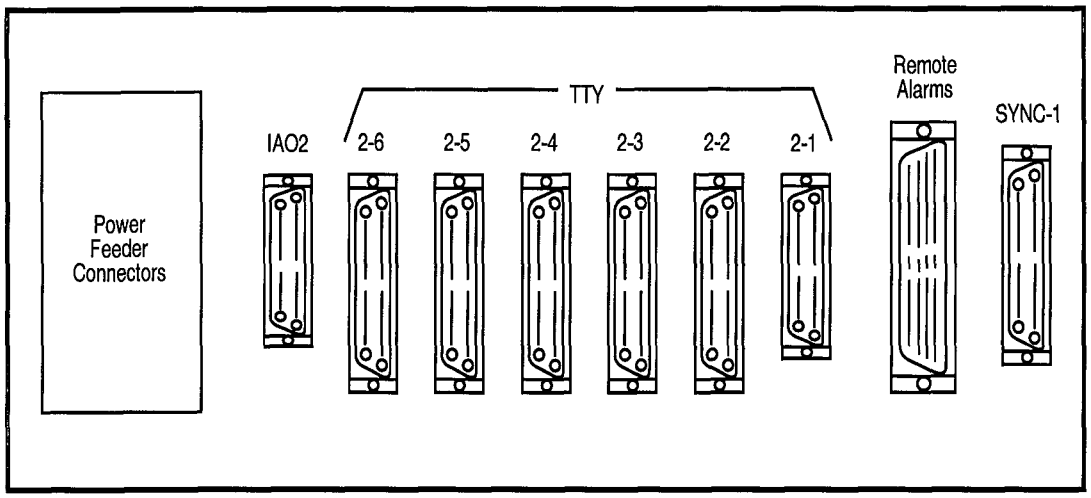
   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`



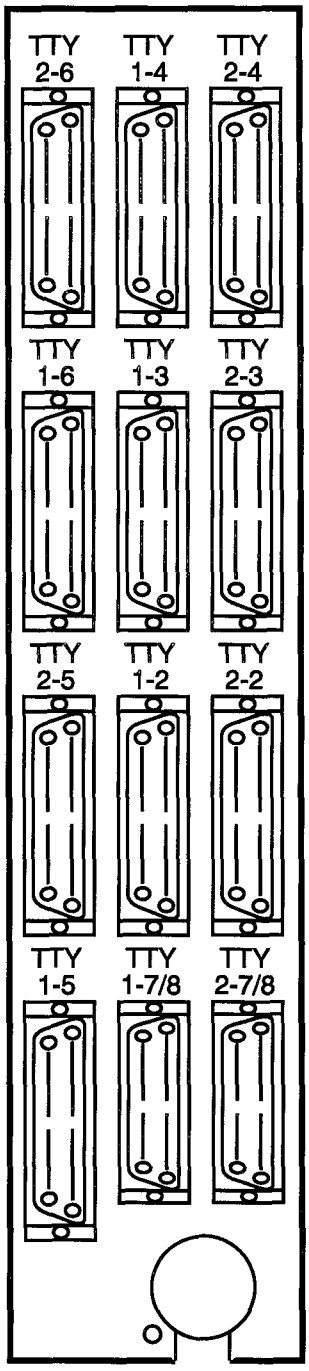
A. Top Panel of Switch Bay in Bay Position 11



B. Top Panel of Switch Bay in Bay Position 13

Note: TTY connectors IAO1 and IAO2 are used for DACSlink connections.

Figure 9-1. **CILINK Connectors at the Rear of the Switch Bays**



Note: Only the links labelled TTY 1-7/8 and TTY 2-7/8 are used. Links {1,2}-{2-6} are unused.

Figure 9-2. **CILINK Connectors at the Rear of the RUI Module**

10. Edit the desired Snider link parameter(s) of the link you are changing by entering the following command:

    `ED-PRMTR-LINK:`*[a]*`:`*b*`::,`*[e]*`,`*[f]*`,`*[g]*`,,`*[i]*`;`

    Where:

    a = Target ID (optional)

    b = Snider link location: `CILINK-[1,2]-[1-3,7,8]`

    e = Baud rate: `[ 1200, 2400, 4800, 9600, 19200, CURVAL ]` (optional)
    Default: `CURVAL`
    Initial system value: `1200` or `9600` for `CILINK-1-1`, `9600` for `CILINK-2-1` and `CILINK-[1,2]-[3,7,8]` and `2400` for `CILINK-[1,2]-2`
    CILINK-1-1 can be set by a hardware strap to a baud rate of 1200 or 9600 (check with office records to determine initial system baud rate value). CILINKs 1-2 and 2-2 support baud rates up to 9600 only. It is recommended that you use the initial system value for the baud rate.

    f = Message screening: `[ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL ]` (optional)
    Default: `CURVAL`
    Initial system value: `ALL`

    g = Dialog mode: `[ MENU, COMMAND, CURVAL ]` (optional)
    Default: `CURVAL`
    Initial system value: `COMMAND`

    i = Flow control: `[ DC3, ACK, CURVAL ]` (optional)
    Default: `CURVAL`
    Initial system value: `DC3`

11. Restore the link you changed by entering the following command:

    `RST-LINK:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Snider link location: `CILINK-[1,2]-[1-3,7,8]`

    This command takes up to 1 minute to complete.

12. Log off the link you are using by entering one of the following commands:

    `CANC-USER:`*[a]*`:`*[b]*`;`

    or

    `LGT-USER:`*[a]*`:`*[b]*`;`

    Where:

    a = Target ID (optional)

    b = User ID: <1 to 10 legal characters> (optional)

13. Move the connector cable of your terminal to the TTY connector of the link you changed.

NOTE:

If the Snider link's baud and/or flow control parameters were changed in Step 10 or if the terminal's baud and/or flow control parameters were changed in Step 5, change the speed and/or flow control of your terminal to match those values.

14. Enter your user ID at the `login:` prompt.

    If you do not receive the `login:` prompt, press the <RETURN> or <ENTER> key on your terminal. If you still do not receive the `login:` prompt, your terminal may not be set to the correct speed.

15. Enter your password at the `password:` prompt.

    Your password is not echoed back.

    If the login is successful, the following response is output:

    ```
    /* Unauthorized access, use, or modification */
    /* of the DACS IV-2000 system is a criminal */
    /* violation of Federal and State laws */
    ```

16. Remove the unterminated Snider link by entering the following command:

    `RMV-LINK:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

Changing TABS Link Parameters

This procedure is used to change parameters associated with TABS links.

1. Determine the state of the TABS link by entering the following command:

   RTRV-PRMTR-LINK:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = TABS link location: CILINK-[1,2]-4 (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,..."
    "..."
;
```

   Where:

   d = Link location: CILINK-{1,2}-4

   e = Link state: { IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }

2. If the state of the TABS link is OOS-MTCE, go to Step 3. Otherwise, remove the TABS link from service by entering the following command:

   RMV-LINK:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = TABS link location: CILINK-{1,2}-4

3. Edit the desired TABS link parameter(s) by entering the following command:

   ED-PRMTR-LINK:*[a]*:*b*::,,,*[g]*,*[h]*;

   Where:

   a = Target ID (optional)

   b = TABS link location: CILINK-[1,2]-4

   g = Telemetry set: { SUMMARY, DETAILED, EXTENDED, CURVAL } (optional)
   Default: CURVAL
   Initial system value: EXTENDED

h = Poll timing: { 10-60, CURVAL } (optional)
Default: CURVAL
Initial system value: 20

4. If you changed the telemetry set parameter, wait at least one polling interval (up to 60 seconds) before continuing with this procedure.
5. Restore the TABS link by entering the following command:

   RST-LINK:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = TABS link location: CILINK-{1,2}-4

   This command takes up to 1 minute to complete.

Changing X.25 Link Parameters

NOTE:
The following commands must be entered on a link other than the one you are changing.

1. Determine whether any users are logged in to the link you are changing by entering the following command:

   RTRV-SECU-LINK:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6} (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC,LGN:INACTV:NUMBR,INTRVL,TM:LCKD-OUT */
   "d, e:..."
;
```

   Where:

   d = Link location: CILINK-{1,2}-{5,6}

   e = Login UID: <1-10 UID legal characters>

2. If necessary, notify users to log out (all UIDs associated with CILINKs 1-5, 1-6, 2-5, and 2-6).

3. Determine the state of the link you are changing by entering the following command:

   RTRV-PRMTR-LINK: *[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6} (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,..."
    "..."
;
```

   Where:

   d = Link location: CILINK-{1,2}-{5,6}

   e = Link state: { IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }

   If the state of the link is OOS-MTCE, go to Step 5. Otherwise, go to Step 4.

4. Remove the link from service by entering the following command:

   RMV-LINK: *[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6}

5. Edit the desired X.25 link parameter(s) of the link you are changing by entering the following command:

   ED-PRMTR-LINK: *[a]*:*b*::,*[e]*,*[f]*,*[g]*,,:*[j]*,*[k]*,*[l]*,*[m]*,*[n]*,*[o]*,*[p]*,*[q]*,*[r]*,*[s]*,*[t]*,*[u]*,*[v]*,*[w]*,*[x]*,*[y]*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6}

   e = Baud rate: { 1200, 2400, 4800, 9600, 19200, CURVAL, NOVAL } (optional)
   Default: CURVAL
   Initial system value: 9600
   It is recommended that you use the initial system value for the baud rate.

f = Message screening: [INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL] (optional)
Default: CURVAL
Initial system value: ALL

g = Dialog mode: [MENU, COMMAND, CURVAL] (optional)
Default: CURVAL
Initial system value: COMMAND

j = Link window size K: [2-7, CURVAL] (optional)
Default: CURVAL
Initial system value: 7

k = Counter N2: [2-15, CURVAL] (optional)
Default: CURVAL
Initial system value: 7

l = Timer T1: [2-20, CURVAL] (optional)
Default: CURVAL
Initial system value: 3

m = Timer T3: [4-120, CURVAL] (optional)
Default: CURVAL
Initial system value: 26

n = Network window size W: [1-7, CURVAL] (optional)
Default: CURVAL
Initial system value: 2

o = Packet size P: [128, 256, CURVAL] (optional)
Default: CURVAL
Initial system value: 128

p = Timer T20: [30-180, CURVAL] (optional)
Default: CURVAL
Initial system value: 180

q = Timer T22: [30-180, CURVAL] (optional)
Default: CURVAL
Initial system value: 180

r = Timer T23: [30-180, CURVAL] (optional)
Default: CURVAL
Initial system value: 180

s = Timer T25: [30-200, CURVAL] (optional)
Default: CURVAL
Initial system value: 200

t = Timer T26: [30-180, CURVAL] (optional)
Default: CURVAL
Initial system value: 180

u = Counter R20: { 1-10, CURVAL } (optional)
Default: CURVAL
Initial system value: 1

v = Counter R22: { 1-10, CURVAL } (optional)
Default: CURVAL
Initial system value: 1

w = Counter R23: { 1-3, CURVAL } (optional)
Default: CURVAL
Initial system value: 1

x = Counter R25: { 0-3, CURVAL } (optional)
Default: CURVAL
Initial system value: 0

y = D bit: { ON, OFF, CURVAL } (optional)
Default: CURVAL
Initial system value: ON

6. Restore the link you changed by entering the following command:

   RST-LINK:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6}

   This command takes up to 1 minute to complete.

7. If necessary, notify the users logged out during Step 2 that the link has been restored.

Changing Link Security Parameters

This procedure is used to set or change security parameters associated with CILINKs. Parameters set in this procedure provide for autonomously logging off users that remain inactive for a specified amount of time and locking out CILINKs when a specified number of invalid login sessions are attempted. The DACS IV-2000 issues an alarm with the code FRD to indicate security violations resulting in a link lock-out.

NOTE:
Only users with a User Privilege Code (UPC) of S4 or higher can execute this procedure.

1. Change or set link security parameters by entering the following command:

   `ED-SECU-LINK:`*[a]*`:`*b*`: :`*[d]*`:`*[e]*`,`*[f]*`,`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = Link location: `CILINK-[1,2]-[1-8]`

   d = Inactivity: `[ 0-60, CURVAL ]` (optional)
   Default: `CURVAL`
   Initial system value: `10` (minutes)
   Specifies the number of minutes allowed before a user session is logged off autonomously due to inactivity. Specifying `0` disables this feature (that is, user sessions are not logged off autonomously).

   e = Number of invalid sessions: `[ 1-10, CURVAL ]` (optional)
   Default: `CURVAL`
   Initial system value: `5`
   Specifies the number of invalid login session setup attempts in a given interval (parameter *f*) before a CILINK is locked out.

   f = Interval: `[ 0-90, CURVAL ]` (optional)
   Default: `CURVAL`
   Initial system value: `30` (minutes)
   Specifies the number of minutes that make up an interval for the count of invalid login session setup attempts (parameter *e*). Specifying `0` disables the link lock-out feature (that is, links are not locked out due to invalid login session attempts).

   g = Lock-out time: `[ 1-30, CURVAL ]` (optional)
   Default: `CURVAL`
   Initial system value: `10` (minutes)
   Specifies the number of minutes that a link is locked out due to invalid login session setup attempts. A `REPT ALM LINK` message is issued with the alarm code `FRD` when a link is locked out.

2. Verify security parameter settings by entering the following command:

   `RTRV-SECU-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Link location: `{ CILINK-{1,2}-{1-8}, ALL }`

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC,LGN:INACTV:NUMBR,INTRVL,TM:LCKD-OUT */
    "d,...:f:g,h,i:..."
;
```

   Where:

   d = Link location: `CILINK-{1,2}-{1-8}`

   f = Inactivity: `0-60`

   g = Number of invalid sessions: `1-10`

   h = Interval: `0-90`

   i = Lock-out time: `1-30`

3. If the desired values are not shown, redo this procedure from Step 1.

Connecting an X.25 Packet Assembler and Disassembler (PAD)

Administrative links CILINK-1-5, CILINK-1-6, CILINK-2-5, and CILINK-2-6 can be configured for asynchronous operation by using an external X.25 asynchronous packet assembler and disassembler (PAD). The PAD can be configured for either local operation or networking operation as shown in Figure 9-3.

This procedure provides information for preparing CILINK-1-5, CILINK-1-6, CILINK-2-5, and CILINK-2-6 for connecting a MICOM® box Type 2 PAD to the link. For details to connect and configure the PAD, refer to the instructions provided with the PAD.

The following equipment is required for this procedure:

- MICOM Box Type 2 asynchronous PAD
- Terminal(s) to connect to the PAD
- Modem eliminator or X.25 Packet Network and its required equipment

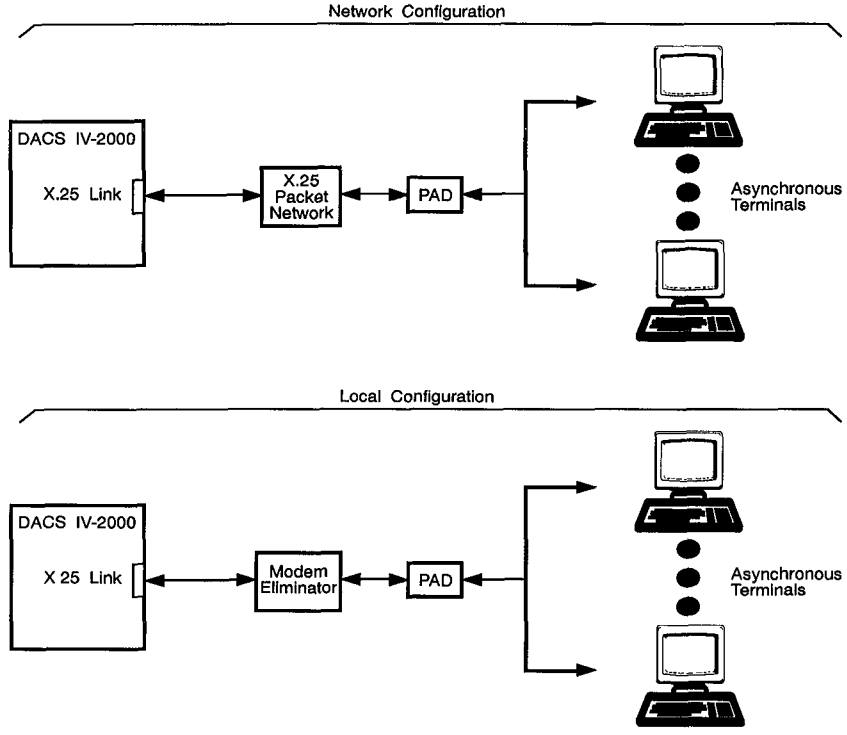


Figure 9-3. CILINK-1-5, CILINK-1-6, CILINK-2-5, or CILINK-2-6 Configured for MICOM Box PAD

1. Remove the link from service by entering the following command:

   RMV-LINK: *[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6}

2. Refer to the user's manual provided with the X.25 PAD, X.25 network, and/or modem eliminator to connect and configure the equipment.

3. Determine the parameters of the link by entering the following command:

   RTRV-PRMTR-LINK: *[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: CILINK-{1,2}-{5,6} (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:..."
    "l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, aa"
;
```

   Where:

   d = Link location: CILINK-{1,2}-{5,6}

   l = Link window size K: 2-7

   m = Counter N2: 2-15

   n = Timer T1: 2-20

   o = Timer T3: 4-120

   p = Network window size W: 1-7

   q = Packet size P: { 128, 256 }

   r = Timer T20: 30-180

   s = Timer T22: 30-180

   t = Timer T23: 30-180

   u = Timer T25: 30-200

   v = Timer T26: 30-180

   w = Counter R20: 1-10

   x = Counter R22: 1-10

y = Counter R23: `1-3`

z = Counter R25: `0-3`

aa = D bit: `{ ON, OFF }`

The link parameters and the X.25 PAD parameters must agree. Refer to the section "X.25 link location: CILINK-{1,2}-{5,6} (optional)" (page 9-13) to edit X.25 link parameters.

4. Restore the link by entering the following command:

   RST-LINK:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: `CILINK-[1,2]-[5,6]`

   This command takes up to one minute to complete.

   If this command is denied with the error code `SOSF`, the PAD, X.25 network, and/or modem eliminator are not configured properly (return to Step 2).

5. Determine the state of the X.25 link you are connecting to the PAD by entering the following command:

   RTRV-PRMTR-LINK:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = X.25 link location: `CILINK-[1,2]-[5,6]` (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,... ,l, ... "
    "..."
;
```

   Where:

   d = Link location: `CILINK-[1,2]-[5,6]`

   e = Link state: `{ IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }`

   l = Link window size K (K): `{ 2-7 }`

   If the state of the link is `OOS-PRTCL`, the PAD may not be connected properly. Check the physical connections. If the physical connections are correct the problem can be traced to the PAD configuration. Contact your system administrator or next level of support for further assistance and do not continue with this procedure.

6. Enter the auto baud/auto parity attention sequence of <RETURN>.<RETURN> or <ENTER>.<ENTER> to access the channel and receive the PAD prompt.

   If the prompt is not displayed, repeat the attention sequence.

   If the prompt still does not appear, check the physical connections. If the physical connections are correct and the link is in service, the problem can be traced to the PAD configuration. Contact your system administrator or next level of support for further assistance.

Adding a Terminal to a Snider Link

This procedure requires both a terminal already connected to a link and an unterminated Snider link (TTY1-1, TTY1-2, TTY1-3, TTY1-7/8, TTY2-1, TTY2-2, TTY2-3, or TTY2-7/8).

NOTE:
CILINKs 1-2, 1-3, 2-2, and 2-3 are interoperable with EIA-232-D via the use of the suggested adapters. For DACS IV-2000-to-terminal communication, it is suggested the ED-2C646,G2 adapter be used. For DACS IV-2000-to-OS via modem communication, it is suggested the ED-2C646,G1 adapter be used.

CILINKs 1-2, 1-7/8, 2-2, and 2-7/8 are electrically compatible with the EIA-232-D (with the suggested adapters) standard up to 9600 baud. Links 1-3 and 2-3 are electrically compatible with the EIA-232-D (with the suggested adapters) standard up to 19200 baud. These links may operate with the EIA-232-D above these data rates; however, the four percent rise time specification of EIA-232-D is violated.

1. Plug in the terminal you are adding to an AC power outlet and power up the terminal.
2. Determine the Snider link parameters of the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

   `RTRV-PRMTR-LINK:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}` (optional)

The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:...,g,h,i,...,k,"
    "..."
;
```

Where:

d = Link location: `CILINK-{1,2}-{1-3,7,8}`

g = Baud rate: `{ 1200, 2400, 4800, 9600, 19200 }`

h = Message screening: `{INPUT, AUTO, ALL, DBAUTO, DBALL}`

i = Dialog mode: `{ MENU, COMMAND }`

k = Flow control: `{ DC3, ACK }`

3. Edit the desired Snider link parameters of the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

   `ED-PRMTR-LINK:`*[a]*`:`*b*`::,`*[e]*`,`*[f]*`,`*[g]*`,,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

   e = Baud rate: `{ 1200, 2400, 4800, 9600, 19200, CURVAL, NOVALL }` (optional)
   Default: `CURVAL`
   Initial system value: `9600` for `CILINK-{1-2}-{1,3,7,8}` and `2400` for `CILINK-{1-2}-2`
   CILINK-1-1 can be set by a hardware strap to a baud rate of 1200 or 9600 (check with office records to determine initial system baud rate value). CILINKs 1-2 and 2-2 support baud rates up to 9600 only. It is recommended that you use the initial system value for the baud rate.

   f = Message screening: `{ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `ALL`

   g = Dialog mode: `{ MENU, COMMAND, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `COMMAND`

   i = Flow control: `{ DC3, ACK, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `DC3`

4. Set the options of the terminal you are adding to the following:

   Baud rate: (same value as the baud rate [BAUD] parameter in Step 3)
   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Answerback: ACK (cntrl-F) (only if the flow control parameter in Step 3 is also ACK)

NOTE:
Some terminal models do not allow you to set every option listed above. Only set the available options for those terminals.

5. Connect the terminal connector to the selected Snider TTY port. Figure 9-1 (earlier in this chapter) shows the location of the CILINK TTY connectors on the Switch Complex, and Figure 9-2 shows the location of the CILINK TTY connectors on the Remote Complex.

NOTE:
CILINKs 1-2, 1-7/8, 2-2, and 2-7/8 use EIA-232-D connectors, all other CILINKs use EIA-449 connectors. Refer to note at beginning of this procedure for information on adapters for the EIA-449 connectors.

6. Restore the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

   `RST-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-3,7,8}`

   This command takes up to 1 minute to complete.

   If you do not receive the `login:` prompt on the added terminal, press the <RETURN> or <ENTER> key on your terminal. If you still do not receive the `login:` prompt, your terminal may not be set to the correct speed.

Adding a Printer

Printers can be connected directly to a Snider link or can be used in tandem with a terminal connected to a Snider link or X.25 PAD network.

Adding a Printer Directly to a Snider Link

A printer that is connected directly to a Snider link is added in the same manner a terminal is added to a Snider link. When adding a printer directly, the following applies:

- The message screening is determined by the setting of the Snider link the printer is connected to.
- The printer does not receive any performance monitoring reports. Refer to the previous section titled "Adding a Terminal to a Snider Link" (page 9-21) for information on adding a printer directly to a Snider link.

Adding a Printer in Tandem With a Terminal

To add a printer in tandem with a terminal connected to either a Snider link or X.25 PAD network, perform the following procedure:

1. Connect the terminal to either:
   - A Snider link, as described in the previous section titled "Adding a Terminal to a Snider Link" (page 9-21)
   - An X.25 PAD network set up as described in the section titled "Connecting an X.25 Packet Assembler and Disassembler (PAD)" (page 9-18).
2. Connect the printer to the terminal according to the owner's manual of the terminal and/or printer.
3. Activate or deactivate the printer according to the owner's manual of the terminal and/or printer.

Removing a Terminal From a Snider Link

In addition to the terminal being removed, this procedure requires another terminal connected to a link.

1. Log out of the terminal being removed by entering one of the following commands:

   `CANC-USER:` *[a]*`:` *[b]*`;`

   or

   `LGT-USER:` *[a]*`:` *[b]*`;`

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 legal characters> (optional)

2. From the other terminal, remove from service the link of the terminal being removed by entering the following command:

   `RMV-LINK:` *[a]*`:` *b*`;`

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-[1,2]-[1-3,7,8]`

3. Disconnect the terminal connector from the Snider TTY port of the link removed in Step 2.

Using the Input Command Routing Feature (Message Echo)

The input command routing feature is described in the following procedures. The first three procedures show how to activate, to cancel, and to retrieve the configuration of the DACS IV-2000's input command routing capability. The RTRV-SECU-USER command can be used to retrieve the message echo parameter information. The ED-SECU-USER command is used to change the message echo parameter for existing UIDs. The ENT-SECU-USER command is used to set the message echo parameter for new UIDs.

Activating Input Command Routing

This procedure is used to activate the input command routing capability. After execution of this procedure, the input commands entered and acknowledgment codes generated on the specified link are echoed to all active Snider and X.25 links provisioned to receive them.

NOTE:
Only one link or virtual circuit can be provisioned to echo input commands and acknowledgment codes at a time. Parameters associated with User IDs override parameters associated with links.

1. Activate the input command routing capability by entering the following command:

   ACT-ECHO-LINK:*[a]*:*b*,*c*;

   Where

   a = Target ID (optional)

   b = CILINK location: CILINK-[1,2]-[1-8]
   Specifies the CILINK from which input commands and acknowledgment codes are echoed. For CILINK-[1,2]-[5,6], the virtual circuit must also be specified (parameter *c*).

   c = Virtual circuit location: [[1-4], NOVAL]
   Default: None for CILINK-[1,2]-[5,6]; NOVAL for CILINK-[1,2]-[1-4,7,8]
   Specifies the virtual circuit on the X.25 link from which input commands and acknowledgment codes are echoed.

Cancelling Input Command Routing

This procedure is used to cancel the echo of input commands and acknowledgment codes from the specified Snider or X.25 link.

1. Cancel the input command routing capability by entering the following command:

   `CANC-ECHO-LINK:`*[a]*`:`*b*`,`*c*`;`

   Where

   a = Target ID (optional)

   b = CILINK location: `CILINK-{1,2}-{1-8}`
   Specifies the CILINK from which input commands and acknowledgment codes are echoed. For `CILINK-{1,2}-{5,6}`, the virtual circuit must also be specified (parameter *c*).

   c = Virtual circuit location: `{ {1-4}, NOVAL }`
   Default: None for `CILINK-{1,2}-{5,6}`; `NOVAL` for `CILINK-{1,2}-{1-4,7,8}`
   Specifies the virtual circuit on the X.25 link from which input commands and acknowledgment codes are echoed.

   The `COMPLD` *response indicates that the input command routing capabilities has been cancelled.*

Retrieving Input Command Routing Configuration

This procedure is used to retrieve the current configuration of the input command routing setup for the specified Snider and/or X.25 link(s).

NOTE:
Only one link or virtual circuit can have its input commands and acknowledgment codes echoed at one time.

1. Retrieve the input command routing setup status by entering the following command:

   `RTRV-ECHO-LINK:`*[a]*`:`*[b]*`;`

   Where

   a = Target ID (optional)

   b = CILINK location: `CILINK-{1,2}-{1-8}` (optional)
   Specifies the CILINK(s) for which status of input command routing setup is retrieved. Specifying `CILINK-{1,2}-{5,6}` retrieves status for all virtual circuits (1-4).

   The following response appears, indicating the status of the input command routing setup:

```
   TID YY-MM-DD HH:MM:SS
M  c COMPLD
   /* LOC, VIRT_CIRC:ECHO_STAT */
   "d, e:f"
;
```

   Where:

   d = CILINK location: `CILINK-{1,2}-{1-8}`
   Identifies the individual CILINK specified in the **`RTRV-ECHO-LINK`** command.

   e = Virtual circuit location: `0-4`
   Indicates the virtual circuit with the associated X.25 link. For Snider links, the value is `0`.

   f = Echo status: `{ ACT, CANC }`
   When `ACT`, the associated link has `REPT LOCL IN` messages generated.

Receiving Echo of Input Commands and Acknowledgment Codes

This procedure is used to receive echo of input commands and acknowledgment codes.

NOTE:
Echo of input commands and acknowledgment codes are received through REPT LOCL IN messages. REPT LOCL IN messages are allowed for each user by setting the Message Echo parameter of the respective user (UID) or link to ON. For additional information on the REPT LOCL IN message, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

1. Set the Message Echo parameter to ON by entering one of the following commands:

   - **New user login/password:**

     ENT-SECU-USER:*[a]*:*b*:::*d*,,*e*:*[*SCREEN=*g*, ECHO=*j]*;

     Where:

     a = Target ID (optional)

     b = User ID: < 1 to 10 UID legal characters >

     d = Password: < 6 to 8 password legal characters >

     e = User privilege code (UCFC/UCAL pair): [P[1-5], M[1-5], T[1-5], S[1-5], PM[1-5]]

     g = Message screening: [INPUT, AUTO, ALL, DBAUTO, DBALL]
     Default value: DBALL
     The value INPUT cannot be used if you are to receive echo of input commands and acknowledgment codes.

     j = Message echo: [ON, OFF]
     Default value: OFF
     To turn on the input command routing capability, you must set this parameter to ON, if it is not already done.

- **Existing user login/password:**

  ED-SECU-USER:*[a]*:*b*:::,,,:*[*SCREEN=*h*, ECHO=*k]*;

  Where:

  a = Target ID (optional)

  b = Old user ID: < 1 to 10 UID legal characters >

  h = Message screening: { INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }
  Default value: CURVAL
  The value INPUT cannot be used if you are to receive echo of input commands and acknowledgment codes.

  k = Message echo: { ON, OFF, CURVAL }
  Default value: CURVAL
  To turn on the input command routing capability, you must set this parameter to ON, if it is not already done.

2. Verify the selected user is allowed to receive REPT LOCL IN messages by entering the following command:

   RTRV-SECU-USER:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = User ID: < 1 to 10 UID legal characters > (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* UID:,UCFC/UCAL:<> */
   "d:...:ECHO=j"
;
```

   Where:

   d = User ID: <1-10 UID legal characters>

   j = Message echo: { ON, OFF }
   ON indicates the associated user receives REPT LOCL IN messages

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10

This chapter consists of procedures required for establishing and removing cross-connections.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

For detailed information on cross-connection types, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Retrieving EC-1/VT1.5/DS1/DS3 Port States

This procedure is used to retrieve state information (for example, mapped, performance monitoring, loopbacks, idle) associated with EC-1, VT1.5, DS1, or DS3 ports.

1. Determine the state of an EC-1, VT1.5, DS1, or DS3 port(s) by entering one of the following commands:

   EC-1 Port: `RTRV-STATE-EC1:`*[a]*`:`*b*`;`
   VT1.5 Port: `RTRV-STATE-VT1:`*[a]*`:`*b*`;`
   DS1 Port: `RTRV-STATE-T1:`*[a]*`:`*b*`;`
   DS3 Port: `RTRV-STATE-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port(s) location:
   `{ {1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }`
   DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 group number (STS1 Interface Module):
   `{ {1-64}-{1-15}-{1-7}-{1-4}} }`
   DS3 port location:
   `{ {1-64}-{1-31},UNIT-{1-64} }`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

Where:

e = EC-1 port location: `{1-64}-{1-15}`
VT1.5 port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
DS3 port location: `{1-64}-{1-31}`

f = Input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = Output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Establishing Cross-Connections

These procedures are used to establish a one-way, two-way, or conference cross-connection, or to roll an existing cross-connection so that the FROM port is replaced by a new input port. For DS1 and VT1.5 signals, Table 10-1 shows the mappings used to identify the signals within the DACS IV-2000 to their associated DS2/VT group and signal number within the group. For more information, refer to the sections titled "Cross-Connections" (page 2-16) and "System Addressing" (page 8-5) of the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Table 10-1. **DS1 and VT1.5 Mappings**

Asynchronous DACS IV-2000 to DDM-1000		Synchronous			
		DACS IV-2000		DDM-2000	
DS1 Within DS3	DS2, DS1	VT1.5 Within STS-1	VT Group, VT	VT Group, VT	VT1.5 Within STS-1
1	1,1	1	1,1	1,1	1
2	1,2	2	2,1	1,2	8
3	1,3	3	3,1	1,3	15
4	1,4	4	4,1	1,4	22
5	2,1	5	5,1	2,1	2
6	2,2	6	6,1	2,2	9
7	2,3	7	7,1	2,3	16
8	2,4	8	1,2	2,4	23
9	3,1	9	2,2	3,1	3
10	3,2	10	3,2	3,2	10
11	3,3	11	4,2	3,3	17
12	3,4	12	5,2	3,4	24
13	4,1	13	6,2	4,1	4
14	4,2	14	7,2	4,2	11
15	4,3	15	1,3	4,3	18
16	4,4	16	2,3	4,4	25
17	5,1	17	3,3	5,1	5
18	5,2	18	4,3	5,2	12
19	5,3	19	5,3	5,3	19
20	5,4	20	6,3	5,4	26
21	6,1	21	7,3	6,1	6
22	6,2	22	1,4	6,2	13
23	6,3	23	2,4	6,3	20
24	6,4	24	3,4	6,4	27
25	7,1	25	4,4	7,1	7
26	7,2	26	5,4	7,2	14
27	7,3	27	6,4	7,3	21
28	7,4	28	7,4	7,4	28

Table 10-2. **Allowable VT1.5 and T1 Cross-Connections**

VT1.5 Signal Formats		TO VT1.5 Port				TO DS1 Port
		UNSPEC	BIT	BYTE	ASYN	
FROM VT1.5 Port	UNSPEC	Allowed	Allowed	Allowed	Not Allowed	Not Allowed
	BIT	Allowed	Allowed	Allowed w/Warning	Not Allowed	Not Allowed
	BYTE	Allowed	Allowed w/Warning	Allowed	Not Allowed	Not Allowed
	ASYN	Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed
FROM DS1 Port		Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed

Allowable VT1.5 cross-connections are denoted by the FROM VT1.5 Port rows and the TO VT1.5 Port columns.

Allowable T1 cross-connections are denoted by the FROM DS1 Port row and the TO DS1 Port column. Gateway cross-connections are T1 connections involving a DS1 port and a VT1.5 port.

Establishing One-Way and Two-Way Cross-Connections

Use one of the following procedures to form a one-way or two-way cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and DS1, STS-1, VT1.5 output port (TO):

- "Establishing DS1 One-Way and Two-Way Cross-Connections" (page 10-6)
- "Establishing DS3 One-Way and Two-Way Cross-Connections" (page 10-9)
- "Establishing STS-1 One-Way and Two-Way Cross-Connections" (page 10-12)
- "Establishing VT1.5 One-Way and Two-Way Cross-Connections" (page 10-15)

The FROM and TO ports of a one-way cross-connection can be the same, resulting in a loopback condition.

Establishing DS1 One-Way and Two-Way Cross-Connections

This procedure is used to cross-connect DS1 ports that are in the IDLE-REL state. If either of the selected DS1 ports is within an EC-1 port, the Active Signal Type must be T1 (DS1 signal) or the ENT-CRS-T1 command is denied. If either of the selected DS1 ports is a MUX3 DS3 port, the DS3 mode must be DS1 or the DS1 cross-connect command is denied. For signal mapping information, refer to Table 10-1 in the section titled "Establishing Cross-Connections" (page 10-4).

1. Obtain circuit provisioning information from office records.
2. If either of the selected DS1 ports is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode of the associated DS3 port(s) to be cross-connected by entering the following command:

   RTRV-PORT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3 circuit pack): {1-64}-{1-15}

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d: ... : ,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: {1-64}-{1-15}

   j = DS3 mode: { CC, DS1 }

   If the specified DS3 port(s) has a DS3 mode of CC, a DS1 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS1 port(s) is to be selected.

3. Retrieve active signal type (DS1 ports within EC-1 ports) and port state information of the two DS1 ports to be cross-connected by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:<ISTATE=o,OSTATE=p>"
;
```

   Where:

   e = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   f = Active signal type: `{ EC1, T1, VT1 }`

   o = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected DS1 ports are not in the IDLE-REL state (parameters *o* and *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 ports to the IDLE-REL state or selecting DS1 ports in the IDLE-REL state.

   If either of the specified DS1 ports is associated with an EC-1 port and the Active Signal Type is not T1, a DS1 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another DS1 port(s) is to be selected.

4. Establish a one-way or two-way cross-connection by entering the following command:

   ENT-CRS-T1:*[a]*:*b*,*c*:::*[e]*:*[*FOMODE=*f*,TOMODE=*g]*:,*[h]*;

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports:
   DS1 Interface-P Module: 1-64-1-7-1-28
   DS1 Interface Module: 1-64-1-8-1-28
   DS3 Interface-32 Module: 1-64-1-31-1-28
   DS3 Interface-16 Module: 1-64-1-15-1-28
   STS1 Interface-16 Module:
   DS1 port number: 1-64-1-15-1-28
   VT1.5 group number: 1-64-1-15-1-7-1-4

   e = Cross-connect type: { 1WAY, 2WAY }
   Default: 2WAY

   f = FROM output mode: { NORM, TERM, AIS, QRSS }
   Default: NORM
   Specifies what is transmitted from the FROM DS1 output port. This parameter is not used for one-way cross-connections.

   - NORM — Normal (cross-connected data)
   - TERM — Terminated (idle signal)
   - AIS — Alarm indication signal (blue code)
   - QRSS — Quasi-random signal. QRSS **cannot** be specified for DS1 ports within STS1 Interface-16 Modules.

   g = TO output mode: { NORM, TERM, AIS, QRSS }
   Default: NORM
   Specifies what is transmitted from the TO DS1 output port. QRSS **cannot** be specified for DS1 ports within STS1 Interface-16 Modules.

   h = Special service type: { RDLD, NOVAL }
   Default: NOVAL (not red-lined)
   Specifies whether or not the circuit is red-lined.

   Wait for the connection completed (COMPLD) message to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing DS3 One-Way and Two-Way Cross-Connections

This procedure is used to cross-connect DS3 ports that are in the IDLE-REL state. DS3 ports must be associated with either MUX3 (provisioned for CC [clear-channel] mode) or SMUX (provisioned in the ASYN [asynchronous] format) circuit packs. If the selected DS3 ports are not provisioned properly, the **ENT-CRS-T3** command is denied.

1. Obtain circuit provisioning information from office records.
2. Retrieve DS3 mode (MUX3 circuit packs) and/or EC-1 port format (SMUX circuit packs) information for DS3 ports to be cross-connected by entering the following command:

   RTRV-PORT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{1-64}-{1-15}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d: EC1MAP=e ... : ,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: `{1-64}-{1-15}`

   e = Provisioned EC-1 format (DS3 ports associated with SMUX circuit packs): `[ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK ]`

   j = DS3 mode (DS3 ports associated with MUX3 circuit packs): `{ CC, DS1 }`

   If the selected DS3 ports associated with MUX3 circuit packs are not in CC mode, a DS3 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port can be changed to CC mode [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS3 port(s) is to be selected.

   If the selected DS3 ports associated with SUMX circuit packs are not formatted for ASYN, a DS3 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be formatted for ASYN [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another EC1 port(s) is to be selected.

3. Retrieve the port state information of the two DS3 ports to be cross-connected by entering the following command:

   `RTRV-STATE-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:IN-STATE,OUT-STATE */
      "e:f,g"
   ;
   ```

   Where:

   e = DS3 port location: `[1-64]-[1-15]`

   f = DS3 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = DS3 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected DS3 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected DS3 ports to the IDLE-REL state or selecting DS3 ports in the IDLE-REL state.

4. Retrieve the port output mode information of the two DS3 ports to be cross-connected by entering the following command:

   `RTRV-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<> */
      "g:...OMODE=u..."
   ;
   ```

Where:

g = DS3 port location: `{1-64}-{1-15}`

u = Output mode: `{ NORM, TERM, AIS }`

If the output mode of either of the selected DS3 ports is TERM (parameter *u*), continue with Step 5. Otherwise, go to Step 6.

5. Change the output mode of the DS3 ports in the TERM mode to the NORM mode by entering the following command:

   `ED-T3:`*[a]*`:`*b*`::::OMODE=NORM;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{1-64}-{1-15}`

6. Establish a one-way or two-way cross-connection by entering the following command:

   `ENT-CRS-T3:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[FOMODE=`*f*`,TOMODE=`*g*`]:,`*[h]*`;`

   Where:

   a = Target ID (optional)

   b = FROM DS3 port location:

   c = TO DS3 port location:

   FROM/TO DS3 Ports:
   DS3 port: `{1-64}-{1-15}`

   e = Cross-connect type: `{ 1WAY, 2WAY }`
   Default: `2WAY`

   f = FROM output mode: `{ NORM, AIS }`
   Default: `NORM`
   Specifies what is transmitted from the FROM DS3 output port. This parameter is not used for one-way cross-connections.

   - `NORM` — Normal (cross-connected data)
   - `AIS` — Alarm indication signal (blue code)

   g = TO output mode: `{ NORM, AIS }`
   Default: `NORM`
   Specifies what is transmitted from the TO DS3 output port.

   h = Special service type: `{ RDLD, NOVAL }`
   Default: `NOVAL` (not red-lined)
   Specifies whether or not the circuit is red-lined.

   Wait for the connection completed (`COMPLD`) message to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer

to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

7. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing STS-1 One-Way and Two-Way Cross-Connections

This procedure is used to cross-connect EC-1 ports (STS-1 signals) that are in the IDLE-REL state and have an Active Signal Type of EC1 (STS-1 signal). If the Active Signal Type is not EC1, the `ENT-CRS-STS1` command is denied. Table 10-3 shows the allowable STS-1 cross-connections for the different STS-1 signal formats.

Table 10-3. **Allowable STS-1 Cross-Connections**

STS-1 Signal Formats		TO STS-1 Port				
		UNSPEC	VTLOCK	ASYNC	SYNC	VTFLOAT*
FROM STS-1 Port	UNSPEC	Allowed	Allowed	Allowed	Allowed	Not Allowed
	VTLOCK	Allowed	Allowed	Allowed w/Warning	Allowed w/Warning	Not Allowed
	ASYN	Allowed	Allowed w/Warning	Allowed	Allowed w/Warning	Not Allowed
	SYNC	Allowed	Allowed w/Warning	Allowed w/Warning	Allowed	Not Allowed
	VTFLOAT*	Not Allowed	Not Allowed	Not Allowed	Not Allowed	Not Allowed

* VTFLOAT is used to identify demultiplexed VT1.5 signals.To cross-connect a STS-1 signal containing 28 VT1.5 signals without demultiplexing the STS-1 signal, the UNSPEC format must be used instead of VTFLOAT.

1. Obtain circuit provisioning information from office records.
2. Retrieve the active signal type of the two EC-1 ports (STS-1 signals) to be cross-connected by entering the following command:

   `RTRV-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:..."
;
```

Where:

g = EC-1 port location: `{1-64}-{1-15}`

h = Active signal type: `{ EC1, T1, VT1 }`

If the Active Signal Type for either port is not EC1, an STS-1 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another EC-1 port(s) is to be selected.

3. Retrieve the port state information of the two EC-1 ports (STS-1 signals) to be cross-connected by entering the following command:

   `RTRV-STATE-EC1:`*`[a]`*`:`***`b`**`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **`[1-64]-[1-15]`**

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = EC-1 port location: `{1-64}-{1-15}`

   f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected EC-1 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected EC-1 ports to the IDLE-REL state or selecting EC-1 ports in the IDLE-REL state.

4. Establish a one-way or two-way cross-connection (circuit) by entering the following command:

   ENT-CRS-STS1:*[a]*:*b*,*c*:::*[e]*:[FOMODE=*f*,TOMODE=*g*]:,*[h]*;

   Where:

   a = Target ID (optional)

   b = FROM STS-1 port location:

   c = TO STS-1 port location:

   FROM/TO STS-1 Ports:
   STS-1 port: {1-64}-{1-15}

   e = Cross-connect type: { 1WAY, 2WAY }
   Default: 2WAY

   f = FROM output mode: { NORM, TERM, AIS }
   Default: NORM
   Specifies what is transmitted from the FROM STS-1 output port. This parameter is not used for one-way cross-connections.

   - NORM — Normal (cross-connected data)
   - TERM — Terminated (idle signal)
   - AIS — Alarm indication signal (blue code)

   g = TO output mode: { NORM, TERM, AIS }
   Default: NORM
   Specifies what is transmitted from the TO STS-1 output port.

   h = Special service type: { RDLD, NOVAL }
   Default: NOVAL (not red-lined)
   Specifies whether or not the circuit is red-lined.

   Wait for the connection completed (COMPLD) message to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing VT1.5 One-Way and Two-Way Cross-Connections

This procedure is used to cross-connect VT1.5 ports that are in the IDLE-REL state and have an Active Signal Type of VT1 (VT1.5 signal). If the Active Signal Type is not VT1, the **ENT-CRS-VT1** command is denied. Table 10-2 in the section titled "Establishing Cross-Connections" (page 10-4) shows the allowable VT1.5 cross-connections for the different VT1.5 signal formats. For signal mapping information, refer to Table 10-1 in the section titled "Establishing Cross-Connections" (page 10-4).

1. Obtain circuit provisioning information from office records.
2. Retrieve the active signal type of the two VT1.5 ports to be cross-connected by entering the following command:

   RTRV-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: **[1-64]-[1-15]-[1-28]**
   VT1.5 group number: **[1-64]-[1-15]-[1-7]-[1-4]**

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:..."
;
```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

   f = Active signal type: { EC1, T1, VT1 }

   If the Active Signal Type for either port is not VT1, a VT1.5 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another VT1.5 port(s) is to be selected.

3. Retrieve the port state information of the two VT1.5 ports to be cross-connected by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:IN-STATE,OUT-STATE */
      "e:f,g"
   ;
   ```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected VT1.5 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 ports to the IDLE-REL state or selecting VT1.5 ports in the IDLE-REL state.

4. Establish a one-way or two-way cross-connection by entering the following command:

   `ENT-CRS-VT1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[FOMODE=`*f*`,TOMODE=`*g*`]:,[`*h*`];`

   Where:

   a = Target ID (optional)

   b = FROM VT1.5 port location:

   c = TO VT1.5 port location:

   FROM/TO VT1.5 Ports:
   STS1 Interface-16 Module:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

e = Cross-connect type: { 1WAY, 2WAY }
Default: 2WAY

f = FROM output mode: { NORM, TERM, AIS }
Default: NORM
Specifies what is transmitted from the FROM VT1.5 output port. This parameter is not used for one-way cross-connections.

- NORM — Normal (cross-connected data)
- TERM — Terminated (idle signal)
- AIS — Alarm indication signal (blue code)

g = TO output mode: { NORM, TERM, AIS }
Default: NORM
Specifies what is transmitted from the TO VT1.5 output port.

h = Special service type: { RDLD, NOVAL }
Default: NOVAL (not red-lined)
Specifies whether or not the circuit is red-lined.

Wait for the connection completed (COMPLD) message to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing Conference (Broadcast) Cross-Connections

Conference cross-connections are one-way connections from the designated input port (FROM) to a new output port (ADDTO). The input port can already be cross-connected to one or more output ports. The `ENT-CONF-EC1`, `ENT-CONF-T1`, and `ENT-CONF-VT1` commands can be used to cross-connect at most two output ports to one input port. Figure 10-1 shows an example of two T1 conference cross-connections established to an existing cross-connection. If a third conference cross-connection is attempted, the command is denied. EC-1 and VT1.5 conference cross-connections are made in similar manners.

NOTE:
Conference cross-connections are considered secondary cross-connections. Therefore, the 60- ms switching time is not guaranteed in the event of a protection switch. In certain situations, restoration of secondary cross-connections could be blocked.

Use one of the following procedures to form a conference cross-connection between a DS1, STS-1, or VT1.5 input port (FROM), which may already be cross-connected to one DS1, STS-1, or VT1.5 output port, to another DS1, STS-1, VT1.5 output port (ADDTO):

- "Establishing DS1 Conference (Broadcast) Cross-Connections" (page 10-19)
- "Establishing DS3 Conference (Broadcast) Cross-Connections" (page 10-22)
- "Establishing STS-1 Conference (Broadcast) Cross-Connections" (page 10-25)
- "Establishing VT1.5 Conference (Broadcast) Cross-Connections" (page 10-27)

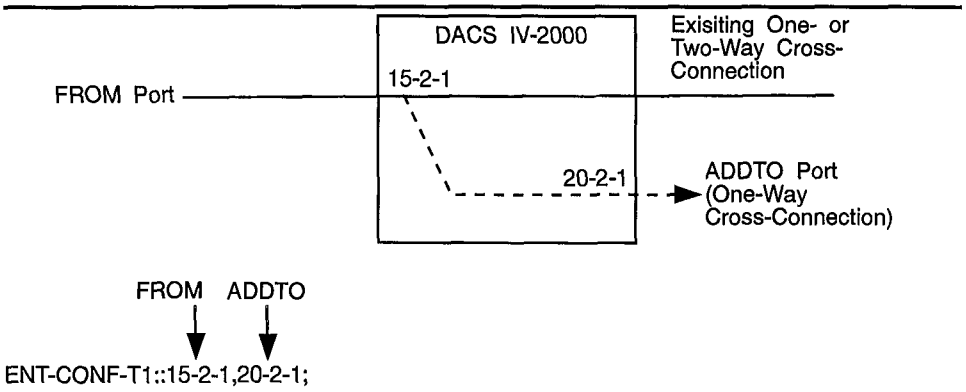


Figure 10-1. **Conference (Broadcast) Cross-Connection Example**

Establishing DS1 Conference (Broadcast) Cross-Connections

This procedure is used to form a conference DS1 cross-connect from a selected DS1 input port to another DS1 output port that is in the IDLE-REL state. If either of the selected DS1 ports are within EC-1 ports, the Active Signal Type must be T1 (DS1 signal) or the cross-connection is denied. You cannot cross-connect one DS1 input port to more than two DS1 output ports. A conference connection cannot be established on a port that is in the loopback state or under test access. Either of these cases results in a denial of the conference cross-connect command.

1. Obtain circuit provisioning information from office records.
2. If the selected DS1 port is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode of the DS1 port to be used in the cross-connection by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3 circuit pack): `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d: ... : ,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: `[1-64]-[1-15]`

   j = DS3 mode: `[ CC, DS1 ]`

   If the specified DS3 port has a DS3 mode of CC, a DS1 conference cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS1 port is to be selected.

3. Retrieve active signal type (DS1 ports within EC-1 ports) and port state information of the two DS1 ports to be used in the conference cross-connection by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:<ISTATE=o,OSTATE=p>"
;
```

   Where:

   e = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   f = Active signal type: `{ EC1, T1, VT1 }`

   o = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected ADDTO DS1 port is not in the IDLE-REL state (parameters *o* and *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 port to the IDLE-REL state or selecting another DS1 port in the IDLE-REL state.

   If either of the specified DS1 ports is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 cross-connection can not be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another DS1 port(s) is to be selected.

4. Establish a conference cross-connection by entering the following command:

   ENT-CONF-T1:*[a]*:*b*,*c*:::*[*OMODE=*e]*:,*[f]*;

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = ADDTO DS1 port location:

   FROM/ADDTO DS1 Ports:
   DS1 Interface-P Module: [1-64]-[1-7]-[1-28]
   DS1 Interface Module: [1-64]-[1-8]-[1-28]
   DS3 Interface-32 Module: [1-64]-[1-31]-[1-28]
   DS3 or STS1 Interface-16 Module:
   DS1 port number: [1-64]-[1-15]-[1-28]
   VT1.5 group number: [1-64]-[1-15]-[1-7]-[1-4]

   e = Output mode: [NORM, TERM, AIS, QRSS]
   Default: NORM
   Specifies what is transmitted from the ADDTO DS1 output port.

   - NORM — Normal (cross-connected data)
   - TERM — Terminated (idle signal)
   - AIS — Alarm indication signal (blue code)
   - QRSS — Quasi-random signal. QRSS **cannot** be specified for DS1 ports within DS3 Clear-Channel or STS1 Interface-16 Modules.

   f = Special service type: [RDLD, NOVAL]
   Default: NOVAL (not red-lined)
   Specifies whether or not the conference connection is red-lined. If the circuit you are bridging from is red-lined, the conference connection must also be red-lined.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing DS3 Conference (Broadcast) Cross-Connections

This procedure is used to form a conference DS3 cross-connect from a selected DS3 input port to another DS3 output port that is in the IDLE-REL state. The selected DS3 ports must be associated with either MUX3 (provisioned for CC [clear-channel] mode) or SMUX (provisioned in the ASYN [asynchronous] format) circuit packs or the cross-connection is denied. You cannot cross-connect one DS3 input port to more than two DS3 output ports. A conference connection cannot be established on a port that is in the loopback state or under test access. Either of these cases results in a denial of the conference cross-connect command.

1. Obtain circuit provisioning information from office records.
2. Retrieve DS3 mode (MUX3 circuit packs) and/or EC-1 port format (SMUX circuit packs) information of the two DS3 ports to be used in the conference cross-connected by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3 or SMUX circuit pack): `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<>:ACTSIG */
      "d:EC1MAP=e ... : ,DS3MODE=j"
   ;
   ```

   Where:

   d = DS3 port location: `[1-64]-[1-15]`

   e = Provisioned EC-1 format (DS3 ports associated with SMUX circuit packs): `[ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK ]`

   j = DS3 mode (DS3 ports associated with MUX3 circuit packs): `[ CC, DS1 ]`

   If the selected DS3 ports associated with MUX3 circuit packs are not in CC mode, a DS3 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port can be changed to CC mode [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS3 port(s) is to be selected.

   If the selected DS3 ports associated with SUMX circuit packs are not formatted for ASYN, a DS3 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be formatted for ASYN [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another EC-1 port(s) is to be selected.

3. Retrieve the port state information of the ADDTO DS3 port to be used in the conference cross-connection by entering the following command:

   `RTRV-STATE-T3:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = DS3 port location: `[1-64]-[1-15]`

   f = DS3 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = DS3 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected ADDTO DS3 port is not in the IDLE-REL state (parameter *g*), contact the system administrator or next level of support for assistance in moving the selected DS3 ports to the IDLE-REL state or selecting DS3 clear-channel ports in the IDLE-REL state.

4. Retrieve the port output mode information of the ADDTO DS3 port to be used in the cross-connection by entering the following command:

   `RTRV-T3:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "g:...OMODE=u..."
;
```

Where:

g = DS3 port location: {1-64}-{1-15}

u = Output mode: { NORM, TERM, AIS }

If the output mode of the selected DS3 ports is TERM (parameter *u*), continue with Step 5. Otherwise, go to Step 6.

5. Change the output mode of the DS3 port in the TERM mode to the NORM mode by entering the following command:

   ED-T3:*[a]*:*b*::::OMODE=NORM;

   Where:

   a = Target ID (optional)

   b = DS3 port location: {1-64}-{1-15}

6. Establish a conference cross-connection by entering the following command:

   ENT-CONF-T3:*[a]*:*b*,*c*::::*[*OMODE=*e]*:,*[f]*;

   Where:

   a = Target ID (optional)

   b = FROM DS3 port location:

   c = ADDTO DS3 port location:

   FROM/ADDTO DS3 Ports:
   DS3 or STS1 Interface-16 Module: {1-64}-{1-15}

   e = Output mode: { NORM, AIS }
   Default: NORM
   Specifies what is transmitted from the ADDTO DS3 output port.

   - NORM — Normal (cross-connected data)
   - AIS — Alarm indication signal (blue code)

   f = Special service type: { RDLD, NOVAL }
   Default: NOVAL (not red-lined)
   Specifies whether or not the conference connection is red-lined. If the circuit you are bridging from is red-lined, this parameter must be RDLD.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

7. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing STS-1 Conference (Broadcast) Cross-Connections

This procedure is used to form a conference STS-1 cross-connect from a selected EC-1 input port to another EC-1 output port that is in the IDLE-REL state. The selected EC-1 ports must have an Active Signal Type of EC1 (STS-1 signal) or the cross-connection is denied. You can not cross-connect one EC-1 input port to more than two EC-1 output ports. A conference connection cannot be established on a port that is in the loopback state or under test access. Either of these cases results in a denial of the conference cross-connect command.

1. Obtain circuit provisioning information from office records.
2. Retrieve the active signal type of the two EC-1 ports (STS-1 signals) to be used in the conference cross-connection by entering the following command:

   `RTRV-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{1-64}-{1-15}`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:ACTSIG:<> */
      "g:h:..."
   ;
   ```

   Where:

   g = EC-1 port location: `{1-64}-{1-15}`

   h = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type for either port is not EC1, an STS-1 conference cross-connection can not be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/ DS1/DS3 Operation" (page 6-32)] or whether another EC-1 port(s) is to be selected.

3. Retrieve the port state information of the ADDTO EC-1 port (STS-1 signal) to be used in the conference cross-connection by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{1-64}-{1-15}`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

Where:

e = EC-1 port location: `{1-64}-{1-15}`

f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected EC-1 port is not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected EC-1 port to the IDLE-REL state or selecting another EC-1 port in the IDLE-REL state.

4. Establish a conference cross-connection by entering the following command:

   `ENT-CONF-STS1:`*[a]*`:`*b*`,`*c*`:::`*[*`OMODE=`*e]*`:,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = FROM STS-1 port location:

   c = ADDTO STS-1 port location:

   FROM/ADDTO STS-1 Ports:
   STS1 Interface-16 Module: `{1-64}-{1-15}`

   e = Output mode: `{ NORM, TERM, AIS }`
   Default: `NORM`
   Specifies what is transmitted from the ADDTO STS-1 output port.

   - `NORM` — Normal (cross-connected data)
   - `TERM` — Terminated (idle signal)
   - `AIS` — Alarm indication signal (blue code)

   f = Special service type: `{ RDLD, NOVAL }`
   Default: `NOVAL` (not red-lined)
   Specifies whether or not the conference connection is red-lined. If the circuit you are bridging from is red-lined, the conference connection must also be red-lined.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Establishing VT1.5 Conference (Broadcast) Cross-Connections

This procedure is used to form a conference VT1.5 cross-connect from a selected VT1.5 input port to another VT1.5 output port that is in the IDLE-REL state. The selected VT1.5 ports must have an Active Signal Type of VT1 (VT1.5 signal) or the cross-connection is denied. You cannot cross-connect one VT1.5 input port to more than two VT1.5 output ports. A conference connection cannot be established on a port that is in the loopback state or under test access. Either of these cases results in a denial of the conference cross-connect command.

1. Obtain circuit provisioning information from office records.
2. Retrieve the active signal type of the two VT1.5 ports to be used in the conference cross-connection by entering the following command:

   `RTRV-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:..."
;
```

   Where:

   g = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   h = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type for either port is not VT1, a VT1.5 conference cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfig-

ured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/ DS1/DS3 Operation" (page 6-32)] or whether another VT1.5 port(s) is to be selected.

3. Retrieve the port state information of the ADDTO VT1.5 port to be used in the conference cross-connection by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected VT1.5 port is not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 port to the IDLE-REL state or selecting another VT1.5 port in the IDLE-REL state.

4. Establish a conference cross-connection by entering the following command:

   ENT-CONF-VT1:*[a]*:*b*,*c*:::*[*OMODE=*e]*:,*[f]*;

   Where:

   a = Target ID (optional)

   b = FROM VT1.5 port location:

   c = ADDTO VT1.5 port location:

   FROM/ADDTO VT1.5 Ports:
   STS1 Interface-16 Module:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

   e = Output mode: { NORM, TERM, AIS }
   Default: NORM
   Specifies what is transmitted from the ADDTO VT1.5 output port.

   - NORM — Normal (cross-connected data)
   - TERM — Terminated (idle signal)
   - AIS — Alarm indication signal (blue code)

   f = Special service type: { RDLD, NOVAL }
   Default: NOVAL (not red-lined)
   Specifies whether or not the conference connection is red-lined. If the circuit you are bridging from is red-lined, the conference connection must also be red-lined.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Rolling Over Cross-Connections

Use one of the following procedures to roll over a one-way or two-way cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and a DS1, STS-1, or VT1.5 output port (TO), so that the FROM port is replaced by a new DS1, STS-1, or VT1.5 input port (NEWFROM):

- "DS1 Cross-Connection Rollover" (page 10-30)
- "DS3 Cross-Connection Rollover" (page 10-34)
- "STS-1 Cross-Connection Rollover" (page 10-38)
- "VT1.5 Cross-Connection Rollover" (page 10-41)

DS1 Cross-Connection Rollover

This procedure is used to roll a DS1 cross-connect from a selected DS1 input port to another DS1 output port that is in the IDLE-REL state. If either of the selected DS1 ports are within EC-1 ports, the Active Signal Type must be T1 (DS1 signal) or the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Identify the TO, FROM, and NEWFROM ports to be used in the `ENT-ROLL-T1` command.
3. Retrieve active signal type (DS1 ports within EC-1 ports) and port state information of the three DS1 ports to be used in the cross-connection rollover by entering the following command:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:<ISTATE=o,OSTATE=p>"
;
```

Where:

g = DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`

h = Active signal type: `{ EC1, T1, VT1 }`

o = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected NEWFROM DS1 port is not in the IDLE-REL state (parameters *o* and *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 port to the IDLE-REL state or selecting another DS1 port in the IDLE-REL state.

If any of the specified DS1 ports are associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another DS1 port(s) is to be selected.

4. If the selected DS1 port is associated with a DS3 port of a MUX3 clear-channel circuit pack, retrieve the DS3 mode of the DS1 port to be used in the rollover cross-connection by entering the following command:

`RTRV-PORT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = DS3 port location (MUX3 clear-channel circuit pack):
`[1-64]-[1-15]`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d: ... : ,DS3MODE=j"
;
```

Where:

d = DS3 port location: `{1-64}-{1-15}`

j = DS3 mode: `{ CC, DS1 }`

If the specified DS3 port(s) has a DS3 mode of CC, a DS1 rollover cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS1 port is to be selected.

5. Copy the database in working memory (WKG) to the PRI disk drive by entering the following command:

   `CPY-MEM:`*[a]*`:::WKG,PRI,DBASE;`

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   Executing this command before entering the `ENT-ROLL-T1` command prevents interruption of the roll operation due to automatic database updates to the PRI disk drive.

6. Roll over a one-way or two-way cross-connection by entering the following command:

   `ENT-ROLL-T1:`*[a]*`:`*b*`,`*c*`,`*e*`::`*[f]*`:`*[g]*`:`*[h]*`;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   e = NEWFROM DS1 port location:
   FROM/TO/NEWFROM DS1 Ports:
   DS1 Interface-P Module: `{1-64}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-64}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-64}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-64}-{1-15}-{1-28}`
   STS1 Interface-16 Module:
   DS1 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   f = Special service type: `{ RDLD, Y, N }`
   Default: `N` (not red-lined)
   Specifies whether or not the connection is red-lined. If the circuit you are rolling from is red-lined, the rollover connection must also be red-lined. Both `RDLD` and `Y` indicate a red lined circuit.

   g = To Output mode: `{ NORM, TERM, AIS, QRSS }`
   Default: `NORM`
   Specifies what is transmitted from the TO DS1 output port.

   - `NORM` — Normal (cross-connected data)
   - `TERM` — Terminated (idle signal)

- AIS — Alarm indication signal (blue code)
- QRSS — Quasi-random signal. QRSS **cannot** be specified for DS1 ports within STS1 Interface-16 Modules.

h = Roll type: [ONEWAY, TWOWAY]
Default: ONEWAY
Specifies a one-way or two-way roll.

Figure 10-2 shows an example of using the ENT-ROLL-T1 command to perform a rollover of a two-way cross-connection. A one-way cross-connection is rolled over in a similar fashion by specifying ONEWAY instead of TWOWAY.

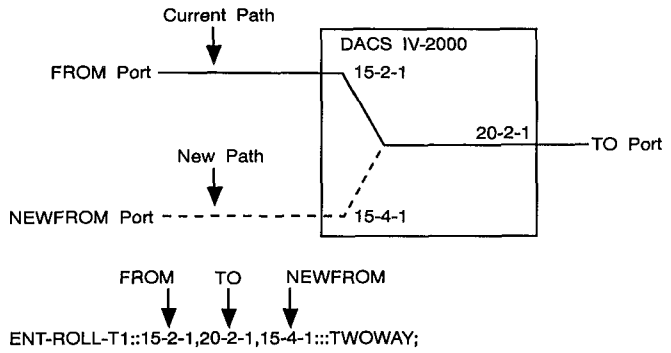


Figure 10-2. **Example of Using the ENT-ROLL-T1 Command**

NOTE:
The ENT-ROLL-T1 command does not automatically take down conference connections. Conference connections must be taken down before attempting a rollover using the DLT-CONF-T1 command. See the section titled "Disconnecting Cross-Connections" (page 10-44) for information on disconnecting conference connections.

If the NEWFROM port is not in the IDLE-REL state, the ENT-ROll-T1 command is denied with the SNVS or SACC error code.

This command takes up to 2 seconds to complete (the COMPLD message appears when done). An open on the circuit occurs during the ENT-ROLL-T1 command. If the COMPLD message does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

7. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

DS3 Cross-Connection Rollover

This procedure is used to roll a DS3 cross-connect from a selected DS3 input port to another DS3 input port (NEWFROM). DS3 ports must be associated with either MUX3 (provisioned for CC [clear-channel] mode) or SMUX (provisioned in the ASYN [asynchronous] format) circuit packs or the rollover is denied. The following restrictions also apply:

- The input and output ports for the NEWFROM port of a two-way rollover must be in the IDLE-REL state.
- If the existing connection is red-lined, the connection from the NEWFROM port must also be red-lined.

1. Obtain circuit provisioning information from office records.
2. Identify the TO, FROM, and NEWFROM ports to be used in the `ENT-ROLL-T3` command.
3. Retrieve DS3 mode (MUX3 circuit packs) or EC-1 port format (SMUX circuit packs) information of the three DS3 ports to be used in the cross-connected rollover by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{1-64}-{1-31}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:EC1MAP=e...:,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: `{1-64}-{1-15}`

   e = Provisioned EC-1 format (DS3 ports associated with SMUX circuit packs): `{ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }`

   j = DS3 mode (DS3 ports associated with MUX3 circuit packs): `{ CC, DS1 }`

   If the selected DS3 ports associated with MUX3 circuit packs are not in CC mode, a DS3 cross-connection cannot be made. Contact the system administrator or next level of support to determine whether the DS3 port can be changed to CC mode [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS3 port(s) is to be selected.

   If the selected DS3 ports associated with SMUX circuit packs are not formatted for ASYN, a DS3 cross-connection can not be made. Contact the system administrator or next level of support to determine whether the

EC-1 port can be formatted for ASYN [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another EC-1port(s) is to be selected.

4. Retrieve the port state information of the three DS3 ports to be used in the cross-connected rollover by entering the following command:

   RTRV-STATE-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = DS3 port location: `[1-64]-[1-15]`

   f = DS3 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = DS3 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   For a two-way rollover, if the selected NEWFROM DS3 port is not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected DS3 ports to the IDLE-REL state or selecting DS3 ports in the IDLE-REL state.

5. Retrieve the port output mode information of the NEWFROM DS3 port to be used in the cross-connection by entering the following command:

   RTRV-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "g:...OMODE=u..."
;
```

Where:

g = DS3 port location: `[1-64]-[1-15]`

u = Output mode: `[ NORM, TERM, AIS ]`

If the output mode of the selected NEWFROM DS3 ports is TERM (parameter *u*), continue with Step 6. Otherwise, go to Step 7.

6. Change the output mode of the DS3 port in the TERM mode to the NORM mode by entering the following command:

`ED-T3:`*[a]*`:`*b*`::::OMODE=NORM;`

Where:

a = Target ID (optional)

b = DS3 port location: `[1-64]-[1-15]`

7. Roll over a one-way or two-way cross-connection by entering the following command:

`ENT-ROLL-T3:`*[a]*`:`*b*`,`*c*`,`*e*`::`*[f]*`:`*[g]*`:`*[h]*`;`

Where:

a = Target ID (optional)

b = FROM DS3 port location:

c = TO DS3 port location:

e = NEWFROM DS3 port location:

FROM/TO/NEWFROM DS3 Ports:
DS3 Clear-Channel or STS1 Interface-16 Module: `[1-64]-[1-15]`

f = Special service type: `[ RDLD, NOVAL ]`
Default: `NOVAL` (not red-lined)
Specifies whether or not the connection is red-lined. If the circuit you are rolling from is red-lined, this parameter must be `RDLD`.

g = To Output mode: `[ NORM, AIS ]`
Default: `NORM`
Specifies what is transmitted from the TO DS3 output port.

- `NORM` — Normal (cross-connected data)
- `AIS` — Alarm indication signal (blue code)

h = Roll type: `[ ONEWAY, TWOWAY ]`
Default: `ONEWAY`
Specifies a one-way or two-way roll.

Figure 10-3 shows an example of using the `ENT-ROLL-T3` command to perform a rollover of a two-way cross-connection. A one-way cross-connection is rolled over in a similar fashion by specifying `ONEWAY` instead of `TWOWAY`.

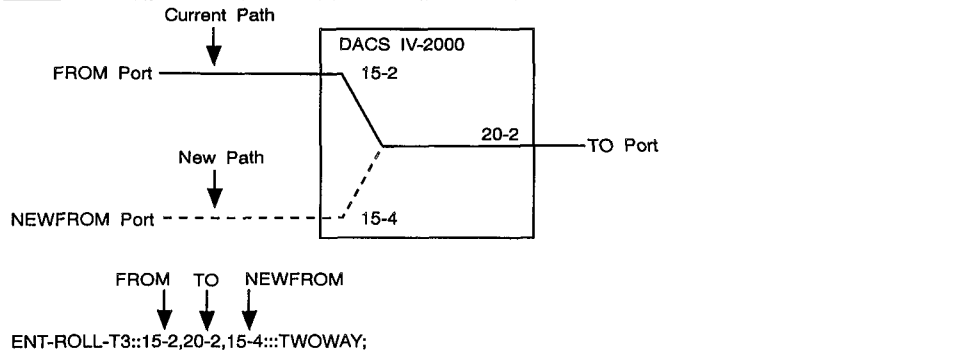


Figure 10-3. **Example of Using the ENT-ROLL-T3 Command**

NOTE:

The ENT-ROLL-T3 command does not automatically take down conference connections. Conference connections must be taken down using the DLT-CONF-T3 command. See the section titled "Disconnecting Cross-Connections" (page 10-44) for information on disconnecting conference connections.

For two-way rollovers, if the NEWFROM port is not in the IDLE-REL state, the ENT-Roll-T3 command is denied with the SNVS or SACC error code.

This command takes up to two seconds to complete (the COMPLD message appears when done). An open on the circuit occurs during the ENT-ROLL-T3 command. If the COMPLD message does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

8. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

STS-1 Cross-Connection Rollover

This procedure is used to rollover an STS-1 cross-connect from a selected EC-1 input port to another EC-1 output port that is in the IDLE-REL state. The selected EC-1 ports must have an Active Signal Type of EC1 (STS-1 signal) or the cross-connection is denied. The following restrictions also apply:

- The input and output ports for the NEWFROM port of a two-way rollover must be in the IDLE-REL state.
- If the existing connection is red-lined, the connection from the NEWFROM port must also be red-lined.

1. Obtain circuit provisioning information from office records.
2. Identify the TO, FROM, and NEWFROM ports to be used in the `ENT-ROLL-STS1` command.
3. Retrieve the active signal type of the three EC-1 ports (STS-1 signals) to be used in the cross-connection rollover by entering the following command:

   `RTRV-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:..."
;
```

   Where:

   g = EC-1 port location: `[1-64]-[1-15]`

   h = Active signal type: `[ EC1, T1, VT1 ]`

   If the Active Signal Type for any port is not EC1, an STS-1 cross-connection rollover can not be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another EC-1 port(s) is to be selected.

4. Retrieve the port state information of the NEWFROM EC-1 port (STS-1 signal) to be used in the cross-connection rollover by entering the following command:

   `RTRV-STATE-EC1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = EC-1 port location: `[1-64]-[1-15]`

   f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected EC-1 port is not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected EC-1 port to the IDLE-REL state or selecting another EC-1 port in the IDLE-REL state.

5. Roll over a one-way or two-way cross-connection by entering the following command:

   `ENT-ROLL-STS1:[a]:b,c::e:[f]:[g]:[h];`

   Where:

   a = Target ID (optional)

   b = FROM STS-1 port location:

   c = TO STS-1 port location:

   e = NEWFROM STS-1 port location:

   FROM/TO/NEWFROM STS-1 Ports:
   STS1 Interface-16 Module: `[1-64]-[1-15]`

   f = Special service type: `[ RDLD, NOVAL ]`
   Default: NOVAL (not red-lined)
   Specifies whether or not the connection is red-lined. If the circuit you are rolling from is red-lined, the parameter must be RDLD.

g = To Output mode: { NORM, TERM, AIS }
Default: NORM
Specifies what is transmitted from the TO STS-1 output port.

- NORM — Normal (cross-connected data)
- TERM — Terminated (idle signal)
- AIS — Alarm indication signal (blue code)

h = Roll type: { ONEWAY, TWOWAY }
Default: ONEWAY
Specifies a one-way or two-way roll.

Figure 10-4 shows an example of using the ENT-ROLL-STS1 command to perform a rollover of a two-way cross-connection. A one-way cross-connection is rolled over in a similar fashion by specifying ONEWAY instead of TWOWAY.

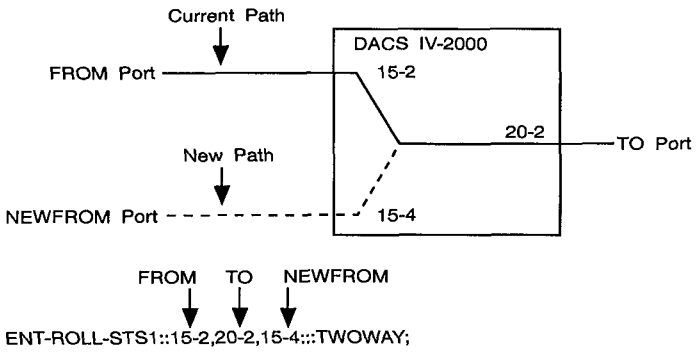


Figure 10-4. **Example of Using the ENT-ROLL-STS1 Command**

NOTE:

The ENT-ROLL-STS1 command does not automatically take down conference connections. Conference connections must be taken down before attempting a rollover using the DLT-CONF-STS1 command. See the section titled "Disconnecting Cross-Connections" (page 10-44) for information on disconnecting conference connections.

If the NEWFROM port is not in the IDLE-REL state, the ENT-ROll-STS1 command is denied with the SNVS or SACC error code.

This command takes up to two seconds to complete (the COMPLD message appears when done). An open on the circuit occurs during the ENT-ROLL-STS1 command. If the COMPLD message does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document

titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

VT1.5 Cross-Connection Rollover

This procedure is used to rollover a VT1.5 cross-connect from a selected VT1.5 input port to another VT1.5 output port that is in the IDLE-REL state. The selected VT1.5 ports must have an Active Signal Type of VT1 (VT1.5 signal) or the cross-connection is denied. The following restrictions also apply:

- The input and output ports for the NEWFROM port of a two-way rollover must be in the IDLE-REL state.
- If the existing connection is red-lined, the connection from the NEWFROM port must also be red-lined.

1. Obtain circuit provisioning information from office records.
2. Identify the TO, FROM, and NEWFROM ports to be used in the `ENT-ROLL-VT1` command.
3. Retrieve the active signal type of the two VT1.5 ports to be used in the cross-connection rollover by entering the following command:

   `RTRV-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:..."
;
```

   Where:

   g = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   h = Active signal type: `{ EC1, T1, VT1 }`

If the Active Signal Type for any port is not VT1, a VT1.5 cross-connection rollover can not be made. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another VT1.5 port(s) is to be selected.

4. Retrieve the port state information of the NEWFROM VT1.5 port to be used in the cross-connection rollover by entering the following command:

   `RTRV-STATE-VT1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   For two-way rollovers, if the selected VT1.5 port is not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 port to the IDLE-REL state or selecting another VT1.5 port in the IDLE-REL state.

5. Roll over a one-way or two-way cross-connection by entering the following command:

   `ENT-ROLL-VT1:`*[a]*`:`*b*`,`*c*`::`*e*`:`*[f]*`:`*[g]*`:`*[h]*`;`

   Where:

   a = Target ID (optional)

   b = FROM VT1.5 port location:

   c = TO VT1.5 port location:

   e = NEWFROM VT1.5 port location:

   FROM/TO/NEWFROM VT1.5 Ports:
   STS1 Interface-16 Module:
   VT1.5 port: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   f = Special service type: `RDLD`
   Default: None (not red-lined)
   Specifies whether or not the connection is red-lined. If the circuit you are rolling from is red-lined, the rollover connection must also be red-lined.

   g = To Output mode: `[ NORM, TERM, AIS ]`
   Default: `NORM`
   Specifies what is transmitted from the TO VT1.5 output port.

   - `NORM` — Normal (cross-connected data)
   - `TERM` — Terminated (idle signal)
   - `AIS` — Alarm indication signal (blue code)

   h = Roll type: `[ ONEWAY, TWOWAY ]`
   Default: `ONEWAY`
   Specifies a one-way or two-way roll.

   Figure 10-5 shows an example of using the `ENT-ROLL-VT1` command to perform a rollover of a two-way cross-connection. A one-way cross-connection is rolled over in a similar fashion by specifying `ONEWAY` instead of `TWOWAY`.

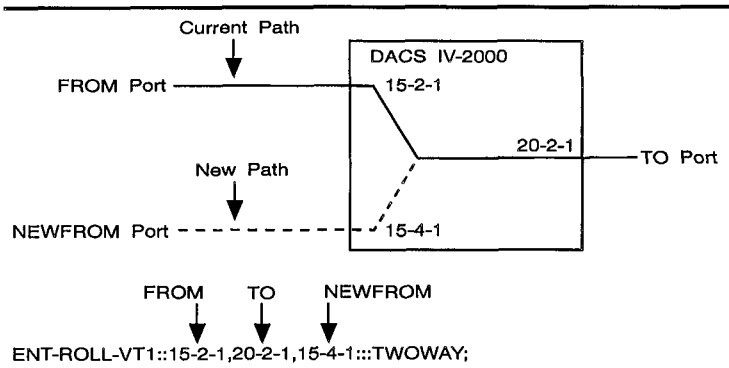


Figure 10-5. **Example of Using the ENT-ROLL-VT1 Command**

NOTE:

The ENT-ROLL-VT1 command does not automatically take down conference connections. Conference connections must be taken down before attempting a rollover using the DLT-CONF-VT1 command. See the section titled "Disconnecting Cross-Connections" (page 10-44) for information on disconnecting conference connections.

If the NEWFROM port is not in the IDLE-REL state, the ENT-Roll-VT1 command is denied with the SNVS or SACC error code.

This command takes up to two seconds to complete (the COMPLD message appears when done). An open on the circuit occurs during the ENT-ROLL-VT1 command. If the COMPLD message does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, when cross-connections have been established and update your office records.

Disconnecting Cross-Connections

These procedures are used to disconnect a one-way, two-way, or conference cross-connection.

Disconnecting One-Way and Two-Way Cross-Connections

Use one of the following procedures to disconnect a one-way or two-way cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and a DS1, STS-1, or VT1.5 output port (TO):

- "Disconnecting DS1 One-Way and Two-Way Cross-Connections" (page 10-45)
- "Disconnecting DS3 One-Way and Two-Way Cross-Connections" (page 10-46)
- "Disconnecting STS-1 One-Way and Two-Way Cross-Connections" (page 10-47)
- "Disconnecting VT1.5 One-Way and Two-Way Cross-Connections" (page 10-48)

Disconnecting DS1 One-Way and Two-Way Cross-Connections

This procedure is used to disconnect a one-way or two-way DS1 cross-connection. DS1 ports within EC-1 ports must have an Active Signal Type of T1 (DS1 signal) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a one-way or two-way DS1 cross-connection by entering the following command:

   `DLT-CRS-T1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[INCL=`*f*`];`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports:
   DS1 Interface-P Module: `{1-64}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-64}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-64}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-64}-{1-15}-{1-28}`
   STS1 Interface-16 Module:
   DS1 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   e = Cross-connect type: `{ 1WAY, 2WAY }`
   Default: `2WAY`

f = Special service type: { Y, N }
Default: N (not red-lined)
Specifies the disconnection of red-lined circuits.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting DS3 One-Way and Two-Way Cross-Connections

This procedure is used to disconnect a one-way or two-way DS3 cross-connection. DS3 ports within EC-1 ports must have a provisioned EC-1 format of ASYN (asynchronous) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a one-way or two-way DS3 cross-connection by entering the following command:

   DLT-CRS-T3:*[a]*:*b*,*c*:::*[e]*:*[*INCL=*f]*;

   Where:

   a = Target ID (optional)

   b = FROM DS3 port location:

   c = TO DS3 port location:

   FROM/TO DS3 Ports:
   DS3 Clear-Channel or STS1 Interface-16 Module: {1-64}-{1-15}

   e = Cross-connect type: { 1WAY, 2WAY }
   Default: 2WAY

   f = Special service type: { Y, N }
   Default: N (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting STS-1 One-Way and Two-Way Cross-Connections

This procedure is used to disconnect a one-way or two-way STS-1 cross-connection. The specified EC-1 ports must have an Active Signal Type of EC1 (STS-1 signal) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a one-way or two-way STS-1 cross-connection by entering the following command:

   `DLT-CRS-STS1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[INCL=`*f*`]`;

   Where:

   a = Target ID (optional)

   b = FROM STS-1 port location:

   c = TO STS-1 port location:

   FROM/TO STS-1 Ports:
   STS1 Interface-16 Module: `[1-64]-[1-15]`

   e = Cross-connect type: `[ 1WAY, 2WAY ]`
   Default: `2WAY`

   f = Special service type: `[ Y, N ]`
   Default: `N` (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (`COMPLD`) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.
3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting VT1.5 One-Way and Two-Way Cross-Connections

This procedure is used to disconnect a one-way or two-way VT1.5 cross-connection. The specified VT1.5 ports must have an Active Signal Type of VT1 (VT1.5 signal) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a one-way or two-way VT1.5 cross-connection by entering the following command:

   `DLT-CRS-VT1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[INCL=`*f*`]`;

   Where:

   a = Target ID (optional)

   b = FROM VT1.5 port location:

   c = TO VT1.5 port location:

   FROM/TO VT1.5 Ports:
   STS1 Interface-16 Module:
   VT1.5 port number: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   e = Cross-connect type: `[ 1WAY, 2WAY ]`
   Default: `2WAY`

   f = Special service type: `[ Y, N ]`
   Default: `N` (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.
3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting Conference (Broadcast) Cross-Connections

Use one of the following procedures to disconnect a conference cross-connection between a DS1, DS3 (MuX3 circuit pack), STS-1, or VT1.5 input port (FROM) and a DS1, STS-1, VT1.5 output port (ADDTO).

- "Disconnecting DS1 Conference (Broadcast) Cross-Connections" (page 10-49)
- "Disconnecting DS3 Conference (Broadcast) Cross-Connections" (page 10-50)
- "Disconnecting STS-1 Conference (Broadcast) Cross-Connections" (page 10-51)
- "Disconnecting VT1.5 Conference (Broadcast) Cross-Connections" (page 10-52)

Disconnecting DS1 Conference (Broadcast) Cross-Connections

This procedure is used to disconnect a conference DS1 cross-connection. DS1 ports within EC-1 ports must have an Active Signal Type of T1 (DS1 signal) or the disconnection of the cross-connection is denied.

This procedure is used to disconnect a conference DS1 cross-connection.

1. Obtain circuit provisioning information from office records.
2. Disconnect a conference cross-connection by entering the following command:

   `DLT-CONF-T1:`*[a]*`:`*b*`,`*c*`::::[INCL=`*e*`];`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports:
   DS1 Interface-P Module: `[1-64]-[1-7]-[1-28]`
   DS1 Interface Module: `[1-64]-[1-8]-[1-28]`
   DS3 Interface-32 Module: `[1-64]-[1-31]-[1-28]`
   DS3 Interface-16 Module: `[1-64]-[1-15]-[1-28]`
   STS1 Interface-16 Module:
   DS1 port number: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

e = Special service type: [Y, N]
Default: N (not red-lined)
Specifies the disconnection of red-lined circuits.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting DS3 Conference (Broadcast) Cross-Connections

This procedure is used to disconnect a conference DS3 cross-connection. DS3 ports within EC-1 ports must have a provisioned EC-1 format of ASYN (asynchronous) or the disconnection of the cross-connection is denied. DS3 ports on a MUX3 circuit pack must be clear channel.

This procedure is used to disconnect a conference DS3 cross-connection.

1. Obtain circuit provisioning information from office records.
2. Disconnect a conference cross-connection by entering the following command:

   DLT-CONF-T3:*[a]*:*b*,*c*::::*[*INCL=*e]*;

   Where:

   a = Target ID (optional)

   b = FROM DS3 port location:

   c = TO DS3 port location:

   FROM/TO DS3 Ports:
   DS3 Clear-Channel or STS1 Interface-16 Module: [1-64]-[1-15]

   e = Special service type: [Y, N]
   Default: N (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting STS-1 Conference (Broadcast) Cross-Connections

This procedure is used to disconnect a conference STS-1 cross-connection. The specified EC-1 ports must have an Active Signal Type of EC1 (STS-1 signal) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a conference cross-connection by entering the following command:

   `DLT-CONF-STS1:`*[a]*`:`*b*`,`*c*`::::[INCL=`*e*`];`

   Where:

   a = Target ID (optional)

   b = FROM STS-1 port location:

   c = TO STS-1 port location:

   FROM/TO STS-1 Ports:
   STS1 Interface-16 Module: `[1-64]-[1-15]`

   e = Special service type: `[ Y, N ]`
   Default: `N` (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (`COMPLD`) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Disconnecting VT1.5 Conference (Broadcast) Cross-Connections

This procedure is used to disconnect a conference VT1.5 cross-connection. The specified VT1.5 ports must have an Active Signal Type of VT1 (VT1.5 signal) or the disconnection of the cross-connection is denied.

1. Obtain circuit provisioning information from office records.
2. Disconnect a conference cross-connection by entering the following command:

   DLT-CONF-VT1:*[a]*:*b*,*c*::::*[*INCL=*e]*;

   Where:

   a = Target ID (optional)

   b = FROM VT1.5 port location:

   c = TO VT1.5 port location:

   FROM/TO VT1.5 Ports:
   STS1 Interface-16 Module:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

   e = Special service type: { Y, N }
   Default: N (not red-lined)
   Specifies the disconnection of red-lined circuits.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and reenter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and reenter the command or repeat the procedure as required.
3. Notify the appropriate personnel, according to office procedures, when disconnects are completed and update your office records.

Test Access

11

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Test Access

11

This chapter contains procedures used for provisioning and releasing testports (TPPV-REL [testport-provisioned-released] state) and for setting up, changing, or removing a test connection in the DACS IV-2000. Test access in the DACS IV-2000 is provided through a test access port (TAP or testport). Any unused port (that is, a port that is in the IDLE-REL [idle-released] or TPPV-REL [testport provisioned-released] state for test access can be designated as a testport. If an IDLE-REL port is used as a testport, the basic state of the port is changed to TP (test port), where a TPPV-REL port that is used as a testport retains the basic state TPPV. That is, the basic state TPPV indicates that the testport has been provisioned that way and the basic state TP indicates ports that are used as temporary testports.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

For more information on test access, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) or the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

Performing a Typical Test Access Session

This procedure is provided as a typical test access session that can be performed to ensure facility repairs and to test new facilities before they are tuned-up. Your local office procedures may supercede some of the information contained in this procedure. The following procedure is set up to coincide with the information presented in the section titled "Test Access" in the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

1. Designate which port to be tested is to be the E-End (generally the port providing a *short haul* path access to equipment within the same Central Office) and which port to be tested is to be the F-End (generally the port providing a *long haul* path to another Central Office). This designation is to be carried throughout this procedure. Figure 11-1 shows the configuration of the E-End and F-End designations and the direction of signal flow during a test access session.

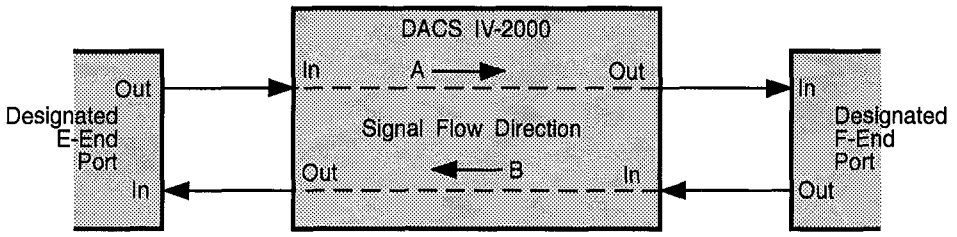


Figure 11-1. **Test Access Conventions**

2. Check the parameters of the ports (E- and F-End) to be tested for loopbacks (also for DS1 ports, check the line coding [AMI or B8ZS]) by entering one of the following commands:

   T1 ports: `RTRV-T1:`*[a]*`:`*b*`;`
   T3 ports: `RTRV-T3:`*a]*`:`*b*`;;`
   STS-1 ports: `RTRV-STATE-EC1:`*[a]*`:`*b*`;`
   VT1.5 ports: `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

b = E- and F-End ports to be tested location:
DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
DS3 port location: `{1-64}-{1-31}`
DS3 ports can be associated with DS3 (MUX3 circuit packs) or
EC-1 port location: `{1-64}-{1-15}`
VT1.5 port location: `{1-64}-{1-15}-{1-28}`
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

One of the following output responses appears (for this step only the parameters that are pertinent are shown):

For `RTRV-T1`:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:ACTSIG:<> */
    "e:f:<... FMT=m ISTATE=o OSTATE=p ... LINECDE=u CPLINECDE=v ...>"
;
```

Check the format (parameter *m*) of the DS1 signal to make sure the signal is set to UNFR, the input and output states (parameters *o* and *p*) to make sure there are no loopbacks up, and the linecode (parameters *u* and *v*) match and are set to the desired value (AMI or B8ZS). If necessary release loopbacks by using the appropriate section titled "Releasing Near-End DS1 Loopbacks" (page 13-4) or "Releasing Far-End DS1 Loopbacks" (page 13-8). If any of the other parameters need to be set, use the `ED-T1` command to set the necessary parameters.

For `RTRV-T3`:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC::<> */
    "g:<... DS3MODE=h, LSTATE=aa ...>"
;
```

Check the DS3 mode (parameter *h*) of the DS3 signal to make sure the signal is in CC (clear channel) mode and check the DS3 loopback state (parameter *aa*) to make sure there are no loopbacks up. If the DS3 mode is not CC, the selected DS3 port can not be used for test access (another port needs to be selected or the mode changed using the `ED-T3` command). If necessary, release loopbacks by using the appropriate section titled "Releasing Near-End DS3 Loopbacks" (page 13-15) or "Releasing Far-End DS3 Loopbacks" (page 13-18).

For RTRV-STATE-EC1 or RTRV-STATE-VT1:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:IN-STATE,OUT-STATE */
    "e:f,g>"
;
```

Check the input and output states (parameters *f* and *g*) to make sure there are no loopbacks up. If necessary release loopbacks by using the appropriate section titled "Releasing Near-End STS-1 Loopbacks" (page 13-23) for STS-1 loopbacks or "Releasing Near-End VT1.5 Loopbacks" (page 13-30) for VT1.5 loopbacks.

3. If you are using test access for DS1 ports, check the parameters of the selected testport for line coding (AMI or B8ZS) by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

   Make sure the line coding parameters are set to the same option (AMI or B8ZS) as the DS1 ports to be tested (line coding determined in Step 2). If necessary use the `ED-T1` command to set the line coding.

4. If necessary, depending on your office procedures, manually provision the testport (DS1, DS3, STS-1, or VT1.5) to be used for this procedure using one of the following procedures: "Provisioning DS1 Testports" (page 11-11) for DS1 test sessions, "Provisioning DS3 Testports" (page 11-12) for DS3 test sessions, "Provisioning STS-1 Testports" (page 11-14) for STS-1 test sessions, or "Provisioning VT1.5 Testports" (page 11-15) for VT1.5 test sessions.

5. Connect your test set (according to office procedures) to the port designated for the testport (test access port [TAP]).

6. To test if the signal from the E-End is received by the DACS IV-2000, establish a MONE test access connection by using one of the following procedures: "Establishing DS1 Test Access Connections for DS1 Cross-Connections" (page 11-23) for DS1 test sessions, "Establishing DS3 Test Access Connections" (page 11-31) for DS3 test sessions, "Establishing STS-1 Test Access Connections" (page 11-34) for STS-1 test sessions, or "Establishing VT1.5 Test Access Connections" (page 11-36) for VT1.5 test

sessions. If you need to leave a test access connection up for some time, it is recommended that you establish the MONE test access connection with the link association parameter set to N.

Figure 11-2 shows the test access configuration after establishing the MONE test access connection.

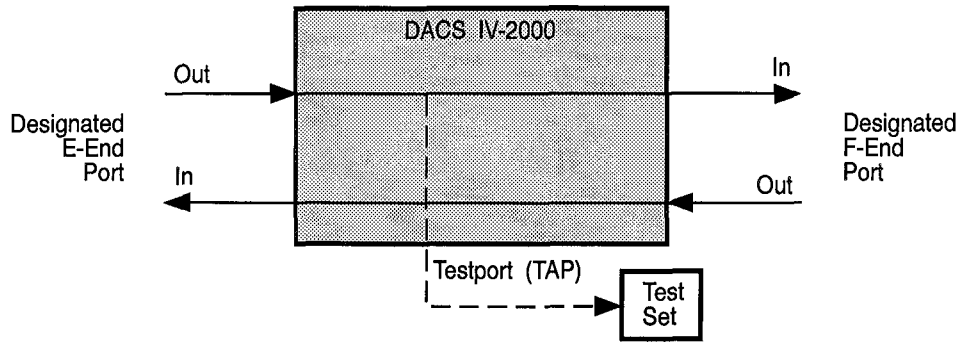


Figure 11-2. **Test Access Configuration After Establishing MONE Connection**

7. Perform the required test (specified by your system administrator) for transmission of the signal from the E-End to the DACS IV-2000.
8. To test both ends of the transmission paths for the E-End, change the MONE test connection to a SPLTE test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 11-39) for DS1 test sessions, "Changing DS3 Test Access Mode" (page 11-42) for DS3 test sessions, "Changing STS-1 Test Access Mode" (page 11-44) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 11-46) for VT1.5 test sessions.

   Figure 11-3 shows the test access configuration after changing to the SPLTE test access connection.
9. Perform the required test (specified by your system administrator) for transmission of the signal to/from the E-End from/to the DACS IV-2000.

   If this is the only test required, leave the network interface in the desired state and release the test access connection using the section titled "Removing Test Access Connections" (page 11-59) (after releasing the test connection you are done with this procedure). Otherwise, continue with Step 10.

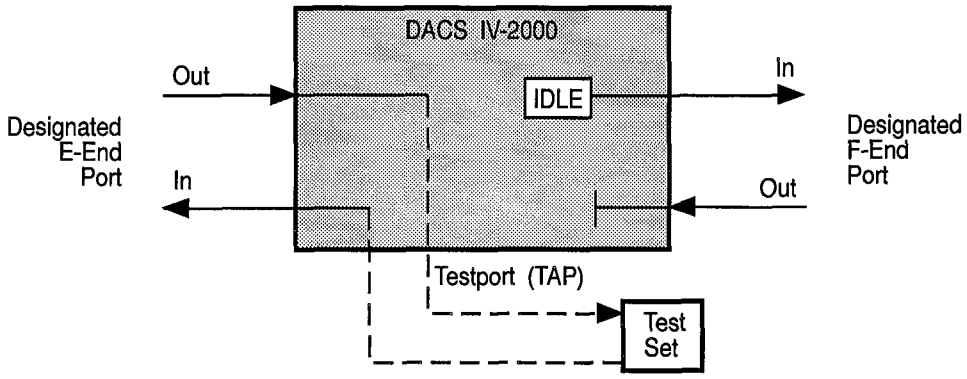


Figure 11-3. **Test Access Configuration After Changing to SPLTE Connection**

10. To test both ends of the transmission paths for the F-End, change the SPLTE test connection to a SPLTF test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 11-39) for DS1 test sessions, "Changing DS3 Test Access Mode" (page 11-42) for DS3 test sessions, "Changing STS-1 Test Access Mode" (page 11-44) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 11-46) for VT1.5 test sessions.

    Changing the test access connection to a SPLTF allows you to test the transmission between the F-End and the DACS IV-2000.
    Figure 11-4 shows the test access configuration after changing to the SPLTF test access connection.

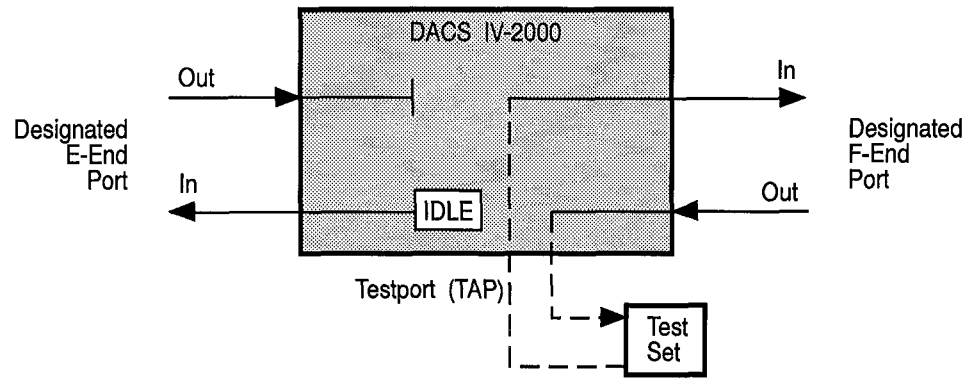


Figure 11-4. **Test Access Configuration After Changing to SPLTF Connection**

11. Perform the required test (specified by your system administrator) for transmission of the signal to/from the F-End from/to the DACS IV-2000.

    If these are the only tests required, leave the network interface in the desired state and release the test access connection using the section titled "Removing Test Access Connections" (page 11-59). After releasing the test connection you are done with this procedure. Otherwise, continue with Step 12.

12. If a round-robin test is required, loop up both ends (E- and F-Ends) of the network interface as shown in Figure 11-5. Exterior/physical loops must be used. A LPBKT loopback cannot be used.

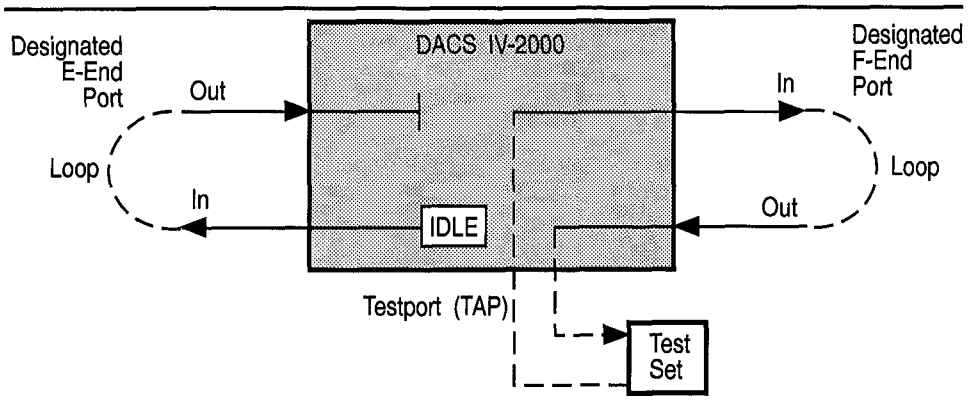


Figure 11-5. **Test Access Configuration After Looping Both Ends of the DACS IV-2000**

13. To do a round-robin test, change the SPLTF test connection to a SPLTA test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 11-39) for DS1 test sessions, ""Changing DS3 Test Access Mode" (page 11-42) for DS3 test sessions, "Changing STS-1 Test Access Mode" (page 11-44) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 11-46) for VT1.5 test sessions.

    Changing the test access connection to a SPLTA allows you to test the transmission from the E-End to the F-End through the DACS IV-2000. Figure 11-6 shows the test access configuration after changing to the SPLTA test access connection.

14. Perform the required test (specified by your system administrator) for transmission of the signal from the E-End to the F-End through the DACS IV-2000.

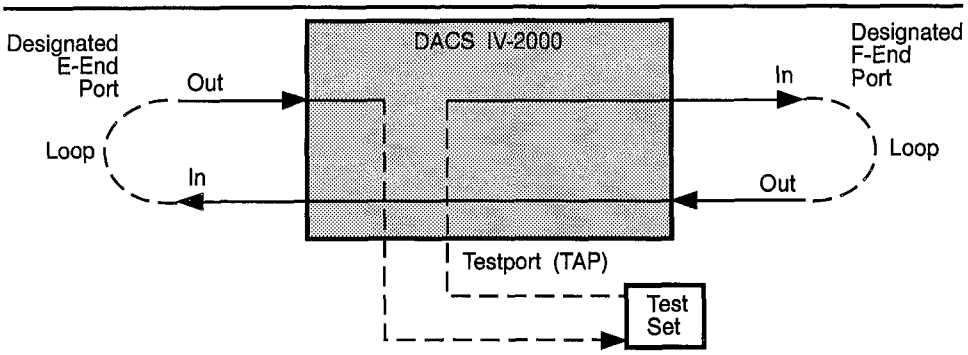


Figure 11-6. **Test Access Configuration After Changing to SPLTA Connection**

15. Change the SPLTA test connection to a SPLTB test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 11-39) for DS1 test sessions, "Changing DS3 Test Access Mode" (page 11-42) for DS3 test sessions, "Changing STS-1 Test Access Mode" (page 11-44) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 11-46) for VT1.5 test sessions.

    Changing the test access connection to a SPLTB allows you to test the transmission from the F-End to the E-End through the DACS IV-2000. Figure 11-7 shows the test access configuration after changing to the SPLTB test access connection.

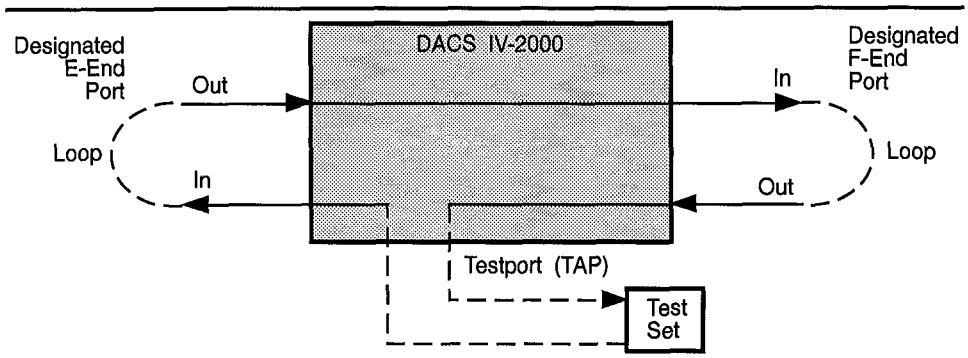


Figure 11-7. **Test Access Configuration After Changing to SPLTB Connection**

16. Perform the required test (specified by your system administrator) for transmission of the signal from the F-End to the E-End through the DACS IV-2000.

17. Disconnect the test access connection using the section titled "Removing Test Access Connections" (page 11-59).
18. To complete the test access session, remove the loops made in Step 12.

Retrieving EC-1/VT1.5/DS3/DS1 Test Access Information

This procedure is used to retrieve test access and DS1 test signal identification (TSID) information (for example, provisioned testports, active test access connections) associated with EC-1, VT1.5, DS3, or DS1 facilities.

1. Retrieve EC-1, VT1.5, DS3, or DS1 test access or DS1 TSID (`RTRV-TACC-T1` only) information by entering one of the following commands:

   EC-1 Port: `RTRV-TACC-EC1:`*[a]*;
   VT1.5 Port: `RTRV-TACC-VT1:`*[a]*;
   DS3 Port: `RTRV-TACC-T3:`*[a]*;
   DS1 Port: `RTRV-TACC-T1:`*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT_STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = Test access port (TAP):
   DS1 TAP location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
   DS3 TAP location: `{1-64}-{1-31}`
   DS3 ports can be associated with DS3 (MUX3 circuit packs) or
   EC-1 TAP location: `{1-64}-{1-15}`
   VT1.5 TAP location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

d = TAP input and output port state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the port currently used a s the TAP. The second part of the state name indicates the test access mode. The state TPPV-REL identifies provisioned testports that are idle. The basic state TSGR is associated with DS1 ports on PMGR circuit packs used for DS1 test signal identification (TSID).

e = E-End port:
DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
DS3 port location: {1-64}-{1-31}
DS3 ports can be associated with DS3 (MUX3 circuit packs) or
EC-1 port location: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the E-End port.

f = Current F-End port:
DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
DS3 port location: {1-64}-{1-31}
DS3 ports can be associated with DS3 (MUX3 circuit packs) or
EC-1 port location: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the F-End port.

g = Link ID: { CILINK-0-0, CLINK-{1,2}-{1-8} }
Specifies the link the test session was set up. The value CILINK-0-0 is used to designate a test session that is not associated with any link, and is therefore not subject to automatic release.

h = User ID: {<1-10 UID legal characters>}
Specifies the user ID used to set up the test session.

Provisioning Testports

Use one of the following procedures: "Provisioning DS1 Testports" (page 11-11), "Provisioning DS3 Testports" (page 11-12), "Provisioning STS-1 Testports" (page 11-14), or "Provisioning VT1.5 Testports" (page 11-15) to manually provision DS1, STS-1, or VT1.5 ports as testports.

Provisioning DS1 Testports

The `ENT-TSTPT-T1` command moves DS1 ports from the IDLE-REL (idle-released) state to the TPPV-REL (testport-provisioned-released) state.

DS1 ports to be provisioned as testports must be in the IDLE-REL state.

Depending on your local office procedures, it may not be necessary to provision testports.

1. Determine if the DS1 port(s) to be provisioned as a testport(s) is in the IDLE-REL state by entering the following command:

   `RTRV-STATE-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be provisioned as the testport(s) location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]]`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = DS1 port location:
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`

   f = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected DS1 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected DS1 ports to the IDLE-REL state or selecting DS1 ports in the IDLE-REL state.

2. Provision a DS1 port(s) as a testport(s) by entering the following command:

   `ENT-TSTPT-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be provisioned as the testport(s) location:
   DS1 port number: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the DS1 port has been provisioned as a testport and update your office records.

Provisioning DS3 Testports

The `ENT-TSTPT-T3` command moves DS3 ports (associated with MUX3 circuit packs only) from the IDLE-REL (idle-released) state to the TPPV-REL (testport-provisioned-released) state.

DS3 ports to be provisioned as testports must be in the IDLE-REL state.

Depending on your local office procedures, it may not be necessary to provision testports.

1. Retrieve the DS3 mode (MUX3 circuit packs) information for DS3 port to be provisioned as a DS3 testport by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-15]`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d: ... : ,DS3MODE=j"
;
```

Where:

d = DS3 port location: `{1-64}-{1-15}`

j = DS3 mode (DS3 ports associated with MUX3 circuit packs): `{ CC, DS1 }`

If the selected DS3 port associated with a MUX3 circuit pack is not in CC mode, the DS3 port can not be provisioned as a testport. Contact the system administrator or next level of support to determine whether the DS3 port can be changed to CC mode [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS3 port(s) is to be selected.

2. Determine if the DS3 port(s) to be provisioned as a testport(s) is in the IDLE-REL state by entering the following command:

`RTRV-STATE-T3:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = DS3 port(s) to be provisioned as the testport(s) location:
`{ {1-64}-{1-15}, UNIT-{1-64} }`
DS3 ports must be associated with MUX3 circuit packs only.

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

Where:

e = DS3 port location: `{1-64}-{1-15}`

f = DS3 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = DS3 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected DS3 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected DS3 ports to the IDLE-REL state or selecting DS3 ports in the IDLE-REL state.

3. Provision a DS3 port(s) as a testport(s) by entering the following command:

   `ENT-TSTPT-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port(s) to be provisioned as the testport(s) location:
   `[ [1-64]-[1-15], UNIT-[1-64] ]`
   DS3 ports must be associated with MUX3 circuit packs only.

4. Notify the appropriate personnel, according to office procedures, when the DS3 port has been provisioned as a testport and update your office records.

Provisioning STS-1 Testports

The `ENT-TSTPT-EC1` command moves STS-1 ports form the IDLE-REL (idle-released) state to the TPPV-REL (testport-provisioned-released) state.

STS-1 ports to be provisioned as testports must be in the IDLE-REL state.

Depending on your local office procedures, it may not be necessary to provision testports.

1. Determine if the STS-1 port(s) to be provisioned as a testport(s) is in the IDLE-REL state by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 port(s) to be provisioned as the testport(s) location:
   `[ [1-64]-[1-15], UNIT-[1-64] ]`
   STS-1 ports are associated with STS1 Interface Modules.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = STS-1 port location: `[1-64]-[1-15]`

f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the desired STS-1 port is not in the IDLE-REL state (parameters *f* and *g*) and/or not provisioned, you can provision the STS-1 port by referring to the section titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 6-25) before performing this procedure.

2. Provision a STS-1 port(s) as a testport(s) by entering the following command:

   `ENT-TSTPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = STS1 port(s) to be provisioned as the testport(s) location:
   `[ [1-64]-[1-15], UNIT-[1-64] ]`
   STS-1 ports are associated with STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the STS-1 port has been provisioned as a testport and update your office records.

Provisioning VT1.5 Testports

The `ENT-TSTPT-VT1` command moves VT1.5 ports form the IDLE-REL (idle-released) state to the TPPV-REL (testport-provisioned-released) state.

VT1.5 ports to be provisioned as testports must be in the IDLE-REL state.

Depending on your local office procedures, it may not be necessary to provision testports.

1. Determine if the VT1.5 port(s) to be provisioned as a testport(s) is in the IDLE-REL state by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port(s) to be provisioned as the testport(s) location:
   VT1.5 port number: `[ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] ]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
   VT1.5 ports are associated with STS1 Interface Modules.

A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:IN-STATE,OUT-STATE */
    "e:f,g"
;
```

Where:

e = VT1.5 port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the desired VT1.5 port is not in the IDLE-REL state (parameters *f* and *g*) and/or not provisioned, you can provision the VT1.5 port by referring to the section titled "Provisioning VT1.5 Facilities" (page 6-29) before performing this procedure.

2. Provision a VT1.5 port(s) as a testport(s) by entering the following command:

   `ENT-TSTPT-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port(s) to be provisioned as the testport(s) location:
   VT1.5 port number: `[ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} ]`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   VT1.5 ports are associated with STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the VT1.5 port has been provisioned as a testport and update your office records.

Releasing Testports

Use one of the following procedures: "Releasing DS1 Testports" (page 11-17), "Releasing DS3 Testports" (page 11-18), "Releasing STS-1 Testports" (page 11-19), or "Releasing VT1.5 Testports" (page 11-21) to manually deprovision DS1, DS3, STS-1, or VT1.5 testports.

Releasing DS1 Testports

The `RLS-TSTPT-T1` command moves DS1 ports from the TPPV-REL (testport-provisioned-released) state to the IDLE-REL (idle-released) state.

DS1 testports to be deprovisioned must be in the TPPV-REL state.

1. Determine if the DS1 testport(s) to be deprovisioned is in the TPPV-REL state by entering the following command:

   `RTRV-STATE-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 testport(s) to be deprovisioned location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module: `[1-64]-[1-15]-[107]-[1-4]`
   DS1 testports can be associated with DS1, DS3, or STS1 Interface Modules.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`

   f = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected DS1 ports are not in the TPPV-REL state (parameters *f* and *g*), the DS1 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a DS1 testport(s) by entering the following command:

   `RLS-TSTPT-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 testport(s) to be deprovisioned location:
   DS1 port number: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`
   VT1.5 group number (STS1 Interface Module: `[1-64]-[1-15]-[1-28]`
   DS1 testports can be associated with DS1, DS3, or STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the DS1 testport has been deprovisioned and update your office records.

Releasing DS3 Testports

The `RLS-TSTPT-T3` command moves DS3 ports (must be associated with MUX3 circuit packs only) from the TPPV-REL (testport-provisioned-released) state to the IDLE-REL (idle-released) state.

DS3 testports to be deprovisioned must be in the TPPV-REL state.

1. Determine if the DS3 testport(s) to be deprovisioned is in the TPPV-REL state by entering the following command:

   `RTRV-STATE-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 testport(s) to be deprovisioned location: `[ [1-64]-[1-15], UNIT-[1-64] ]`
   DS3 testports must be associated with MUX3 circuit packs.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

Where:

e = DS3 port location: `{1-64}-{1-15}`

f = DS3 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = DS3 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected DS3 ports are not in the TPPV-REL state (parameters *f* and *g*), the DS3 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a DS3 testport(s) by entering the following command:

   `RLS-TSTPT-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 testport(s) to be deprovisioned location:
   `{ {1-64}-{1-15}, UNIT-{1-64} }`
   DS3 testports must be associated with MUX3 circuit packs.

3. Notify the appropriate personnel, according to office procedures, when the DS3 testport has been deprovisioned and update your office records.

Releasing STS-1 Testports

The `RLS-TSTPT-EC1` command moves STS-1 ports from the TPPV-REL (testport-provisioned-released) state to the IDLE-REL (idle-released) state.

STS-1 testports to be deprovisioned must be in the TPPV-REL state.

1. Determine if the STS-1 testport(s) to be deprovisioned is in the TPPV-REL state by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 testport(s) to be deprovisioned location:
   `{ {1-64}-{1-15}, UNIT-{1-64} }`
   STS-1 testports are associated with STS1 Interface Modules.

A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:IN-STATE,OUT-STATE */
    "e:f,g"
;
```

Where:

e = STS-1 port location: `{1-64}-{1-15}`

f = STS-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

g = STS-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the selected STS-1 ports are not in the TPPV-REL state (parameters *f* and *g*), the STS-1 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a STS-1 testport(s) by entering the following command:

   `RLS-TSTPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 testport(s) to be deprovisioned location:
   `[ {1-64}-{1-15}, UNIT-{1-64} ]`
   STS-1 testports are associated with STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the STS-1 testport has been deprovisioned and update your office records.

Releasing VT1.5 Testports

The `RLS-TSTPT-VT1` command moves VT1.5 ports from the TPPV-REL (testport-provisioned-released) state to the IDLE-REL (idle-released) state.

VT1.5 testports to be deprovisioned must be in the TPPV-REL state.

1. Determine if the VT1.5 testport(s) to be deprovisioned is in the TPPV-REL state by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 testport(s) to be deprovisioned location:
   VT1.5 port number: `[ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} ]`
   VT1.5 group number: `[ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} ]`
   VT1.5 ports are associated with STS1 Interface Modules.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected VT1.5 ports are not in the TPPV-REL state (parameters *f* and *g*), the VT1.5 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a VT1.5 testport(s) by entering the following command:

   `RLS-TSTPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 testport(s) to be deprovisioned location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   VT1.5 testports are associated with STS1 Interface Modules.

3. Notify the appropriate personnel, according to office procedures, when the VT1.5 testport has been deprovisioned and update your office records.

Establishing Test Access Connections

Use one of the following procedures: "Establishing DS1 Test Access Connections for DS1 Cross-Connections" (page 11-23), "Establishing DS1 Test Access Connections for VT1.5 Cross-Connections" (page 11-27), "Establishing DS3 Test Access Connections" (page 11-31), "Establishing STS-1 Test Access Connections" (page 11-34), or "Establishing VT1.5 Test Access Connections" (page 11-36) to establish a DS1, DS3, STS-1, or VT1.5 test access connection. The ten types of test access connections are:

- MONE — establishes a monitor connection between a test access port (TAP) and the E-End (input port).
- MONF — establishes a monitor connection between a TAP and the F-End (output port).
- MONEF — establishes a monitor connection between a pair of TAPs and both the E-End and the F-End of the two-way connection. This test access requires a pair of TAPs. The pair must be made up of an odd numbered port and the next higher even numbered port (for example, 11-4-3 and 11-4-4).
- SPLTA — splits the E-End to F-End connection of a one-way or two-way cross-connection to provide test access in the A direction.
- SPLTB — splits the F-End to E-End connection of a two-way cross-connection to provide test access in the B direction.
- SPLTE — splits the E-End to F-End connection of a one-way or a two-way cross-connection to provide test access at the E-End.
- SPLTF — splits the F-End to E-End connection of a two-way cross-connection to provide test access at the F-End.

- SPLTEF — splits both directions of a two-way cross-connection to provide test access at both the E-End and the F-End. The SPLTEF mode requires a pair of TAPs. The pair must be made up of an odd numbered port and the next higher even numbered port (for example, 19-4-3 and 19-4-4).
- LOOPE — establishes a terminal loopback on the E-End port and monitors the loopback signal.
- LOOPF — establishes a terminal loopback on the F-End port and monitors the loopback signal.

NOTE:
Test access connections are considered secondary cross-connections. Therefore, the 60 ms switching time is not guaranteed in the event of a protection switch. In certain situations restoration of secondary cross-connections could be blocked.

NOTE:
The CONN-TACC command does not allow split or loopback test access on red-lined (RDLD) circuits. You must use the CHG-ACCMD command in conjunction with the CONN-TACC command to accomplish this (that is, establish a monitor test access connection and change it to a split or loop test access connection.

The port(s) used as the testport(s) for test access must be in the IDLE-REL (idle-released) or TPPV-REL (testport-provisioned-released) state.

Establishing DS1 Test Access Connections for DS1 Cross-Connections

This procedure is used to establish a DS1 test access connection for a DS1 cross-connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Determine type of test access connection to make, TAP port to be used, and assign E-End port to be used in the test access connection.

   Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the CHG-ACCMD-T1 command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 11-2) for more information].

2. If either of the selected DS1 ports is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode of the DS1 port(s) to be used as the test access port by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3 circuit pack): `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:...:,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: `{1-64}-{1-15}`

   j = DS3 mode: `{ CC, DS1 }`

   If the specified DS3 port(s) has a DS3 mode of CC, the DS1 cannot be used as a TAP. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS1 port(s) is to be selected.

3. Determine if the DS1 port(s) to be used as the testport(s) are in the IDLE-REL or TPPV-REL state and the linecode and framing parameters match the ports to be test accessed (if necessary use the or `RTRV-T1` command for the ports to be test accessed) by entering the following command:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be used as the testport(s) location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

The following output response appears (for this step only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:ACTSIG:<> */
    "e:f:<... FMT=m ISTATE=o OSTATE=p ... LINECDE=u CPLINECDE=v ...>"
;
```

Check the format (parameter *m*) of the DS1 signal to make sure the signal is set to UNFR or matches the ports to be test accessed, the input and output states (parameters o and p) to make sure they are in the IDLE-REL or TPPV-REL state, and the linecodes (parameters *u* and *v*) match and are the same as the ports to be test accessed. If necessary, if any of the parameters need to be changed, use the `ED-T1` command to set the necessary parameters.

4. Establish a two-way DS1 cross-connection between the designated E-End DS1 port and the designated F-End DS1 port using the section titled "Establishing One-Way and Two-Way Cross-Connections" (page 10-5), if necessary.

5. Establish a test access connection by entering the following command:

   `CONN-TACC-T1:`*[a]*`:`*b*`,`*c*`,:::`*[f]*`:`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port (TAP) location:
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`
   Specifies the TAP, which is the DS1 port used as the testport for this test session. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

NOTE:
When the MONEF or SPLTEF test mode is specified for parameter *f*, two TAPs are used: the one specified, which must end in an odd-numbered value, and the next DS1 port in sequential order (for example, 11-4-3 and 11-4-4).

   c = DS1 port (E-END):
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`
   Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The DS1 port can be associated with a DS1 or DS3 Interface Module.

NOTE:
If the E-End DS1 input port is mapped to exactly one DS1 output port, the output DS1 port becomes the current F-End DS1 output port for the test session. If the E-End DS1 input port is mapped to more than one DS1 output port (broadcast connection), the current F-End DS1 port defaults to the DS1 port that forms a two-way connection with the E-End DS1 input port.

f = Test mode: { MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF }
Default: MONE
Specifies the test access mode.

g = Link association: { Y, N }
Default: Y (yes, the test session is associated with the link)
Specifies whether the test session is to be associated with the link on which the CONN-TACC-T1 command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the CONN-TACC-T1 command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "m:n,o,..."
;
```

Where:

m = Test access port (TAP) location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

n = E-END port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

o = F-END port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

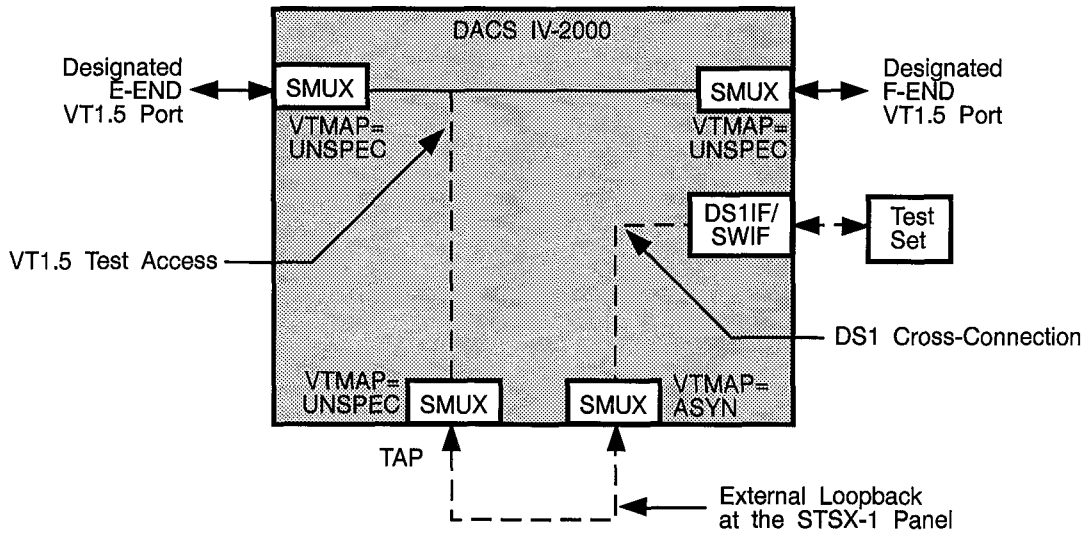
If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512)*

Release 5.0 Commands and Messages manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, when the DS1 test access connection is established and update your office records.

Establishing DS1 Test Access Connections for VT1.5 Cross-Connections

This procedure is used to establish a DS1 test access connection for a VT1.5 cross-connection. To establish the test access connection, an external loopback between two SMUX circuit packs, a DS1 cross-connection, and a VT1.5 test access session are required. Figure 11-8 shows the configuration necessary for testing the DS1 within the VT1.5 cross-connection between two SMUX circuit packs. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).



Note: For MONEF and SPLTEF test modes, two DS1 cross-connections are required (one for each TAP port).

Figure 11-8. **DS1 Test Access Connection for VT1.5 Cross-Connection**

1. Determine type of test access connection to make, TAP port to be used, assign E-End port to be used in the test access connection, SMUX circuit pack for external loopback to be used, and DS1 ports for test set connections.

Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the CHG-ACCMD-VT1 command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 11-2) for more information].

2. Determine if the VT1.5 ports (E-End, F-End, TAPs, and gateway DS1 cross-connection) to be used are in the IDLE-REL state by entering the following command (one for each port, if necessary):

   RTRV-STATE-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port(s) to be used as the testport(s) location:
   VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   VT1.5 ports are associated with STS1 Interface Modules.

   The following output response appears (for this step only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g">
;
```

   Check the input and output states (parameters f and g) to make sure they are in the IDLE-REL state.

3. Provision the E-End, F-End, and TAP ports for a VT map of UNSPEC and provision the gateway VT1.5 port for a VT map of ASYN by referring to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32).

4. Externally loop the SMUX circuit pack used for the TAP ports to the SMUX circuit pack used for the gateway VT1.5 ports at the STSX-1 panel.

5. Connect the test set(s) to the gateway DS1 ports (connection from DS1IF circuit packs).

6. Establish two-way DS1 cross-connections (one for each TAP port) from DS1 ports connected to the test sets to the gateway VT1.5 ports (SMUX looped to the SMUX containing the TAP ports) by referring to the section titled "Establishing One-Way and Two-Way Cross-Connections" (page 10-5).

7. Establish a two-way VT1.5 cross-connection between the designated E-End VT1.5 port and the designated F-End VT1.5 port using the section titled "Establishing One-Way and Two-Way Cross-Connections" (page 10-5), if necessary.

8. Establish a test access connection by entering the following command:

   CONN-TACC-VT1:*[a]*:*b*,*c*,*[d]*:::*[f]*:*[g]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port (E-END) location:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The VT1.5 port is associated with an STS1 Interface Module.

NOTE:
When the MONEF or SPLTEF test mode is specified for parameter *f*, two TAPs are used: the one specified, which must end in an odd-numbered value, and the next VT1.5 port in sequential order (for example, 11-3-3 and 11-3-4).

   c = VT1.5 port (E-END):
   VT1.5 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The VT1.5 port is associated with an STS1 Interface Module.

   d = VT1.5 port (F-END)
   VT1.5 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the F-End for a test session. The VT1.5 port is associated with an STS1 Interface Module.

NOTE:
If the E-End VT1.5 input port is mapped to exactly one VT1.5 output port, the output VT1.5 port becomes the current F-End VT1.5 output port for the test session. If the E-End VT1.5 input port is mapped to more than one VT1.5 output port (broadcast connection), the current F-End VT1.5 port defaults to the VT1.5 port that forms a two-way connection with the E-End VT1.5 input port.

   f = Test mode: { MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF }
   Default: MONE
   Specifies the test access mode.

   g = Link association: { Y, N }
   Default: Y (yes, the test session is associated with the link)
   Specifies whether the test session is to be associated with the link on which the CONN-TACC-VT1 command is given. When a test ses-

sion is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the **CANC-USER** command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the **CONN-TACC-VT1** command:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
    "m:n,o,..."
;
```

Where:

m = Test access (TAP) location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

n = E-End port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

o = F-End port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

9. Notify the appropriate personnel, according to office procedures, when the SMUX circuit packs are looped, the DS1 gateway cross-connection is established, and the VT1.5 test access connection is established. In addition, update your office records.

Establishing DS3 Test Access Connections

This procedure is used to establish a DS3 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Determine the type of test access connection to make, TAP port to be used, and assign the E-End port to be used in the test access connection.

   Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the CHG-ACCMD-T3 command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 11-2) for more information].

2. Retrieve the DS3 mode (MUX3 circuit packs) information for the DS3 port to be used as a testport by entering the following command:

   RTRV-PORT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: [1-64]-[1-15]

   A sample output is (only the pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:<>:ACTSIG */
    "d: ... :,DS3MODE=j"
;
```

   Where:

   d = DS3 port location: [1-64]-[1-15]

   j = DS3 mode (DS3 ports associated with MUX3 circuit packs): { CC, DS1 }

   If the selected DS3 port associated with a MUX3 circuit pack is not in CC mode, the DS3 port can not be used as a testport. Contact the system administrator or next level of support to determine whether the DS3 port can be changed to CC mode [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether another DS3 port(s) is to be selected.

3. Determine if the DS3 port(s) to be used as the testport(s) are in the IDLE-REL or TPPV-REL state by entering the following command:

   `RTRV-STATE-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port(s) to be used as the testport(s) location:
   `[ [1-64]-[1-15], UNIT-[1-64] ]`
   DS3 ports must be associated with MUX3 circuit packs.

   The following output response appears (for this step only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:f,g"
;
```

   Check the input and output states (parameters f and g) to make sure they are in the IDLE-REL or TPPV-REL state. If necessary, use the procedure in the section titled "Provisioning DS3 Testports" (page 11-12).

4. Establish a two-way DS3 cross-connection between the designated E-End DS3 port and the designated F-End DS3 port using the section titled "Establishing DS3 One-Way and Two-Way Cross-Connections" (page 10-9), if necessary.

5. Establish a test access connection by entering the following command:

   `CONN-TACC-T3:`*[a]*`:`*b*`,`*c*`,:::`*[f]*`:`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port (TAP) location: `[1-64]-[1-15]`
   Specifies the TAP, which is the DS3 port used as the testport for this test session. The DS3 port can only be associated with a MUX3 circuit pack.

NOTE:
When the MONEF or SPLTEF test mode is specified for parameter *f*, two TAPs are used: the one specified, which must end in an odd-numbered value, and the next DS3 port in sequential order (for example, 11-3 and 11-4).

   c = DS3 port (E-END): `[1-64]-[1-15]`
   Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The DS3 port is associated with a MUX3 circuit pack or an STS1 Interface Module.

NOTE:
If the E-End DS3 input port is mapped to exactly one DS3 output port, the output DS3 port becomes the current F-End DS3 output port for the test session. If the E-End DS3 input port is mapped to more than one DS3 output port (broadcast connection), the current F-End DS3 port defaults to the DS3 port that forms a two-way connection with the E-End DS3 input port.

f = Test mode: `[ MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF ]`
Default: `MONE`
Specifies the test access mode.

g = Link association: `[ Y, N ]`
Default: `Y` (yes, the test session is associated with the link)
Specifies whether the test session is to be associated with the link on which the `CONN-TACC-T3` command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the `CONN-TACC-T3` command:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
    "m:n,o,..."
;
```

Where:

m = Test access port (TAP) location: `{1-32}-{1-15}`

n = E-END port location: `{1-32}-{1-15}`

o = F-END port location: `{1-32}-{1-15}`

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, when the DS3 test access connection is established and update your office records.

Establishing STS-1 Test Access Connections

This procedure is used to establish an STS-1 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Determine type of test access connection to make, TAP port to be used, and assign E-End port to be used in the test access connection.

   Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the `CHG-ACCMD-EC1` command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 11-2) for more information].

2. Determine if the STS-1 port(s) to be used as the testport(s) are in the IDLE-REL or TPPV-REL state by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 port(s) to be used as the testport(s) location:
   `{ {1-64}-{1-15}, UNIT-{1-64} }`
   STS-1 ports are associated with STS1 Interface Modules.

   The following output response appears (for this step only the parameters that are pertinent are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:IN-STATE,OUT-STATE */
      "e:f,g">
   ;
   ```

   Check the input and output states (parameters f and g) to make sure they are in the IDLE-REL or TPPV-REL state. If necessary, use the procedure in the section titled "Provisioning STS-1 Testports" (page 11-14).

3. Establish a two-way STS-1 cross-connection between the designated E-End EC-1 port and the designated F-End EC-1 port using the section titled "Establishing One-Way and Two-Way Cross-Connections" (page 10-5), if necessary.

4. Establish a test access connection by entering the following command:

   `CONN-TACC-EC1:`*[a]*`:`*b*`,`*c*`,`*[d]*`:::`*[f]*`:`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 port (TAP) location: `[1-64]-[1-15]`
   Specifies the TAP, which is the STS-1 port used as the testport for this test session. The STS-1 port can only be associated with a STS1 Interface Module.

NOTE:
When the MONEF or SPLTEF test mode is specified for parameter *f*, two TAPs are used: the one specified, which must end in an odd-numbered value, and the next STS-1 port in sequential order (for example, 11-3 and 11-4).

   c = STS-1 port (E-END): `[1-64]-[1-15]`
   Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The STS-1 port is associated with an STS1 Interface Module.

   d = VT1.5 port (F-END)
   VT1.5 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
   Specifies the F-End for a test session. The VT1.5 port is associated with an STS1 Interface Module.

NOTE:
If the E-End STS-1 input port is mapped to exactly one STS-1 output port, the output STS-1 port becomes the current F-End STS-1 output port for the test session. If the E-End STS-1 input port is mapped to more than one STS-1 output port (broadcast connection), the current F-End STS-1 port defaults to the STS-1 port that forms a two-way connection with the E-End STS-1 input port.

   f = Test mode: `[ MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF ]`
   Default: `MONE`
   Specifies the test access mode.

   g = Link association: `[ Y, N ]`
   Default: `Y` (yes, the test session is associated with the link)
   Specifies whether the test session is to be associated with the link on which the `STS1` command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous

logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the CONN-TACC-EC1 command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "m:n,o,..."
;
```

Where:

m = Test access port (TAP) location: {1-64}-{1-15}

n = E-END port location: {1-64}-{1-15}

o = F-END port location: {1-64}-{1-15}

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when the STS-1 test access connection is established and update your office records.

Establishing VT1.5 Test Access Connections

This procedure is used to establish a VT1.5 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Determine the type of test access connection to make, TAP port to be used, and assign E-End port to be used in the test access connection.

   Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the CHG-ACCMD-VT1 command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 11-2) for more information].

2. Determine if the VT1.5 port(s) to be used as the testport(s) are in the IDLE-REL or TPPV-REL state by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port(s) to be used as the testport(s) location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }`
   VT1.5 ports are associated with STS1 Interface Modules.

   The following output response appears (for this step only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:IN-STATE,OUT-STATE */
    "e:f,g">
;
```

   Check the input and output states (parameters f and g) to make sure they are in the IDLE-REL or TPPV-REL state. If necessary, use the procedure in the section titled "Provisioning VT1.5 Testports" (page 11-15).

3. Establish a two-way VT1.5 cross-connection between the designated E-End VT1.5 port and the designated F-End VT1.5 port using the section titled "Establishing One-Way and Two-Way Cross-Connections" (page 10-5), if necessary.

4. Establish a test access connection by entering the following command:

   `CONN-TACC-VT1:`*[a]*`:`*b*`,`*c*`,`*[d]*`:::`*[f]*`:`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port (TAP) location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the TAP, which is the STS-1 port used as the testport for this test session. The STS-1 port can only be associated with a STS1 Interface Module.

NOTE:
When the MONEF or SPLTEF test mode is specified for parameter *f*, two TAPs are used: the one specified, which must end in an odd-numbered value, and the next VT1.5 port in sequential order (for example, 11-3-3 and 11-3-4).

c = VT1.5 port (TAP) location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the TAP, which is the STS-1 port used as the testport for this test session. The STS-1 port can only be associated with a STS1 Interface Module.

d = VT1.5 port (F-END)
VT1.5 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the F-End for a test session. The VT1.5 port is associated with an STS1 Interface Module.

NOTE:
If the E-End VT1.5 input port is mapped to exactly one VT1.5 output port, the output VT1.5 port becomes the current F-End VT1.5 output port for the test session. If the E-End VT1.5 input port is mapped to more than one VT1.5 output port (broadcast connection), the current F-End VT1.5 port defaults to the VT1.5 port that forms a two-way connection with the E-End VT1.5 input port.

f = Test mode: `{ MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF }`
Default: `MONE`
Specifies the test access mode.

g = Link association: `{ Y, N }`
Default: `Y` (yes, the test session is associated with the link)
Specifies whether the test session is to be associated with the link on which the `CONN-TACC-VT1` command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the `CONN-TACC-VT1` command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "m:n,o,..."
;
```

Where:

m = Test access port (TAP) location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

n = E-END port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

o = F-END port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, when the VT1.5 test access connection is established and update your office records.

Changing Test Access Connections

The procedures in this section provide information for changing test access modes (for example, from MONE to SPLTE) and parameters associated with a test connection (for example, associating a test connection with a link that previously was not associated)

Changing Test Access Mode

Use one of the following procedures ["Changing DS1 Test Access Mode" (page 11-39), "Changing DS3 Test Access Mode" (page 11-42), "Changing STS-1 Test Access Mode" (page 11-44), or "Changing VT1.5 Test Access Mode" (page 11-46)] to change the test access mode of a test session.

Changing DS1 Test Access Mode

This procedure is used to change a DS1 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Obtain testport and parameter information from office records.
2. Before changing the test access mode, determine test activity in the system by entering the following command:

   `RTRV-TACC-T1:`*[a]*`;`

   Where:

   a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

Where:

c = TAP DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the DS1 port used as the TAP.

d = TAP DS1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

e = E-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the E-End DS1 port.

f = F-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the F-End DS1 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

The test modes are divided into two groups: one-way test modes that use one TAP (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two TAPs (MONEF and SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode can not be changed with the `CHG-ACCMD-T1` command from a one-way mode to a two-way mode or

from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the DISC-TACC command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

   CHG-ACCMD-T1:*[a]*:*b*::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS1 port (TAP) location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the test access port (TAP), which is represented by the DS1 port being used as the TAP for this test session. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

   d = Test mode: { MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, LOOPF, MONEF, SPLTEF }
   Default: MONE
   Specifies the new test mode. The following restrictions apply:

   - If both the input and output of the E-End are mapped to the same DS1 Port (two-way connection), all test modes are allowed.
   - If the input of the E-End is idle, the only test modes allowed are MONE, SPLTE, and LOOPE.
   - If the input of the E-End is mapped and the output of the E-End is idle (one-way connection), the only test modes allowed are MONE, SPLTA, SPLTE, and LOOPE.
   - If both the input and output of the E-End are mapped, but to different DS1 ports (separate one-way connections), the only test modes allowed are MONE and SPLTA.

   Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the DS1 test access mode has been changed and update your office records.

Changing DS3 Test Access Mode

This procedure is used to change a DS3 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Obtain testport and parameter information from office records.
2. Before changing the test access mode, determine test activity in the system by entering the following command:

   `RTRV-TACC-T3:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS3 port location: `{1-64}-{1-15}`
   Specifies the DS3 port used as the TAP.

   d = TAP DS3 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the DS3 port currently used as the TAP. The second part of the state name indicates the test access mode or release state.

   e = E-END DS3 port location: `{1-64}-{1-15}`
   Specifies the E-End DS3 port.

   f = F-END DS3 port location: `{1-64}-{1-15}`
   Specifies the F-End DS3 port.

   g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

   h = User ID: <1-10 UID legal characters>
   Specifies the User ID the test session is associated with.

   The test modes are divided into two groups: one-way test modes that use one TAP (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two TAPs (MONEF and

SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode can not be changed with the CHG-ACCMD-T3 command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the DISC-TACC command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

   CHG-ACCMD-T3:*[a]*:*b*::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS3 port (TAP) location: [1-64]-[1-15]
   Specifies the test access port (TAP), which is represented by the DS3 port being used as the TAP for this test session. The DS3 port must be associated with a MUX3 circuit pack.

   d = Test mode: [MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, LOOPF, MONEF, SPLTEF]
   Default: MONE
   Specifies the new test mode. The following restrictions apply:

   - If both the input and output of the E-End are mapped to the same DS3 Port (two-way connection), all test modes are allowed.
   - If the input of the E-End is idle, the only test modes allowed are MONE, SPLTE, and LOOPE.
   - If the input of the E-End is mapped and the output of the E-End is idle (one-way connection), the only test modes allowed are MONE, SPLTA, SPLTE, and LOOPE.
   - If both the input and output of the E-End are mapped, but to different DS3 ports (separate one-way connections), the only test modes allowed are MONE and SPLTA.

   Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the DS3 test access mode has been changed and update your office records.

Changing STS-1 Test Access Mode

This procedure is used to change an STS-1 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Obtain testport and parameter information from office records.
2. Before changing the test access mode, determine test activity in the system by entering the following command:

   `RTRV-TACC-EC1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP STS-1 port location: `{1-64}-{1-15}`
   Specifies the STS-1 port used as the TAP.

   d = TAP STS-1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the STS-1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

   e = E-END STS-1 port location: `{1-64}-{1-15}`
   Specifies the E-End STS-1 port.

   f = F-END STS-1 port location: `{1-64}-{1-15}`
   Specifies the F-End STS-1 port.

   g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

   h = User ID: <1-10 UID legal characters>
   Specifies the User ID the test session is associated with.

   The test modes are divided into two groups: one-way test modes that use one TAP (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two TAPs (MONEF and

SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode can not be changed with the CHG-ACCMD-EC1 command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the DISC-TACC command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

   CHG-ACCMD-EC1:*[a]*:*b*::*[d]*;

   Where:

   a = Target ID (optional)

   b = STS-1 port (TAP) location: {1-64}-{1-15}
   Specifies the test access port (TAP), which is represented by the STS-1 port being used as the TAP for this test session. The STS-1 port can only be associated with an STS1 Interface Module.

   d = Test mode: { MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, LOOPF, MONEF, SPLTEF }
   Default: MONE
   Specifies the new test mode. The following restrictions apply:

   - If both the input and output of the E-End are mapped to the same STS-1 Port (two-way connection), all test modes are allowed.
   - If the input of the E-End is idle, the only test modes allowed are MONE, SPLTE, and LOOPE.
   - If the input of the E-End is mapped and the output of the E-End is idle (one-way connection), the only test modes allowed are MONE, SPLTA, SPLTE, and LOOPE.
   - If both the input and output of the E-End are mapped, but to different STS-1 ports (separate one-way connections), the only test modes allowed are MONE and SPLTA.

   Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the STS-1 test access mode has been changed and update your office records.

Changing VT1.5 Test Access Mode

This procedure is used to change a VT1.5 test access connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 11-2).

1. Obtain testport and parameter information from office records.
2. Before changing the test access mode, determine test activity in the system by entering the following command:

   `RTRV-TACC-VT1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the STS-1 port used as the TAP.

   d = TAP VT1.5 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the VT1.5 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

   e = E-END VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the E-End VT1.5 port.

   f = F-END VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the F-End VT1.5 port.

   g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

The test modes are divided into two groups: one-way test modes that use one TAP (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two TAPs (MONEF and SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode can not be changed with the CHG-ACCMD-VT1 command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the DISC-TACC command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

CHG-ACCMD-VT1:*[a]*:*b*::*[d]*;

Where:

a = Target ID (optional)

b = VT1.5 port (TAP) location:
VT1.5 port number: [1-64]-[1-15]-[1-28]
VT1.5 group number: [1-64]-[1-15]-[1-7]-[1-4]
Specifies the test access port (TAP), which is represented by the VT1.5 port being used as the TAP for this test session. The VT1.5 port can only be associated with an STS1 Interface Module.

d = Test mode: [MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, LOOPF, MONEF, SPLTEF]
Default: MONE
Specifies the new test mode. The following restrictions apply:

- If both the input and output of the E-End are mapped to the same VT1.5 Port (two-way connection), all test modes are allowed.
- If the input of the E-End is idle, the only test modes allowed are MONE, SPLTE, and LOOPE.
- If the input of the E-End is mapped and the output of the E-End is idle (one-way connection), the only test modes allowed are MONE, SPLTA, SPLTE, and LOOPE.
- If both the input and output of the E-End are mapped, but to different VT1.5 ports (separate one-way connections), the only test modes allowed are MONE and SPLTA.

Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the

document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the VT1.5 test access mode has been changed and update your office records.

Changing Test Access Parameters

Use one of the following procedures: "Changing DS1 Test Access Parameters" (page 11-48), "Changing DS3 Test Access Parameters" (page 11-51), "Changing STS-1 Test Access Parameters" (page 11-54), or "Changing VT1.5 Test Access Parameters" (page 11-56) to change the test access parameters.

Changing DS1 Test Access Parameters

This procedure is used to change parameters associated with a DS1 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   `RTRV-TACC-T1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
    "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the DS1 port used as the TAP.

d = TAP DS1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

e = E-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the E-End DS1 port.

f = F-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the F-End DS1 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

`CHG-TACC-T1:`*[a]*`:`*b*`,`*[c]*`,`*[d]*`:::`*[f]*`:`*[g]*`:`*[h]*`;`

Where:

a = Target ID (optional)

b = DS1 port (TAP) location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the test access port (TAP), which is represented by the DS1 port being used as the TAP for this test session. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

c = DS1 port (E-END):
DS1 port number: `[1-64]-[1-31]-[1-28]`
VT1.5 group number (STS1 Interface Module):
`[1-64]-[1-15]-[1-7]-[1-4]`
Specifies the E-End DS1 input port which is under test access. This parameter is optional and, if specified, must be the E-End DS1 port which is being tested by the specified TAP DS1 port or the command is denied. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

d = DS1 port (current F-END):
DS1 port number: `[1-64]-[1-31]-[1-28]`
VT1.5 group number (STS1 Interface Module):
`[1-64]-[1-15]-[1-7]-[1-4]`
Specifies the current F-End DS1 port for the test session. This parameter is useful if the E-End DS1 input port is broadcasting to several DS1 output ports to allow switching split accesses between them. If this parameter is given, it must be mapped to the E-End input DS1 port or the command is denied. If the current test mode is MONF, SPLTB, SPLTF, LOOPF, MONEF, or SPLTEF, the current F-End DS1 port cannot be changed. If the parameter is omitted, it retains its current value. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

f = E-END output mode: `[ NORM, TERM, AIS, QRSS ]`
Specifies the new output mode of the E-End. If the E-End DS1 output port is idle, the value TERM cannot be given. If there is no QRSS (quasi-random signal source) provisioned, `QRSS` cannot be specified. If the test mode is SPLTF, SPLTEF, or LOOPF, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

- `NORM` — Normal (cross-connected data)
- `TERM` — Terminated (idle signal)
- `AIS` — Alarm indication signal (blue code)
- `QRSS` — Quasi-random signal

g = F-END output mode: `[ NORM, TERM, AIS, QRSS ]`
Specifies the new output mode of the F-End (if any). If the F-End DS1 output port is idle, the value TERM cannot be given. If there is no QRSS (quasi-random signal source) provisioned, `QRSS` cannot be specified. If the test mode is SPLTE, SPLTEF, or LOOPE, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

h = Link association: [Y, N, CURVAL]
Default: CURVAL
Specifies whether the test session is to be associated with the link on which the CONN-TACC-T1 command is given when the AUTOREL parameter of the ED-NE command is set to ON. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the AUTOREL parameter of the ED-NE command is set to OFF, this command must have this parameter set to N otherwise, the command is denied with the error code IDNV. Only the user who initially set up this test session can specify a value for this parameter.

Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the DS1 test access parameters have been changed and update your office records.

Changing DS3 Test Access Parameters

This procedure is used to change parameters associated with a DS3 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   RTRV-TACC-T3:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS3 port location: {1-64}-{1-15}
   Specifies the DS3 port used as the TAP.

d = TAP DS3 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the DS3 port currently used as the TAP. The second part of the state name indicates the test access mode or release state.

e = E-END DS3 port location: {1-64}-{1-15}
Specifies the E-End DS3 port.

f = F-END DS3 port location: {1-64}-{1-15}
Specifies the F-End DS3 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

   CHG-TACC-T3:*[a]*:*b*,*[c]*,*[d]*::*[f]*:*[g]*:*[h]*;

   Where:

   a = Target ID (optional)

   b = DS3 port (TAP) location: {1-64}-{1-15}
   Specifies the test access port (TAP), which is represented by the DS3 port being used as the TAP for this test session. The DS3 port must be associated with a MUX3 circuit pack.

   c = DS3 port (E-END): {1-64}-{1-15}
   Specifies the E-End DS3 input port which is under test access. This parameter is optional and, if specified, must be the E-End DS3 port which is being tested by the specified TAP DS3 port or the command is denied. The DS3 port can be associated with a MUX3 circuit pack or an STS1 Interface Module.

d = DS3 port (current F-END): `{1-64}-{1-15}`
Specifies the current F-End DS3 port for the test session. This parameter is useful if the E-End DS3 input port is broadcasting to several DS3 output ports to allow switching split accesses between them. If this parameter is given, it must be mapped to the E-End input DS3 port or the command is denied. If the current test mode is MONF, SPLTB, SPLTF, LOOPF, MONEF, or SPLTEF, the current F-End DS3 port cannot be changed. If the parameter is omitted, it retains its current value. The DS3 port can be associated with a MUX3 circuit pack or an STS1 Interface Module.

f = E-END output mode: `{ NORM, AIS, CURVAL }`
Specifies the new output mode of the E-End. If the test mode is SPLTF, SPLTEF, or LOOPF, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

- `NORM` — Normal (cross-connected data)
- `AIS` — Alarm indication signal (blue code)

g = F-END output mode: `{ NORM, AIS, CURVAL }`
Specifies the new output mode of the F-End (if any). If the test mode is SPLTE, SPLTEF, or LOOPE, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

h = Link association: `{ Y, N, CURVAL }`
Default: `CURVAL`
Specifies whether the test session is to be associated with the link on which the `CONN-TACC-T3` command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. Only the user who initially set up this test session can specify a value for this parameter.

Wait for connection completed message (`COMPLD`) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the DS3 test access parameters have been changed and update your office records.

Changing STS-1 Test Access Parameters

This procedure is used to change parameters associated with an STS-1 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   `RTRV-TACC-EC1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP STS-1 port location: `{1-64}-{1-15}`
   Specifies the STS-1 port used as the TAP.

   d = TAP STS-1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the STS-1 port currently used as the TAP. The second part of the state name indicates the test access mode or release state.

   e = E-END STS-1 port location: `{1-64}-{1-15}`
   Specifies the E-End STS-1 port.

   f = F-END STS-1 port location: `{1-64}-{1-15}`
   Specifies the F-End STS-1 port.

   g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

   h = User ID: <1-10 UID legal characters>
   Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

   `CHG-TACC-EC1:`*[a]*`:`*b*`,`*[c]*`,`*[d]*`:`*:*`:`*[f]*`:`*[g]*`:`*[h]*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 port (TAP) location: `[1-64]-[1-15]`
   Specifies the test access port (TAP), which is represented by the STS-1 port being used as the TAP for this test session. The STS-1 port can only be associated with an STS1 Interface Module.

   c = STS-1 port (E-END): `[1-64]-[1-15]`
   Specifies the E-End STS-1 input port which is under test access. This parameter is optional and, if specified, must be the E-End STS-1 port which is being tested by the specified TAP STS-1 port or the command is denied. The STS-1 port can only be associated with an STS1 Interface Module.

   d = STS-1 port (current F-END): `[1-64]-[1-15]`
   Specifies the current F-End STS-1 port for the test session. This parameter is useful if the E-End STS-1 input port is broadcasting to several STS-1 output ports to allow switching split accesses between them. If this parameter is given, it must be mapped to the E-End input STS-1 port or the command is denied. If the current test mode is MONF, SPLTB, SPLTF, LOOPF, MONEF, or SPLTEF, the current F-End STS-1 port cannot be changed. If the parameter is omitted, it retains its current value. The STS-1 port can only be associated with an STS1 Interface Module.

   f = E-END output mode: `[ NORM, TERM, AIS ]`
   Specifies the new output mode of the E-End. If the E-End STS-1 output port is idle, the value TERM cannot be given. If the test mode is SPLTF, SPLTEF, or LOOPF, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

   - `NORM` — Normal (cross-connected data)
   - `TERM` — Terminated (idle signal)
   - `AIS` — Alarm indication signal (blue code)

   g = F-END output mode: `[ NORM, TERM, AIS ]`
   Specifies the new output mode of the F-End (if any). If the E-End STS-1 output port is idle, the value TERM cannot be given. If the test mode is SPLTE, SPLTEF, or LOOPE, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

h = Link association: { Y, N, CURVAL }
Default: CURVAL
Specifies whether the test session is to be associated with the link on which the CONN-TACC-EC1 command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. Only the user who initially set up this test session can specify a value for this parameter.

Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the STS-1 test access parameters have been changed and update your office records.

Changing VT1.5 Test Access Parameters

This procedure is used to change parameters associated with a VT1.5 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   RTRV-TACC-VT1:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP VT1.5 port location:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the STS-1 port used as the TAP.

d = TAP VT1.5 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the VT1.5 port currently used as the TAP. The second part of the state name indicates the test access mode or release state.

e = E-END VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the E-End VT1.5 port.

f = F-END VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the F-End VT1.5 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

CHG-TACC-VT1:*[a]*:*b*,*[c]*,*[d]*::*[f]*:*[g]*:*[h]*;

Where:

a = Target ID (optional)

b = VT1.5 port (TAP) location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the TAP being used for this test session. The VT1.5 port can only be associated with an STS1 Interface Module.

c = VT1.5 port (E-END):
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the E-End VT1.5 input port which is under test access. This parameter is optional and, if specified, must be the E-End VT1.5 port which is being tested by the specified TAP VT1.5 port or the command is denied. The VT1.5 port can only be associated with an STS1 Interface Module.

d = VT1.5 port (current F-END):
VT1.5 port number: `[1-64]-[1-15]-[1-28]`
VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
Specifies the current F-End VT1.5 port for the test session. This parameter is useful if the E-End VT1.5 input port is broadcasting to several VT1.5 output ports to allow switching split accesses between them. If this parameter is given, it must be mapped to the E-End input VT1.5 port or the command is denied. If the current test mode is MONF, SPLTB, SPLTF, LOOPF, MONEF, or SPLTEF, the current F-End VT1.5 port cannot be changed. If the parameter is omitted, it retains its current value. The VT1.5 port can only be associated with an STS1 Interface Module.

f = E-END output mode: `[ NORM, TERM, AIS ]`
Specifies the new output mode of the E-End. If the E-End VT1.5 output port is idle, the value TERM cannot be given. If the test mode is SPLTF, SPLTEF, or LOOPF, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

- `NORM` — Normal (cross-connected data)
- `TERM` — Terminated (idle signal)
- `AIS` — Alarm indication signal (blue code)

g = F-END output mode: `[ NORM, TERM, AIS ]`
Specifies the new output mode of the F-End (if any). If the E-End VT1.5 output port is idle, the value TERM cannot be given. If the test mode is SPLTE, SPLTEF, or LOOPE, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

h = Link association: `[ Y, N, CURVAL ]`
Default: `CURVAL`
Specifies whether the test session is to be associated with the link on which the `CONN-TACC-VT1` command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. Only the user who initially set up this test session can specify a value for this parameter.

Wait for connection completed message (`COMPLD`) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the VT1.5 test access parameters have been changed and update your office records.

Removing Test Access Connections

This procedure is used to remove DS1 test access connections.

1. Obtain testport and parameter information from office records.
2. Before disconnecting a test access connection, determine test activity in the system by entering one or more of the following commands:

   DS1 Testports: `RTRV-TACC-T1:`*[a]*`;`
   DS3 Testports: `RTRV-TACC-T3:`*[a]*`;`
   STS-1 Testports: `RTRV-TACC-EC1:`*[a]*`;`
   VT1.5 Testports: `RTRV-TACC-VT1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = Test access port (TAP):
   DS1 TAP location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
   DS3 TAP location: `{1-64}-{1-31}`
   DS3 ports must be associated with DS3 (MUX3 circuit packs)
   EC-1 TAP location: `{1-64}-{1-15}`
   VT1.5 TAP location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

d = TAP port input and output state:
DS1, VT1.5, STS-1, or DS3 port: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the DS1, VT1.5, STS-1, or DS3 port currently used as the TAP. The second part of the state name indicates the test access mode or release state.

e = E-End port:
DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
DS3 port location: {1-64}-{1-31}
DS3 ports can be associated with DS3 (MUX3 circuit packs) or STS1 Interface Modules.
EC-1 port location: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the E-End port.

f = Current F-End port:
DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
DS3 port location: {1-64}-{1-31}
DS3 ports can be associated with DS3 (MUX3 circuit packs) or STS1 Interface Modules.
EC-1 port location: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
Specifies the F-End port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Remove a test access connection by entering the following command:

   DISC-TACC:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Port (TAP) location:

   All DS1, DS3, STS-1, and VT1.5 ports: ALL
   DS1 ports only: [1-64]-[1-31]-[1-28]
   (DS1, DS3, or STS1 Interface Modules)
   DS3 port only: [1-64)-(1-15]
   (DS3 Clear-Channel Module)
   STS-1 ports only: [1-64]-[1-15]
   (STS1 Interface Modules only)
   VT1.5 ports only: [1-64]-[1-15]-[1-28]
   (STS1 Interface Modules only)

   Specifies the test access port, which is represented by the port that is being used as the TAP for this test session. If this port is not an active TAP, the command is denied. If ALL is specified, all current test sessions are disconnected with the following exceptions:

   - Test sessions that are not associated with any link are not affected. Test sessions that are not associated with any link can only be disconnected by explicitly specifying the TAP in the DISC-TACC command.
   - If ALL is specified and at least one but not all of the test sessions can be released, the command completes with the termination report code PRTL (Partial) instead of COMPLD. When this occurs, the RTRV-TACC-T1, RTRV-TACC-T3, RTRV-TACC-EC1, and/or RTRV-TACC-VT1 command must be given to determine which test sessions were not released. Individual DISC-TACC commands can be given for each test session that was not released to determine the reason for the test session not being released.

   Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the test access connection is removed and update your office records.

Transport Self-Identification (TRANSID)

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Transport Self-Identification (TRANSID)

12

This chapter contains procedures used for DS1 test signal identification (TSID) and DS3 path identification (PID). DS1 TSID in the DACS IV-2000 is provided through a test access port (TAP or testport). Any unused port (that is, a port that is in the IDLE-REL [idle-released] or TSGR-REL [test signal-released] state) can be designated as a TSID testport. If an IDLE-REL port is used as a testport, the basic state of the port is changed to TSGR, where a TSGR-REL port that is used as a TSID testport retains the basic state TSGR. DS3 PID provides the ability to identify the source of a DS3 signal at any point along the path of the signal.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

For more information on TSID, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

DS1 Test Signal Identification (TSID)

Writing TSIDs

This procedure is used to write a TSID on a DS1 idle port using a test signal generator and receiver (TSGR) port on a PMGR circuit pack. You select a TSGR port or have the system select the TSGR port. When the SPLTE mode of test access is established using the CONN-TACC-T1 command, the DACS IV-2000 begins to monitor the specified DS1 port for a TSID. Once a TSID is detected and read, the system reports the TSID, continues to monitor the connection, and continues writing the TSID out to the specified DS1 port. Both activities continue until you log out (if you specify NO as the link association value in the CONN-TACC-T1 command, the SPLTE connection remains after logging off) or enter a DISC-TACC command to disconnect the test access connection.

1. Retrieve the PMGR1 circuit pack's provisioned parameters by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: { SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PCODE=f,CCODE=g,FNCT=q:..."
;
```

   Where:

   d = SWIF or MUX circuit pack location: { SWIF-{1-64}-{1-8} MUX-{1-64}-{1-31} }

   f = Provisioned circuit pack code: AKM66 is setting for PMGR1 circuit packs

   g = Circuit pack code: AKM66 is setting for PMGR1 circuit packs

   q = Circuit pack function: { PM, PM-SCAN, TSGR }

   If the circuit pack code is not set to AKM66 and/or the circuit pack function is not set to TSGR, refer to the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53) to provision the PMGR circuit pack for TSID.

2. Retrieve current TSID network element provisioning information by entering the following command:

   `RTRV-NE:[a];`

   Where:

   a = Target ID (optional)

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...,CLEI=n,CLLI=o,FIC=p,EQTYPE=q"
;
```

   Where:

   n = CLEI code: <1-10 TRANSID Legal Characters>

   o = CLLI code: <1-11 TRANSID Legal Characters>

   p = FIC code: <1-10 TRANSID Legal Characters>

   q = Equipment type: `{ CPE, NET, CURVAL }`

   If the TSID network element parameters are not set to the desired values, refer to the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53) in Chapter 5 to provision the PMGR circuit pack for TSID.

3. Determine test activity of the system by entering the following command:

   `RTRV-TACC-T1:[a];`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the DS1 port used as the TAP.

d = TAP DS1 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF, TSGR-REL }
Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

e = E-END DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
Specifies the E-End DS1 port.

f = F-END DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
Specifies the F-End DS1 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

From the output response determine which TAP DS1 ports are in the TSGR-REL state (parameters *c* and *d*).

4. Determine if the DS1 port to be used as the E-End port is in the IDLE-REL state by entering the following command (the TSID can only be written on DS1 ports in the IDLE-REL state):

   RTRV-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be used as the E-END location:
   DS1 port number: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }
   VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}}
   DS1 ports can be associated with DS1, DS3 or STS1 Interface Modules.

The following output response appears (for this step only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:ACTSIG:<> */
    "...:< ISTATE=o,OSTATE=p... >"
;
```

Check the input and output states (parameters *o* and *p*) to make sure they are in the IDLE-REL state. If the ports are not in the IDLE-REL state, the selected ports can not be used for TSID until the associated connections are taken down (check with your system administrator or next level of support for instructions).

5. You can verify that the system generates the TSID by setting a loopback on the TSGR port [refer to the section titled "Operating Near-End DS1 Loopbacks" (page 13-2), if necessary].

   After establishing the loopback (with the **OPR-LPBK-T1** command) and performing Step 6 a REPT T1ID message is sent to announce the TSID.

6. Begin writing the TSID on a TSGR port by entering the following command:

   CONN-TACC-T1:*[a]*:*b*,*c*,:::**SPLTE:***[g]*;

   Where:

   a = Target ID (optional)

   b = DS1 port (TAP) location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies a TSGR port used as the testport for this test session. The TSGR port must be in the TSGR-REL state or the command is denied. Selecting **TSGR**, causes the system to choose an idle TSGR port with the lowest unit-slot-port address. The DS1 port can be associated with a DS1 or DS3 Interface Module.

   c = DS1 port (E-END):
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the E-End used for the test session. The specified port is the DS1 port where the TSID is transmitted from. The DS1 port can be associated with a DS1 or DS3 Interface Module.

   g = Link association: [Y, N]
   Default: Y (yes, the test session is associated with the link)
   Specifies whether the test session is to be associated with the link on which the **CONN-TACC-T1** command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or

autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If N is selected, the TSID is continually written until the connection is released with the DISC-TACC command [refer to the section "Removing TSID Connections" (page 12-20) for removing TSID connections].

The following output response appears indicating completion of the CONN-TACC-T1 command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "h:i,..."
;
```

Where:

h = Test access port (TAP) location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

i = E-END port location: {1-64}-{1-31}-{1-28}

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

Example:

```
CONN-TACC-T1:14-31-1,14-2-1,::SPLTE;
```

As shown in Figure 12-1, the above command establishes a connection to write a TSID using port 14-31-1 on a PMGR circuit pack as the testport and port 14-2-1 as the DS1 port. Port 14-2-1 was in the IDLE-REL state before execution of the CONN-TACC-T1 command. In addition to writing the TSID, the TSID is simultaneously being read at the TSGR port and a REPT T1ID message is generated to announce the reading of the TSID.

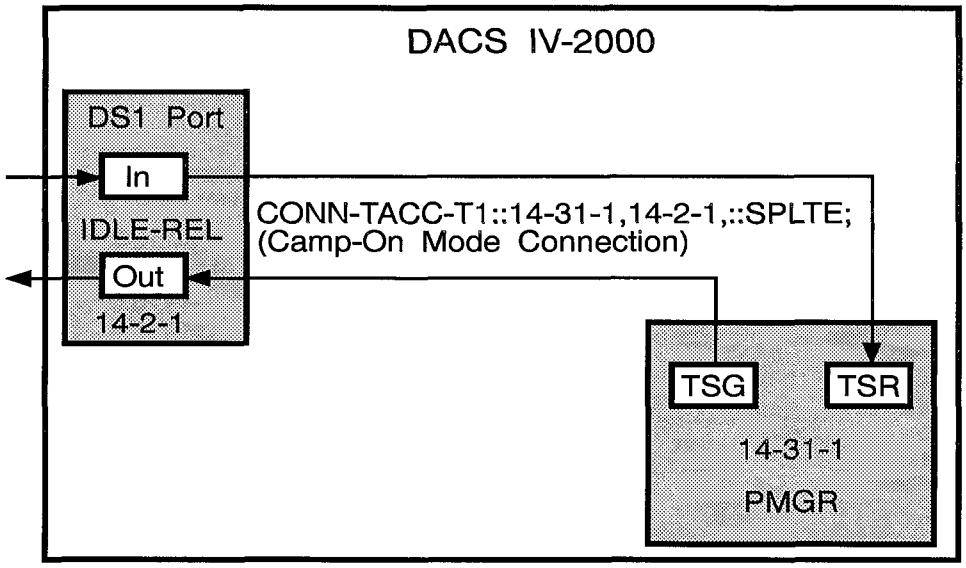


Figure 12-1. **Writing an TSID**

7. After verifying the generation of the TSID, release the loopback created in Step 5 with the `RLS-LPBK-T1` command with the same port and loopback type [refer to the section titled "Releasing Near-End DS1 Loopbacks" (page 13-4), if necessary].

Example:

```
OPR-LPBK-T1::14-31-1:::LPBKT;
```

As shown in Figure 12-2, a terminal loopback is established on the PMGR circuit pack port 14-31-1. When the loopback is established, the TSG transmits the TSID and a REPT T1ID message is sent to announce the TSID by reading the designated TSGR port. The `RLS-LPBK-T1::14-31-1:::LPBKT;` command is used to release the loopback created by the OPR-LPBK-T1 command.

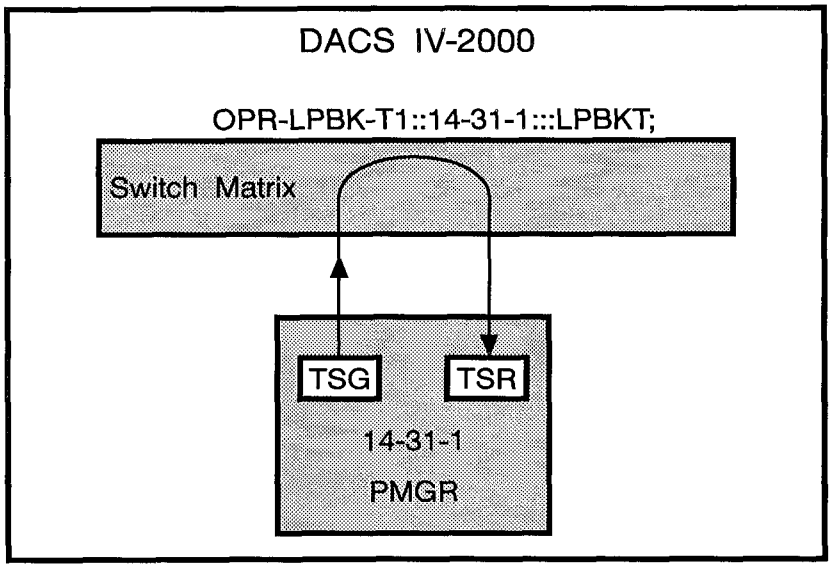


Figure 12-2. **Verifying the Generation of a TSID with a Terminal Loopback**

Reading TSIDs

Reading an TSID consists of establishing a connection between a test signal receiver (TSR) of a PMGR circuit pack and a DS1 port. The TSID can be read by camp-on mode or automatic read mode.

A camp-on connection is established by using the CONN-TACC-T1 command with the MONE, SPLTE, or LOOPE test access mode. The TSID is automatically read and reported when the connection is established. After completion of the CONN-TACC-T1 command, the REPT T1ID message reports the TSID. The CONN-TACC-T1 command is used to read the TSID for the duration of the test access connection. The test access connection remains in effect until it is released with the DISC-TACC command. The test mode connection is also terminated if you log out or are logged out by the DACS IV-2000 (if you specified link association when the CONN-TACC-T1 command was issued).

For an automatic read mode connection, the RTRV-TLID command is used to establish a connection and to read the TSID. The connection is released automatically after the TSID is read and reported.

Camp-on Mode Connection

The following procedure is used to read a TSID using a camp-on mode connection.

NOTE:
In order to use the TSID feature, the DACS IV-2000 must be provisioned for TSID and the PMGR circuit pack must be provisioned in the TSGR state. Refer to the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53) for provisioning information.

1. Determine test activity of the system by entering the following command:

   RTRV-TACC-T1:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS1 port location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the DS1 port used as the TAP.

   d = TAP DS1 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF, TSGR-REL }
   Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

   e = E-END DS1 port location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the E-End DS1 port.

f = F-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the F-End DS1 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

From the output response, determine which TAP DS1 ports are in the TSGR-REL state (parameters *c* and *d*). The TSID can only be read on ports in the TSGR-REL state.

2. Determine if the DS1 port to be used as the E-End port is in the IDLE-REL or MAP-REL state by entering the following command (the TSID can only be written on DS1 ports in the IDLE-REL state):

`RTRV-T1:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = DS1 port(s) to be used as the E-END location:
DS1 port number: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
VT1.5 group number (STS1 Interface Modules only):
`{1-64}-{1-15}-{1-7}-{1-4}]`
DS1 ports can be associated with DS1 or DS3 Interface Modules.

The following output response appears (for this step only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:ACTSIG:<> */
    "...:< ISTATE=o OSTATE=p... >"
;
```

Check the input and output states (parameters *o* and *p*) to make sure they are in the IDLE-REL or MAP-REL state. If the ports are not in the IDLE-REL or MAP-REL state, the selected ports can not be used to read TSIDs until the associated connections are taken down (check with your system administrator or next level of support for instructions).

3. Begin reading the TSID on a TSGR camp-on mode connection by entering the following command:

   CONN-TACC-T1:*[a]*:*b*,*c*,:::*f*:*[g]*;

   Where:

   a = Target ID (optional)

   b = DS1 port (TAP) location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies a TSGR port used as the testport for this test session. The TSGR port must be in the TSGR-REL state or the command is denied. Selecting TSGR, causes the system to choose an idle TSGR port with the lowest unit-slot-port address. The DS1 port can be associated with a DS1 or DS3 Interface Module.

   c = DS1 port (E-END):
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the E-End used for the test session. The specified port is the DS1 port where the TSID is transmitted from. The DS1 port can be associated with a DS1 or DS3 Interface Module.

   f = Test mode: [MONE, SPLTE, LOOPE]
   Specifies the type of test access mode to use for this command.

   g = Link association: [Y, N]
   Default: Y (yes, the test session is associated with the link)
   Specifies whether the test session is to be associated with the link on which the CONN-TACC-T1 command is given when the AUTOREL parameter of the ED-NE command is set to ON. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the AUTOREL parameter of the ED-NE command is set to OFF, this command must have this parameter set to N otherwise, the command is denied with the error code IDNV. If N is selected, the TSID is continually written until the connection is released with the DSIC-TACC command (refer to the section titled "Removing TSID Connections" (page 12-20) for removing TSID connections).

The following output response appears indicating completion of the CONN-TACC-T1 command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "h:i,..."
;
```

Where:

h = Test access port (TAP) location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

i = E-END port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number (STS1 Interface Module):
{1-64}-{1-15}-{1-7}-{1-4}

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

The TSID is reported in the autonomous message REPT T1ID.

The following examples illustrate reading the TSID on a camp-on mode connection.

Example 1:

```
CONN-TACC-T1::14-29-2,14-8-1,::MONE;
```

As shown in Figure 12-3, the above command establishes a MONE connection to read a TSID using port 14-29-2 on a PMGR circuit pack as the testport and port 14-8-1 as the DS1 port. Port 14-8-1 is in the IDLE-REL state. A REPT T1ID message is generated to report the TSID.

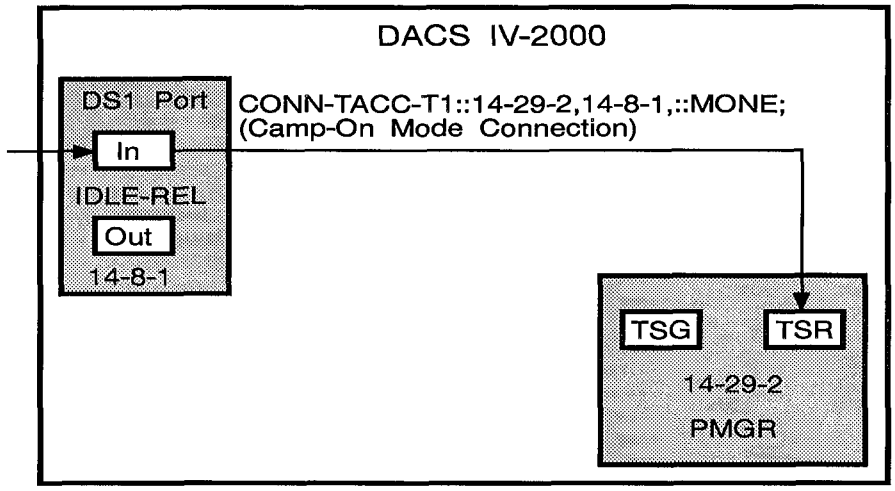


Figure 12-3. **Reading TSID using MONE Access in Camp-on Mode**

Example 2:

```
CONN-TACC-T1::14-31-1,14-2-1,::SPLTE;
```

As shown in Figure 12-4, the above command establishes a SPLTE connection to read a TSID using port 14-31-1 on a PMGR circuit pack as the testport and port 14-2-1 as the DS1 port. Port 14-2-1 is in the IDLE-REL state. A `REPT T1ID` message is generated to report the TSID.

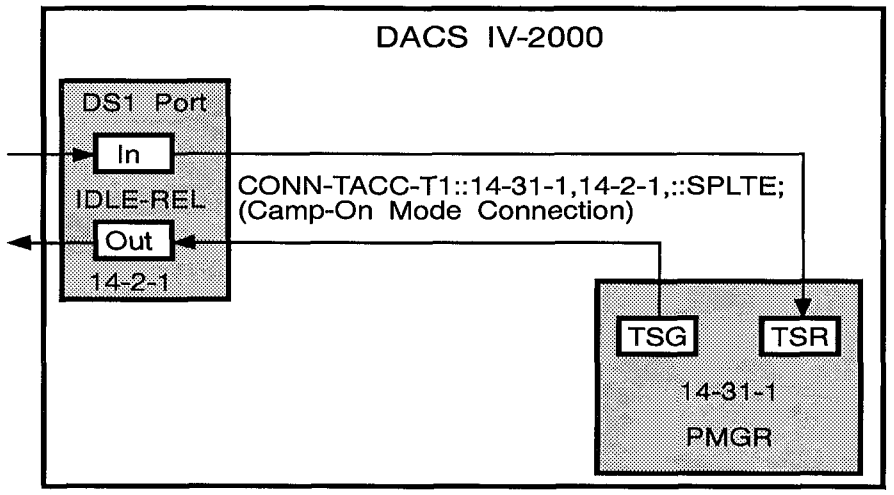


Figure 12-4. **Reading TSID using SPLTE Access in Camp-on Mode**

Example 3:

```
CONN-TACC-T1::14-30-1,14-3-1,::LOOPE;
```

As shown in Figure 12-5, the above command establishes a LOOPE connection to read a TSID using port 14-30-1 on a PMGR circuit pack as the testport and port 14-3-1 as the DS1 port. Port 14-3-1 is in the IDLE-REL state. A `REPT T1ID` message is generated to report the TSID.

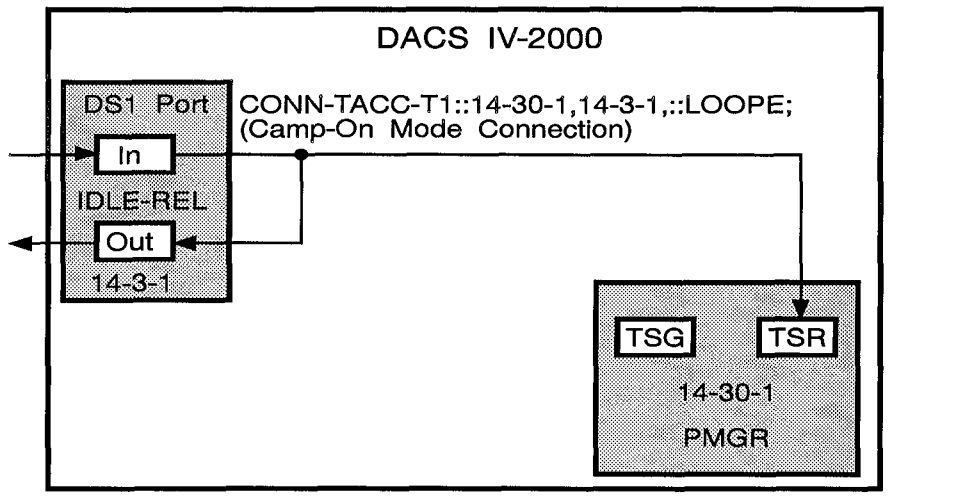


Figure 12-5. **Reading TSID using LOOPE Access in Camp-on Mode**

Example 4:

```
CONN-TACC-T1::14-29-1,14-1-1,::MONE;
RTRV-T1ID::14-1-1::14-29-1;
```

As shown in Figure 12-6, the CONN-TACC-T1 command (label A) establishes a MONE connection to read a TSID using port 14-29-1 on a PMGR circuit pack as the testport and port 14-1-1 as the DS1 port. Port 14-1-1 is in the MAP-REL state. A REPT T1ID message is generated to report the TSID. The RTRV-T1ID command (label B) can be issued to read the TSID, if necessary.

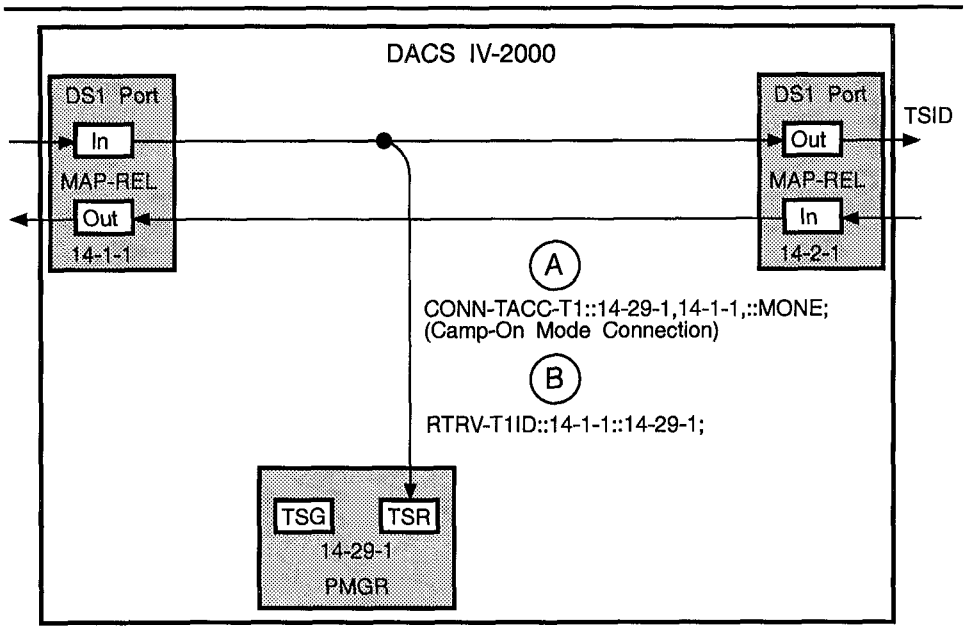


Figure 12-6. **Reading TSID using MONE Access in Camp-on Mode on a Mapped Port**

4. After receiving the REPT T1ID message, disconnect the TSRG port by referring to the section titled "Removing TSID Connections" (page 12-20) using the ports in the connection in Step 3.

Automatic Read Mode Connection

The following procedure is used to read the TSID using an automatic read mode connection.

NOTE:
In order to use the TSID feature, the DACS IV-2000 must be provisioned for TSID and the PMGR circuit pack must be provisioned in the TSGR state. Refer to the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53) for provisioning information.

1. Determine test activity of the system by entering the following command:

   `RTRV-TACC-T1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the DS1 port used as the TAP.

   d = TAP DS1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF, TSGR-REL }`
   Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

   e = E-END DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the E-End DS1 port.

f = F-END DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the F-End DS1 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

From the output response determine which TAP DS1 ports are in the TSGR-REL state (parameters *c* and *d*). The TSID can only be read on ports in the TSGR-REL state.

2. Determine if the DS1 port to be used as the E-End port is in the IDLE-REL or MAP-REL state by entering the following command (the TSID can only be written on DS1 ports in the IDLE-REL state):

`RTRV-T1:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = DS1 port(s) to be used as the E-END location:
DS1 port number: `{ {1-64}-{1-31}-{1-28},`
`DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
VT1.5 group number (STS1 Interface Modules only):
`{1-64}-{1-15}-{1-7}-{1-4}`
DS1 ports can be associated with DS1 or DS3 Interface Modules.

The following output response appears (for this step only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:ACTSIG:<> */
    "...:< ISTATE=o OSTATE=p... >"
;
```

Check the input and output states (parameters *o* and *p*) to make sure they are in the IDLE-REL or MAP-REL state. If the ports are not in the IDLE-REL or MAP-REL state, the selected ports can not be used to read TSIDs until the associated connections are taken down (check with your system administrator or next level of support for instructions).

3. Perform an automatic read of a TSID on a specified port by entering the following command:

   `RTRV-T1ID:`*[a]*`:`*b*`::`*d*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the DS1 port that the TSID is read from.

   d = TSGR Port:
   `{ {1-64}-{1-31}-{1-28}, TSGR }`
   Specifies a test signal receiver (TSR) port used for the test session. The TSGR port must be in the TSGR-REL state. You can designate the TSGR port (from Step 1) or can specify TSGR. If TSGR is specified, the system chooses the TSR as the lowest unit-slot-address available.

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:TYPE:CLEI:CLLI:FIC:UNIT:GEN:TSR_LOC:RCV_ERR */
   "e:f:g:h:i:j:k:l:m"
;
```

   Where:

   e = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   f = Type: <2-4 TRANSID Legal Characters>
   Specifies the ID type read from the data link of the DS1 port.

   g = Common Language Equipment ID code:
   #<1-10 TRANSID Legal Characters >

   h = Common Language Location ID code:
   #<1-11 TRANSID Legal Characters >

   i = Frame ID code:
   #<1-10 TRANSID Legal Characters >

   j = Unit: #<1-6 TRANSID Legal Characters >

   k = Generator number: #<1-38 TRANSID Legal Characters >

l = Test signal receiver DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`
Specifies the test signal receiver port that was used to read values listed with the above parameters.

m = Receiver error: `{ ERR-ID, NO-ID, BADT1, CRC6 }`
Specifies the error, if any, that resulted from attempting to read from the TSID.

For more information on the **RTRV-T1ID** command refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902)

Example:

```
RTRV-T1ID::14-6-1::14-29-1;
```

As shown in Figure 12-7, the above command establishes a connection using port 14-29-1 on a PMGR circuit pack as the testport and port 14-6-1 as the DS1 port. When the connection is established, the TSID is read automatically, the TSID is reported by the `REPT T1ID` message, and the test access connection is released.

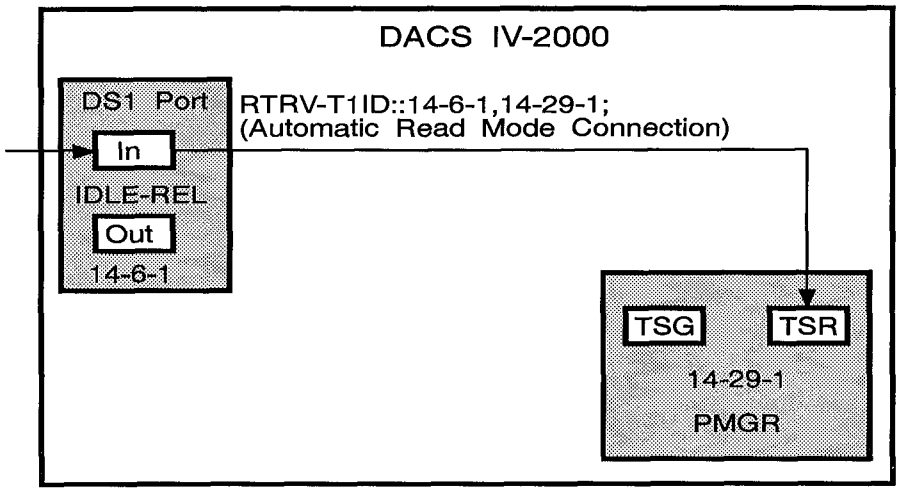


Figure 12-7. **Reading TSID using Automatic Read Mode**

Removing TSID Connections

This procedure is used to remove TSID connections.

1. Obtain testport and parameter information from office records.
2. Before disconnecting a TSID connection, determine DS1 test activity in the system by entering the following command:

   `RTRV-TACC-T1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module only):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the port used as the TAP.

   d = TAP port input and output state:
   DS1 port: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF, TSGR-MONE, TSGR-SPLTE, TSGR-LOOPE, TSGR-REL }`
   Specifies the DS1 port currently used as the TAP. The second part of the state name indicates the test access mode or releases state.

   e = E-END port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module only):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the E-End port.

   f = F-END port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module only):
   `{1-64}-{1-15}-{1-7}-{1-4}`
   Specifies the F-End port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Remove a TSID connection by entering the following command:

   DISC-TACC:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Port (TAP) location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   Specifies the TSID port, which is represented by the port that is being used as the TAP for this test session. If this port is not an active TAP, the command is denied. If ALL is specified, all current test sessions are disconnected with the following exceptions:

   Test sessions that are not associated with any link are not affected. Test sessions that are not associated with any link can only be disconnected by explicitly specifying the TAP in the DISC-TACC command.

   Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the test access connection is removed and update your office records.

DS3 Path Identification (PID)

The PID provides the ability to identify the source of a DS3 signal at any point along the path of the signal. The PID for any DS3 in the DACS IV-2000 can be manually provisioned by using the ED-T3ID and the ED-NE commands. The PID applies to DS3 network terminal equipment (NTE) and the transmission path. When the PID is provisioned, it is written in a terminal-to-terminal-path maintenance data link in the DS3 format using the C-bit parity application.

When the transmitter of a DS3 NTE is provisioned for the A-to-Z direction of transmission, the receiver at the Z-end of the path is provisioned with the same PID, so the receiver can identify the PID transmitted at the A-end of the path. The PID is comprised of unique identifiers using COMMON LANGUAGE codes. The PID is made up of the following parameters:

- TYPE - The PID type is 00111000 (binary) or 38 (hexadecimal).
- CLEI Code - The COMMON LANGUAGE Equipment Identification code consists of zero to ten characters and identifies the transmission equipment or product.
- CLLI Code - The COMMON LANGUAGE Location Identification code consists of zero to eleven characters and uniquely identifies the geographic location of a frame or NTE.
- FIC - The frame identification code consists of zero to ten characters and identifies the physical location of the frame within a building.
- UNIT - The unit designation consists of zero to six characters and identifies the equipment location within a bay.
- CLFI Code - The COMMON LANGUAGE Facility Identifier code consists of up to 38 characters and is used only for the PID. The CLFI code identifies the type of technology and the originating and terminating CLLI code.

With DS3 PID, the DACS IV-2000 can:

- Create (provision) and retrieve identification for each DS3 signal from the internal database
- Transmit the PID and read the received PID from the data link of a C-bit parity format signal
- Take appropriate action based on provisioned data if a mismatch is found between the expected and received CLLI code and CLFI code or take appropriate action if the DACS IV-2000 is unable to read the DS3 PID on an incoming C-bit parity format signal
- Maintain transmission of the DS3 PID if a protection switch occurs.

Writing Path IDs

The following procedure allows the DACS IV-2000 to enable one or all MUX2/ MUX3 circuit packs to write a PID to row 5 of a DS3 formatted signal that is provisioned for C-bit parity. The PID that is written is a concatenation of values provisioned with the `ED-NE` and the `ED-T3ID` commands. The PID fields, CLEI, CLLI, and FIC, are provisioned and set by the `ED-NE` command are common for all DS3 ports writing a PID. The PID fields, CLFI and UNIT, are either provisioned or set by the
DACS IV-2000 on a per DS3 port basis. The CLFI is set by the `ED-T3ID` command and UNIT is set by the DACS IV-2000 to the string value represented by the unit-slot address of the MUX circuit pack.

In order to use the path identification (PID) feature of TRANSID, the DACS IV-2000 must be provisioned for TRANSID and the DS3 signal format for the DS3 port must be provisioned for C-bit parity. Use the `RTRV-NE` and `RTRV-T3` commands to verify that necessary provisioning has been done.

1. Provision the DACS IV-2000 for DS3 PID by entering the following command:

   `ED-NE:`*[a]*`::::CLEI=`*l*`,CLLI=`*m*`,FIC=`*n*`,EQTYPE=`*o*`,APPL=`*r*`;`

   Where:

   a = Target ID (optional)

   l = # and 1 to 10 character CLEI code that this DS3 port transmits (for example, `#DACSIV512`).

   m = # and 1 to 11 character CLLI code that this DS3 port transmits (for example, `#8CHRCOID`).

   n = # and 1 to 10 character FIC that this DS3 port transmits (for example, `#RRSWBAY4`).

   o = Equipment Type: `[ NET, CPE ]`

   r = Application: `TRANSID`

2. Verify the DS3 PID network element parameters by entering the following command:

   `RTRV-NE:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "...:CLEI=n,CLLI=o,FIC=p,EQTYPE=q,APPL=t,..."
;
```

Where:

n = Common Language Equipment Identification (CLEI):
#<1-10 TRANSID Legal Characters>

o = Common Language Location Identification (CLLI):
#<1-11 TRANSID Legal Characters>

p = Frame Identification Code (FIC):
#<1-10 TRANSID Legal Characters>

t = Application: { TRANSID, OTHER }

If the desired parameters do not appear, repeat Step 1 to enter the parameters correctly.

3. Provision DS3 PID by entering the following command for each DS3 signal:

ED-T3ID:*[a]*:*b*:::::MISRSP=*d*,EXPCLFI=*e*,EXPCLLI=*f*,
TRNCLFI=*g*,TRNDS3ID=*h*;

Where:

a = Target ID (optional)

b = DS3 interface port: {1-64}-{1-31}

d = Mismatch response: { NONE, ALARM, BLOCK, CURVAL }
Specifies system response to mismatched or unreadable IDs. The valid values are:

- NONE - indicates that the system does not monitor for mismatched or unreadable IDs.
- ALARM - indicates an alarm is raised for a mismatched or unreadable ID.
- BLOCK - indicates that an alarm is raised for an unreadable ID or mismatched ID. A DS1 AIS is sent to all downstream DS1 tributaries.

e = Expected CLFI: { #<1-38 TRANSID Legal Characters>, ALL1SIGNAL, NOVAL, CURVAL }
Specifies the CLFI code that this DS3 port expects to receive in an incoming DS3 signal (for example, #DACSIV512orgicoidRECICOID).

f = Expected CLLI: { #<1-11 TRANSID Legal Characters>, NOVAL, CURVAL }
Specifies the CLLI code that this DS3 port expects to receive in an incoming DS3 signal (for example, #8CHRCOID).

g = Transmitted CLFI: { #<1-38 TRANSID Legal Characters>, ALL1SIGNAL, NOVAL, CURVAL }
Specifies the CLFI code that this DS3 port transmits (for example, #DACSIV512orgicoidRECICOID).

h = Transmitted DS3 ID type: `{ PID, ISID, NOVAL, CURVAL }`
Specifies the type of message being transmitted from this DS3 port.

- `PID` - Path Identification
- `ISID` - Idle Signal Identification

4. Verify the provisioned DS3 PID parameters by entering the following command:

   `RTRV-T3ID:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 interface port: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* LOC:<> */
   "k:TRNDS3ID=l,...,TRNCLFI=q,EXPCLLI=r,EXPCLFI=s,...,
   MISRSP=aa"
;
```

   k = DS3 interface port: `{1-64}-{1-31}`

   l = Transmitted DS3 ID type: `{ PID, ISID }`

   q = Transmitted CLFI: `{ #<1-38 TRANSID Legal Characters>, ALL1SIGNAL }`

   r = Expected CLLI: `#<1-11 TRANSID Legal Characters>`

   s = Expected CLFI: `{ #<1-38 TRANSID Legal Characters>, ALL1SIGNAL }`

   aa = Mismatch response: `{ NONE, ALARM, BLOCK }`

   If the desired parameters do not appear, repeat Step 3 to enter the parameters correctly.

5. Establish the alarm level (according to the procedures set up in your office) for mismatched or unreadable PIDs by entering the following command:

   `SET-ATTR-T3:`*[a]*`:`*b*`:::`*d*`,FAULT;`

   Where:

   a = Target ID (optional)

   b = DS3 interface port: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   d = Alarm level: `{ MJ, MN, NA )`

Reading Path IDs on DS3 Ports

The following procedure is used to read (retrieve) the PID elements on a designated DS3 interface port or group of DS3 interface ports in a unit. You have the option of specifying the type of information to be retrieved. You can select among expected, received, or transmitted DS3 PIDs.

In order top use the path identification (PID) feature of TRANSID, the DACS IV-2000 must be provisioned for TRANSID and the DS3 signal format for the DS3 port must be provisioned for C-bit parity. Use the `RTRV-NE` and `RTRV-T3` commands to verify that necessary provisioning has been done. If the system has not been provisioned, refer to Chapters 5 and 6 for provisioning information.

1. Retrieve PID information by entering the following command:

   `RTRV-T3ID:`*[a]*`:`*b*`::::<RTRVSEL=`*d*`,CLFI=`*e*`,TYPE=`*f*`,CLEI=`*g*`, CLLI=`*h*`,FIC=`*i*`,UNIT=`*j*`>;`

   Where:

   a = Target ID (optional)

   b = DS3 interface port: `{ [1-64]-[1-31], UNIT-[1-64] }`

   d = Retrieve DS3 ID selector: `{ EXP, RCV, XMIT }`
   Default value: `RCV`
   Specifies the type of information to be retrieved. The valid values are:

   - `EXP` - indicates that the system is searching for information based on the expected CLLIs and CLFIs.
   - `RCV` - indicates that the system is searching for information in the IDs being received on the DS3 interface ports.
   - `XMIT` - indicates that the system is searching for information in the IDs being transmitted from the DS3 interface ports.

   e = CLFI code: `{ #`<1-38 TRANSID Legal Characters>`, ALL1SIGNAL, ALL, NOVAL }`
   Default value: `ALL`
   Specifies the CLFI code to be retrieved.

   f = DS3 ID type: `{ `<2 Digit Hex Number>`, TSID, ISID, PID, ALL, NOVAL }`
   Specifies the type of message to be retrieved. The valid values are:

   - `TSID` - specifies test signal ID.
   - `ISID` - specifies idle signal ID.
   - `PID` - specifies path ID.

g = CLEI code: { #<1-10 TRANSID Legal Characters>, ALL, NE, NOVAL }
Specifies the CLEI code to be retrieved.

h = CLLI code: { #<1-11 TRANSID Legal Characters>, ALL, NE, NOVAL }
Specifies the CLLI code to be retrieved.

i = FIC code: { #<1-10 TRANSID Legal Characters>, ALL, NE, NOVAL }
Specifies the FIC to be retrieved.

j = Unit string: { #<1-6 TRANSID Legal Characters>, {1-64}-{1-31,P}, ALL, NOVAL }
Default value: ALL
Specifies the Unit code to be retrieved.

A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* LOC:<> */
   "k:TRNDS3ID=l,TRNCLEI=m,TRNCLLI=n,TRNFIC=o,
   TRNUNIT=p,TRNCLFI=q,EXPCLLI=r,EXPCLFI=s,RTYPE=t,
   RCLEI=u,RCLLI=v,RFIC=w,RUNIT=x,RCLFI=y,MTCH=z,
   MISRSP=aa"
;
```

k = DS3 interface port: {1-64}-{1-31}

l = Transmitted DS3 ID type: { PID, ISID }

m = Transmitted CLEI: #<1-10 TRANSID Legal Characters>

n = Transmitted CLLI: #<1-11 TRANSID Legal Characters>

o = Transmitted FIC: #<1-10 TRANSID Legal Characters>

p = Transmitted unit string: #<1-6 TRANSID Legal Characters>

q = Transmitted CLFI: { #<1-38 TRANSID Legal Characters>, ALL1SIGNAL }

r = Expected CLLI: #<1-11 TRANSID Legal Characters>

s = Expected CLFI: { #<1-38 TRANSID Legal Characters>, ALL1SIGNAL }

t = Received DS3 ID type: { <2 Digit Hex Number>, TSID, ISID, PID }

u = Received CLEI: #<1-10 TRANSID Legal Characters>

v = Received CLLI: #<1-11 TRANSID Legal Characters>

w = Received FIC: #<1-10 TRANSID Legal Characters>

x = Received unit string: #<1-6 TRANSID Legal Characters>

y = Received CLFI: { #<1-38 TRANSID Legal Characters>, ALL1SIGNAL, IDUNREADABLE }

z = Match: { YES, NO }
Specifies whether the received and expected CLLIs and CLFIs match.

aa = Mismatch response: { NONE, ALARM, BLOCK }

Loopbacks

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Loopbacks

13

This chapter consists of procedures required for establishing, disconnecting, inhibiting, and allowing near-end and far-end DS1 and DS3 loopbacks and near-end STS-1 and VT1.5 loopbacks.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

For more information on loopbacks, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900) or the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

DS1 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing DS1 loopbacks at the near-end or far-end. DS1 loopbacks can be associated with DS1 facilities, or DS1 signals that are within DS3 and EC-1 facilities. For DS1 signals within EC-1 facilities, only DS1 terminal loopbacks (LPBKT) are allowed.

Operating Near-End DS1 Loopbacks

This procedure is used to create a near-end DS1 loopback. Only DS1 ports in the IDLE-REL or MAP-REL state and are not inhibited from loopbacks can be looped back. In addition to create a terminal loopback associated with an EC-1 port, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. Retrieve active signal type (DS1 ports within EC-1 ports) and port state information of the DS1 port to be looped back by entering the following command:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{1-64}-{1-31}-{1-28}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:<OSTATE=p>"
;
```

   Where:

   e = DS1 port location: `{1-64}-{1-31}-{1-28}`

   f = Active signal type: `{ EC1, T1, VT1 }`

   p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected DS1 port is not in the IDLE-REL or MAP-REL state (parameter *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 port to the IDLE-REL or MAP-REL state or selecting a DS1 port in the IDLE-REL or MAP-REL state.

If the specified DS1 port is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 loopback can not be created. Contact the system administrator or next level of support to determine if the EC-1 port can be reconfigured using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) or if another DS1 port is to be selected.

3. Determine if near-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-T1:`*[a]*`:`*b*`:::INHDS1LPBK;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `[1-64]-[1-31]-[1-28]`

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the DS1 port can be allowed to be loopback or if another DS1 port is to be selected. The DS1 port can be allowed to be looped back by using the section titled "Allowing DS1 Loopbacks" (page 13-11).

4. Create a near-end DS1 loopback by entering the following command:

   `OPR-LPBK-T1:`*[a]*`:`*b*`:::NEND:`*e*`:`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `[1-64]-[1-31]-[1-28],`
   `DS1GRP-[1-64]-[1-31], UNIT-[1-64]`
   The specified DS1 port can be associated with an STS1 Interface Module [that is, a VT1.5(DS1) signal].

   e = Loopback state: `LPBKL, LPBKT, LPBKI, LPBKM`
   Specifies the loopback state. For DS1 ports associated with EC-1 ports, only `LPBKT` is allowed. Refer to the DS1 loopback state description in the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

f = Link association: { Y, N }
Default: Y (yes, the DS1 loopback is associated with the link). Specifies whether the DS1 loopback is associated with the link on which the OPR-LPBK-T1 command is given when the AUTOREL parameter of the ED-NE command is set to ON. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the AUTOREL parameter of the ED-NE command is set to OFF, this command must have this parameter set to N otherwise, the command is denied with the error code IDNV.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, that the DS1 loopback has been established and update your office records.

Releasing Near-End DS1 Loopbacks

This procedure is used to release near-end DS1 loopbacks.

1. Retrieve DS1 loopbacks by entering the following command:

   RTRV-LPBK-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   d = DS1 port location:
   DS1 port number: { [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }
   VT1.5 group number: [1-64]-[1-15]-[1-7]-[1-4]

   A sample output i:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

Where:

d = DS1 port location:
DS1 port number: {1-64}-{1-31}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

e = Loopback state: { LPBKL, LPBKT, LPBKI, LPBKM, FLPBKM, LPBKF, NONE }
The value NONE indicates no loopback is present on the specified DS1 port.

f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

g = User ID: <1-10 UID legal characters>
Specifies the User ID the loopback is associated with.

h = Inhibit state: { NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }
Specifies whether the loopback is inhibited.

2. Release the desired near-end DS1 loopback by entering the following command:

RLS-LPBK-T1:*[a]*:*b*:::NEND;**

Where:

a = Target ID (optional)

b = DS1 port location:
DS1 port number: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the DS1 loopback has been released and update your office records.

Operating Far-End DS1 Loopbacks

Far-end DS1 loopbacks can only be established on DS3 interface ports on MUX2 (AKM68 or AKM68B) or MUX3 (AKM91) circuit packs provisioned to communicate with far-end remote multiplexers. The only type of loopback allowed is a DS1 tributary loopback (LPBKM). Far-end DS1 loopbacks are allowed for any of the remote multiplexer communication protocols (FEAC, TR9, and SBIT). Both MUX2 and MUX3 circuit packs and far-end remote multiplexers must have the same DS3 format (CBIT or M13) and DS3 idle status (ON or OFF). If the FEAC protocol is used, only CBIT formatted DS3 signals are allowed.

1. Obtain circuit provisioning information from office records.
2. Verify that the DS3 interface port that you are establishing DS1 loopbacks on has been provisioned for remote multiplexer communications by entering the following command:

   `RTRV-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   A sample output response is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:ACTSIG:<> */
      "e::<DS3FORMAT=l,IDLE=x,LSTATE=y,RMTMUXC=z>"
   ;
   ```

   Where:

   e = DS3 port location: `{1-64}-{1-31}`

   l = DS3 signal format: `{ ASYNC, CBIT }`

   x = DS3 idle signal status: `{ ON, OFF }`

   y = DS3 loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`

   z = Remote multiplexer communications status: `{ SBIT, FEAC, TR9, NONE }`

   If the desired DS3 interface port(s) are not provisioned for remote multiplexer communications, contact the system administrator or next level of support to determine if the DS3 port can be provisioned to communicate with remote multiplexers. If necessary, refer to the section titled "Provisioning DS3 Facilities" (page 6-15) to provision the DS3 interface port(s). If the DS3 loopback state (parameter *y*) is not set to `NONE`, a loopback is already active. If there are no loopbacks active, continue with this procedure.

3. Determine if far-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-T1:`*[a]*`:`*b*`:::INHDS1FLPBK;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `[1-64]-[1-31]-[1-28]`

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from far-end loopbacks. Contact the system administrator or next level of support to determine if the DS1 port can be allowed to be loopback or if another DS1 port is to be selected. The DS1 port can be allowed to be looped back by using the section titled "Allowing DS1 Loopbacks" (page 13-11).

4. Create a far-end DS1 loopback by entering the following command:

   `OPR-LPBK-T1:`*[a]*`:`*b*`:::FEND:LPBKM:`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`

   f = Link association: `{ Y, N }` (for FEAC and TR9 remote multiplexers)
   Default: `Y` (yes, the DS1 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the `OPR-LPBK-T1` command is given when the `AUTOREL` parameter of the `ED-NE` command is set to `ON`. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the `AUTOREL` parameter of the `ED-NE` command is set to `OFF`, this command must have this parameter set to `N` otherwise, the command is denied with the error code `IDNV`.

NOTE:
It is desired operation and procedure to issue far-end loopbacks only if it is known that the far-end office does not contain any near-end LPBKT or LPBKM loopbacks on the corresponding port. Otherwise, signal conflict can occur. Also, the physical connection between the DACS IV-2000 and the far-end equipment must be maintained as long as the DS1 far-end loopback is set up with link association (parameter *f* set to `Y`). Once the

DS1 far-end loopback is released the physical connection can be disconnected.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

The COMPLD response signifies that the loopback request itself (not the action requested at the far-end) has completed.

When establishing a far-end loopback on a DS3 interface port provisioned for SBIT communications, there is a one to two minute delay between the **OPR-LPBK-T1** command completing (for a single loopback) and the actual loopback taking place at the remote end. During this time delay, the DACS IV-2000 denies any other remote request with the SABT error code. However, if the DS1 group is requested, the loopback is completed immediately.

Under TR-TSY-000009 protocol, confirmation of the loopback operation requested is not sent back to the near-end; verification is done through test equipment.

5. Notify far-end personnel that the DS1 loopback has been established and update your office records.

Releasing Far-End DS1 Loopbacks

This procedure is used to release far-end DS1 loopback(s).

1. Retrieve DS1 loopbacks by entering the following command:

   RTRV-LPBK-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

Where:

d = DS1 port location: {1-64}-{1-31}-{1-28}

e = Loopback state: { LPBKL, LPBKT, LPBKI, LPBKM, FLPBKM, LPBKF, NONE }
The value NONE indicates no loopback is present on the specified DS1 port.

f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-8} }
Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

g = User ID: <1-10 UID legal characters>
Specifies the User ID the loopback is associated with.

h = Inhibit state: { NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }
Specifies whether the loopback is inhibited.

The state LPBKF indicates that a far-end loopback was established by the DACS IV-2000. the state FLPBKM indicates a loopback was established in response to a far-end (remote multiplexer) command. Loopbacks established by the remote multiplexer using TR9 protocol can only be release by the remote multiplexer. If you need to release a loopback established by the remote multiplexer (FLPBKM state) using TR9 protocol, go to Step 4. Otherwise, continue with Step 2.

2. Release the desired far-end DS1 loopback (LPBKF loopback state) by entering the following command:

RLS-LPBK-T1:*[a]*:*b*:::FEND;

Where:

a = Target ID (optional)

b = DS1 port location: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }

NOTE:
This command is denied with the error code SARL if the loopback being release is in the FLPBKM state for remote multiplexers using TR9 protocol.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify far-end personnel that the DS1 loopback has been released and update your office records. After updating your office records you are done with this procedure.

4. From office records, determine if the port indicating a FLPBKM loopback state is connected to a remote multiplexer using TR9 protocol.

   If the port is connected to a remote multiplexer using TR9 protocol, contact the far-end personnel and have them release the loopback.

   If the port is not connected to a remote multiplexer using TR9 protocol, connect a remote multiplexer using TR9 protocol to the port and have a loopback established by the remote multiplexer and released by the remote multiplexer.

5. After the DS1 loopback has been released update your office records.

Inhibiting DS1 Loopbacks

This procedure is used to inhibit DS1 ports from being looped back (near- and far-end). In addition, to inhibit a DS1 signal associated with a EC-1 port to be looped back, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. If the DS1 port is associated with a EC-1 port, retrieve the active signal type of the DS1 port by entering the following command:

   RTRV-T1: *[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{1-64}-{1-31}-{1-28}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:..."
;
```

   Where:

   e = DS1 port location: `{1-64}-{1-31}-{1-28}`

   f = Active signal type: `{ EC1, T1, VT1 }`

   If the specified DS1 port is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 loopback can not be created. Therefore, the selected port cannot be used for DS1 operations and you are done with this procedure for the selected port.

3. Inhibit DS1 loopback by entering the following command:

   `INH-LPBK-T1:`*[a]*`:`*b*`:::`*[d]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28],`
   `DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   The specified DS1 port can be associated with an STS1 Interface Module [that is, a VT1.5(DS1) signal].

   d = Loopback control: `{ NEND, FEND, BOTH }`
   Specifies what type of loopbacks are inhibited. `NEND` specifies near-end loopbacks, `FEND` specifies far-end loopbacks, and `BOTH` specifies near- and far-end loopbacks.

   Wait for the completed message (`COMPLD`) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the DS1 port has been inhibited from loopbacks and update your office records.

Allowing DS1 Loopbacks

This procedure is used to allow DS1 ports to be looped back (near- and far-end). In addition, to allow a DS1 signal associated with a EC-1 port to be looped back, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. If the DS1 port is associated with a EC-1 port, retrieve the active signal type of the DS1 port by entering the following command:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `[1-64]-[1-31]-[1-28]`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:..."
;
```

Where:

e = DS1 port location: `{1-64}-{1-31}-{1-28}`

f = Active signal type: `{ EC1, T1, VT1 }`

If the specified DS1 port is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 loopback can not be created. Therefore, the selected port cannot be used for DS1 operations and you are done with this procedure for the selected port.

3. Allow DS1 loopback by entering the following command:

   ALW-LPBK-T1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28},`
   `DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   The specified DS1 port can be associated with an STS1 Interface Module [that is, a VT1.5(DS1) signal].

   d = Loopback control: `{ NEND, FEND, BOTH }`
   Specifies what type of loopbacks are allowed. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the DS1 port has been allowed for loopbacks and update your office records.

DS3 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing DS3 loopbacks at the near-end or far-end.

Operating Near-End DS3 Loopbacks

This procedure is used to operate a DS3 line loopback on a specified DS3 interface port or a range of DS3 interface ports at the facility level on a DS3 interface circuit pack within the system. The following procedures can only be done using a MUX2 (AKM68 or AKM68B) or MUX3 (AKM91) circuit pack.

1. Obtain circuit provisioning information from office records.
2. Verify that the DS3 interface port that you are establishing a DS3 loopback on does not have any loopbacks by entering the following command:

   `RTRV-T3:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   A sample output response is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:ACTSIG:<> */
      "e::<LSTATE=y>"
   ;
   ```

   Where:

   e = DS3 port location: `{1-64}-{1-31}`

   y = DS3 loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`

   If the DS3 loopback state (parameter *y*) is not set to `NONE`, a loopback is already active. If there are no loopbacks active, continue with this procedure.

3. Determine if near-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-T3:[a]:b:::INHDS3LPBK;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{1-64}-{1-31}`

The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the DS3 port can be allowed to be loopback or if another DS3 port is to be selected. The DS3 port can be allowed to be looped back by using the section titled "Allowing DS3 Loopbacks" (page 13-20).

4. Create a near-end DS3 loopback by entering the following command:

   OPR-LPBK-T3:*[a]*:*b*:::**NEND**:*[e]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-64}-{1-31}, UNIT-{1-64} }**
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the interface module.

   e = Link association: **{ Y, N }**
   Default: **Y** (yes, the DS3 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the **OPR-LPBK-T3** command is given when the **AUTOREL** parameter of the **ED-NE** command is set to **ON**. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the **CANC-USER** command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the **AUTOREL** parameter of the **ED-NE** command is set to **OFF**, this command must have this parameter set to **N** otherwise, the command is denied with the error code **IDNV**.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, that the DS3 loopback has been established and update your office records.

Releasing Near-End DS3 Loopbacks

This procedure is used to release near-end DS3 loopback(s).

1. Retrieve DS3 loopbacks by entering the following command:

   `RTRV-LPBK-T3:`*[a]*`:`*b*`:::NEND;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS3 port location: `{1-64}-{1-31}`

   e = Loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`
   The value `NONE` indicates no loopback is present on the specified DS3 port.

   f = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the loopback is associated with. `CILINK-0-0` is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: `{ NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }`
   Specifies whether the loopback is inhibited.

2. Disconnect the desired near-end DS3 loopback by entering the following command:

   `RLS-LPBK-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the DS3 loopback has been released and update your office records.

Operating Far-End DS3 Loopbacks

Far-end DS3 loopbacks can only be established on DS3 interface ports on MUX2 (AKM68 or AKM68B) or MUX3 (AKM91) circuit packs provisioned to communicate with far-end remote multiplexers that use the FEAC communications protocol and CBIT as the DS3 format.

1. Obtain circuit provisioning information from office records.
2. Verify that the DS3 interface port that you are establishing DS3 loopbacks has been provisioned for remote multiplexer using FEAC communication protocol and has no loopbacks by entering the following command:

   RTRV-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-64}-{1-31}, UNIT-{1-64} }**

   A sample output response is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e::<DS3FORMAT=l,LSTATE=y,RMTMUXC=z>"
;
```

   Where:

   e = DS3 port location: {1-64}-{1-31}

   l = DS3 signal format: { ASYNC, CBIT }

   y = DS3 loopback state: { LPBKL, FLPBKL, LPBKF, NONE }

   z = Remote multiplexer communications status: { SBIT, FEAC, TR9, NONE }

   If the desired DS3 interface port(s) are not provisioned for remote multiplexer using FEAC communication protocol, contact the system administrator or next level of support to determine if the DS3 port can be provisioned for remote multiplexer communications. If necessary, refer to the section titled "Provisioning DS3 Facilities" (page 6-15) to provision the

DS3 interface port(s). If the DS3 loopback state (parameter y) is not set to NONE, a loopback is already active. If there are no loopbacks (DS3 and its corresponding DS1s) active, continue with this procedure.

3. Determine if far-end loopbacks are inhibited by entering the following command:

   RTRV-COND-T3:*[a]*:*b*:::**INHDS3FLPBK;**

   Where:

   a = Target ID (optional)

   b = DS3 port location: **[1-64]-[1-31]**

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from far-end loopbacks. Contact the system administrator or next level of support to determine if the DS3 port can be allowed to be loopback or if another DS3 port is to be selected. The DS3 port can be allowed to be looped back by using the section titled "Allowing DS3 Loopbacks" (page 13-20).

4. Create a far-end DS3 loopback by entering the following command:

   OPR-LPBK-T3:*[a]*:*b*:::**FEND:***[e]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **[[1-64]-[1-31], UNIT-[1-64]]**

   e = Link association: **[Y, N]**
   Default: **Y** (yes, the DS3 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the **OPR-LPBK-T3** command is given when the **AUTOREL** parameter of the **ED-NE** command is set to **ON**. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the **CANC-USER** command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the **AUTOREL** parameter of the **ED-NE** command is set to **OFF**, this command must have this parameter set to **N** otherwise, the command is denied with the error code IDNV.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

The COMPLD response signifies that the loopback request itself (not the action requested at the far-end) has completed. Under TR-TSY-000009 protocol, confirmation of the loopback operation requested is not sent back to the near-end; verification is done through test equipment.

5. Notify far-end personnel that the DS3 loopback has been established and update your office records.

Releasing Far-End DS3 Loopbacks

This procedure is used to release far-end DS3 loopback(s).

1. Retrieve DS3 loopbacks by entering the following command:

   RTRV-LPBK-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS3 port location: `[1-64]-[1-31]`

   e = Loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`
   The value NONE indicates no loopback is present on the specified DS3 port.

   f = Link ID location: `{ CILINK-0-0, CILINK-[1,2]-[1-8] }`
   Specifies the link the loopback is associated with. `CILINK-0-0` is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: `{ NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }`
   Specifies whether the loopback is inhibited.

   The state LPBKF indicates that a far-end loopback was established by the DACS IV-2000. the state FLPBKL indicates a loopback was established in response to a far-end (remote multiplexer) command.

2. Release the desired far-end DS3 loopback (LPBKF loopback state) by entering the following command:

   `RLS-LPBK-T3:[a]:b:::FEND;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify far-end personnel that the DS3 loopback has been released and update your office records.

Inhibiting DS3 Loopbacks

This procedure is used to inhibit DS3 ports from being looped back (near- and far-end).

1. Obtain circuit provisioning information from office records.
2. Inhibit DS3 loopback by entering the following command:

   `INH-LPBK-T3:[a]:b:::[d];`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`

   d = Loopback control: `{ NEND, FEND, BOTH }`
   Specifies what type of loopbacks are inhibited. NEND specifies near-end loopbacks, FEND specifies far-end loopbacks, and BOTH specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the DS3 port has been inhibited from loopbacks and update your office records.

Allowing DS3 Loopbacks

This procedure is used to allow DS3 ports to be looped back (near- and far-end).

1. Obtain circuit provisioning information from office records.
2. Allow DS3 loopback by entering the following command:

   ALW-LPBK-T3:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

   d = Loopback control: `[ NEND, FEND, BOTH ]`
   Specifies what type of loopbacks are allowed. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.
3. Notify the appropriate personnel, according to office procedures, that the DS3 port has been allowed for loopbacks and update your office records.

STS-1 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing STS-1 loopbacks at the near-end. For EC-1 ports configured in the VTFLOAT mode, only STS-1 line loopbacks (LPBKL) are allowed.

Operating Near-End STS-1 Loopbacks

This procedure is used to create a near-end STS-1 loopback. Only EC-1 ports in the IDLE-REL or MAP-REL state can be looped back. In addition, to create an STS-1 loopback the Active Signal Type must be EC1 (STS-1 signal) for the specified port.

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) to be looped back by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:<EC1MAP=e ... >:i"
;
```

   Where:

   d = EC-1 port location: `{1-64}-{1-15}`

   e = Provisioned EC-1 format: `{ UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }`

   i = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type (parameter *i*) for the port is not EC1, an STS-1 loopback can not be created. Contact the system administrator or next level of support to determine if the EC-1 port can be reconfigured using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) or if another EC-1 port(s) is to be selected. If the Provisioned EC-1 Format (parameter *e*) is VTFLOAT, only an STS-1 line loopback (LPBKL) can be created.

3. Retrieve the port state information of the EC-1 ports (STS-1 signals) to be looped back by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{1-64}-{1-15}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:...,g"
;
```

   Where:

   e = EC-1 port location: `{1-64}-{1-15}`

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected EC-1 port is not in the IDLE-REL or MAP-REL state (parameter *g*), contact the system administrator or next level of support for assistance in moving the selected EC-1 ports to the IDLE-REL or MAP-REL state or selecting an EC-1 port in the IDLE-REL or MAP-REL state.

4. Determine if near-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-EC1:`*[a]*`:`*b*`:::INHEC1LPBK;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{1-64}-{1-15}`

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the EC-1 port can be allowed to be loopback or if another EC-1 port is to be selected. The EC-1 port can be allowed to be looped back by using the section titled "Allowing STS-1 Loopbacks" (page 13-26).

5. Create a near-end STS-1 loopback by entering the following command:

   OPR-LPBK-EC1:*[a]*:*b*::::*e*:*[f]*;

   Where:

   a = Target ID (optional)

   b = STS-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

   e = Loopback state: { LPBKL, LPBKT }
   Specifies the loopback state. Only LPBKL is valid for EC-1 ports configured in the VTFLOAT mode. Refer to the STS-1 loopback state description in the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

   f = Link association: { Y, N }
   Default: Y (yes, the STS-1 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the OPR-LPBK-EC1 command is given when the AUTOREL parameter of the ED-NE command is set to ON. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the CANC-USER command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the AUTOREL parameter of the ED-NE command is set to OFF, this command must have this parameter set to N otherwise, the command is denied with the error code IDNV.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, that the STS-1 loopback has been established and update your office records.

Releasing Near-End STS-1 Loopbacks

This procedure is used to release near-end STS-1 loopback(s).

1. Retrieve STS-1 loopbacks by entering the following command:

   RTRV-LPBK-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = STS-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

Where:

d = STS-1 port location: `{1-64}-{1-15}`

e = Loopback state: `{ LPBKL, LPBKT, NONE }`
The value `NONE` indicates no loopback is present on the specified STS-1 port.

f = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
Specifies the link the loopback is associated with. `CILINK-0-0` is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

g = User ID: <1-10 UID legal characters>
Specifies the User ID the loopback is associated with.

h = Inhibit state: `{ NONE, INHEC1LPBK }`
Specifies whether the loopback is inhibited.

2. Release the desired near-end STS-1 loopback by entering the following command:

   `RLS-LPBK-EC1:`*`[a]`*`:`*`b`*`;`

   Where:

   a = Target ID (optional)

   b = STS-1 port location: `{ {1-64}-{1-15}, UNIT-{1-64} }`

   Wait for the connection completed message (`COMPLD`) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the STS-1 loopback has been released and update your office records.

Inhibiting STS-1 Loopbacks

This procedure is used to inhibit EC-1 ports from being looped back (near--end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<>:ACTSIG */
      "d:< ... >:i"
   ;
   ```

   Where:

   d = EC-1 port location: `{1-64}-{1-15}`

   i = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type (parameter *i*) for the port is not EC1, an STS-1 loopback can not be created. Therefore, the selected port cannot be used for STS-1 operations and you are done with this procedure for the selected port.

3. Inhibit STS-1 loopback by entering the following command:

   `INH-LPBK-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ [1-64]-[1-15], UNIT-[1-64] }`

   Wait for the completed message (`COMPLD`) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the EC-1 port has been inhibited from loopbacks and update your office records.

Allowing STS-1 Loopbacks

This procedure is used to allow EC-1 ports to be looped back (near-end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<>:ACTSIG */
      "d:< ... >:i"
   ;
   ```

   Where:

   d = EC-1 port location: `{1-64}-{1-15}`

   i = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type (parameter *i*) for the port is not EC1, an STS-1 loopback can not be created. Therefore, the selected port cannot be used for STS-1 operations and you are done with this procedure for the selected port.

3. Allow STS-1 loopback by entering the following command:

   `ALW-LPBK-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the EC-1 port has been allowed for loopbacks and update your office records.

VT1.5 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing VT1.5 terminal (LPBKT) loopbacks at the near-end. Only VT1.5 tributaries of EC-1 ports that have an Active Signal Type of VT1 (VT1.5 signal) are allowed have VT1.5 loopbacks.

Operating Near-End VT1.5 Loopbacks

This procedure is used to create a near-end VT1.5 terminal loopback. Only VT1.5 ports in the IDLE-REL or MAP-REL state can be looped back. In addition, to create a VT1.5 loopback, the Active Signal Type must be VT1 (VT1.5 signal) for the specified port.

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the VT1.5 port to be looped back by entering the following command:

   RTRV-PORT: *[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
   VT1.5 group number: `{ [1-64]-[1-15]-[1-7]-[1-4], UNIT-[1-64] }`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:< ... >:i"
;
```

   Where:

   c = VT1.5 port location:
   VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   i = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type (parameter *i*) for the port is not VT1, a VT1.5 loopback can not be created. Contact the system administrator or next level of support to determine if the EC-1 port can be reconfigured using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) or if another EC-1 port(s) is to be selected.

3. Retrieve the port state information of the VT1.5 port to be looped back by entering the following command:

   `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:...,g"
;
```

   Where:

   c = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the selected VT1.5 port is not in the IDLE-REL or MAP-REL state (parameter *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 port to the IDLE-REL or MAP-REL state or selecting another VT1.5 port in the IDLE-REL or MAP-REL state.

4. Determine if near-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-VT1:`*[a]*`:`*b*`:::INHVT1LPBK;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the VT1.5 port can be allowed to be loopback or if another VT1.5 port is to be selected. The VT1.5 port can be allowed to be looped back by using the section titled "Allowing VT1.5 Loopbacks" (page 13-33).

5. Create a near-end VT1.5 loopback by entering the following command:

   `OPR-LPBK-VT1:`*[a]*`:`*b*`::::`*e*`:`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   e = Loopback state: `LPBKT`
   Specifies the loopback state. Refer to the VT1.5 loopback state description in the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903).

   f = Link association: `{ Y, N }`
   Default: `Y` (yes, the VT1.5 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the `OPR-LPBK-VT1` command is given when the `AUTOREL` parameter of the `ED-NE` command is set to `ON`. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Manual logout is achieved through the `CANC-USER` command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer. If the `AUTOREL` parameter of the `ED-NE` command is set to `OFF`, this command must have this parameter set to `N` otherwise, the command is denied with the error code `IDNV`.

   Wait for the connection completed message (`COMPLD`) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, that the VT1.5 loopback has been established and update your office records.

Releasing Near-End VT1.5 Loopbacks

This procedure is used to release near-end VT1.5 loopback(s).

1. Retrieve VT1.5 loopbacks by entering the following command:

   `RTRV-LPBK-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
      "d:e,f,g,h"
   ;
   ```

   Where:

   d = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   e = Loopback state: `{ LPBKT, NONE }`
   The value `NONE` indicates no loopback is present on the specified VT1.5 port.

   f = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-8} }`
   Specifies the link the loopback is associated with. `CILINK-0-0` is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: `{ NONE, INHVT1LPBK }`
   Specifies whether the loopback is inhibited.

2. Release the desired near-end VT1.5 loopback by entering the following command:

   `RLS-LPBK-VT1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the VT1.5 loopback has been released and update your office records.

Inhibiting VT1.5 Loopbacks

This procedure is used to inhibit VT1.5 ports from being looped back (near--end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the VT1.5 port by entering the following command:

   `RTRV-PORT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:< ... >:i"
;
```

Where:

d = VT1.5 port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

i = Active signal type: `{ EC1, T1, VT1 }`

If the Active Signal Type (parameter *i*) for the port is not VT1, a VT1.5 loopback can not be created. Therefore, the selected port cannot be used for VT1.5 operations and you are done with this procedure for the selected port.

3. Inhibit VT1.5 loopback by entering the following command:

`INH-LPBK-VT1:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = VT1.5 port location:
VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
`VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the VT1.5 port has been inhibited from loopbacks and update your office records.

Allowing VT1.5 Loopbacks

This procedure is used to allow VT1.5 ports to be looped back (near-end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the VT1.5 port by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<>:ACTSIG */
      "d:< ... >:i"
   ;
   ```

   Where:

   d = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   i = Active signal type: `{ EC1, T1, VT1 }`

   If the Active Signal Type (parameter *i*) for the port is not VT1, a VT1.5 loopback can not be created. Therefore, the selected port cannot be used for VT1.5 operations and you are done with this procedure for the selected port.

3. Allow VT1.5 loopback by entering the following command:

   `ALW-LPBK-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the VT1.5 port has been allowed for loopbacks and update your office records.

DACS IV-2000 (512)
Digital Access and Cross-Connect System IV-2000
Release 5.3.1 Volume 2
Operations and Maintenance

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Performance Monitoring

14

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

For detailed information on performance monitoring, refer to the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

DS1 Performance Monitoring Procedures

This section consists of procedures that allow you to provision and establish DS1 performance monitoring, schedule DS1 performance monitoring reports, and retrieve DS1 performance monitoring information. Table 14-1 lists the types of DS1 performance monitoring modes and the associated procedures necessary for each mode.

In order to use these procedures, your user login must have at least a PM (for performance monitoring) setting for your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various DS1 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all DS1 performance monitoring functions. In addition, if you are using PMGR1 circuit packs for performance monitoring (DS1 signals not associated with SWIF2 or MUX3 circuit

packs), these procedures assume that the PMGR1 circuit packs have been provisioned using the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53).

The procedures are organized in a manner that allow you to use them separately (for individual functions) or in the order they appear in Table 14-1 to set up your DS1 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings). For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

NOTE:

If you remove a circuit pack or a circuit pack fails in a DS1 protection group (pair of DS1IFs and SWIF circuit packs) or a PMGR1 circuit pack or manually switch to a DS1 protection group, loss of the current short interval (15 minute or 1 hour) and the current daily total DS1 path performance monitoring data that is being collected occurs. Also, the removal, failure, or provisioned removal of a UC4 circuit pack in a DS1 Interface Module and/or a module equipped with PMGR1 circuit packs causes the loss of all short interval and the current daily total DS1 performance monitoring data. This data is associated with the DS1 interfaces or DS1 interfaces monitored by the PMGR1 circuit packs in the module.

Failure of both PRI disk drives causes loss of the seven-day history of daily total DS1 performance monitoring data for all monitored DS1 facilities on the DACS IV-2000.

Any unused ports being monitored, either full-time or scanned, should be provisioned as unframed (UNF). Since whole DS1 interface groups or DS1 ports associated with MUXs can be monitored or scanned, there is the possibility of including unused ports. By not provisioning unused ports as UNF, the communications interface terminal can be inundated with `REPT EVT T1` messages.

Table 14-1. **DS1 Performance Monitoring Procedures**

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Dedicated full-time — using SWIF2 (AKM50) or MUX3 (AKM91) circuit pack	"Verifying DS1 Equipment Parameters" (page 14-6) "Setting DS1 Performance Monitoring Threshold Values" (page 14-9) and/or "Copying DS1 Performance Monitoring Threshold Values" (page 14-13) "Setting DS1 Facility Parameters" (page 14-17)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 14-5) (Short Accumulation Time) "Initializing Accumulated DS1 Performance Monitoring Data" (page 14-24)
Camp-on full-time—using PMGR1 (AKM66) circuit packs (DS1 signals not associated with SWIF2 and MUX3 circuit packs)	"Verifying DS1 Equipment Parameters" (page 14-6) "Setting DS1 Facility Parameters" (page 14-17) "Establishing DS1 Manual Camp-on Performance Monitoring" (page 14-19) "Setting DS1 Performance Monitoring Threshold Values" (page 14-9) and/or "Copying DS1 Performance Monitoring Threshold Values" (page 14-13)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 14-5) (Short Accumulation Time) "Initializing Accumulated DS1 Performance Monitoring Data" (page 14-24) "Scheduling DS1 Performance Monitoring Reports" (page 14-26) "Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 14-29) "Allowing Scheduled DS1 Performance Monitoring Reports" (page 14-29) "Retrieving DS1 Performance Monitoring Report Schedule" (page 14-30)

Table continued on next page.

Table 14-1. **DS1 Performance Monitoring Procedures (Continued)**

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Camp-on full-time—using PMGR1 (AKM66) circuit packs (continued)		"Retrieving DS1 Performance Monitoring Data" (page 14-31) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 14-33)
Scan—using PMGR1 (AKM66) circuit packs (DS1 signals not associated with SWIF2 and SMUX circuit packs and Enhanced DS3 and DS3 Clear-Channel Interface Modules)	"Verifying DS1 Equipment Parameters" (page 14-6) "Setting DS1 Facility Parameters" (page 14-17) "Setting DS1 Scan Monitoring Threshold Values" (page 14-21) "Starting DS1 Scan Performance Monitoring" (page 14-22)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 14-5) (Short Accumulation Time) "Initializing Accumulated DS1 Performance Monitoring Data" (page 14-24) "Scheduling DS1 Performance Monitoring Reports" (page 14-26) "Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 14-29) "Allowing Scheduled DS3 Performance Monitoring Reports" (page 14-44) "Retrieving DS1 Performance Monitoring Report Schedule" (page 14-30) "Retrieving DS1 Performance Monitoring Data" (page 14-31) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 14-33)

Table continue on next page.

Table 14-1. **DS1 Performance Monitoring Procedures (Continued)**

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Automatic Camp-on —using PMGR1 (AKM66) circuit packs (DS1 signals not associated with SWIF2 and SMUX circuit packs and Enhanced DS3 and Clear-Channel Interlace Modules)	"Verifying DS1 Equipment Parameters" (page 14-6) "Provisioning Automatic Camp-on Performance Monitoring DS1 Ports" (page 14-20)	"Retrieving DS1 Performance Monitoring Data" (page 14-31) "Copying DS1 Performance Monitoring Threshold Values" (page 14-13) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 14-33)

Setting Network Element DS1 Performance Monitoring Parameters

This procedure is used to set the DS1 performance monitoring parameters that are at the network element level (that is, frame-wide parameters). These parameters are generally only set during the initial provisioning of the DACS IV-2000 frame (refer to Chapters 5 and 6 for provisioning).

1. Determine if the values of the short accumulation period (SHACCUM) parameters are the desired values by entering the following command:

   `RTRV-NE:` *[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "... ,SHACCUM=u, ... "
;
```

   Where:

   u = DS1 short accumulation period: `{ 15-MIN, 1-HR }`

   If the values set for DS1 short accumulation period (parameter *u*) are the desired values, do not perform Steps 2 and 3.

2. Edit the DS1 performance monitoring network element parameters by entering the following command:

   `ED-NE:`*[a]*`::::[SHACCUM=`*s*`];`

   Where:

   a = Target ID (optional)

   s = Short accumulation period: `{ 15-MIN, 1-HR }` (optional)

3. If the value of SHACCUM was changed in Step 2, a system reset needs to be performed by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

`INIT-SYS:`*[a]*`::::9;`

Where:

a = Target ID (optional)

The system takes about 20 minutes to reset. Refer to the section titled "Reset and Boot" (page 8-7) for detailed information on system reset.

Verifying DS1 Equipment Parameters

Any signal associated with a SWIF2 (AKM50), a MUX3 (AKM91), or a PMGR1 (AKM66) circuit pack can be monitored. Dedicated full-time performance monitoring can be performed on DS1 signals associated with SWIF2 or MUX3 circuit packs. Camp-on or scan performance monitoring can be performed on DS1 signals associated with PMGR1 circuit packs.

Verifying SWIF2 and MUX3 Parameters

This procedure is used to set the DS1 performance monitoring parameters that are associated with SWIF2 or MUX3 circuit packs (that is, parameters associated with dedicated full-time monitoring through the specified SWIF2 or MUX3 circuit pack).

1. Verify the circuit pack code name is set to AKM50 (SWIF2) or AKM91 (MUX3) and the basic state is ACT or POS of the SWIF2 or MUX3 circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

b = SWIF2 circuit pack location: `SWIF-{1-64}-{1-8}`
MUX3 circuit pack location: `MUX-{1-64}-{1-15}`

A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d::<PCODE=f,CCODE=g>::y"
;
```

Where:

d = SWIF2 circuit pack location: `SWIF-{1-64}-{1-8}`
MUX3 circuit pack location: `MUX-{1-64}-{1-15}`

f = Provisioned circuit pack code name: `{ AKM50, AKM49, AKM66, AKM91, INVALID }`

g = Circuit pack code name: `{ AKM50, AKM49, AKM66, AKM91, INVALID }`

y = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is AKM49, AKM66, or INVALID, refer to the section titled "Provisioning SWIF and DS1IF Circuit Packs" (page 5-39) to provision a SWIF2 (AKM50) circuit pack, or "Provisioning MUX and SMUX Circuit Packs" (page 5-30) to provision a MUX3 (AKM91) circuit pack.

If the basic state (parameter *x*) is EQPD, PNDG, or AVAIL, refer to the "Switch Interface (SWIF)" state diagram (SWIF2 circuit pack) or "Multiplexer (MUX) or SONET Multiplexer (SMUX) state diagram (MUX3 circuit pack) in the appendix on "State Diagrams" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the appropriate actions to provision the SWIF2 or MUX3 circuit pack to the POS state.

Verifying PMGR1 Parameters

This procedure is used to verify the circuit pack provisioning that is associated with PMGR1 circuit packs (that is, parameters associated with camp-on or scan monitoring through the specified PMGR1 circuit pack). PMGR1 circuit packs can reside in SWIF (DS1 Interface Modules) or MUX (DS3 Interface-16 Modules and DS3 Interface-32 Modules only) circuit pack slots and **cannot** reside in SMUX circuit pack slots or MUX circuit pack slots associated with Enhanced DS3 Interface-16 and DS3 Clear-Channel Interface-16 Modules.

1. Verify the circuit pack code name is AKM66, the function is PM or PM-SCAN, and the basic state is ACT or POS for the PMGR1 circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `{ SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d::<PCODE=f,CCODE=g,FNCT=q>::y"
;
```

   Where:

   d = SWIF or MUX circuit pack location: `{ SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31} }`

   f = Provisioned circuit pack code name: `{ AKM66, AKM49, AKM50, AKM52, AKM68B, INVALID }`

   g = Circuit pack code name: `{ AKM66, AKM49, AKM50, AKM52, AKM68B, INVALID }`

   q = Performance monitoring function: `{ PM, PM-SCAN }`

   y = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is AKM49, AKM50, AKM52, AKM68B, or INVALID, refer to the section titled "Provisioning PMGR1 Circuit Packs for DS1 PM and DS1 TSID" (page 5-53) to provision a PMGR1 (AKM66) circuit pack.

   The performance monitoring function (parameter *q*) must be set to PM to be used for full-time, camp-on, and automatic camp-on performance monitoring or PM-SCAN for scan performance monitoring.

If the basic state (parameter *y*) is `EQPD, PNDG, or AVAIL`, refer to the "Performance Monitor/Generator Receiver (PMGR1)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the appropriate actions to provision the SWIF2 to the POS state.

Setting DS1 Performance Monitoring Threshold Values

This procedure is used to set DS1 performance monitoring parameter threshold values for dedicated full-time, and camp-on performance monitoring. DS1 signals within DS3 associated with MUX1 and MUX2 circuit packs or STS-1 signals can only be monitored using full-time or camp-on monitoring. For MUX3 circuit packs, dedicated full-time monitoring must be used. For scan monitoring, refer to the section titled "Setting DS1 Scan Monitoring Threshold Values" (page 14-21). System-wide DS1 performance monitoring default thresholds can be changed using the values **SFPATH**, **ESFPATH**, and **LINE** for path parameters for super frame (SF) signals, path parameters for extended super frame (ESF) signals, and line parameters for SF, ESF, and unframed (UNFR) signals, respectively. Using the above values eliminates using individual DS1 ports to change all ports set to the default thresholds.

1. If any of the selected DS1 ports is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode (MUX3) of the associated DS3 port by entering the following command:

   RTRV-PORT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3/SMUX circuit pack): `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:...:,DS3MODE=j"
;
```

   Where:

   d = DS3/EC-1 port location: `[1-64]-[1-15]`

   j = DS3 mode: `[ CC, DS1 ]`

   If the specified DS3 port(s) has a DS3 mode of `CC`, the DS1 selected DS1 ports cannot be used in this procedure. Contact the system administrator or next level of support to determine whether the DS3 port associated with

a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether other DS1 ports are to be selected.

2. If any of the selected DS1 ports is associated with an EC-1 port, retrieve active signal type (DS1 ports within EC-1 ports) and signal format by entering the following command:

   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "g:ACTSIG=h,FMT=n, ... "
;
```

   Where:

   g = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   h = Active signal type: `{ EC1, T1, VT1 }`

   n = Signal format: `{ ESF, SF, UNFR }`

If the specified DS1 port is associated with the EC-1 port and the Active Signal Type is not T1 or the signal format is `UNFR`, the DS1 port cannot be used in this procedure. Contact the system administrator or next level of support for assistance.

3. Determine the threshold values for the desired parameters for dedicated full-time and camp-on performance monitoring by entering the following command:

NOTE:
This command can create a large amount of output if `DS1GRP` or `UNIT` is specified for the DS1 port parameter and `ALL` is specified for the monitored parameter.

`RTRV-TH-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

Where:

a = Target ID (optional)

b = DS1 port location: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64], SFPATH, ESFPATH, LINE }`
The values `SFPATH, ESFPATH,` and `LINE` are used to retrieve system-wide default thresholds for path parameters for SF signals, path parameters for ESF signals, and line parameters for SF, ESF, and UNFR signals, respectively, When using the above values, parameter *d* must be set to `ALL`. If the DS1 being monitored is on an SMUX circuit pack, VT1.5 numbering can be used.

d = Monitored parameter: refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) for parameters (optional)

e = Location: `{ NEND, FEND }` (optional)

f = Time period: `{ 15-MIN, 1-HR, 1-DAY, ALL }` (optional)

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:MONPARM,LOCN,,THLEV,TMPER */
   "g:h,i,,j,k"
;
```

Where:

g = DS1 port location: `{ {1-64}-{1-31}-{1-28}, SFPATH, ESFPATH, LINE }`

h = Monitored parameter

i = Location: `{ NEND, FEND }`

j = Threshold value: `0-134217728`

k = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

4. Determine if the values are set to the desired levels for the various monitored parameters (refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* [AT&T 365-340-903] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual [AT&T 365-340-902] for the monitored values and the default threshold values). If the values are set to the desired level, you do not need to perform Step 5.

5. Set the threshold values for the desired performance monitoring parameters by entering the following command:

   `SET-TH-T1:`*[a]*`:`*b*`:::`*d*`,`*e*`,`*[f]*`,,`*g*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64], SFPATH, ESFPATH, LINE }`
   The DS1 port can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with an VT1.5 port as long as the VT1.5 port is configured for ASYN (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for configuring EC-1/VT1.5 ports). The values `SFPATH, ESFPATH`, and `LINE` are used to set system-wide default thresholds for path parameters for SF signals, path parameters for ESF signals, and line parameters for SF, ESF, and UNFR signals, respectively.

   d = Monitored parameter: refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids (AT&T 365-340-903)* for parameters (optional)

   e = Threshold Level: `[0-134217728]`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for the default threshold levels.

   f = Location: `{ NEND, FEND, ALL }` (optional)

   g = Time Period: `{ 15-MIN, 1-HR, 1-DAY }`
   The accumulation time period must match the short accumulation time set for the network element.

Copying DS1 Performance Monitoring Threshold Values

This procedure is used to copy DS1 performance monitoring parameter threshold values for dedicated full-time, and camp-on performance monitoring from one DS1 port to another DS1 port or to a range of up to 28 DS1 ports. The following restrictions apply when copying threshold values:

- When copying far-end values, the far-end NTE of the destination ports must be the same as the far-end NTE of the source port.
- The framing format of the source DS1 port and the destination DS1 ports must be identical.
- Threshold settings on a DS1 port on a DS1IF circuit pack can only be copied to another DS1 port or range of DS1 ports that are on DS1IF circuit packs.
- Threshold settings on a DS1 port within a MUX or SMUX circuit pack can only be copied to another DS1 port or range of DS1 ports within MUX or SMUX circuit packs.
- A PMGR circuit pack cannot reside in any of the destination locations.
- The destination DS1 ports of SMUX circuit packs must have an active signal type of T1.

1. Retrieve the threshold values of the source DS1 port to obtain a record of the values being copied by entering the following command:

   `RTRV-TH-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}, UNIT-{1-64}, DS1GRP-{1-64}-{1-31}, SFPATH, ESFPATH, LINE`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   d = Monitored parameter: refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) for parameters (optional)

   e = Location: `{ NEND, FEND }` (optional)

   f = Time period: `{ 15-MIN, 1-HR, 1-DAY, ALL }` (optional)

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:MONPARM,LOCN,,THLEV,TMPER */
   "g:h,i,,j,k"
;
```

Where:

g = DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}, UNIT-{1-64}, DS1GRP-{1-64}-{1-31}, SFPATH, ESFPATH, LINE`
VT1.5 group number (STS1 Interface Module):
`{ {1-64}-{1-15}-{1-7}-{1-4} }`

h = Monitored parameter

i = Location: `{ NEND, FEND }`

j = Threshold value: `0-134217728`

k = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

2. Determine the settings of the source DS1 port and destination DS1 ports to be used by entering the following command:

RTRV-T1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = DS1 port location:
DS1 port number: **`{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`**
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:<BER=j,FMT=n,FENDNTE=y,NENDADD=ai,FENDADD=aj>"
;
```

Where:

g = DS1 port location:
DS1 port number: `{1-64}-{1-31}-{1-28}`
VT1.5 group number (STS1 Interface Module):
`{1-64}-{1-15}-{1-7}-{1-4}`

h = Active signal type: `{ T1, EC1, VT1 }`

j = BER threshold value: `3-9`

n = Signal format: `{ ESF, SF, UNFR }`

y = Far-end notification: { ANSI, NOT-ANSI }

ai = Near-end address (MUX3 circuit pack only).

aj = Far-end address (MUX3 circuit pack only).

From the above response, determine if the values for bit error rate (parameter *j*), signal format (parameter *n*), and far-end network equipment type (parameter *y*) for the destination ports match those of the source port. If the values match, you do not need to perform Step 3.

If the active signal type (parameter *f*) for a given destination port is not T1, DS1 performance monitoring thresholds can not be copied for that destination port.

3. Edit the destination DS1 ports to match the parameters of the source DS1 port by entering the following command:

   ED-T1:*[a]*:*b*::::*[*BERL=*d*,FMT=*h*,FENDNTE=*l*, NENDADD=*u]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number:{ {1-64}-{1-31}-{1-28},
   DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }
   VT1.5 group number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}
   The DS1 port can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with an VT1.5 port as long as the VT1.5 port is configured for ASYN (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for configuring EC-1/VT1.5 ports).

   d = BER threshold: { 3-9, CURVAL }
   Initial system value: 3

   h = DS1 signal format: { ESF, SF, UNF, CURVAL }
   Initial system value: UNF

   l = Far-end notification: { ANSI, NOT-ANSI, CURVAL }
   Initial system value: NOT-ANSI
   Set to ANSI if parameter *h* is set to ESF. Otherwise, set to NOT-ANSI.

   u = Near-end address: { A, Z, NOVAL, CURVAL }

   If a range of DS1GRPs or a UNIT is specified, this command can take up to 10 minutes to complete.

   When the DS1 signal format is changed on a SWIF2 or a MUX3 circuit pack from UNF to ESF or SF, full-time performance monitoring is enabled on those DS1 signals.

4. Copy threshold values for the desired performance monitoring parameters by entering the following command:

   `CPY-TH-T1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = Source DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28},`
   `DS1GRP-{1-64}-{1-31}, UNT-{1-64} }`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}}`
   The source DS1 port can be located in any interface module, including STS1 Interface-16 Modules.

   c = Destination DS1 port location(s):
   DS1 port number: `{ {1-64}-{1-31}-{1-28},`
   `DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 group number (STS1 Interface Module):
   `{ {1-64}-{1-15}-{1-7}-{1-4} }`
   The destination DS1 port(s) can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with a VT1.5 port as long as the VT1.5 port is configured for ASYNC (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/ DS1/DS3 Operation" (page 6-32) in Chapter 6 for configuring EC-1/ VT1.5 ports).

   e = Location: `{ NEND, FEND, ALL }` (optional)

   f = Time period: `{ 15-MIN, 1-HR, 1-DAY, ALL }`
   The accumulation time period must match the short accumulation time set for the network element.

   Depending upon the number of ports to which threshold settings are being copied and the number of monitored parameters involved, the time required for this command to complete varies.

Setting DS1 Facility Parameters

This procedure is used to set the signal format, bit error rate threshold, and far-end network equipment type parameters needed for DS1 ports to be monitored.

1. Determine the settings of the DS1 port(s) to be monitored by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:<BER=j,FMT=n,FENDNTE=y>"
;
```

   Where:

   g = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}`

   h = Active signal type: `{ T1, EC1, VT1 }`

   j = BER threshold value: `3-9`

   n = Signal format: `{ ESF, SF, UNFR }`

   y = Far-end notification: `{ ANSI, NOT-ANSI }`

   From the above response, determine if the values for bit error rate (parameter *j*), signal format (parameter *n*, and far-end network equipment type (parameter *y*) are set to the desired levels. If the values are set to the desired levels, you do not need to perform Step 2.

   If the active signal type (parameter *h*) is not T1, DS1 performance monitoring cannot be done for the selected port.

2. Edit the DS1 performance monitoring parameters of the DS1 port(s) to be monitored by entering the following command:

   `ED-T1:`*[a]*`:`*b*`::::[BERL=`*d*`,FMT=`*h*`,FENDNTE=`*l*`]`;

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`
   The DS1 port can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with a VT1.5 port as long as the VT1.5 port is configured for ASYN (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for configuring EC-1/VT1.5 ports).

   d = BER threshold: `{ 3-9, CURVAL }`
   Initial system value: `3`

   h = DS1 signal format: `{ ESF, SF, UNF, CURVAL }`
   Initial system value: `UNF`

   l = Far-end notification: `{ ANSI, NOT-ANSI, CURVAL }`
   Initial system value: `NOT-ANSI`
   Set to `ANSI` if parameter *h* is set to `ESF`. Otherwise, set to `NOT-ANSI`.

   If a range of DS1GRPs or a UNIT is specified, this command can take up to 10 minutes to complete.

   When the DS1 signal format is changed on a SWIF2 circuit pack from UNF to ESF or SF, full-time performance monitoring is enabled on those DS1 signals.

Establishing DS1 Manual Camp-on Performance Monitoring

This procedure establishes a bridged-access full-time or manual camp-on performance monitoring connection.

1. If any of the selected DS1 ports is associated with an EC-1 port, retrieve active signal type (DS1 ports within EC-1 ports) by entering the following command:

   `RTRV-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   "g:ACTSIG=h, ... "
;
```

   Where:

   g = DS1 port location: `[1-64]-[1-31]-[1-28]`

   h = Active signal type: `{ EC1, T1, VT1 }`

   If the specified DS1 port is associated with the EC-1 port and the Active Signal Type is not T1, the DS1 port cannot used in this procedure. Contact the system administrator or next level of support to determine whether the EC-1 port can be reconfigured [using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32)] or whether another DS1 port(s) is to be selected.

2. Establish manual camp-on performance monitoring between DS1 port(s) and PMGR1 port(s) by entering the following command:

   CONN-PM-T1:*[a]*:*b*,*c*::*[e]*;

   Where:

   a = Target ID (optional)

   b = Monitored DS1 port (SWIF, MUX, or SMUX) location:
   `[1-64]-[1-31]-[1-28]`
   The DS1 port can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with an VT1.5 port as long as the VT1.5 port is configured for ASYNC (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1/DS3 Operation" (page 6-32) for configuring EC-1/VT1.5 ports).

   c = Performance monitoring DS1 port (PMGR1 circuit pack in SWIF or MUX circuit pack slot): `[1-64]-[1-31]-[1-28]`

   e = Red lined: `[ Y, N ]`

Provisioning Automatic Camp-on Performance Monitoring DS1 Ports

This procedure establishes an automatic camp-on performance monitoring connection. Camp-on performance monitoring begins when BER or OOFS threshold values are exceeded.

1. Provision a DS1 port(s) on a PMGR1 circuit pack for an automatic camp-on monitoring port when a DS1 facility being scanned shows degraded service by entering the following command:

   ENT-AUTOCMPN-T1:*[a]*:*b*::Y;

   Where:

   a = Target ID (optional)

   b = Monitoring DS1 port (PMGR1 signal) location:
   `[1-64]-[1-31]-[1-28]`

Setting DS1 Scan Monitoring Threshold Values

This procedure is used to set DS1 performance monitoring parameter threshold values for scan performance monitoring. Only DS1 facilities or DS1 tributaries within DS3 facilities can be scan monitored. DS1 tributaries within EC-1, Enhanced DS3, or DS3 Clear-Channel facilities cannot be scan monitored. For full-time and camp-on monitoring, refer to the section titled "Setting DS1 Performance Monitoring Threshold Values" (page 14-9).

1. Retrieve the scan monitoring threshold values by entering the following command:

   RTRV-SCANTH-NE:*[a]*::::*[c]*,*[d]*,*[e]*;

   Where:

   a = Target ID (optional)

   c = Monitored parameters: **{ CVP, ESP, SESP, OOFS, SEFS, ALL }**

   d = Location: **{ NEND, FEND, ALL }**

   e = DS1 signal format: **{ ESF, SF, ALL }**

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :MONPARM,LOCN,FMT,THLEV,TMPER */
   " :f,g,h,i,j"
;
```

   Where:

   f = Monitored parameter { CVP, ESP, SESP, OOFS, SEFS }

   g = Location: { NEND, FEND }

   h = DS1 signal format: { ESF, SF }

   i = Threshold value: 0-134217728

   j = Time period: { 15-MIN, 1-HR, 1-DAY }

   From the above output response, determine if the values are set to the desired levels for the various monitored parameters. If the values are set to the desired level, you do not need to perform Step 2.

2. Set the threshold values for the desired scan performance monitoring parameters by entering the following command:

   `SET-SCANTH-NE:`*[a]*`::`*c*`,`*d*`,`*[e]*`,`*[f]*`,`*[g]*`;`

   Where:

   a = Target ID (optional)

   c = Monitored parameter: `[ CVP, ESP, SESP, OOFS, SESF ]`

   d = Threshold Level: `[0-134217728]`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for the default threshold levels.

   e = Location: `[ NEND, FEND ]`

   f = Time period: `[ 15-MIN, 1-HR, 1-DAY ]`
   If a short accumulation time is entered (`15-MIN` or `1-HR`), the value for this parameter must match the value of the short accumulation time set for the network element.

   g = DS1 signal format: `[ ESF, SF ]`

Starting DS1 Scan Performance Monitoring

This procedure starts scan performance monitoring of the DS1 signals of the SWIO circuit pack pair associated with the specified SWIF1 and MUX2 circuit pack slot occupied with a PMGR1 circuit pack. MUX2 circuit packs contained in Enhanced DS3 Interface-16 Modules cannot be replaced with a PMGR circuit pack. Enhanced DS3 or DS3 Clear-Channel facilities cannot be scan monitored.

NOTE:
The PMGR1 circuit pack must be within the same SWIO circuit pack pair as the SWIF or MUX circuit packs to be scanned. SWIF2, MUX3, and SMUX circuit packs cannot be scanned.

1. Start scan performance monitoring on a group of DS1 ports by entering the following command:

   `STA-SCANPM-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Scanned MUX or SWIF circuit pack location:
   `[ SWIF-[1-64]-[1-8], MUX-[1-64]-[1-31] ]`

Stopping DS1 Scan Performance Monitoring

This procedure stops scan performance monitoring of the DS1 signals of the SWIO circuit pack pair associated with the specified SWIF or MUX circuit pack slot occupied with a PMGR1 circuit pack.

1. Stop scan performance monitoring on a group of DS1 ports by entering the following command:

   `STP-SCANPM-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Scanned MUX or SWIF circuit pack location:
   `[ SWIF-[1-64]-[1-8], MUX-[1-64]-[1-31] ]`

Disconnecting DS1 Camp-on Performance Monitoring

This procedure disconnects a bridged-access full-time or manual camp-on performance monitoring connection.

1. Disconnect desired camp-on or auto camp-on performance monitoring connections by entering the following command:

   `DISC-PM-T1:`*[a]*`:`*b*`,`*c*`::`*[e]*`;`

   Where:

   a = Target ID (optional)

   b = Monitored DS1 port (SWIF or MUX):
   DS1 port number:
   DS1 port number: `[ [1-64]-[1-31]-[1-28],`
   `DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`

   c = Performance monitoring DS1 port (PMGR1):
   `[1-64]-[1-31]-[1-28]`

   e = Red lined: `[ RDLD, NOVAL ]`
   Default value: `NOVAL` (indicates not red-lined)
   Red-lined connections must be disconnected with red-lined specified.

Initializing Accumulated DS1 Performance Monitoring Data

This procedure is used to initialize DS1 performance monitoring accumulation registers. Under normal conditions, it is not necessary to initialize accumulation registers before scheduling performance monitoring reports.

1. If any of the selected DS1 ports is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode (MUX3) of the associated DS3 port by entering the following command:

   `RTRV-PORT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3/SMUX circuit pack): `[1-64]-[1-15]`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:<>:ACTSIG */
      "d:..:,DS3MODE=j"
   ;
   ```

   Where:

   d = DS3/EC-1 port location: `[1-64]-[1-15]`

   j = DS3 mode: `[ CC, DS1 ]`

   If the specified DS3 port(s) has a DS3 mode of CC, the DS1-selected DS1 ports cannot be used in this procedure. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether other DS1 ports are to be selected.

2. Initialize the accumulation registers used to store accumulated performance monitoring data by entering the command:

   `INIT-REG-T1:`*[a]*`:`*b*`:::`*d*`,`*[e]*`,`*f*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`
   The DS1 port can be located in any interface module, including STS1 interface modules. A DS1 port is present in an STS-1 port as long as the STS-1 port is provisioned for VTFLOAT and the VT1.5 port is provisioned for ASYNC (refer to Chapter 6 for provisioning STS-1 and VT1.5 signals).

   d = Monitored parameters: `{ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, CSS, ALL }`

   e = Monitored Value: `[0-134217728]`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for the default threshold levels.

   f = Location: `{ NEND, FEND, ALL }`

   g = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
   The value entered must match the short accumulation time set for the network element.

   h = Monitored date: `{ [1-12]-[1-31], CURVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are initialized.

   i = Monitored time: `{ [0-23]-[0,15,30,45], CURVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are initialized.

   If all the registers in a range are not initialized, instead of receiving a `COMPLD` *or* `DENY` *response, you receive a* `PRTL` *response.*

Scheduling DS1 Performance Monitoring Reports

This procedure is used to schedule DS1 performance monitoring reports. Up to 64 DS1 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one DS1 port within the same interface module (UNIT) or DS1 interface group (DS1GRP), using one schedule is much faster and more effective than scheduling individual DS1 ports. For example, if all the DS1 ports associated with DS1GRP-15-5 are to be scheduled, the DS1 interface group DS1GRP-15-5 should be used instead of the 28 individual DS1 ports. For another example, if all 28 ports are associated with DS1 interface groups DS1GRP-15-5 and DS1GRP-15-6, the interface module UNIT-15 should be used instead of the 56 individual DS1 ports or the two individual DS1 interface groups.

1. If any of the selected DS1 ports is associated with a DS3 port of a MUX3 circuit pack, retrieve the DS3 mode (MUX3) of the associated DS3 port by entering the following command:

   `RTRV-PORT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location (MUX3/SMUX circuit pack): `{1-64}-{1-15}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:..:,DS3MODE=j"
;
```

   Where:

   d = DS3/EC-1 port location: `{1-64}-{1-15}`

   j = DS3 mode: `{ CC, DS1 }`

   If the specified DS3 port(s) has a DS3 mode of CC, the selected DS1 ports cannot be used in this procedure. Contact the system administrator or next level of support to determine whether the DS3 port associated with a MUX3 circuit pack can be reprovisioned [using the section titled "Provisioning DS3 Facilities" (page 6-15)] or whether other DS1 ports are to be selected.

2. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-T1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: { [1-64]-[1-31]-[1-28],
   DS1GRP-[1-64]-[1-31], UNIT-[1-64] }
   VT1.5 group number (STS1 Interface Module):
   [1-64]-[1-15]-[1-7]-[1-4]

   d = Report interval: { 15-MIN, [1-24]-HR, [1-7]-DAY }

   e = Report start time: { [0-23]-[0-59], CURVAL }
   CURVAL is the current time.

   f = Number of intervals: { [0-96], CONT }
   If CONT is specified, the performance monitoring schedule remains in effect until the schedule is canceled.

   g = Monitored parameters: { CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, CSS, ALL }

   h = Monitored level: [0-134217728]-[UP,DN]
   Specifying UP indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying DN indicates the monitoring parameter with values equal to or less than the specified level are reported.

   i = Location: { NEND, FEND }

   j = Time period: { 15-MIN, 1-HR, 1-DAY }
   The value entered must match the short accumulation time set for the network element.

   k = Time offset: [0-7]-[0-23]-[0,15,30,45]

   No report is generated if there is no data to report, unless the monitored level is set to 0-UP.

   As the total number of reports scheduled approaches 128, this command can take up to three minutes to complete.

Canceling DS1 Performance Monitoring Reports

This procedure is used to cancel reporting of scheduled DS1 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28},`
   `DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 Group Number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   d = Report interval: `{ 15-MIN, {1-24}-HR, {1-7}-DAY }`

   e = Report start time: `{ {0-23}-{0-59}, CURVAL }`
   `CURVAL` is the current time.

   i = Location: `{ NEND, FEND }`

   j = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
   The value entered must match the short accumulation time set for the network element.

   k = Time offset: `{0-7}-{0-23}-{0,15,30,45}`

Inhibiting Scheduled DS1 Performance Monitoring Reports

This procedure is used to inhibit the generation of scheduled DS1 performance monitoring reports. Inhibiting scheduled performance monitoring reports does not stop the data collection process. It only stops the scheduled reporting of the accumulated data. The accumulated data can still be accessed by the `RTRV-PM-T1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`

Allowing Scheduled DS1 Performance Monitoring Reports

This procedure is used to allow the generation of scheduled DS1 performance monitoring reports that were previously inhibited with the `INH-PMREPT-T1` command.

1. Resume inhibited performance monitoring reports by entering the following command:

   `ALW-PMREPT-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module): `[1-64]-[1-15]-[1-7]-[1-4]`

Retrieving DS1 Performance Monitoring Report Schedule

This procedure is used to retrieve DS1 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   `RTRV-PMSCHED-T1:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `[ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] ]`
   VT1.5 group number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`

   If this parameter is omitted, all of the active `SCHED-PMREPT-T1` commands are provided in the output response. If this parameter includes DS1 port locations, all active DS1 reporting associated with the specified ports is provided in the output response.

   Sample output responses are:

   No DS1 ports specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST */
    /* SCHED-PMREPT-T1::d:f,g,h,i,j,k,l,,m,n, */
;
```

   DS1 port(s) specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST,INH */
    "e:f,g,h,i,j,k,l,,m,n,o"
;
```

   Where:

   d = DS1 port location:
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 Group Number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`

   e = DS1 port location:
   DS1 port number: `[1-64]-[1-31]-[1-28]`
   VT1.5 Group Number (STS1 Interface Module):
   `[1-64]-[1-15]-[1-7]-[1-4]`

f = Report interval: `{ 15-MIN, {1-7}-DAY, {1-24}-HR }`

g = Report date: `{1-12}-{1-31}`

h = Report time: `{0-23}-{0-59}`

i = Number of intervals: `{ 1-96, CONT }`

j = Monitored parameters

k = Monitored level: `{0-134217728}-{UP,DN}`

l = Location: `{ NEND, FEND }`

m = Time period: `{ 15-MIN, 1-DAY }`

n = Time offset: `{0-7}-{0-23}-{0-59}`

o = Report inhibited: `INH`
An omitted value for this parameter indicates the report is not inhibited.

Retrieving DS1 Performance Monitoring Data

This procedure is used to retrieve DS1 performance monitoring data for the specified DS1 ports. Performance monitoring data is only sent to a link if you have a UCFC for PM and are logged into that link.

NOTE:
DS1 performance monitoring data is collected by a SWIF2, MUX3, or PMGR1 circuit pack. If a manual switch to protection is executed the data on the service SWIF2 or MUX3 circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the service SWIF2 or MUX3 circuit pack is not bad or has not been removed. After switching back to working, the performance monitoring data on the protection SWIF2 or MUX3 circuit pack is not available for retrieval. Performance monitoring data on PMGR1 circuit packs is lost when they fail or are extracted.

1. Retrieve DS1 performance monitoring data for the desired monitored port(s) by entering the following command:

   `RTRV-PM-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28},`
   `DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 Group Number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

The DS1 port can be located in any interface module, including STS1 interface modules. A DS1 port is present in an STS-1 port as long as the STS-1 port is provisioned for VTFLOAT and the VT1.5 port is provisioned for ASYN (refer to Chapter 6 for provisioning STS-1 and VT1.5 signals).

d = Monitored parameters: `[ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, UAS, SEFS, ALL ]`

e = Monitored level: `[0-134217728]-[UP,DN]`
Specifying `UP` indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying `DN` indicates the monitoring parameter with values equal to or less than the specified level are reported.

Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

f = Location: `[NEND, FEND ]`

g = Time period: `[ 15-MIN, 1-HR, 1-DAY ]`
The value entered must match the short accumulation time set for the network element.

h = Monitored date: `[ [1-12]-[1-31], CURVAL, NOVAL, ALL ]`
If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are retrieved.

i = Monitored time: `[ [0-23]-[0,15,30,45], CURVAL, NOVAL, ALL ]`
If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are retrieved.

A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:MONPARM,MONVAL,VLDTY,LOCN,,TMPER,MONDAT,MONTM */
    "j:k,l,m,n,,o,p,q"
;
```

Where:

j = DS1 port location:
DS1 port number: `[1-64]-[1-31]-[1-28]`
VT1.5 group number (STS1 Interface Module):
`[1-64]-[1-15]-[1-7]-[1-4]`

k = Monitored parameters: `[ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, UAS, SEFS, ALL ]`

l = Monitored value: `0-134217728`

m = Validity: `[ COMPL, NA, PRTL ]`

n = Location: { NEND, FEND }

o = Time period: { 15-MIN, 1-HR, 1-DAY }

p = Monitored date: {1-12}-{1-31}

q = Monitored time: {0-23}-{0,15,30,45}

Retrieving Provisioned DS1 Performance Monitoring Configuration

This procedure is used to retrieve provisioned DS1 performance monitoring configurations. This procedure can only be used to retrieve camp-on, automatic camp-on, and/or scanning configurations for DS1 facilities (including DS1 tributaries within DS3 and EC-1 facilities).

1. Retrieve the performance monitoring configuration by entering the following command:

   RTRV-PMCNFGRN-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }
   VT1.5 Group Number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MONPORT:PORT,STATE */
   "d:e,f"
;
```

   Where:

   d = Monitored DS1 port location: {1-64}-{1-31}-{1-28}

   e = DS1 port location:
   DS1 port number: {1-64}-{1-31}-{1-28}
   VT1.5 Group Number (STS1 Interface Module):
   {1-64}-{1-15}-{1-7}-{1-4}

   f = DS1 performance monitoring port state: { PM-REL, PM-CMPN, PM-AUTOCMPN-IDLE, PM-AUTOCMPN, PM-SCAN, PN-SCAN-IDLE }

Stopping Dedicated DS1 Performance Monitoring

This procedure is used to stop dedicated full-time DS1 performance monitoring of the specified DS1 ports.

1. Stop dedicated performance monitoring of the DS1 port(s) by entering the following command:

   `ED-T1:`*[a]*`:`*b*`:::FMT=UNFR;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }`
   VT1.5 Group Number (STS1 Interface Module): `{1-64}-{1-15}-{1-7}-{1-4}}`

   If a range of `DS1GRP`*s or a* `UNIT` *is specified, this command can take up to 10 minutes to complete.*

   When the DS1 signal format is changed to `UNFR` on a SWIF2 or MUX3 circuit pack, full-time performance monitoring is disabled on those DS1 ports.

Deprovisioning Automatic Camp-on Performance Monitoring DS1 Ports

This procedure is used to deprovision DS1 ports for automatic camp-on DS1 performance monitoring.

1. Deprovision a DS1 port(s) on a PMGR1 circuit pack for an automatic camp-on monitoring port by entering the following command:

   `ENT-AUTOCMPN-T1:`*[a]*`:`*b*`::N;`

   Where:

   a = Target ID (optional)

   b = Monitoring DS1 port (SWIF or MUX circuit pack slot) location:
   `{1-64}-{1-31}-{1-28}`

   When specifying MUX circuit pack locations, the location cannot be associated with an Enhanced DS3 Interface-16 or DS3 Clear-Channel Interface-16 Module.

DS3 Performance Monitoring Procedures

This section consists of procedures that allow you to provision and establish DS3 performance monitoring, schedule DS3 performance monitoring reports, and retrieve DS3 performance monitoring information.

In order to use these procedures, your user login must have at least a PM (for performance monitoring) setting for your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various DS3 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all DS3 performance monitoring functions.

The procedures are organized in a manner that allow you to use them as stand-alone (for individual functions) or in the order they appear to set up your DS3 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings).

For more information on the commands UCFC and UCAL and their parameters, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

NOTE:
Removing a MUX2 or MUX3 circuit pack or failure of a MUX2 or MUX3 circuit pack causes the loss of all stored DS3 performance monitoring data for the associated DS3 facility.

NOTE:
To do far-end performance monitoring on DS3 signals, the signal format must be C-bit parity.

Setting Network Element DS3 Parameters

This procedure is used to set the DS3 performance monitoring parameters that are at the network element level (that is, frame-wide parameters). These parameters are generally only set during the initial provisioning of the DACS IV-2000 frame (refer to Chapter 5 for provisioning).

1. Determine if the values of the DS3 performance monitoring type (PMTYPE) and DS3 accumulation period (ACCUM) parameters are the desired values by entering the following command:

   RTRV-NE:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output response is (only pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* NETYPE,NESIZE,SFTWR-VRSN:<> */
      "... ,PMTYPE=v,ACCUM=w, ... "
   ;
   ```

   Where:

   v = DS3 performance monitoring type: { PSET#1, PSET#2, NONE }
   PSET#1 indicates CB149 parameters, PSET#2 indicates TR820 parameters.

   w = DS3 accumulation period: { 15-MIN, 1-HR }

   If the values set for DS3 performance monitoring type (parameter *v*) and DS3 accumulation period (parameter *w*) are the desired values, do not perform Steps 2 and 3.

2. Edit the DS3 performance monitoring network element parameters by entering the following command:

   ED-NE:*[a]*::::*[***PMTYPE=***v*,ACCUM=*w]*;

   Where:

   a = Target ID (optional)

   v = DS3 performance monitoring type: { **PSET#1, PSET#2, NONE** }
   PSET#1 indicates CB149 parameters, **PSET#2** indicates TR820 parameters. Specifying **NONE** turns off DS3 performance monitoring. However, any bit error rate (BER) values are still active.

   w = DS3 accumulation period: { **15-MIN, 1-HR** }
   If **PSET#1** is specified for parameter *t*, **15-MIN** must be specified for this parameter.

3. If the DS3 performance monitoring type (PMTYP) was changed in Step 2, a system reset needs to be performed by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

`INIT-SYS:`*[a]*`::::9;`

Where:

a = Target ID (optional)

The system takes about 20 minutes to reset. Refer to the section titled "Reset and Boot" (page 8-7) for detailed information on system reset.

Verifying DS3 Equipment Parameters

This procedure is used to set the DS3 performance monitoring parameters that are associated with MUX2 and MUX3 circuit packs. Any DS3 signal associated with a MUX2 (AMK68B) or MUX3 (AKM91) circuit pack can be monitored.

1. Verify the circuit pack code name is set to AKM68B (MUX2) or AKM91 (MUX3) and the basic state is ACT or POS of the MUX2 or MUX 3 circuit pack by entering the following command:

`RTRV-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = MUX2/MUX3 circuit pack location: `MUX-[1-64]-[1-31]`

A sample output response is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d::<PCODE=f,CCODE=g>::x"
;
```

Where:

d = MUX circuit pack location: `MUX-[1-64]-[1-31]`

f = Provisioned circuit pack code name: `[ AKM52, AKM68B, AKM91, INVALID ]`

g = Circuit pack code name: `[ AKM52, AKM68B, AKM91, INVALID ]`

x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30) to provision a MUX2 (AKM68B) or MUX3 (AKM91) circuit pack.

If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is AKM52, a MUX1 circuit pack occupies the circuit pack slot and DS3 performance monitoring parameters cannot be edited for the specified MUX circuit pack. If the MUX1 circuit pack needs to be changed to a MUX2 circuit pack, refer to the section titled "Changing Multiplexer From MUX1 (AKM52) to MUX2 (AKM68B)" (page 19-29).

If the basic state (parameter *x*) is EQPD, PNDG, or AVAIL, refer to the "Multiplexer (MUX) and SONET Multiplexer (SMUX)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the appropriate actions to provision the MUX2 to the POS state.

Setting DS3 Performance Monitoring Threshold Values

This procedure is used to set DS3 performance monitoring parameter threshold values. When any of the threshold values are exceeded, a `REPT EVT T3` message is output to the links with users with a UCFC for PM logged in. Performance monitoring data is not sent to a link if a printer is connected to the link.

1. Determine the threshold values for the desired parameters for performance monitoring by entering the following command:

   `RTRV-TH-T3:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

   d = Monitored Parameter: `[ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL ]` (optional)

   The parameter `BEC` is supported by the MUX2/MUX3 circuit pack only.

   e = Location: `[ NEND, FEND, ALL ]` (optional)

   f = Time Period: `[ 15-MIN, 1-HR, 1-DAY, ALL ]` (optional)

A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:MONPARM,LOCN,,THLEV,TMPER */
    "g:h,i,,j,k"
;
```

Where:

g = DS3 port location: `{1-64}-{1-31}`

h = Monitored parameter `{ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES }`
The parameter `BEC` is supported by the MUX2/MUX3 circuit pack only.

i = Location: `{ NEND, FEND }`

j = Threshold value: `0-811987200`

k = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

2. Determine if the values are set to the desired levels for the various monitored parameters (refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* [AT&T 365-340-903] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual [AT&T 365-340-902] for PSET#1 (CB149) and PSET#2 (TR820) parameter monitored values and the default threshold values). If the values are set to the desired level, you do not need to perform Step 3.

3. Set the threshold values for the desired performance monitoring parameters by entering the following command:

   `SET-TH-T3:`*[a]*`:`*b*`:::`*d*`,`*e*`,`*[f]*`,,`*g*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   d = Monitored parameter: `{ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES }`
   The parameter `BEC` is supported by the MUX2/MUX3 circuit pack only.

   e = Threshold Level: `{0-811987200}`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `{ NEND, FEND }`

g = Time Period: `{ 15-MIN, 1-HR, 1-DAY }`
The accumulation time period must match the DS3 accumulation time set for the network element.

Setting DS3 Facility Parameters

This procedure is used to set the DS3 signal format, bit error rate threshold, and bit error rate metric parameters needed for DS3 ports to be monitored.

1. Determine the settings of DS3 port(s) to be monitored by entering the following command:

   `RTRV-T3:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`

   A sample output is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:ACTSIG:<> */
      "e::<BER=j,BERM=l,FMT=n>"
   ;
   ```

   Where:

   e = DS3 port location: `[1-64]-[1-31]`

   j = BER threshold value: `3-9`

   l = BER metric: `{ BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }`

   n = Signal format: `{ ASYNC, CBIT }`

   From the above response, determine if the values for bit error rate (parameter *j*), bit error rate metric (parameter *l*), and DS3 signal format (parameter *n*) are set to the desired level. If the values are set to the desired levels, you do not need to perform Step 2.

2. Edit the DS3 performance monitoring parameters of the DS3 port(s) to be monitored by entering the following command:

   `ED-T3:[a]:b::::[BERL=d,BERM=f,DS3FORMAT=h];`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ (1-64]-[1-31], UNIT-[1-64] }`

d = Bit error rate threshold: `[3-9]`
If `PTY` or `CP-BITS` is specified for parameter *e*, this parameter cannot be set to `3`.

f = Bit error rate metric: `[ BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS ]`
If `BPV` is specified for this parameter, no DS3 performance monitoring is accumulated.

h = DS3 signal format: `[ ASYNC, CBIT ]`

Initializing Accumulated DS3 Performance Monitoring Data

This procedure is used to initialize DS3 performance monitoring accumulation registers. Under normal conditions, it is not necessary to initialize accumulation registers before scheduling performance monitoring reports.

1. Initialize the accumulation registers used to store accumulated performance monitoring data by entering the command:

   `INIT-REG-T3:`*[a]*`:`*b*`:::`*d*`,`*[e]*`,`*f*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

   d = Monitored parameter: `[ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL ]`

   e = Monitored Value: `[0-811987200]`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `[ NEND, FEND, ALL ]`

   g = Time period: `[ 15-MIN, 1-HR, 1-DAY ]`
   The value entered must match the DS3 accumulation time set for the network element.

   h = Monitored date: `[ [1-12]-[1-31], CURVAL, ALL ]`
   If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are initialized.

   i = Monitored time: `[ [0-23]-[0,15,30,45], CURVAL, ALL ]`
   If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are initialized.

   If all the registers in a range are not initialized, instead of receiving a `COMPLD` *or* `DENY` *response, you receive a* `PRTL` *response.*

Scheduling DS3 Performance Monitoring Reports

This procedure is used to schedule DS3 performance monitoring reports. Up to 64 DS3 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one DS3 port within the same interface module (UNIT), using one schedule is much faster and more effective than scheduling individual DS3 ports. For example, if all the DS3 ports are associated with the DS3 Interface Module in unit 31, UNIT-31 should be used instead of the 31 individual DS3 ports.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-T3:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { [1-64]-[1-31], UNIT-[1-64] }

   d = Report interval: { 15-MIN, [1-24]-HR, [1-7]-DAY }

   e = Report start time: { [0-23]-[0-59], CURVAL }
   CURVAL is the current time.

   f = Number of intervals: { [0-96], CONT }
   If CONT is specified, the performance monitoring schedule remains in effect until the schedule is canceled.

   g = Monitored parameter: { BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL }
   The parameter BEC is supported by the MUX2/MUX3 circuit pack only.

   h = Monitored level: [0-811987200]-[UP,DN]
   Specifying UP indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying DN indicates the monitoring parameter with values equal to or less than the specified level are reported.

   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   i = Location: { NEND, FEND }

j = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
The value entered must match the DS3 accumulation time set for the network element.

k = Time offset: `[0-7]-[0-23]-[0,15,30,45]`

No report is generated if there is no data to report, unless the monitored level is set to `0-UP`.

As the total number of reports scheduled approaches 128, this command can take up to three minutes to complete.

Canceling DS3 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled DS3 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-T3:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ [1-64]-[1-31], UNIT-[1-64] }`

   d = Report interval: `{ 15-MIN, [1-24]-HR, [1-7]-DAY }`

   e = Report start time: `{ [0-23]-[0-59], CURVAL }`
   `CURVAL` is the current time.

   i = Location: `{ NEND, FEND }`

   j = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
   The value entered must match the DS3 accumulation time set for the network element.

   k = Time offset: `[0-7]-[0-23]-[0,15,30,45]`

Inhibiting Scheduled DS3 Performance Monitoring Reports

This procedure inhibits the generation of scheduled DS3 performance monitoring reports. Inhibiting scheduled performance monitoring reports does not stop the data collection process. It only stops the reporting of the accumulated data. The accumulated data can still be accessed by the `RTRV-PM-T3` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

Allowing Scheduled DS3 Performance Monitoring Reports

This procedure allows the generation of scheduled DS3 performance monitoring reports that were previously inhibited with the `INH-PMREPT-T3` command.

1. Resume inhibited performance monitoring reports by entering the following command:

   `ALW-PMREPT-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

Retrieving DS3 Performance Monitoring Report Schedule

This procedure retrieves DS3 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   `RTRV-PMSCHED-T3:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }` (optional)
If this parameter is omitted, all of the active SCHED-PMREPT-T3 commands are provided in the output response. If this parameter includes DS3 port locations, all active DS3 reporting associated with the specified ports is provided in the output response.

Sample output responses are:

No DS3 ports specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST */
    /* SCHED-PMREPT-T3::d:f,g,h,i,j,k,l,,m,n, */
;
```

DS3 port(s) specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST,INH */
    "e:f,g,h,i,j,k,l,,m,n,o"
;
```

Where:

d = DS3 port location(s): `{ {1-64}-{1-31}, UNIT-{1-64} }`

e = DS3 port location: `{1-64}-{1-31}`

f = Report interval: `{ 15-MIN, {1-7}-DAY, {1-24}-HR }`

g = Report date: `{1-12}-{1-31}`

h = Report time: `{0-23}-{0-59}`

i = Number of intervals: `{ 1-96, CONT }`

j = Monitored parameters

k = Monitored level: `{0-811987200}-{UP,DN}`

l = Location: `{ NEND, FEND }`

m = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

n = Time offset: `{0-7}-{0-23}-{0-59}`

o = Report inhibited: `INH`
An omitted value for this parameter indicates the report is not inhibited.

Retrieving DS3 Performance Monitoring Data

This procedure is used to retrieve DS3 performance monitoring data for the specified DS3 ports. Performance monitoring data is only sent to a link if you have a UCFC for PM and are logged into that link. Performance monitoring data is not sent to a link if a printer is connected to the link.

NOTE:
DS3 performance monitoring data is collected by a MUX2/MUX3 or MUXP2/MUXP3 circuit pack. If a manual switch to protection is executed, the data on the MUX2/MUX3 circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the MUX2/MUX3 circuit pack is not bad or has not been removed. After switching back to working, the performance monitoring data on the MUXP2/MUXP3 circuit pack is not available for retrieval.

1. Retrieve DS3 performance monitoring data for the desired monitored port(s) by entering the following command:

   `RTRV-PM-T3:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

   d = Monitored parameter: `[ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL ]`

   e = Monitored level: `[0-811987200]-[UP,DN]`
   Specifying `UP` indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying `DN` indicates the monitoring parameter with values equal to or less than the specified level are reported.

   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `[ NEND, FEND ]`

   g = Time period: `[ 15-MIN, 1-HR, 1-DAY ]`
   The value entered must match the DS3 accumulation time set for the network element.

h = Monitored date: `{ {1-12}-{1-31}, CURVAL, ALL }`
If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are retrieved.

i = Monitored time: `{ {0-23}-{0,15,30,45}, CURVAL, ALL }`
If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are retrieved.

A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:MONPARM,MONVAL,VLDTY,LOCN,,TMPER,MONDAT,MONTM */
    "j:k,l,m,n,,o,p,q"
;
```

Where:

j = DS3 port location: `{1-64}-{1-31}`

k = Monitored parameters: `{ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL }`

l = Monitored value: `0-811987200`

m = Validity: `{ COMPL, NA, PRTL }`

n = Location: `{ NEND, FEND }`

o = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

p = Monitored date: `{1-12}-{1-31}`

q = Monitored time: `{0-23}-{0,15,30,45}`

STS-1 Performance Monitoring Procedures

This section consists of procedures that allow you to provision and establish STS-1 performance monitoring, schedule STS-1 performance monitoring reports, and retrieve STS-1 performance monitoring information.

In order to use these procedures, your user login must have at least a PM (for performance monitoring) setting for your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various STS-1 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all STS-1 performance monitoring functions.

The procedures are organized in a manner that allow you to use them as stand-alone (for individual functions) or in the order they appear to set up your STS-1 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings).

For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

NOTE:
Removing an SMUX circuit pack, or failure of an SMUX circuit pack, causes the loss of all stored STS-1 performance monitoring data for the associated EC-1 facility.

Setting Network Element STS-1 Performance Monitoring Parameters

This procedure sets the STS-1 performance monitoring parameters that are at the network element level (that is, frame-wide parameters).

1. Determine if the threshold values of the coding violations (CVs) that trigger severely errored seconds (SESs) for the line and path layers are the desired values by entering the following command:

   RTRV-TH-NE:*[a]*:EC1::ALL:ALL;**

   Where:

   a = Target ID (optional)

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SIG-TYPE:MONPAR,LOCN,THLEV */
   "EC1:SESL,NEND,j"
   "EC1:SESP,NEND,j"
   "EC1:SESL,FEND,j"
   "EC1:SESP,FEND,j"
;
```

   Where:

   j = Coding violation threshold value: `1-55`

   If the values set for the difference coding violation parameters (line/path and near-end/far-end) are the desired values, do not perform Step 2.

2. Set the STS-1 coding violation threshold values for the network element by entering the following command:

   SET-TH-NE:*[a]*:EC1:::*d*,*[e]*,*[f]*;**

   Where:

   a = Target ID (optional)

   d = Monitored parameter: `[ SESL, SESP ]`
   `SESL` is used to set the coding violation threshold for the line layer and `SESP` is used to set the coding violation threshold for the path layer.

   e = Threshold level: `1-55`
   Sets the number of coding violations needed to trigger a severely errored second (SES).

   f = Location: `[ NEND, FEND, ALL ]`
   Specifying `ALL` sets the threshold values for the near-end and far-end to the same level.

Enabling STS-1 Performance Monitoring Mode

This procedure is used to set the STS-1 performance monitoring mode. EC-1 facilities can be monitored for section, line, or path performance on a port by port basis.

1. Determine the STS-1 performance monitoring mode and mode types for the EC-1 facilities to be monitored by entering the following command:

   RTRV-PMMODE-EC1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{ [1-64]-[1-15], UNIT-[1-64] }**

   d = Location: **{ NEND, FEND, ALL }**

   If the performance monitoring mode is turned off for all EC-1 facilities, the above command completes without any output lines. Otherwise, a sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:LOCN,MTYPE */
   "e:f,g"
;
```

   Where:

   e = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

   f = Location: { NEND, FEND }

   g = STS-1 performance monitoring mode type: { S, L, P }
   Where S is section, L is line, and P is path. More than one mode type per port can be combined on one output line with a single ampersand (for example, S&L).

   If the performance monitoring mode and mode type for the selected ports are the desired mode and types, you are done with this procedure. Otherwise, go to Step 2.

2. Turn on the STS-1 performance mode and set the mode types for the EC-1 facilities to be monitored by entering the following command:

   `SET-PMMODE-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,ON;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   d = Location: `[ NEND, FEND, ALL ]`
   Specifying `ALL` sets the mode type for the near-end and far-end.

   e = STS-1 performance monitoring mode type: `[ S, L, P ]`
   Where *S* is section, `L` is line, and `P` is path. More than one mode type per port can be assigned with a single ampersand (for example, `S&L`).

Disabling STS-1 Performance Monitoring Mode

This procedure is used to disable the STS-1 performance monitoring mode. EC-1 facility monitoring can be disabled on a port by port basis.

1. Turn off the STS-1 performance mode for the EC-1 facilities that are no longer to be monitored by entering the following command:

   `SET-PMMODE-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,OFF;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   d = Location: `[ NEND, FEND, ALL ]`
   Specifying `ALL` sets the mode type for the near-end and far-end.

   e = STS-1 performance monitoring mode type: `[ S, L, P ]`
   Where *S* is section, `L` is line, and `P` is path. More than one mode type per port can be assigned with a single ampersand (for example, `S&L`).

Verifying STS-1 Equipment State

This procedure is used to set the STS-1 performance monitoring parameters that are associated with SMUX circuit packs. Any STS-1 signal associated with an SMUX (AKM84) circuit pack can be monitored.

1. Verify the circuit pack code name is set to AKM84 and the basic state is ACT or POS of the SMUX circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SMUX circuit pack location: `SMUX-{1-64}-{1-15}`

   A sample output response is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: :<PCODE=f,CCODE=g>:...:y"
;
```

   Where:

   d = SMUX circuit pack location: `SMUX-{1-64}-{1-15}`

   f = Provisioned circuit pack code name: `{ AKM84, INVALID }`

   g = Circuit pack code name: `{ AKM84, INVALID }`

   y = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30) to provision an SMUX (AKM84) circuit pack.

   If the basic state (parameter *y*) is EQPD, PNDG, or AVAIL, refer to the "Multiplexer (MUX) and SONET Multiplexer (SMUX)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the appropriate actions to provision the MUX2 to the POS state.

Setting STS-1 Performance Monitoring Threshold Values

This procedure is used to set STS-1 performance monitoring parameter threshold values. When any of the threshold values are exceeded, a `REPT EVT EC1` message is output to the links with users with a UCFC for PM logged in. Performance monitoring data is not sent to a link if a printer is connected to the link.

1. Determine the threshold values for the desired parameters for performance monitoring by entering the following command:

   `RTRV-TH-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ [1-64]-[1-15], UNIT-[1-64] }`

   d = Monitored Parameter: `{` <valid monitored parameter>, `ALL }` (optional)

   e = Location: `{ NEND, FEND, ALL }` (optional)

   f = Time Period: `{ 15-MIN, 1-DAY, ALL }` (optional)

   A sample output response is:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:MONPARM,LOCN,,THLEV,TMPER */
      "g:h,i,,j,k"
   ;
   ```

   Where:

   g = EC-1 port location: `[1-64]-[1-15]`

   h = Monitored parameter

   i = Location: `{ NEND, FEND }`

   j = Threshold value: `0-4479000`

   k = Time period: `{ 15-MIN, 1-DAY }`

2. Determine if the values are set to the desired levels for the various monitored parameters (refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* [AT&T 365-340-903] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual [AT&T 365-340-902] for parameter monitored values and the default threshold values). If the values are set to the desired level, you do not need to perform Step 3.

3. Set the threshold values for the desired performance monitoring parameters by entering the following command:

   `SET-TH-EC1:`*[a]*`:`*b*`:::`*d*`,`*e*`,`*[f]*`,,`*g*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ [1-64]-[1-15], UNIT-[1-64] }`

   d = Monitored parameter: `{ SEFSS, LOSSS, CVL, ESL, ESAL, ESBL, SESL, AISSL, UASL, CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP }`
   Only near-end section and line errors and far-end path errors are monitored for STS-1 signals. Section parameters end in `S`, line parameters end in `L`, and path parameters end in `P`.

   e = Threshold Level: `{0-4479000}`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `{ NEND, FEND, ALL }`
   Default: `ALL`

   g = Time Period: `{ 15-MIN, 1-DAY }`

Setting EC-1 Facility Parameters

This procedure is used to set the STS-1 line bit error rate, SONET condition onset soak time, and SONET condition clear soak time parameters needed for STS-1 ports to be monitored.

1. Determine the settings of STS-1 port(s) to be monitored by entering the following command:

   `RTRV-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ [1-64]-[1-15], UNIT-[1-64] }`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:...:<BERL=j,SOAKON=ag,SOAKCLR=ah>"
;
```

Where:

g = EC-1 port location: `{1-64}-{1-15}`

j = STS-1 line BER threshold value: `{ 3, 5-9 }`

ag = SONET condition onset soak time: `1-30`

ah = SONET condition clear soak time: `1-30`

From the above response, determine if the values for line bit error rate (parameter *j*), SONET condition onset soak time (parameter *ag*), and SONET condition clear soak time (parameter *ah*) are set to the desired level. If the values are set to the desired levels, you do not need to perform Step 2.

2. Edit the STS-1 performance monitoring parameters of the STS-1 port(s) to be monitored by entering the following command:

   `ED-EC1:`*[a]*`:`*b*`:::[BERL=`*e*`,SOAKON=`*s*`,SOAKCLR=`*t*`];`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ (1-64}-{1-15}, UNIT-{1-64} }`

   e = Line bit error rate threshold: `{ 3, 5-9, CURVAL }`
   Default: `CURVAL`
   Initial system value: `3`

   s = SONET condition onset soak time: `{ {1-30}, CURVAL }`
   Default: `CURVAL`
   Initial system value: `2` (seconds)

   t = SONET condition clear soak time: `{ {1-20}, CURVAL }`
   Default: `CURVAL`
   Initial system value: `10` (seconds)

Initializing Accumulated STS-1 Performance Monitoring Data

This procedure is used to initialize STS-1 performance monitoring accumulation registers. Under normal conditions, it is not necessary to initialize accumulation registers before scheduling performance monitoring reports.

1. Initialize the accumulation registers used to store accumulated performance monitoring data by entering the command:

   `INIT-REG-EC1:`*[a]*`:`*b*`:::`*d*`,`*[e]*`,`*f*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ {1-64}-{1-15}, UNIT-{1-64} }`

   d = Monitored parameter: `{ SEFSS, LOSSS, CVL, ESL, ESAL, ESBL, SESL, AISSL, UASL, CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP }`
   Section parameters end in `S`, line parameters end in `L`, and path parameters end in `P`.

   e = Monitored Value: `{0-4479000}`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `{ NEND, FEND, ALL }`

   g = Time period: `{ 15-MIN, 1-DAY }`

   h = Monitored date: `{ {1-12}-{1-31}, CURVAL, NOVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `1-DAY` and parameter *i* must not be `ALL`), all the daily performance monitoring registers are initialized.

   i = Monitored time: `{ {0-23}-{0,15,30,45}, CURVAL, NOVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `15-MIN` and parameter *h* must be `NOVAL`), all the short accumulation period registers are initialized.

   If all the registers in a range are not initialized, instead of receiving a `COMPLD` *or* `DENY` *response, you receive a* `PRTL` *response.*

Scheduling STS-1 Performance Monitoring Reports

This procedure is used to schedule STS-1 performance monitoring reports. Up to 64 STS-1 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports or 3600 report lines per hour) can be scheduled. Scheduling 64 reports can generate a large amount of output.

NOTE:
When scheduling reports for more than one STS-1 port within the same interface module (UNIT), using one schedule is much faster and more effective than scheduling individual STS-1 ports. For example, if all the STS-1 ports are associated with the STS-1 Interface Module in unit 31, UNIT-31 should be used instead of the 31 individual STS-1 ports.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-EC1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

   d = Report interval: { 15-MIN, [1-24]-HR, [1-7]-DAY }

   e = Report start time: { [0-23]-[0-59], CURVAL }
   CURVAL is the current time.

   f = Number of intervals: { [0-96], CONT }
   If CONT is specified, the performance monitoring schedule remains in effect until the schedule is canceled.

   g = Monitored parameter: { SEFSS, LOSSS, CVL, ESL, ESAL, ESBL, SESL, AISSL, UASL, CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL }
   Section parameters end in S, line parameters end in L, and path parameters end in P.

   h = Monitored level: [0-4479000]-{UP,DN}
   Specifying UP indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying DN indicates the monitoring parameter with values equal to or less than the specified level are reported.

   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   i = Location: { NEND, FEND }

j = Time period: { 15-MIN, 1-DAY }

k = Time offset: [0-1]-[0-7]-[0,15,30,45]
If the value of 1 is given for the first component (DAY), the value 0 must be given for the last two components (HR and MIN).

No report is generated if there is no data to report, unless the monitored level is set to 0-UP.

As the total number of reports scheduled approaches 128, this command can take up to three minutes to complete.

Canceling STS-1 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled STS-1 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   SCHED-PMREPT-EC1:*[a]*:*b*:::*[d]*,*[e]*,0,ALL,,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

   d = Report interval: { 15-MIN, [1-24]-HR, [1-7]-DAY }

   e = Report start time: { [0-23]-[0-59], CURVAL }
   CURVAL is the current time.

   i = Location: { NEND, FEND }

   j = Time period: { 15-MIN, 1-DAY }

   k = Time offset: [0-1]-[0-7]-[0,15,30,45]
   If the value of 1 is given for the first component (DAY), the value 0 must be given for the last two components (HR and MIN).

Inhibiting Scheduled STS-1 Performance Monitoring Reports

This procedure is used to inhibit the generation of scheduled STS-1 performance monitoring reports. Inhibiting scheduled performance monitoring reports does not stop the data collection process. It only stops the reporting of the accumulated data. The accumulated data can still be accessed by the `RTRV-PM-EC1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

Allowing Scheduled STS-1 Performance Monitoring Reports

This procedure is used to allow the generation of scheduled STS-1 performance monitoring reports that were previously inhibited with the `INH-PMREPT-EC1` command.

1. Resume inhibited performance monitoring reports by entering the following command:

   `ALW-PMREPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

Retrieving STS-1 Performance Monitoring Report Schedule

This procedure is used to retrieve STS-1 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   `RTRV-PMSCHED-EC1:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

b = EC-1 port location: `{ {1-64}-{1-15}, UNIT-{1-64} }`
If this parameter is omitted, all of the active SCHED-PMREPT-EC1 commands are provided in the output response. If this parameter includes EC-1 port locations, all active STS-1 reporting associated with the specified ports is provided in the output response.

Sample output responses are:

No EC-1 ports specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST */
    /* SCHED-PMREPT-EC1::d:f,g,h,i,j,k,l,,m,n, */
;
```

EC-1 port(s) specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST,INH */
    "e:f,g,h,i,j,k,l,,m,n,o"
;
```

Where:

d = EC-1 port location(s): `{ {1-64}-{1-15}, UNIT-{1-64} }`

e = EC-1 port location: `{1-64}-{1-15}`

f = Report interval: `{ 15-MIN, {1-7}-DAY, {1-24}-HR }`

g = Report date: `{1-12}-{1-31}`

h = Report time: `{0-23}-{0-59}`

i = Number of intervals: `{ 1-96, CONT }`

j = Monitored parameters

k = Monitored level: `{0-4479000}-{UP,DN}`

l = Location: `{ NEND, FEND }`

m = Time period: `{ 15-MIN, 1-DAY }`

n = Time offset: `{0-7}-{0-7}-{0-59}`

o = Report inhibited: `INH`
An omitted value for this parameter indicates the report is not inhibited.

Retrieving STS-1 Performance Monitoring Data

This procedure is used to retrieve STS-1 performance monitoring data for the specified EC-1 ports. Performance monitoring data is only sent to a link if you have a UCFC for PM and are logged into that link. Performance monitoring data is not sent to a link if a printer is connected to the link.

NOTE:
STS-1 performance monitoring data is collected by an SMUX or SMUXP circuit pack. If a manual switch to protection is executed, the data on the SMUX circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the SMUX circuit pack is not bad or has not been removed. After switching back to working, the performance monitoring data on the SMUXP circuit pack is not available for retrieval.

1. Retrieve STS-1 performance monitoring data for the desired monitored port(s) by entering the following command:

   `RTRV-PM-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `[ [1-64]-[1-15], UNIT-[1-64] ]`

   d = Monitored parameter: `[ SEFSS, LOSSS, CVL, ESL, ESAL, ESBL, SESL, AISSL, UASL, CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL ]`
   Section parameters end in `S`, line parameters end in `L`, and path parameters end in `P`.

   e = Monitored level: `[0-4479000]-[UP,DN]`
   Specifying `UP` indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying `DN` indicates the monitoring parameter with values equal to or less than the specified level are reported.

   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `[ NEND, FEND ]`

   g = Time period: `[ 15-MIN, 1-DAY ]`

   h = Monitored date: `[ [1-12]-[1-31], CURVAL, NOVAL, ALL ]`
   If `ALL` is specified (parameter *g* must be `1-DAY` and parameter *i* must not be `ALL`), all the daily performance monitoring registers are initialized.

i = Monitored time: { {0-23}-{0,15,30,45}, CURVAL, NOVAL, ALL }
If ALL is specified (parameter *g* must be 15-MIN and parameter *h* must be NOVAL), all the short accumulation period registers are initialized.

A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:MONPARM,MONVAL,VLDTY,LOCN,,TMPER,MONDAT,MONTM */
    "j:k,l,m,n,,o,p,q"
;
```

Where:

j = EC-1 port location: {1-64}-{1-15}

k = Monitored parameter: { SEFSS, LOSSS, CVL, ESL, ESAL, ESBL, SESL, AISSL, UASL, CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL }

l = Monitored value: 0-4479000

m = Validity: { COMPL, NA, PRTL, LONG, ADJ }

n = Location: { NEND, FEND }

o = Time period: { 15-MIN, 1-DAY }

p = Monitored date: {1-12}-{1-31}

q = Monitored time: {0-23}-{0,15,30,45}

VT1.5 Performance Monitoring Procedures

This section consists of procedures that allow you to provision and establish VT1.5 performance monitoring, schedule VT1.5 performance monitoring reports, and retrieve VT1.5 performance monitoring information.

In order to use these procedures, your user login must have at least a PM (for performance monitoring) setting for your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various DS3 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all VT1.5 performance monitoring functions.

The procedures are organized in a manner that allow you to use them as stand-alone (for individual functions) or in the order they appear to set up your VT1.5 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings).

For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

NOTE:
Removing an SMUX circuit pack or failure of an SMUX circuit pack causes the loss of all stored VT1.5 performance monitoring data for the associated VT1.5 facility.

Setting Network Element VT1.5 Performance Monitoring Parameters

This procedure is used to set the VT1.5 performance monitoring parameters that are at the network element level (that is, frame-wide parameters).

1. Determine if the threshold values of the coding violations (CVs) that trigger severely errored seconds (SESs) for the path layers are the desired values by entering the following command:

   RTRV-TH-NE:*[a]*:VT1::SESP:ALL;**

   Where:

   a = Target ID (optional)

   A sample output response is (only pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* SIG-TYPE:MONPAR,LOCN,THLEV */
      "VT1:SESP,NEND,j"
      "VT1:SESP,FEND,j"
   ;
   ```

   Where:

   j = Coding violation threshold value: 1-20

   If the values set for the difference coding violation parameters (path and near-end/far-end) are the desired values, do not perform Step 2.

2. Set the VT1.5 coding violation threshold values for the network element by entering the following command:

   SET-TH-NE:*[a]*:VT1:::SESP,*[e]*,*[f]*;**

   Where:

   a = Target ID (optional)

   e = Threshold level: 1-20
   Sets the number of coding violations for the path layer needed to trigger a severely errored second (SES).

   f = Location: **NEND**

Enabling VT1.5 Performance Monitoring Mode

This procedure is used to set the VT1.5 performance monitoring mode. VT1.5 facilities can be monitored for path performance on a port-by-port basis.

1. Determine the VT1.5 performance monitoring mode and mode types for the VT1.5 facilities to be monitored by entering the following command:

   `RTRV-PMMODE-VT1:`*[a]*`:`*b*`:::`*[d]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   d = Location: `NEND`

   If the performance monitoring mode is turned off for all VT1.5 facilities, the above command completes without any output lines. Otherwise, a sample output response is:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:LOCN,MTYPE */
      "e:NEND,P"
   ;
   ```

   Where:

   e = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   If the performance monitoring mode and mode type for the selected ports are the desired mode and types, you are done with this procedure. Otherwise, go to Step 2.

2. Turn on the VT1.5 performance mode and set the mode types for the EC-1 facilities to be monitored by entering the following command:

   `SET-PMMODE-VT1:`*[a]*`:`*b*`:::,,ON;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   Only near-end path performance can be monitored for VT1.5 facilities.

Disabling VT1.5 Performance Monitoring Mode

This procedure is used to disable the VT1.5 performance monitoring mode. VT1.5 facility monitoring can be disabled on a port by port basis.

1. Turn off the VT1.5 performance mode for the VT1.5 facilities that are no longer to be monitored by entering the following command:

   `SET-PMMODE-VT1:`*[a]*`:`*b*`::::,,OFF;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28},`
   `VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   Only near-end path performance can be monitored for VT1.5 facilities.

Verifying VT1.5 Equipment State

This procedure is used to set the VT1.5 performance monitoring parameters that are associated with SMUX circuit packs. Any VT1.5 signal associated with an SMUX (AKM84) circuit pack can be monitored.

1. Verify the circuit pack code name is set to AKM84 and the basic state is ACT or POS of the SMUX circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SMUX circuit pack location: `SMUX-{1-64}-{1-15}`

   A sample output response is (only the pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:UTYPE:<>:CLEI:STATE */
      "d: :<PCODE=f, CCODE=g>:...:y"
   ;
   ```

   Where:

   d = SMUX circuit pack location: `SMUX-{1-64}-{1-15}`

   f = Provisioned circuit pack code name: `{ AKM84, INVALID }`

   g = Circuit pack code name: `{ AKM84, INVALID }`

y = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30) to provision an SMUX (AKM84) circuit pack.

If the basic state (parameter *y*) is EQPD, PNDG, or AVAIL, refer to the "Multiplexer (MUX) and SONET Multiplexer (SMUX)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine the appropriate actions to provision the SMUX to the POS state.

Setting VT1.5 Performance Monitoring Threshold Values

This procedure is used to set VT1.5 performance monitoring parameter threshold values. When any of the threshold values are exceeded, a `REPT EVT VT1` message is output to the links with users with a UCFC for PM logged in. Performance monitoring data is not sent to a link if a printer is connected to the link.

1. Determine the threshold values for the desired parameters for performance monitoring by entering the following command:

   `RTRV-TH-VT1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   VT1.5 ports are located on SMUX circuit packs only.

   d = Monitored Parameter: `{` <valid monitored parameter>, `ALL }` (optional)

   e = Location: `NEND` (optional)

   f = Time Period: `{ 15-MIN, 1-DAY, ALL }` (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:MONPARM,LOCN,,THLEV,TMPER */
   "g:h,i,,j,k"
;
```

Where:

g = VT1.5 port location:
VT1.5 port number: `{1-64}-{1-15}-{1-28}`
VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

h = Monitored parameter

i = Location: `NEND`

j = Threshold value: `0-1048575`

k = Time period: `{ 15-MIN, 1-DAY }`

2. Determine if the values are set to the desired levels for the various monitored parameters (refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* [AT&T 365-340-903] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual [AT&T 365-340-902] for parameter monitored values and the default threshold values). If the values are set to the desired level, you do not need to perform Step 3.

3. Set the threshold values for the desired performance monitoring parameters by entering the following command:

`SET-TH-VT1:`*[a]*`:`*b*`:::`*d*`,`*e*`,`*[f]*`,,`*g*`;`

Where:

a = Target ID (optional)

b = VT1.5 port location:
VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
VT1.5 ports are located on SMUX circuit packs only.

d = Monitored parameter: `{ CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP }`
Only near-end path errors are monitored for VT1.5 signals.

e = Threshold Level: `[0-1048575]`
Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

f = Location: `NEND`
Default: `NEND`

g = Time Period: `{ 15-MIN, 1-DAY }`

Initializing Accumulated VT1.5 Performance Monitoring Data

This procedure is used to initialize VT1.5 performance monitoring accumulation registers. Under normal conditions, it is not necessary to initialize accumulation registers before scheduling performance monitoring reports.

1. Initialize the accumulation registers used to store accumulated performance monitoring data by entering the command:

   `INIT-REG-VT1:`*[a]*`:`*b*`:::`*d*`,`*[e]*`,`*f*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `[ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] ]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
   VT1.5 ports are located on SMUX circuit packs only.

   d = Monitored parameter: `[ CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL ]`

   e = Monitored Value: `[0-1048575]`
   Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

   f = Location: `NEND`

   g = Time period: `[ 15-MIN, 1-DAY ]`

   h = Monitored date: `[ [1-12]-[1-31], CURVAL, NOVAL, ALL ]`
   If `ALL` is specified (parameter *g* must be `1-DAY` and parameter *i* must not be `ALL`), all the daily performance monitoring registers are initialized.

   i = Monitored time: `[ [0-23]-[0,15,30,45], CURVAL, NOVAL, ALL ]`
   If `ALL` is specified (parameter *g* must be `15-MIN` and parameter *h* must be `NOVAL`), all the short accumulation period registers are initialized.

   If all the registers in a range are not initialized, instead of receiving a `COMPLD` *or* `DENY` *response, you receive a* `PRTL` *response.*

Scheduling VT1.5 Performance Monitoring Reports

This procedure is used to schedule VT1.5 performance monitoring reports. Up to 64 VT1.5 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one VT1.5 port within the same interface module (UNIT) or VT1.5 interface group (VT1GRP), using one schedule is much faster and more effective than scheduling individual VT1.5 ports. For example, if all the VT1.5 ports associated with VT1GRP-31-5 are to be scheduled, the VT1.5 interface group VT1GRP-31-5 should be used instead of the 28 individual VT1.5 ports. For another example, if all 28 ports are associated with VT1.5 interface groups VTS1GRP-31-5 and VT1GRP-31-6, the interface module UNIT-31 should be used instead of the 56 individual VT1.5 ports or the two individual VT1.5 interface groups.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-VT1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}
   VT1.5 ports are located on SMUX circuit packs only.

   d = Report interval: { 15-MIN, {1-24}-HR, {1-7}-DAY }

   e = Report start time: { {0-23}-{0-59}, CURVAL }
   CURVAL is the current time.

   f = Number of intervals: { {0-96}, CONT }
   If CONT is specified, the performance monitoring schedule remains in effect until the schedule is canceled.

   g = Monitored parameter: { CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL }

   h = Monitored level: {0-1048575}-{UP,DN}
   Specifying UP indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying DN indicates the monitoring parameter with values equal to or less than the specified level are reported.

Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

i = Location: `NEND`

j = Time period: `{ 15-MIN, 1-DAY }`

k = Time offset: `{0-1}-{0-7}-{0,15,30,45}`
If the value of `1` is given for the first component (DAY), the value `0` must be given for the last two components (HR and MIN).

No report is generated if there is no data to report, unless the monitored level is set to `0-UP`.

As the total number of reports scheduled approaches 128, this command can take up to three minutes to complete.

Canceling VT1.5 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled VT1.5 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-VT1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   VT1.5 ports are located on SMUX circuit packs only.

   d = Report interval: `{ 15-MIN, {1-24}-HR, {1-7}-DAY }`

   e = Report start time: `{ {0-23}-{0-59}, CURVAL }`
   `CURVAL` is the current time.

   i = Location: `NEND`

   j = Time period: `{ 15-MIN, 1-DAY }`

   k = Time offset: `{0-1}-{0-7}-{0,15,30,45}`
   If the value of `1` is given for the first component (DAY), the value `0` must be given for the last two components (HR and MIN).

Inhibiting Scheduled VT1.5 Performance Monitoring Reports

This procedure is used to inhibit the generation of scheduled VT1.5 performance monitoring reports. Inhibiting scheduled performance monitoring reports does not stop the data collection process. It only stops the reporting of the accumulated data. The accumulated data can still be accessed by the `RTRV-PM-VT1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`
   VT1.5 ports are located on SMUX circuit packs only.

Allowing Scheduled VT1.5 Performance Monitoring Reports

This procedure is used to allow the generation of scheduled VT1.5 performance monitoring reports that were previously inhibited with the `INH-PMREPT-VT1` command.

1. Resume inhibited performance monitoring reports by entering the following command:

   `ALW-PMREPT-VT1:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ [1-64]-[1-15]-[1-28], VT1GRP-[1-64]-[1-15], UNIT-[1-64] }`
   VT1.5 group number: `{ [1-64]-[1-15]-[1-7]-[1-4], UNIT-[1-64] }`
   VT1.5 ports are located on SMUX circuit packs only.

Retrieving VT1.5 Performance Monitoring Report Schedule

This procedure is used to retrieve VT1.5 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   `RTRV-PMSCHED-VT1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: `{ {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`
   VT1.5 ports are located on SMUX circuit packs only. If this parameter is omitted, all of the active `SCHED-PMREPT-VT1` commands are provided in the output response. If this parameter includes VT1.5 port locations, all active VT1.5 reporting associated with the specified ports is provided in the output response.

   Sample output responses are:

   No VT1.5 ports specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST */
    /* SCHED-PMREPT-VT1::d:f,g,h,i,j,k,l,,m,n, */
;
```

   VT1.5 port(s) specified:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:INVL,REPTDAT,REPTTM,NUMINVL,MONPARM,MONLEV,LOCN,,TMPER,
    TMOFST,INH */
    "e:f,g,h,i,j,k,l,,m,n,o"
;
```

   Where:

   d = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   e = VT1.5 port location:
   VT1.5 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

   f = Report interval: `{ 15-MIN, {1-7}-DAY, {1-24}-HR }`

   g = Report date: `{1-12}-{1-31}`

h = Report time: {0-23}-{0-59}

i = Number of intervals: { 1-96, CONT }

j = Monitored parameters

k = Monitored level: {0-1048575}-{UP,DN}

l = Location: NEND

m = Time period: { 15-MIN, 1-DAY }

n = Time offset: {0-7}-{0-7}-{0-59}

o = Report inhibited: INH
An omitted value for this parameter indicates the report is not inhibited.

Retrieving VT1.5 Performance Monitoring Data

This procedure is used to retrieve VT1.5 performance monitoring data for the specified VT1.5 ports. Performance monitoring data is only sent to a link if you have a UCFC for PM and are logged into that link. Performance monitoring data is not sent to a link if a printer is connected to the link.

NOTE:
VT1.5 performance monitoring data is collected by an SMUX or SMUXP circuit pack. If a manual switch to protection is executed the data on the SMUX circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the SMUX circuit pack is not bad or has not been removed. After switching back to working, the performance monitoring data on the SMUXP circuit pack is not available for retrieval.

1. Retrieve VT1.5 performance monitoring data for the desired monitored port(s) by entering the following command:

   RTRV-PM-VT1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,,*g*,*[h]*,*[i]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location:
   VT1.5 port number: { {1-64}-{1-15}-{1-28}, VT1GRP-{1-64}-{1-15}, UNIT-{1-64} }
   VT1.5 group number: { {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }
   VT1.5 ports are located on SMUX circuit packs only.

   d = Monitored parameter: { CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL }

e = Monitored level: `[0-1048575]-[UP,DN]`
Specifying `UP` indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying `DN` indicates the monitoring parameter with values equal to or less than the specified level are reported.

Refer to the *DACS IV-2000 (512) Release 5.0 Quick Reference Job Aids* (AT&T 365-340-903) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for default threshold levels.

f = Location: `NEND`

g = Time period: `{ 15-MIN, 1-DAY }`

h = Monitored date: `{ [1-12]-[1-31], CURVAL, NOVAL, ALL }`
If `ALL` is specified (parameter *g* must be `1-DAY` and parameter *i* must not be `ALL`), all the daily performance monitoring registers are initialized.

i = Monitored time: `{ [0-23]-[0,15,30,45], CURVAL, NOVAL, ALL }`
If `ALL` is specified (parameter *g* must be `15-MIN` and parameter *h* must be `NOVAL`), all the short accumulation period registers are initialized.

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:MONPARM,MONVAL,VLDTY,LOCN,,TMPER,MONDAT,MONTM */
   "j:k,l,m,n,,o,p,q"
;
```

Where:

j = VT1.5 port location:
VT1.5 port number: `[1-64]-[1-15]-[1-28]`
VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

k = Monitored parameter: `{ CVP, ESP, ESAP, ESBP, SESP, ALSP, UASP, ALL }`

l = Monitored value: `0-1048575`

m = Validity: `{ COMPL, NA, PRTL, LONG, ADJ }`

n = Location: `NEND`

o = Time period: `{ 15-MIN, 1-DAY }`

p = Monitored date: `[1-12]-[1-31]`

q = Monitored time: `[0-23]-[0,15,30,45]`

Alarms

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Contents

Alarms

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This chapter consists of procedures required to clear critical, major, and minor alarms that occur in the DACS IV-2000.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

CAUTION:
When clearing alarms, only clear one alarm at a time and never extract more than one circuit pack at a time.

Alarm Types

There are three levels of alarms:

- Critical — Indicates a severe, service-affecting condition. You can set the threshold that activates this alarm (that is, a specific number of DS1/VT1.5 facility failures). You can also set the type of failure to monitor (that is, facility, equipment, or both).
- Major — Provided for all service-affecting failures, main or unit controller failures, and power supply failures. A Main Controller failure (one that causes loss of communications with the DACS IV-2000) initiates a main controller failure alarm indication in addition to the major alarm.
- Minor — Caused by failures, manual actions, and certain other abnormal conditions that are non-service-affecting.

The DACS IV-2000 provides for alarm indications and audible alarm cutoffs in several ways as shown in Table 15-1. Using the ACO switch (on the status panel or remotely) turns off the audible alarms. Contact closures for visual alarms remain on until the condition causing the alarm is corrected.

Detailed alarm information is provided in messages on the administrative links. In these messages there are two parameters that carry alarm information. These parameters are the alarm level and the alarm notification code. Table 15-2 lists the parameters for the various alarm levels.

Table 15-1. **DACS IV-2000 Alarm Indications/Switches**

Indicators/Switches	Frame		Office		
	Status Panel	MC Bay HDA*	Audible	Visual	Remote
CR (critical) indicator	X	X	X	X	X
MJ (major) indicator	X	X	X	X	X
MN (minor) indicator	X	X	X	X	X
MC FAIL (main controller failure) indicator	X	X		X	X
ACO indicator	X	X			
ACO switch	X				X
Remote ID (active whenever CR, MJ, MN, and MC FAIL alarm indicators are active) indicator					X

* For frames equipped with Header Designation Assemblies (HDAs).

Table 15-2. **Alarm Levels and Related Message Parameters**

Alarm Level	Alarm Code Parameter	Notification Code Parameter
Critical	*C	CR
Major	**	MJ
Minor	*	MN
No alarm	A	NA
Cleared alarm	A	CL

The Switch Complex status panel has seven equipment indicators, five of which are used.

- CR — is red and signals a critical alarm condition.
- MJ — is red and signals a major alarm condition.
- MN — is yellow and signals a minor alarm condition.
- ABN — reserved for future use.
- ACO — is green and shows that the audible alarms have been silenced (ACO status panel switch or remote ACO switch activated).
- MC FAIL — is a red main controller failure alarm indicating a major alarm associated with the main controller and/or loss of communications with the frame (for example, the active control complex failing).
- FE — reserved for future use.

The Remote Complex status panel has eight equipment indicators. six of which are used:

- CRITICAL — is red and signals a critical alarm condition.
- MAJOR — is red and signals a major alarm condition.
- MINOR — is yellow and signals a minor alarm condition.
- ABNORMAL — reserved for future use.
- LOCAL ACO — is green and shows that the audible alarms for the Remote Complex have been silenced (ACO switch activated).
- POWER ON — is green and signals that power is present at the status panel.
- FAIL — is a red processor major alarm and signals a failure in the Remote Unit Interface (RUI) Module.
- FAR END — reserved for future use.

All circuit packs (except version 1 Synchronizer Module and bus extender circuit packs) have a red LED to aid in problem isolation. The LED is mounted so that it is visible while the circuit pack is in the frame. This LED is controlled by a main/unit controller so that it can be illuminated even if the circuit pack it is mounted on is defective. For version 2 Synchronizer Module circuit packs and the DS1, DS3, and STS1 interface circuit packs, the LED indicators flash continuously at one-second intervals on circuit packs that have input signal failures and remain on for failures in the circuit packs. Circuit pack failure indications have a minimum duration of two seconds to distinguish them from incoming signal failure indications. The power supply circuit packs activate their respective LEDs when a fault exists. The power circuit pack failure LED is powered from the primary power supply so it still illuminates when there is a loss of logic level power.

The DACS IV-2000 provides autonomous messages (REPT ALM) that indicate a failure condition has occurred as well as when the failure condition clears for all equipment and facilities within the DACS IV-2000. In addition to the autonomous messages, several commands exist that allow you to retrieve alarm, condition, and state information. These commands and messages, along with the remote alarm indicators, provide for isolating failures from a remote maintenance center.

The section titled "Isolating Failures" (page 15-12) is used to isolate the problem and direct you to the appropriate procedure(s). In some cases, problem conditions can be cleared remotely from a centralized maintenance center using a terminal/printer combination connected to an X.25 PAD network. For equipment failures, maintenance on-site (at the frame) is required. For these types of failures, personnel at the frame can use or be directed (remotely) to use the appropriate procedure.

Critical Alarms

Critical alarms indicate a severe, service-affecting condition. If your DACS IV-2000 is provisioned for critical alarms, this section describes how the critical alarm is activated and it is cleared. Critical alarms occur after a set threshold value of facility alarms is exceeded or a major equipment alarm has occurred, or both. For information on provisioning the system for critical alarms, refer to the section titled "Provisioning the Network Element" (page 5-5).

The following sections describe how critical alarms are activated and cleared based on the failure type setting in the ED-NE command.

Transmission Equipment (EQPT)

The failure type setting of EQPT (equipment) in the ED-NE command activates critical alarms (CR) associated with transmission equipment failure reported as a major alarm (MJ), service-affecting (SA) condition. There is *no failure threshold* associated with equipment failures. In the event of a major, service-affecting equipment failure, the DACS IV-2000 outputs a REPT ALM COM message and activates the critical alarm LED, audible alarm, and remote critical alarm indicators. Transmission equipment includes DS1, DS3, and STS1 interface circuit packs (DS1IFs, MUXs, and SMUXs), switch interface circuit packs (SWIFs), switch input/output circuit packs (SWIOs), switch center stage circuit packs

(SWCSs), Synchronizer Module circuit packs (DPLLs, TBS3s, and DS1TXs), clock generator circuit packs (CLKGNs), and clock distributor circuit packs (CLKDRs).

Facility (FAC)

The failure type setting of FAC (facility) in the ED-NE command activates and clears critical alarms for:

- DS1 interface ports in the DRVN (driven) state — all major facility alarms result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - The DS1 facility alarm clears.
  - The DS1 port is changed to the NDRVN (non-driven) or INIT (initialized) state.
- DS3 interface ports configured in the DS1 mode — only DS1 tributaries which are in the DRVN state contribute toward the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - The DS3 facility alarm clears.
  - The DS3 port is changed to the NDRVN or INIT state.
  - The DS1 tributaries are disconnected.
- DS3 interface ports (MUX3 circuit packs) configured in the CC mode with a DS3 cross-connection present incoming facility failures result in the critical alarm counter being incremented by 30. The critical alarm counter is decremented when the following events occur:
  - The DS3 facility alarm clears.
  - The DS3 port is changed to the NDRVN or INIT state.
  - The DS3 cross-connection is disconnected.
- VT1.5 interface ports — all major facility alarms result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - The VT1.5 facility alarm clears.
  - The VT1.5 port is changed to the NDRVN (not-driven) or INIT (initialized) state.

- STS-1 interface ports not configured for STS-1 clear channel (STS-1cc) — only the VT1/DS1 tributaries that are cross-connected result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - — The STS-1 facility alarm clears.
  - — The STS-1 port is changed to the NDRVN (not driven) or INIT (initialized state).
  - — The VT1/DS1 tributaries are disconnected.
- STS-1 interface ports configured for STS1 clear channel (STS-1cc) with an STS-1cc cross-connection present — incoming facility failures result in the critical alarm counter being incremented by 30. The critical alarm counter is decremented by 30 when the following events occur:
  - — The STS-1 facility alarm clears.
  - — The STS-1 port is changed to the NDRVN or INIT state.
  - — The STS-1cc cross-connection is disconnected.

When facility failures have reached the provisioned DS1 failure threshold, the system outputs a `REPT ALM COM` message and activates the critical alarm LED, audible alarm, and remote critical alarm indicators. Facility alarms that occur after the system has entered the critical alarm state are reported by the `REPT ALM T1`, `REPT ALM T2`, or `REPT ALM T3` messages. The system generates a critical alarm message or `REPT ALM COM` one time for facility-related failures.

In the event that a facility has more than one type of alarm active at any given time, the critical alarm facility counter is incremented for each type of event. Likewise, if another event occurs which overrides all currently existing events, the counter is decreased by the number of events which were eliminated, and then increased by one. For example:

Initial Facility State: YELLOW alarm
Critical Alarm Counter: 1

Next Failure Encountered: T-BER detected on same facility
Critical Alarm Counter: 2

Next Failure Encountered: Loss Of Signal (LOS) detected on same facility
Critical Alarm Counter: 1 LOS overrides YELLOW and T-BER; therefore, the critical alarm counter is subtracted by two (since YELLOW and T-BER are eliminated), and one is added to the critical alarm counter because LOS is active.

Transmission Equipment and Facility (BOTH)

The failure type setting of BOTH (equipment and facility) in the ED-NE command activates and clears critical alarms in the following ways:

- If the system is currently in the critical alarm state (CR LED lit and remote critical alarm indicator active) due to transmission equipment failures and the critical alarm facility threshold is reached, the system outputs a REPT ALM COM message with a CONDTYPE code of FAC and reactivates the audible alarm.
- If the system is currently in the critical alarm state (CR LED lit and remote critical alarm indicator active) due to facility failures and a major alarm, service affecting transmission equipment failure occurs. The system outputs a REPT ALM COM message with a CONDTYPE code of INT and reactivates the audible alarm.
- When critical alarms are eliminated, the last event that caused the system to come out of the critical alarm state is reported. For example, if the system had a critical alarm active due to transmission equipment and facility failures, and facility failures were eliminated so that the number of remaining facility failures is below the facility threshold, the system does not generate a critical alarm clear message. The system does not turn off the critical alarm LED and remote critical alarm indicators until the transmission equipment failures are eliminated. The audible alarm can be deactivated by pushing the ACO button or entering the OPR-ACO-ALL command. The REPT ALM COM message contains a CONDTYPE field that tells you what type of event caused the system to exit the critical alarm state (INT if transmission equipment-related, and FAC if facility-related).

Link Communication Availability

The following sections contain information of CILINK availability for specific frame and ECI circuit pack states.

Main Controller Failure Alarm (MC FAIL) Active

When the main controller failure alarm becomes active (the MC FAIL LED is lit and the remote main controller failure alarm is active), one of the following has occurred:

- The main controller failed (due to multiple failures) and cannot recover autonomously. Link communications are lost until the failure is resolved.
- The active control complex (CPU/SSC/MTC/SCI/UI) fails. Link communications are temporarily lost for approximately five minutes.

Depending on the type of failure that occurred, the following system action takes place:

- MC Failure is caused by one of the following events:
  - — Both ECI circuit packs extracted or failed
  - — Both controller complexes (CPU/SSC/MTC/SCI/UI) failed

  For MC failures, the main controller failure alarm indicators (MC FAIL LED and remote indicator) become active and remain active until the problem is cleared on the frame.
- Active Control Complex (CPU/SSC/MTC/SCI/UI) Failure — causes the MC to enter the OOS-FLT state, the main controller failure alarm indicators become active, and an autonomous *side switch* (restart) to the standby control complex is started [a manual side switch is described in the section titled "Manual Synchronizer Side Switch" (page 8-20)]. No commands are accepted until the side switch is completed.

  After the side switch is completed, all links are taken down (ending all login sessions) and immediately brought back into service (provided the associated ECI circuit pack is working), the main controller failure alarm indicators clear, and a minor alarm becomes active (if there are no critical or major alarms pending) for the failed control complex.

Single ECI Failure

When a single ECI circuit pack fails, a ECI circuit pack *restart* is initiated. Link communications is temporarily lost (approximately two minutes) during the *restart*. Depending on which ECI circuit pack fails, one of the following system response takes place:

- When the ECI circuit pack your terminal or the X.25 network to which it is connected to fails, communications with the frame are lost, the minor alarm indicators become active, an autonomous *call redirect* (X.25 networks supporting call redirect only) to the working ECI circuit pack is started, and an autonomous restart of the working ECI circuit pack is performed. The restart of the working ECI circuit pack takes up to two minutes to complete.

  When the restart is completed, the TTY1 link of the working ECI circuit pack is put into service and all login sessions are disconnected.
- When the ECI circuit pack your terminal or the X.25 network to which it is **not** connected to fails, the minor alarm indicators become active and the ECI circuit pack you are connected to is restarted. During the restart (up to two minutes), any command that you entered is acknowledged with an `RL` or `NA` response.

  After the restart is completed, all the links associated with the working ECI circuit pack are taken down (ending all login sessions) and immediately brought back into service. That is, you must log in again to access the system.

Major Alarms

Major alarms (both service-affecting and non-service-affecting) are caused by the following events:

- Blown primary fuse(s)
- Blown secondary fuses in Switch Power Module for fuses associated with SWIO, SWCS, or active CC circuit packs
- Blown secondary fuses in OPEX Power Module for fuses associated with OPEX circuit packs
- Blown secondary fuses in the Switch Power Module for fuses associated with CLKGN or SYNC circuit packs
- Power circuit pack failures
- Loss of -48 Vdc feeder (causes power circuit pack to alarm)
- Blown fuse(s) in the Memory Storage Module (both PRI disk drive affected)
- Main Controller (MC) failures (active or both CCs fails) or manual removal
- ECI circuit pack failure
- Both synchronizer sides fail
- DPLL, TBS3, DS1TX, and CLKGN circuit pack failures
- Both PRI disk drives fail
- Unit controller (UC) failures
- Interface circuit pack failures when active and not protected
- Protection switch failures
- Internal clock, signal failures, or optical fiber associated with interface (MUX, SMUX, DS1IF, or SWIF), switch (SWIO, SWCS, or OPEX), and clock generator (CLKGN) circuit packs when active and not protected
- Fan assembly failure
- Fan filter replacement indicator (fan assembly WP9231024)
  Incoming DS1, DS3, STS-1, or VT1.5 signal failures when attributes are set to MJ
- Remote Unit Interface (RUI) failures.

Minor Alarms

Minor alarms (service-affecting and non-service-affecting) are caused by the following events:

- Internal clock and signal failures associated with interface (MUX, SMUX, DS1IF, or SWIF), switch (SWIO or SWCS), and clock generator (CLKGN) circuit packs when protected
- Blown secondary fuses in Switch Power Module for fuses associated with protected SWIO and SWCS circuit packs
- Blown secondary fuses in OPEX Power Module for fuses associated with protected OPEX circuit packs
- Blown secondary fuses in Switch Power Module for fuses associated with one PRI disk drive, SEC disk drive, or stand-by CC circuit packs
- Blown secondary fuses in Switch Power Module for fuses associated with CLKGN or SYNC circuit packs
- Interface circuit pack failures in an interface module when protected
- Main Controller (MC) failures when only the stand-by CC fails
- BITS timing reference failures
- DS1TX circuit pack failures
- Single PRI or SEC disk drive failure
- CILINK failure (including OOS-PRTCL state)
- PMGR1 circuit pack failures
- DS3PM2 circuit pack failures
- Time of day clock failure
- Autonomous switch to protection is in progress
- Manual switch to protection is active
- Incoming DS1, DS3, STS-1, or VT1.5 signal failures when attributes are set to MN

Turning Off Audible Alarm

This procedure is used to turn off the audible alarm associated with the DACS IV-2000 Switch Complex and associated collocated interface bays and/or Remote Complexes. This procedure does not clear other alarm indicators, and does not disable future alarms. To clear failures, refer to the section titled "Isolating Failures" (page 15-12).

1. Turn off the audible alarm by pushing the ACO button on the Switch Complex status panel to turn off audible alarms associated with the Switch Complex and collocated interface bays, pushing the LOCAL ACO button on the Remote Complex status panel to turn off audible alarms associated with the Remote Complex or by entering the following command:

   `OPR-ACO:`*[a]*`:`*b*`;`

   Where:

   a = Target ID of frame with alarm(s)

   b = Equipment location: `{ ALL, LOCAL, RX-[1,2] }`
   Specifies the location to turn off audible alarms.

   - `ALL` — specifies the Switch Complex and its associated Remote Complex
   - `LOCAL` — specifies the Switch Complex only
   - `RX` — specifies the associated Remote Complex only

   The green ACO (Switch Complex) or LOCAL ACO (Remote Complex) LED on the status panel lights and the audible alarm is silenced.

Isolating Failures

The DACS IV-2000 provides compatibility with Bell Communications Research's (Bellcore) Operations Systems/Intelligent Network Elements (OPS/INE), and Network Monitoring and Analysis (NMA) operations systems. Isolating failures can be done at a remote maintenance center by communicating with the DACS IV-2000, normally through an X.25 PAD network.

These procedures can be used by personnel at a remote maintenance center (through an X.25 PAD network) to clear and/or direct personnel at the frame to clear alarms or by personnel (using a communications interface terminal [CIT]) at the frame. In the case of most equipment failures, maintenance must be performed at the frame.

NOTE:
If all battery plants that power the Switch Complex fail (causing loss of power to the entire frame), refer to the section titled "Emergency Power Restoration" (page 21-6) to restore power before performing any other procedure.

Prioritizing Alarms

This procedure isolates and prioritizes alarms to be cleared. After the highest priority alarm has been determined, the alarm is isolated to the equipment or facility that is causing the alarm. After the alarm is isolated, you are directed to the appropriate procedure for clearing the alarm. The referenced procedure indicates whether the alarm can be cleared remotely or must be cleared at the frame.

It is recommended that you have a printer working and available to aid in isolating and clearing alarms. (Refer to the section titled "Adding a Printer" (page 9-24), if necessary.)

NOTE:
When the active DPLL or TBS3 circuit pack fails or associated fuse fails, the DACS IV-2000 initiates a autonomous synchronizer switch. During this switch, several `REPT ALM`, `REPT SW`, and `REPT DBCHG` messages are output indicating temporary alarm states of facilities and equipment and protection switches during the synchronizer switch. These alarms and protection switches clear once the standby synchronizer becomes active. After the series of messages, you can enter the **`RTRV-ALM-ALL`** or **`RTRV-ALM-EQPT`** command to determine which synchronizer circuit pack has failed.

1. Check to see if the MC FAIL alarm indicator (MC FAIL LED on the status panel) is active.

   If the MC FAIL alarm indicator is active and remains active for ten minutes, a hard failure has occurred and service at the frame is necessary to clear the equipment failures. To clear these type of failures, either personnel at the frame or service personnel must be sent to the frame to perform the following procedure:

   a. Check for and/or replace blown primary fuses in the fuse and alarm panels in the Switch Bays and in the OPEX Bay's Fuse and Alarm Panel if the system has a remote complex. Use the section titled "Primary Fuses" (page 15-79). Replacement fuses may be necessary (see fuse chart in the referenced procedure information).

   b. Check for and/or replace failed High-Capacity Controller PWRJ circuit pack(s) located in Switch Power Modules 1 and 3. Use the section titled "Power Circuit Pack Failure" (page 15-93). Replacement PWRJ circuit packs may be necessary (up to 12).

   c. Check for and/or replace blown secondary fuses in the fuse boards FBK-4 located in the Switch Power Modules 1 and 3. Use the section titled "Power Circuit Pack Failure" (page 15-93). Replacement fuses may be necessary (see fuse chart in the referenced procedure information).

   d. Check for and/or replace failed High-Capacity Controller circuit packs. Use the section titled "High Capacity Controller Failure" (page 15-145). Replacement High-Capacity Controller circuit packs may be necessary (two CPU3, two SSC4, four MTC4, two ECI6, four SCI3, and two UI2 circuit packs).

2. If you are logged in already, continue with Step 3; otherwise, log into the DACS IV-2000. Refer to the logging in procedures in Chapter 4, if necessary.

   If you cannot log into the DACS IV-2000, refer to the section titled "Link Communication Failures" (page 15-33).

3. Verify that the alarm is on the DACS IV-2000 by entering the following command:

   RTRV-ALM-COM: *[a]*;

   Where:

   a = Target ID of frame with alarm(s)

   The following output response appears (any pertinent parameter shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :NTFCNCDE,CTYPE,SRVEFF */
   " :c, d, e"
;
```

   Where:

   c = Notification code: { CR, MJ, MN }

   d = Condition type: { FAC, INT, GP }
   The value GP is specified for major or minor alarms.

   e = Service affecting: { NSA, SA }

   The message returned from the above command indicates the highest alarm level on the frame (critical, major, or minor). In addition, the **RTRV-ALM-COM** command indicates if an equipment (INT) or facility (FAC) failure caused a critical alarm and if the highest alarm level is service affecting.

   If there is an alarm present on the frame, continue with Step 5. If the **RTRV-ALM-COM** command is denied with the SNVS error code, continue with Step 4.

   If the message does not contain a notification code (CR, MJ, or MN), there are no pending alarms for the specified DACS IV-2000. If this is the case, do not continue with this procedure for the specified system (Target ID).

4. Reset the system by entering the following command:

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

`INIT-SYS:`*[a]*`::::9;`

Where:

a = Target ID (optional)

Restoring the main controller takes up to 20 minutes to complete. For more information on booting the system, refer to the section titled "Reset and Boot" (page 8-7).

After the main controller is in-service, return to Step 2.

5. Check for the number of active alarms and note the reported alarm levels for each alarm (on the output from the printer) by entering the following `RTRV` commands:

   - To determine all near-end alarms associated with the DACS IV-2000 frame:

     Near-end alarms:

     `RTRV-ALM-ALL:`*[a]*`;`

     Where:

     a = Target ID (optional)

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

   - To determine all far-end alarms associated with remote multiplexers connected to MUX2/MUX3 circuit packs:

     Far-end alarms:

     `RTRV-ALM-EQPT:`*[a]*`:`*b*`:::,,,FEND;`
     `RTRV-ALM-T1:`*[a]*`:`*b*`:::,,,FEND;`
     `RTRV-ALM-T2:`*[a]*`:UNIT-1&&-64;`
     `RTRV-ALM-T3:`*[a]*`:UNIT-1&&-64:::,,,FEND;`

     Where:

     a = Target ID (optional)

     b = MUX2/MUX3 circuit pack location: `MUX-[1-64]-[1-31]`

6. If you are at the frame and you did not receive an alarm message for any interface circuit pack associated with a flashing red ALM LED, determine the condition that is causing the ALM LED to flash by entering the following commands:

   `RTRV-COND-EC1:`*[a]*`:`*b*`;`
   `RTRV-COND-VT1:`*[a]*`:`*b*`;`
   `RTRV-COND-T1:`*[a]*`:`*b*`;`
   `RTRV-COND-T1:`*[a]*`:`*b*`:::,FEND;`
   `RTRV-COND-T2:`*[a]*`:`*b*`;`
   `RTRV-COND-T2:`*[a]*`:`*b*`:::,FEND;` (TR9 remote multiplexer communications only)
   `RTRV-COND-T3:`*[a]*`:`*b*`;`
   `RTRV-COND-T3:`*[a]*`:`*b*`:::,FEND;`
   `RTRV-COND-EQPT:`*[a]*`:`*b*`:::,FEND;`

   Where:

   a = Target ID (optional)

   b = T1 with FEND specified location: `MUX-[1-64]-[1-31]`
   T1 with NEND (default) specified location: `[ UNIT-[1-64], SWIF-[1-64]-[1-8] ]`
   T2, T3, and EQPT location: `[ UNIT-[1-64], [1-64]-[1-31] ]`
   EC1 location: `[ UNIT-[1-64], [1-64]-[1-15] ]`
   VT1 location:
   VT1.5 port number: `[ [1-64]-[1-15]-[1-28], UNIT-[1-64] ]`
   VT1.5 Group Number: `[ [1-64]-[1-15]-[1-7]-[1-4] ]`

NOTE:
Alarm conditions determined from the `RTRV-COND` commands are cleared after all critical, major, and minor alarms have been cleared.

7. If there are multiple alarms, use Table 15-3 to determine which alarm must be cleared first. Table 15-3 is based on three criteria: the priority of the alarms (CR for critical, MJ for major, and MN for minor), whether the alarm is service-affecting (SA) or not service-affecting (NSA), and the part of the system that has the alarm (EQPT for equipment or FAC for an interface port). Critical alarms caused by near-end equipment failures are identified as major, service-affecting alarms by the `RTRV-ALM-ALL` command. Critical alarms caused by failures of incoming DS1, DS3, VT1.5, and STS-1 signals (ports) are identified as major, service-affecting alarms by the `RTRV-ALM-ALL`, or `RTRV-ALM-[T1/T2/T3/EC1/VT1]` commands. If there is a critical alarm generated by a port failure (FAC) and there is more than one major, service-affecting alarm associated with ports, pick any one of them to clear first.

Table 15-3. **Prioritizing Alarm Clearance**

Alarm Level	Affect on Service	Segment of System	Priority
CR	SA	equipment (INT)	1st
CR	SA	port (FAC)	2nd
MJ	SA	equipment	3rd
MJ	NSA	SYNC equipment*	4th
MN	NSA	SYNC equipment*	5th
MJ	SA	port	6th
MN	SA	port	7th
MJ	NSA	equipment	8th
MN	NSA	equipment	9th
MJ	NSA	port	10th
MN	NSA	port	11th

* Under certain conditions, SYNC equipment alarms can cause port alarms.

8. Determine the condition that caused the alarm (highest priority selected in the previous step) from the condition type parameter output in the `RTRV-ALM-ALL`, `RTRV-ALM-EQPT`, or `RTRV-ALM-[T1/T2/T3/EC1/VT1]` commands.
9. Depending on which `RTRV` command yields the information about the alarm to be cleared, consult Table 15-4 for near-end equipment failures (`RTRV-ALM-ALL` command), Table 15-5 for far-end equipment failures (`RTRV-ALM-EQPT` and `RTRV-COND-EQPT` command), Table 15-6 for near- and far-end T1 facility failures (`RTRV-ALM-ALL` [near-end] and `RTRV-ALM-T1` [far-end] commands), Table 15-7 for near- and far-end T2 facility failure (`RTRV-ALM-ALL` [near-end] and `RTRV-ALM-T2` [far-end] commands), Table 15-8 for near- and far-end T3 facility failures (`RTRV-ALM-ALL` [near-end] and `RTRV-ALM-T3` [far-end] commands), Table 15-9 for near-end EC1 facility failures (`RTRV-ALM-ALL` or `RTRV-ALM-EC1` command), or Table 15-10 for near-end VT1 facility failures (`RTRV-ALM-ALL` or `RTRV-ALM-VT1` command). The procedure to use to clear the selected alarm is determined by the condition type determined in Step 8.
10. If there are multiple alarms, return to Step 8 to determine the next alarm to clear.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
ALLREFFAIL (all timing references failed)	SYNCN	"External Timing Reference (BITS) Failure" (page 15-175)	X	
BKUPMEMS (secondary non-volatile backup failure)	SEC	"CPY-MEM Command Failure" (page 16-9)	X	
CONTBUS (control bus failure)	SWCS SWIO	"Clearing CONTBUS Conditions" (page 15-164)	X	
DTLCH (data latch error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
EOR (end-of-range error) [Version 2 SYNC circuit packs only]	SYNCPRI -{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
EXJIT (excessive jitter) [Version 1 SYNC circuit packs only]	SYNCPRI -{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
EXPHR (excessive phase error)	SYNCPRI -{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
EXTERR (error detected external to system)	CILINK-{1,2}-{1-8}	"Link Communication Protocol Failures (OOS-PRTCL)" (page 15-36)	X	X
FANAUX (fan auxiliary power failure detected)	FAN-{1-4,6-9,11-13,15-18,20-23}	"Fan Assembly Failure" (page 15-169)	X	
FANFILTER (fan filter is clogged)	FAN-{1-4,6-9,11-13,15-18,20-23}	"Fan Filter Alarm" (page 15-173)	X	

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
FANMAIN (fan main power failure detected)	FAN-{1-4,6-9,11-13,15-18,20-23}	"Fan Assembly Failure" (page 15-169)	X	
FANUNIT (fan hardware failure detected)	FAN-{1-4,6-9,11-13,15-18,20-23}	"Replacing a Fan Assembly" (page 17-17)	X	
FRD (security violation has occurred)	CILINK-{1,2}-{1-8}	"Link Communication Failures" (page 15-33)	X	X
FRQOF (frequency offset error) [Version 1 SYNC circuit packs only]	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
FSNLN (frequency synthesizer loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
FSTO (phase lock loop fast start time-out)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
ICTLR (interrupt controller error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
IHRER (interrupt holding register error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
IMPROPBLK (blank BXA circuit pack in wrong slot)	DS1IF DS1IP MUX MUXP SMUX SMUXP SWIF SWIF-P (protection)	"Clearing IMPROPBLK Conditions" (page 15-60)	X	X

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
IMPROPRMVL (circuit pack improperly extracted)	CLKDR CLKGN DS1IF DS1IP DS1RY MUX MUXP MUXPS MC circuit packs OPEX PWRE PWRG PWRJ RPWRA RPWRF RPOWERE-SW SMUX SMUXP SWCS SWIF SWIF-P (protection) SWIO	"Clearing IMPROPRMVL Conditions" (page 15-61)	X	
INHSWPR (switch to protection equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWPR Conditions" (page 15-63)	X	X
INHSWWKG (switch to working equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWWKG Conditions" (page 15-63)	X	X

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
INT (internal hardware failure)	PWRE PWRG PWRJ RPWRA RPWRF RPOWERE	"Primary Fuses" (page 15-79) for blown primary fuses and/or "Power Circuit Pack Failure" (page 15-93) for failed circuit packs	X	
	CILINK-{1,2}-{1-8}	"Link Communication Protocol Failures (OOS-PRTCL)" (page 15-36)	X	X
	MC CC-0/CC-1 CPU-0/CPU-1 ECI-1/ECI-2 MTC-0-1/MTC-0-2 MTC-1-1/MTC-1-2 PRI-1/PRI-2 SCI-0-1/SCI-0-2 SCI-1-1/SCI-1-2 SSC-0/SSC-1 UI-0/UI-1	Critical or Major alarms: "Primary Fuses" (page 15-79) for blown PWRJ circuit pack fuses, "Power Circuit Pack Failure" (page 15-93) for failed PWRJ circuit packs, "Power Circuit Pack Failure" (page 15-93) for blown High Capacity Controller circuit pack fuses, and/or "High Capacity Controller Failure" (page 15-145) for High Capacity Controller circuit pack failure	X	
		Minor Alarms (Stand-by Control Complex): "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177)	X	

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
INT (internal hardware failure) [continued]	SEC	"Minor Alarms Due to High-Capacity Controller Failure" (page 15-177) for blown fuses and/or "CPY-MEM Command Failure" (page 16-9) for other alarm conditions	X	
	DPLL TB (TBS3) TX (DS1TX)	Critical alarm: "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41) Major or Minor alarms: "Synchronizer Module Failure" (page 15-40)	X	
	UC	"Primary Fuses" (page 15-79) for interface bay PWRE circuit packs, "Power Circuit Pack Failure" (page 15-93) for interface bay PWRE circuit packs, and/or "Unit Controller Failure" (page 15-152) for unit controller circuit pack failure	X	X
	CLKDR DS1IF MUX OPEX SMUX SWIF	"Primary Fuses" (page 15-79) for blown interface bay PWRE circuit pack fuses, "Power Circuit Pack Failure" (page 15-93) for failed interface bay PWRE circuit packs, and/or "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) for failed interface module circuit packs	X	

Table continued on next page.

Table 15-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
INT (internal hardware failure) [continued]	DS1IP DS1RY MUXP MUXPS SMUXP SWIF-P (protection)	"Primary Fuses" (page 15-79) for blown interface bay PWRE circuit pack fuses, "Power Circuit Pack Failure" (page 15-93) for failed interface bay PWRE circuit packs, and/or "Protection Circuit Pack Failures" (page 15-167) for failed protection switch circuit packs	X	
	RUI	"Remote Unit Interface Failure" (page 15-151)	X	
	CLKGN OPEX SWCS SWIO	"Primary Fuses" (page 15-79) for blown PWRJ circuit pack fuses in the switch bay, "Power Circuit Pack Failure" (page 15-93) for failed PWRJ circuit packs, "Power Circuit Pack Failure" (page 15-93) for blown SWIO and SWCS Module circuit pack fuses, and/or "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) for failed SWIO and SWCS Module circuit packs	X	
	DS3PM MUX (PMGR) SWIF (PMGR)	"PMGR1 and DS3PM2 Circuit Pack Failures" (page 15-182)	X	
	RFAN	"Fan Assembly Failure" (page 15-169)	X	

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
LERDF (line error detector failure)	TX (DS1TX)	"DS1TX Circuit Pack Failure" (page 15-54)	X	X
LOF (loss of frame)	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
LOS (loss of signal)	SYNCPRI-{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
MAN (manual removal of equipment)	CC-0/CC-1 DS3PM MC PRI-1/PRI-2 RUI-{1,2} SEC SYNC-0/SYNC-1 TX (DS1TX) UC	"Clearing MAN Conditions" (page 15-59)	X	X
PFLCH (phase/frequency readable output latch error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
PHSTP (phase step error)	SYNCPRI-{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
PSHLN (phase shifter output loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
RAMER (RAM error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
ROMER (ROM error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
RTV (real-time violation)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	

Table continued on next page.

Table 15-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
SYNCCLK0 (Clock side 0 hardware failure)	CLKGN-0 SWCS SWIO	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 15-165)	X	
SYNCCLK1 (Clock side 1 hardware failure)	CLKGN-1 SWCS SWIO	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 15-165)	X	
SYNCFRNG (synchronizer has made a transition into free-running mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 15-54)	X	X
SYNCFST (synchronizer has made a transition into fast-start mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 15-54)	X	X
SYNCHLDOVR (synchronizer has made a transition into holdover mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 15-54)	X	X
SYNCPRI (synchronizer has detected failure and isolated it to the primary timing reference)	SYNCN	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
SYNCSEC (synchronizer has detected failure and isolated it to the secondary timing reference)	SYNCN	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
SYPLN (sync pulse generator loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	

Table continued on next page.

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
TBIOER (time base communication error)	TB (TBS3)	"TBS3 Circuit Pack Failure" (page 15-52)	X	
TBLEN (time base strobe loss of energy)	DPLL TB (TBS3) TX (DS1TX)	"Synchronizer Module Failure" (page 15-40)	X	
TBNDF (time base strobe energy detector failure)	TX (DS1TX	"DS1TX Circuit Pack Failure" (page 15-54)	X	
TODC (time-of-day clock failure)	ECI-1/ECI-2	"Time of Day Clock Failure" (page 15-185)	X	X
TRBER (high bit error rate > 10^{-3})	SYNCPRI-{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
TRMNBER (minor bit error rate > 10^{-6}) (version 1 Sync circuit packs only)	SYNCPRI-{0,1} SYNCSEC-{0,1}	"External Timing Reference (BITS) Failure" (page 15-175)	X	X
URTER (UART error)	DPLL	"DPLL Circuit Pack Failure" (page 15-45)	X	
WRNGPWR	PWRJ	"Changing PWRJ (568A) to PWRJ (568B)" (page 19-19)		
X1LEN (loss of energy on 1-ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
X3LEN (loss of energy on 30-ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	

Table continued on next page

Table 15-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
XCOOL (synchronizer cross-couple out-of-lock error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
XCRTV (synchronizer cross-couple real-time violation error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
XCSUM (synchronizer cross-couple summary error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
XFLRG (synchronizer cross-couple fast lock range error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
XFQOF (synchronizer cross-couple frequency offset error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	
XLKDN (synchronizer cross-couple communication link error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 15-48)	X	

Table 15-5. **Procedures for Far-End Equipment Condition (RTRV-ALM-EQPT or RTRV-COND-EQPT)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
ACPWR (AC power failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 15-75)	X	X
COM (common equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 15-75)	X	X
DS1IF (DS1 interface equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 15-75)	X	X
MUX (multiplex equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 15-75)	X	X

Table 15-6. **Procedures for T1 Facility Condition (RTRV-ALM-ALL [Near-End], RTRV-ALM-T1 [Far-End], or RTRV-COND-T1 [Near- and Far-End])**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
LOF (loss of frame) LOS (loss of signal) OOF (out-of-frame — MUX3)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X
AIS (DS1 alarm indication signal detected — MUX3) DS1-AIS (DS1 alarm indication signal detected) YEL (carrier group alarm, yellow, outgoing direction)	NEND	"Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions" (page 15-65)	X	X
INC (incoming DS1 failure) MINC (multiple incoming DS1 failures)	FEND	"Remote Multiplexer Signal Failure" (page 15-75)	X	X

Table continued on next page.

Table 15-6. **Procedures for T1 Facility Condition (RTRV-ALM-ALL [Near-End], RTRV-ALM-T1 [Far-End], or RTRV-COND-T1 [Near- and Far-End]) (Continued)**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
Table continued on next page.				
T-BER (bit error rate threshold exceeded)	NEND	"Clearing T-BER and T-BERL Conditions" (page 15-64)	X	X
DLI (data link inaccessible — MUX3) DLN (data link not responding — MUX3)	NEND	"Clearing DLI or DLN Conditions" (page 15-74)	X	X

Table 15-7. **Procedures for T2 Facility Condition (RTRV-ALM-ALL [Near-end], RTRV-ALM-T2 [Far-end], or RTRV-COND-T2 [Near- and Far-End])**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
OOF (out of frame)	FEND	"Remote Multiplexer Signal Failure" (page 15-75)	X	X
OOF (out of frame)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X

Table 15-8. **Procedures for T3 Facility Condition (RTRV-ALM-ALL [Near-end], RTRV-ALM-T3 [Far-end], or RTRV-COND-T3 [Near- and Far-End])**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
DS3FRMTMISMATCH (DS3 format mismatch - MUX2/MUX3) LOS (loss of signal) OOF (out of frame)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X
AIS (alarm indication signal detected — MUX1/MUX3) AISFRAMED (framed alarm indication signal detected — MUX2/MUX3) AISUNFRAMED (unframed alarm indication signal detected — MUX2/MUX3) ALLDS2SOOF (all DS2s in a DS3 signal are out of frame) IDLE (idle signal detected)	NEND	"Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions" (page 15-65)	X	X
T-BER (bit error rate threshold exceeded)	NEND	"Clearing T-BER and T-BERL Conditions" (page 15-64)	X	X

Table continued on next page.

Table 15-8. **Procedures for T3 Facility Condition (RTRV-ALM-ALL [Near-end], RTRV-ALM-T3 [Far-end], or RTRV-COND-T3 [Near- and Far-End]) (Continued)**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
AIS (alarm indication signal detected) IDLE (idle signal detected) INC (incoming DS1 failure) OOF (out of frame) SBITFAIL (SBIT communications protocol failure indicating that the far end is not responding to [acknowledging] near-end SBIT protocol communication) YEL (carrier group alarm, yellow, outgoing direction)	FEND	"Remote Multiplexer Signal Failure" (page 15-75)	X	X
SWSLMF (signal label match failure - MUX3)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X
IDMISMATCH (DS3 path ID mismatch - MUX2/MUX3)	NEND	"Clearing IDMISMATCH Conditions" (page 15-74)	X	X
IDUNREADABLE (DS3 path ID unreadable - MUX2/MUX3)	NEND	"Clearing IDUNREADABLE Conditions" (page 15-75)	X	X

Table 15-9. **Procedures for EC-1 Facility Condition (RTRV-ALM-ALL, RTRV-ALM-EC1, or RTRV-COND-EC1)**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
AISL (alarm indication signal detected, line) AISP (alarm indication signal detected, path) FERF (far-end receive failure) YEL (carrier group alarm, yellow outgoing direction)	NEND	"Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions" (page 15-65)	X	X
LOF (loss of frame) LOP (loss of pointer LOS (loss of signal) SLMF (signal label match failure)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X
T-BERL (line bit error rate threshold exceeded)	NEND	"Clearing T-BER and T-BERL Conditions" (page 15-64)	X	X

Table 15-10. **Procedures for VT1.5 Facility Condition (RTRV-ALM-ALL, RTRV-ALM-VT1, or RTRV-COND-VT1)**

Condition Type	Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
AISP (alarm indication signal detected, path) YEL (carrier group alarm, yellow outgoing direction)	NEND	"Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions" (page 15-65)	X	X
LOP (loss of pointer)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions" (page 15-65)	X	X

Alarm Clearing Procedures

This section contains alarm clearing procedures referenced in the previous section titled "Prioritizing Alarms" (page 15-12). The "Prioritizing Alarms" procedure should be performed first to determine and isolate the highest priority alarm. Alarms must be cleared in the order of priority.

Link Communication Failures

Communications with the DACS IV-2000 can be lost due to:

- Invalid login session setup attempts (FRD alarm condition, link lock-out)
- Equipment failure (fuses [including those associated with CILINKs], power supplies, and controller circuit packs)
- X.25 PAD network failures
- Terminal/CILINK parameter mismatch
- Communication protocol errors
- RCI circuit pack failure - Remote Complex links (CILINK 1-7, 1-8, 2-7, and 2-8)

Failures not related to equipment on the frame can be fixed remotely.

If you cannot log into the frame (that is, you do not get the login prompt or the ACT-USER command is not accepted) and the MC FAIL alarm indicator is inactive (no indication on the remote main controller alarm for remote locations or the red MC FAIL LED on the status panel is not lit at the frame), use the procedures in this section to clear the trouble. See the following note for alarms associated with the FRD condition.

NOTE:
Links can appear locked if the number of unsuccessful login attempts exceeds the provisioned number for the provisioned interval (FRD alarm condition). The link lockout is released when the provisioned lockout interval has elapsed. Information regarding security link parameters (including the UID causing the lock-out) can be retrieved using the RTRV-SECU-LINK command on a link that is not locked-out. Security link parameters can only be changed by superusers with the ED-SECU-LINK command. The FRD condition clears autonomously after the lock-out time (set by the ED-SECU-LINK command) has expired (that is, there is no alarm clearing procedure required for this condition). Refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for more information on security link parameters and superusers.

If the MC FAIL alarm is active (an indication on the remote main controller alarm for remote locations or the red MC FAIL LED on the status panel is lit at the frame), refer to the section titled "Prioritizing Alarms" (page 15-12). If, after performing all the procedures in this section, you still cannot log in, consult with your system administrator or next level of support for assistance.

Fuses Associated with CILINKs

High-Capacity Controller Module Fuses

There are four 2-amp fuses associated with the links. Two are located on FBJ for ECI-1, and two are located on FBL for ECI-2. The fuse boards FBJ and FBL are located in the Memory Storage Module. If any one of these four fuses is blown, you can lose communications with the system. Perform the following procedure to replace blown fuses associated with CILINKs.

NOTE:
Failure of the +12V fuses (type 77G) for an ECI circuit pack can cause the output associated with the CILINKs to be garbled until the DACS IV-2000 starts the ECI restart process.

If there are alarms associated with ECI circuit packs (for example, blown ECI fuses in FBK-4 in Switch Power Modules 1 and/or 3), clear those alarms first before using this procedure [refer to the section titled "Prioritizing Alarms" (page 15-12)].

1. Check for and replace all blown CILINK fuses (2-amp ECI circuit pack fuses in fuse boards FBJ and FBL). Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
2. Check to make sure all cables connected to the failed links are secure.

Remote Complex Fuses

There are two 5-amp fuses associated with the RCI circuit packs, and they are for +5V supplied to the RCI circuit packs. When these fuses blow, communication with the CILINKs associated with the Remote Complex can be interrupted. The fuse for link 7 (RCI-1) is located on fuse board FBF, and the fuse for link 8 (RCI-2) is located on fuse board FBG.

If there are alarms associated with ECI circuit packs in the HCC Module, clear those alarms first before using this procedure [refer to the section titled "Prioritizing Alarms" (page 15-12).

1. Check for and replace all blown RCI circuit pack fuses (5-amp RCI circuit pack fuses in fuse boards FBF and FBG). Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
2. Check to make sure all cables connected to the failed links are secure.

3. If the fuses for the RCI circuit packs are good, the cable connections are secure, and the associated link is in the OOS-FLT state, obtain a new RCI circuit pack.
4. From another CILINK, remove the failed link from service by entering the following command:

   `RMV-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{7,8}`
5. Extract the RCI circuit pack associated with the failed link. Refer to Chapter 2 for extracting circuit packs, if necessary.
6. Install the RCI circuit pack obtained in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
7. From another CILINK, restore the link removed from service in Step 4 by entering the following command:

   `RST-LINK:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{7,8}`

   If after replacing the RCI circuit pack, the failed link remains in the OOS-FLT state, contact the system administrator or next level of support for assistance in clearing the link failure.

Printer Problems

If you are using a printer in tandem with your terminal, link communications can be lost due to printer problems. Use the following procedure to check for and clear printer problems.

1. Check to make sure the printer is receiving AC power. That is, is the printer plugged in and turned on, is the printer fuse blown, or is the outlet that the printer is plugged into, out of service. If the printer is not receiving AC power, restore it; otherwise, continue with this procedure.
2. Check the printer for paper. If out, add paper and restore printer to on-line (according to the instructions associated with the printer); otherwise, continue with this procedure.
3. Check to see if the printer is off-line. If off-line, restore printer to on-line according to the instructions associated with the printer; otherwise, continue with this procedure.

4. Check to see if the printer communications protocol is set properly. The printer must be connected to the DACS IV-2000 as described in the section titled "Adding a Printer" (page 9-24). If the protocol is set properly continue with this procedure.
5. If any of the previous actions taken did not restore the printer to service, replace the printer. Refer to the section titled "Adding a Printer" (page 9-24), if necessary.

Link Communication Protocol Failures (OOS-PRTCL)

Administration links (CILINKs) can go out of service due to protocol failures. These types of failures are caused by:

- Snider links — terminal and CILINK parameter mismatch, usually mismatches with flow control settings of the interface terminal.
- X.25 PAD links — external equipment to the DACS IV-2000 is improperly connected or the X.25 PAD network has failed.

Restoring proper protocol to the affected CILINK, in most cases, allows the CILINK to autonomously switch back to service allowing you to log in properly. If you are still unable to log in, perform the following procedure:

1. Check to make sure all cables connected to the failed links are secure and have the correct adapters (refer to office records and Table 1-8, if necessary).
2. If you are using an X.25 PAD network, contact personnel responsible for the X.25 PAD network to verify it is working properly.
3. From a CILINK that is active, log into the system (refer to logging in procedures in Chapter 4, if necessary) or request personnel at an active link to log in and direct them to perform the rest of this procedure.

   If no communications are available from any link, refer to the section titled "Recover From Loss of All CILINKs" (page 15-39).
4. If all cables are connected properly, the link that is OOS-PRTCL may need to be removed and restored to service by performing the following procedure:

   a. Determine which CILINKs are OOS-PRTCL by entering the following command:

      `RTRV-PRMTR-LINK:`*[a]*`:ALL;`

      Where:

      a = Target ID (optional)

The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,..."
    "..."
;
```

Where:

d = Link location: `CILINK-{1,2}-{1-8}`

e = Link state: `{ IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }`

From the above message, note the values of the link location (*d*) and state (*e*) parameters for each link.

b. Remove the failed link from service by entering the following command:

`RMV-LINK:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

c. Restore the failed link to service by entering the following command:

`RST-LINK:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

5. If the failed link is still OOS-PRTCL, verify that the flow control parameter is correct for the terminal which is connected to the failed link:
   - **ACK** — terminals with flow control (Snider link connections)
   - **DC3** (XON/XOFF) — computers or terminals without flow control (X.25 link connections)
6. If the flow control setting is incorrect, correct the mismatch by performing the following procedure:

   a. Log off the failed link (if logged on) by entering the following command:

   `CANC-USER:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

   b = User ID: <1 to10 UID legal characters>

b. Remove the failed link from service by entering the following command:

`RMV-LINK:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

c. Edit the flow control parameter of the failed link that was removed in Step 6b by entering the following command:

`ED-PRMTR-LINK:`*[a]*`:`*b*`::,,,,,`*[i]*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

i = Flow control: `{ DC3, ACK }`

d. Restore the link that was removed in Step 6b to service by entering the following command:

`RST-LINK:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

If this command is denied, refer the problem to your system administrator or next level of support for assistance. Otherwise, continue with Step 7.

7. Verify the state of the failed link by entering the following command:

`RTRV-PRMTR-LINK:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-8}`

The following output response appears (only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
   /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
   "d:e,..."
   "..."
;
```

Where:

d = Link location: `CILINK-{1,2}-{1-8}`

e = Link state: `{ IS, OOS-FLT, OOS-PRTCL, OOS-MTCE }`

If the link state (*e*) is IS, you are done with this procedure. If the link state is OOS-PRTCL, refer the problem to your system administrator or next level of support for assistance.

Recover From Loss of All CILINKs

CAUTION:
Only perform this procedure if directed to do so by your system administrator or a previous procedure. This procedure is performed only if communications has been lost to all CILINKs and cannot be autonomously restored to service by fixing other equipment failures or external terminal/X.25 PAD network failures.

1. Check to make sure all cables connected to CILINKs are secure.
2. If you are using an X.25 PAD network, contact personnel responsible for the X.25 PAD network to verify it is working properly.
3. Make sure your terminal is set to the proper protocol settings. The values to look for are:

   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Flow Control:
   DC3 (Terminal connection)
   ACK (Computer connection)
   Answerback: ACK (only if flow control is also ACK)
4. Connect a terminal to the TTY1 connector of either ECI circuit pack. Refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary.
5. If CILINKs on both ECI circuit packs are out-of-service, the system needs to be rebooted. Contact your system administrator or next level of support, for assistance, and refer to the section titled "Reset and Boot" (page 8-7).

Synchronizer Module Failure

The procedures contained in this section are used to clear equipment failures associated with the Synchronizer Module circuit packs. For any failures due to external timing reference (BITS) failure (includes the alarm conditions, EXJIT, EXPHR, FRQOF, LOS, LOF, PHSTP, TRBER, and TRMNBER), go to the section titled "External Timing Reference (BITS) Failure" (page 15-175).

1. If a critical alarm (CR alarm notification in REPT ALM message or RTRV-ALM response) is active due to Synchronizer Module failure, go to the next section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41).
2. Check for blown +5.0V and -5.2V fuses in fuse boards FBK-1-2, FBK-3-2, FBM-1-2, and FBM-3-2 (location K). If there are any blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before continuing with this procedure.
3. If you replace a fuse in Step 2, restore the synchronizer side identified in the alarm message to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: SYNC-[0,1]

   This command takes up to one minute to complete.
4. If there were no blown fuses or the RST-EQPT failed to restore the specified equipment, go to the specified procedure indicated by the alarm condition recorded by the REPT ALM message or RTRV-ALM response:
   - "DPLL Circuit Pack Failure" (page 15-45) — for alarm conditions, DTLCH, EOR, FSNLN, FSTO, ICTLR, IHRER, INT (with equipment location of DPLL), PFLCH, PSHLN, RAMER, ROMER, RTV, SYPLN, and URTER
   - "DPLL Timing Cross-Coupling Failure" (page 15-48) — for alarm conditions, X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, and XLKDN
   - "TBS3 Circuit Pack Failure" (page 15-52) — for alarm conditions, INT (with equipment location of TB), and TBIOER
   - "DS1TX Circuit Pack Failure" (page 15-54) — for alarm conditions (associated with the equipment location TX), INT, LERDF, and TBNDF
   - "DS1TX Circuit Pack Failure" (page 15-54) — for alarm conditions, SYNCFRNG, SYNCFST, and SYNCHLDOVR
   - "Prioritizing Alarms" (page 15-12) — for all other alarm conditions and equipment locations

Critical Alarm Caused by Synchronizer Module Failure

This procedure is used to clear a critical alarm associated with the Synchronizer Module. Since service is affected by this type of failure, it is important to complete this procedure as soon as possible. If there is only a major or minor alarm due to Synchronizer Module failure, go to the previous section titled "Synchronizer Module Failure" (page 15-40).

NOTE:
If the critical alarm associated with the synchronizer is caused by a power failure, the synchronizer will be autonomously restored when power is restored.

1. Notify the system administrator or next level of support that an unprotected failure of the Synchronizer Module has occurred (that is, both synchronizer sides have failed).

CAUTION:
Failure of both synchronizer sides can cause loss of system timing and synchronization. This can impact all cross-connections on the frame.

2. Check for blown +5.0V and -5.2V fuses in fuse boards FBK-1-2, FBK-3-2, FBM-1-2, and FBM-3-2 (location K). If there are any blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before continuing with this procedure.

   Wait a minimum of five minutes for the system to autonomously restore both synchronizer sides. If both synchronizer sides are restored, you are done with this procedure. If only one synchronizer side is autonomously restored, perform Steps 3 through 5 and Step 9. Otherwise, continue with Step 3.

3. Determine which Synchronizer Module circuit packs are in the OOS-FLT state by entering the following command for each type of equipment:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Equipment location: `{ DPLL-{0,1}, TB-{0,1}, TX-{0,1} }`

From the output responses, determine which circuit packs are in the OOS-FLT state. A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = Equipment location: `{ DPLL-{0,1}, TB-{0,1}, TX-{0,1} }`

f = State: `{ OOS-FLT, OOS-FEF, IS }`

The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

4. Obtain necessary Synchronizer Module circuit packs of the same version for all circuit packs indicating an OOS-FLT state.
5. Replace all failed circuit packs with new circuit packs, one at a time. Refer to Chapter 2 for replacing circuit packs if necessary.

NOTE:
If two failed circuit packs are on the same synchronizer side and one is a DPLL circuit pack, replace the DPLL circuit pack first.

After extracting a circuit pack, attach the alarm report.

6. Wait a minimum of five minutes for the system to autonomously restore both synchronizer sides. If both synchronizer sides are restored, you are done with this procedure. If only one synchronizer side is autonomously restored, go to Step 9. If neither synchronizer side is autonomously restored, continue with Step 7.
7. Restore one synchronizer side by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   This command takes up to three minutes to complete. If you replaced a TBS3 circuit pack in Step 5, bit errors can occur for 30 minutes while the oscillator is warming up.

The following message appears only when the replacement DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

Where:

a = Autonomous sequence number: `001-999`

8. If a DS1TX circuit pack associated with the synchronizer side just restored is still in the OOS-FLT state, restore the DS1TX circuit pack by entering the following command:

   `RST-EQPT:`*`[a]`*`:`*`b`*`;`

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: **`TX-{0,1}`**

   This command takes up to one minute to complete.

   Continue with Step 9 even if the restore fails.

   If the TBS3 circuit pack on this synchronizer side was replaced in Step 5, wait 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides can not be switched by software) before continuing this procedure.

9. Restore the other synchronizer side by entering the following command:

   `RST-EQPT:`*`[a]`*`:`*`b`*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: **`SYNC-{0,1}`**

   This command takes up to three minutes to complete. If you replaced a TBS3 circuit pack in Step 5, bit errors can occur for 30 minutes while the oscillator is warming up.

   The following message appears only when the replacement DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

Where:

a = Autonomous sequence number: `001-999`

If the restore fails, contact your system administrator or next level of support for assistance in clearing the trouble. Otherwise, continue with Step 10.

10. If the DS1TX circuit pack associated with the synchronizer side just restored is still in the OOS-FLT state, restore the DS1TX circuit pack by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-{0,1}`

    This command takes up to one minute to complete.

    If the TBS3 circuit pack on this synchronizer side was replaced in Step 5, wait 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides cannot be switched by software) before continuing this procedure.

    If the restore fails, contact your system administrator or next level of support for assistance in clearing the trouble. Otherwise, continue with the next step.

11. If any alarm is present at this time, contact your system administrator or next level of support for assistance in clearing the trouble.

DPLL Circuit Pack Failure

This procedure is used to clear major alarms associated with DPLL circuit packs that are caused by the alarm conditions: DTLCH, FSNLN, FSTO, ICTLR, IHRER, INT, PFLCH, PSHLN, RAMER, ROMER, RTV, SYPLN, and URTER. If a critical alarm is active due to Synchronizer Module failure, go to the previous section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 15-40).

1. Determine which DPLL circuit packs are in the OOS-FLT or OOS-FEF state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:DPLL-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response, determine which DPLL circuit pack is in the OOS-FLT state:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:STATE */
      "DPLL-0:f"
      "DPLL-1:f"
   ;
   ```

   Where:

   f = State: `{ OOS-FLT, OOS-FEF, ACT }`

   If the DPLL circuit pack is in the OOS-FEF state, the associated TBS3 circuit pack has failed [refer to the section titled "TBS3 Circuit Pack Failure" (page 15-52) to clear TBS3 circuit pack failures]. Otherwise, if the DPLL circuit pack is in the OOS-FLT state continue with Step 2.

2. Check for blown +5.0V and -5.2V fuses in fuse boards FBK-1-2, FBK-3-2, FBM-1-2, and FBM-3-2 (location K). If there are any blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before continuing with this procedure.

3. If you replaced a fuse in Step 2, restore the synchronizer side associated with the blown fuse to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to three minutes to complete. The synchronizer side is restored to the STBY state.

If the restore was successful, you are done with this procedure; otherwise, continue with Step 4.

4. Remove the synchronizer side associated with the failed DPLL circuit pack (OOS-FLT state) from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

5. Obtain a diagnostic report for the DPLL circuit pack that failed by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DPLL circuit pack location: `DPLL-{0,1}`

   Diagnostics take up to 15 minutes to complete. This report is used for further reference and/or trouble report generation.

6. Obtain a new DPLL circuit pack of the same version as the failed one.

7. Extract the failed DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

8. Install the new DPLL circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

9. Restore the synchronizer side removed in Step 4 by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   This command takes up to three minutes to complete.

   The following message appears only when the replacement DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

Where:

a = Autonomous sequence number: `001-999`

10. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 9 (standby side) by entering the following command:

    `RST-EQPT:`*`[a]`***`:`***`b`***`;`**

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: **`TX-[0,1]`**

    This command takes up to one minute to complete. The DS1TX circuit pack is restored to the IS state.

11. Retrieve the state of the DPLL circuit pack associated with the synchronizer side restored in Step 9 by entering the following command:

    `RTRV-STATE-EQPT:`*`[a]`***`:`***`b`***`;`**

    Where:

    a = Target ID (optional)

    b = DPLL circuit pack location: **`DPLL-[0,1]`**

    From the following output response, determine the state of the new DPLL circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "DPLL-0:f"
    "DPLL-1:f"
;
```

    Where:

    f = State: `{ OOS-FLT, STBY }`

    If the state of the new DPLL circuit pack is `STBY`, you are done with this procedure.

    If the state of the new DPLL circuit pack is `OOS-FLT`, contact your system administrator or next level of support for assistance in clearing the trouble.

DPLL Timing Cross-Coupling Failure

This procedure is used to clear major and minor alarms associated with DPLL circuit packs that are caused by the following alarm conditions: X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, and XLKDN. If a critical alarm is active due to Synchronizer Module failure, go to the previous section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 15-40).

1. Determine which DPLL circuit pack is in the STBY or OOS-FLT state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:DPLL-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response, determine which DPLL circuit pack is in the STBY or OOS-FLT state:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:STATE */
      "DPLL-0:f"
      "DPLL-1:f"
   ;
   ```

   Where:

   f = State: `{ STBY, OOS-FLT, ACT }`

2. Check for blown +5.0V and -5.2V fuses in fuse boards FBK-1-2, FBK-3-2, FBM-1-2, and FBM-3-2 (location K). If there are any blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before continuing with this procedure.

3. If you replaced a fuse in Step 2, restore the synchronizer side associated with the blown fuse to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to three minutes to complete. The synchronizer side is restored to the STBY state.

   If the restore was successful, you are finished with this procedure. Otherwise, continue with Step 4.

4. Obtain a new DPLL circuit pack of the same version as the failed one.

5. Extract the failed DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and mark for later reference.

6. Install the new DPLL circuit pack obtained in Step 4 (referring to Chapter 2 for installing circuit packs, if necessary).

7. Restore the failed synchronizer side by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   This command takes up to three minutes to complete.

   The following message appears only when the replacement DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

   Where:

   a = Autonomous sequence number: `001-999`

   If the restore is successful, the alarm condition clears, the synchronizer side is restored to the STBY state, and the DS1TX circuit pack is autonomously restored to the IS state.

   If the restore fails and there is no autonomous `REPT DGNDET EQPT` message indicating a diagnostic phase of 800, 1000, or 2000, there is a failure of another type. Go to the section titled "DPLL Circuit Pack Failure" (page 15-45).

   If the restore fails displaying an autonomous `REPT DGNDET EQPT` message indicating a diagnostic phase of 800, 1000, or 2000, or the restore succeeds but the DPLL circuit pack fails again, continue with Step 8.

8. Restore the synchronizer side failed in Step 7 using the FRCD option by entering the following command to determine if the active DPLL circuit pack is causing the cross-couple failure:

   `RST-EQPT:[a]:b::::FRCD;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   This command takes up to three minutes to complete. The OOS-FLT alarm condition clears.

   The synchronizer sides switch and the original active side is autonomously removed to OOS-FLT with MJ, INT alarm messages. The DPLL2 and TBS32 circuit packs green ACT LEDs extinguish and the red ACT LEDs light.

The restored side is now the active side and the DPLL2 and TBS32 circuit packs red ACT LEDs go out and the green ACT LEDs light.

The SYNCN mode transitions from FRNG to FST to NORM.

If the synchronizer does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 9.

9. If the DPLL circuit pack extracted in Step 5 is the same version as the DPLL circuit pack that is now the OOS-FLT DPLL circuit pack, it can be used as the replacement circuit pack in this procedure. Otherwise, obtain a DPLL circuit pack of the same version as the active DPLL circuit pack.
10. Extract the OOS-FLT DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and mark for later reference.
11. Install the DPLL circuit pack obtained in Step 9 (referring to Chapter 2 for installing circuit packs, if necessary).
12. Restore the synchronizer side that was autonomously removed in Step 8 by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Synchronizer side location: `SYNC-[0,1]`

    This command takes up to three minutes to complete. The INT alarm condition clears.

    If the restore is successful, the alarm condition clears, the synchronizer side is restored to the STBY state, and the DS1TX circuit pack is autonomously restored to the IS state.

    If the restore fails (displaying an autonomous `REPT DGNDET EQPT` message indicating a diagnostic phase 800, 1000, or 2000), contact your system administrator or next level of support for assistance before continuing this procedure.

    If the restore fails and there is no autonomous `REPT DGNET EQPT` message indicating a diagnostic phase 800, 1000, or 2000, this indicates another type failure. Go to the section titled "DPLL Circuit Pack Failure" (page 15-45). Otherwise, continue with Step 13.
13. Retrieve the alarm state of the DPLL circuit pack installed in Step 11 by entering the following command:

    `RTRV-ALM-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = DPLL circuit pack location: `DPLL-[0,1]`

If the INT alarm has cleared, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

Attach the alarm report to the DPLL circuit pack extracted in Step 10 and you are done with this procedure.

If the restore is successful and the DPLL circuit pack fails again, the following output response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN*/
   "h:...,j,..."
;
```

Where:

h = DPLL circuit pack location: `DPLL-{0,1}`

j = Alarm condition type: `{ X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, XLKDNTLCH, DTLCH, EOR, EXPHR, FSNLN, FSTO, ICTLR, IHRER, INT, PFLCH, PSHLN, RAMER, ROMER, RTV, SYPLN, TBLEN, URTER }`

If any of the alarm conditions that start with the letter x appear, contact your system administrator or next level of support for assistance in clearing the failure. Otherwise, go to the section titled "DPLL Circuit Pack Failure" (page 15-45).

TBS3 Circuit Pack Failure

This procedure is used to clear major alarms associated with TBS3 circuit packs that are caused by the alarm conditions: INT and TBIOER. If a critical alarm is active due to Synchronizer Module failure, go to the previous section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 15-40).

1. Check for blown +5.0V and -5.2V fuses in fuse boards FBK-1-2, FBK-3-2, FBM-1-2, and FBM-3-2 (location K). If there are any blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before continuing with this procedure.

2. Determine which TBS3 circuit pack is in the OOS-FLT or OOS-FEF state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:TB-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response, determine which TBS3 circuit pack is in the OOS-FLT state:

   ```
       TID YY-MM-DD HH:MM:SS
   M   CTAG COMPLD
       /* LOC:STATE */
       "TB-0:f"
       "TB-1:f"
   ;
   ```

   Where:

   f = State: `{ OOS-FLT, OOS-FEF, ACT }`

   If the TBS3 circuit pack is in the OOS-FEF state, the associated DPLL circuit pack has failed [refer to the section titled "DPLL Circuit Pack Failure" (page 15-45) to clear DPLL circuit pack failures]. Otherwise, if the TBS3 circuit pack is in the OOS-FLT state, continue with Step 3.

3. Remove the synchronizer side associated with the failed TBS3 circuit pack (OOS-FLT state) from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

4. Obtain a new TBS3 circuit pack of the same version as the failed one.

5. Extract the failed TBS3 circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
6. Install the new TBS3 circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).
7. If version 2 synchronizer circuit packs are installed, go to Step 8. Otherwise (for version 1 synchronizer circuit packs), perform the following procedure:
   a. Extract the DPLL1 circuit pack associated with the TBS31 circuit pack installed in Step 6. Refer to Chapter 2 for extracting circuit packs, if necessary.
   b. Reinstall the DPLL1 circuit pack extracted in Step 7a (refer to Chapter 2 for installing circuit packs, if necessary). The extraction and reinstallation of the DPLL1 circuit pack after replacing the TBS31 circuit pack allows the DPLL1 circuit pack to re-establish the linkage between the DPLL1 and the TBS31 circuit packs.
8. Restore the synchronizer side removed in Step 3 by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to three minutes to complete. It takes 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides cannot be switched by software).
9. Retrieve the state of the TBS3 circuit pack of the synchronizer side restored in Step 8 by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = TBS3 circuit pack location: `TB-[0,1]`

   From the following output response, determine the state of the new TBS3 circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "TB-0:f"
    "TB-1:f"
;
```

Where:

f = State: `{ OOS-FLT, STBY }`

The state of the new TBS3 circuit pack is STBY. If the state of the new TBS3 circuit pack is OOS-FLT, contact your system administrator or next level of support for assistance in clearing the trouble.

10. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 8 by entering the following command:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Timing extractor port location: `TX-[0,1]`

This command takes up to one minute to complete.

DS1TX Circuit Pack Failure

This procedure is used to clear minor alarms associated with DS1TX circuit packs (indicated by TX as the equipment location) that are caused by the alarm conditions INT, LERDF, TBLEN, or TBNDF. If a critical alarm is active due to Synchronizer Module failure, go to the section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 15-41) . If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 15-40).

1. If the alarm condition causing the alarm is SYNCFRNG, SYNCFST, or SYNCHLDOVR, retrieve the alarm state of SYNCN to determine if all timing references have failed by entering the following command:

`RTRV-ALM-EQPT:`*[a]*`:SYNCN:::,ALL;`

Where:

a = Target ID (optional)

The following output response appears (only the parameters that are pertinent are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
   "SYNCN:...,j,..."
;
```

Where:

j = Alarm condition type: { ALLREFFAIL, SYNCFRNG, SYNCFST, SYNCHLDOVR }

If the alarm condition ALLREFFAIL appears, do not continue with this procedure, but instead refer to the section titled "External Timing Reference (BITS) Failure" (page 15-175).

2. If the alarm condition causing the alarm is INT, TBLEN, or TBNDF, continue with Step 3. Otherwise, refer to the section titled "External Timing Reference (BITS) Failure" (page 15-175). If after ensuring the BITS references are good and the alarm did not clear, continue with Step 3. If the LERDF alarm cleared, you are done with this procedure.

3. Determine which DS1TX circuit pack (TX) is in the OOS-FLT state by entering the following command for each DS1TX circuit pack:

RTRV-STATE-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Timing extractor port location: TX-{0,1}

From the following output response, determine which TX ports are in the OOS-FLT state:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "e:f"
;
```

Where:

e = Timing extractor port location: TX-{0,1}

f = State: { OOS-FLT, ACT }

4. Determine which synchronizer side is active (ACT state) and which is standby (STBY state) by entering the following command:

RTRV-STATE-EQPT:*[a]*:SYNC-0&-1;

Where:

a = Target ID (optional)

From the following output response (for this procedure only pertinent parameters are shown), determine which synchronizer side is in the ACT state and in the STBY state:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "SYNC-0:f"
    "SYNC-1:f"
;
```

Where:

f = State: { ACT, STBY }

5. If both DS1TX circuit packs indicate an OOS-FLT state or if only one DS1TX circuit pack is in the OOS-FLT state, remove the one associated with the active synchronizer side or if only the DS1TX circuit pack that is in the OOS-FLT state is associated with the standby synchronizer side, remove the DS1TX circuit pack from service by entering the following command:

   RMV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Timing extractor port locations: TX-{0,1}

   The original alarm condition clears and a new alarm occurs with the condition set to MAN.

6. Obtain a new DS1TX circuit pack of the same version as the failed one.

7. Extract the DS1TX circuit pack removed in Step 5 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

8. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

9. Restore the DS1TX circuit pack removed in Step 5 by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: TX-{0,1}

   This command takes up to one minute to complete.

   If alarm remains that is associated with the DS1TX circuit packs installed in Step 8, contact your system administrator or next level of support for assistance in clearing the trouble.

If the DS1TX circuit pack associated with the standby synchronizer side was in the OOS-FLT state, you are done with this procedure. Otherwise continue with Step 10.

10. Remove the DS1TX circuit pack associated with the synchronizer side that is now in the STBY state:

    `RMV-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-{0,1}`

    The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

11. Obtain a new DS1TX circuit pack of the same version as the failed one.

12. Extract the DS1TX circuit pack removed in Step 10 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

13. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

14. Restore the DS1TX circuit pack removed in Step 10 by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-{0,1}`

    This command takes up to one minute to complete.

    If alarm that is associated with the DS1TX circuit packs installed in Step 13 remains, contact your system administrator or next level of support for assistance in clearing the trouble.

    If your office procedures call for you to have a certain synchronizer side as the active one, refer to the section titled "Manual Synchronizer Side Switch" (page 8-20) to switch synchronizer sides if necessary.

Synchronizer Mode Alarm Conditions

This procedure is used to clear alarms associated with the synchronization mode (alarm conditions: SYNCFRNG, SYNCFST, and SYNCHLDOVR). For all other alarm conditions refer to the section titled "Prioritizing Alarms" (page 15-12).

1. Determine the alarm condition that caused the synchronizer alarm from the `REPT ALM EQPT` message or by entering the following command:

   `RTRV-ALM-EQPT:`*`[a]`***`:SYNCN;`**

   Where:

   a = Target ID (optional)

   The following output response appears (for this procedure only pertinent parameters are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN*/
      "SYNCN:...,j,..."
   ;
   ```

   Where:

   j = Alarm condition type: `{ SYNCFRNG, SYNCFST, SYNCHLDOVR }`

   The above alarm condition types indicate the following states:

   - `SYNCFRNG` — Synchronizer Module is not provisioned.
   - `SYNCFST` — Synchronizer Module is in the process of phase-locking the timing reference.
   - `SYNCHLDOVR` — Synchronizer Module is operating in the holdover mode due to failure of external timing reference (BITS) failure or manual switch for maintenance of BITS timing source.

2. Contact your system administrator or next level of support to determine why the above condition exists and take appropriate action as directed. That is, if your system administrator directs you to do so, provision the Synchronizer Module ["Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26)], wait for the Synchronizer Module to phase-lock onto the BITS timing source, or clear BITS failures ["External Timing Reference (BITS) Failure" (page 15-175)].

Clearing MAN Conditions

The condition type MAN occurs when the RMV-EQPT command is used to remove equipment from service. To clear this condition, use the following procedure.

1. If necessary, retrieve the locations of the equipment in alarm by entering the following command:

   RTRV-ALM-EQPT:*[a]*:ALL:::,MAN;**

   Where:

   a = Target ID (optional)

   The following output response appears (only the parameters that are pertinent are shown):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
      "h:...,MAN,..."
   ;
   ```

   Where:

   h = Equipment location: { MC, CC-{0,1}, PRI-{1,2}, SEC, ECI-{1,2}, UC-{1-64}, SYNC-{0,1}, TX-{0,1}, DS3PM-{1-64}, RUI-{1,2} }

2. Determine reason for manual removal of equipment by checking with your system administrator or next level of support.

3. If instructed to do so by your system administrator or next level of support, restore the equipment with the alarm condition to service by entering the following command:

   RST-EQPT:*[a]*:*b*;**

   Where:

   a = Target ID (optional)

   b = Equipment location: **{ MC, CC-{0,1}, PRI-{1,2}, SEC, ECI-{1,2}, UC-{1-64}, SYNC-{0,1}, TX-{0,1}, DS3PM-{1-64}, RUI-{1,2} }**

   This command takes up to five minutes to complete.

Clearing IMPROPBLK Conditions

The condition type IMPROPBLK occurs when a DS1IF, DS1IP, SWIF, SWIF-P, MUX, MUXP, SMUX, or SMUXP circuit pack has been replaced with a bus extender (BXA) circuit pack and has not been properly deprovisioned. To clear this condition, use the following procedure:

1. If a DS1IP, SWIF-P, MUXP, or SMUXP circuit pack has been replaced with a BXA circuit pack, replace the BXA circuit pack with the appropriate protection circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

⚠ CAUTION:
SWIF-P, MUXP, and SMUXP circuit packs must not be replaced with BXA circuit packs. If the above condition exists for SWIF-P, MUXP, or SMUXP circuit pack slots, service can not be protected if a DS1IF, SWIF, MUX, or SMUX circuit pack that is associated with a BXA in a protection slot fails.

2. If service interruption occurred and a BXA circuit pack is in the DS1IF, SWIF, MUX, or SMUX circuit pack slot, the BXA circuit pack must be extracted immediately and replaced with an appropriate DS1IF, SWIF, SWIF2, MUX1, MUX2, MUX3, or SMUX circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
3. If no service interruption occurred, deprovision the slot with the BXA circuit pack by referring to the appropriate deprovisioning procedure ("Deprovisioning DS1 Interface (DS1IF) Circuit Packs" (page 7-20) for DS1IF, "Deprovisioning SWIF Circuit Packs" (page 7-22) for SWIF, or "Deprovisioning MUX or SMUX Circuit Packs" (page 7-23) for MUX and SMUX).

Clearing IMPROPRMVL Conditions

The condition type IMPROPRMVL indicates that a circuit pack has been physically extracted from its slot. To clear this condition, perform the following procedure.

1. If necessary, retrieve the location of the equipment in alarm by entering the following command:

   RTRV-ALM-EQPT:*[a]*:ALL:::,IMPROPRMVL;**

   Where:

   a = Target ID (optional)

   The following output response appears (only the parameters that are pertinent are shown):

   ```
       TID YY-MM-DD HH:MM:SS
   M   CTAG COMPLD
       /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
       "h:...,IMPROPRMVL,..."
   ;
   ```

   Where:

   h = Equipment location: { MC, CC-{0,1}, PRI-{1,2}, SEC, RUI-{1,2}, ECI-{1,2}, CLKGN-{0,1} SWCS-{1-2}-{1-16}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, CLKDR-{1-64}-{1-4}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4},PWRE-{1-64}-{1-2}, PWRJ-{1-3}-{1-6}, RPWRF-{1,2}-{1,2}, RPWRA-{1,2}-{1-4}, RPOWERE-SW-{1,2}-{1,2}, PWRG-{1,2},FAN-{1-4,6-9,11-13,15-18,20-23}, RFAN-{1,2}, TX-{0,1}, STPNL, DPLL-{0,1}, TB-{0,1}, SYNCPRI-{0,1}, SYNCSEC-{0,1}, SYNCN }

2. If the circuit pack location that is identified by the **RTRV-ALM-EQPT** command is occupied, extract the circuit pack from the slot (refer to Chapter 2 for extracting circuit packs, if necessary).

3. If the circuit pack identified in Step 1 is a PWRE, PWRG, or PWRJ, go to Step 4. Otherwise, retrieve the provisioning and circuit pack type/code information for the circuit pack slot indicating the IMPROPRMVL condition by entering the following command:

   `RTRV-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `{ CLKGN-{0,1}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16}, CLKDR-{1-64}-{1-4}, MUX-{1-64}-{1-31}, MUXP-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, MUXPS-{1-64}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4} }`

   The following output response appears (only the pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAGCOMPLD
    /*LOC:UTYPE:<>:CLEI:STATE */
    "d:...:<PCODE=f, CCODE=INVALID,PLBO=h,PEQL=j,CEQL=INVALID ...
;
```

   Where:

   d = Circuit pack location (circuit pack type): `{ CLKGN-{0,1}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16}, CLKDR-{1-64}-{1-4}, MUX-{1-64}-{1-31}, MUXP-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, MUXPS-{1-64}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4} }`

   f = Provisioned code name (circuit pack code): `{ AKM46, AKM47, AKM49, AKM50, AKM52, AKM55,AKM66, AKM68B,AKM70, AKM84, AKM85, AKM91, AKM92, AWP4B, AWP9, AWR11, AWS3, AWS5, ERA4, ERA5, ERA6, ERA8, ERA9, ERA10, ERW1, ERW2, ERW3, ERY1, ERY3, INIT, INIT* }`

   h = Provisioned line build-out (MUX circuit packs only): `{ OUT, IN }`

   j = Provisioned equalizer (DS1IF circuit packs only): `{ 20, 40, 60, 80, 100 }`

4. If the circuit pack identified in Step 1 is a PWRE, PWRG, or PWRJ, obtain the same type of circuit pack. Otherwise, obtain the correct circuit pack type with the proper code identified by the `RTRV-EQPT` command.

5. If the circuit pack to be installed is a DS1IF circuit pack, refer to the section titled "Setting Equalizer (EQL) and DS1 Code Type" (page 5-43) to set the EQL to the value identified by parameter *j* in Step 3.
6. Install the new circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary. If the new circuit pack fails, refer to the section titled "Prioritizing Alarms" (page 15-12).

Clearing INHSWPR Conditions

The condition type INHSWPR occurs when an interface (SWIF, MUX, or SMUX) or switch (SWCS or SWIO) circuit pack is inhibited from switching to protection because the circuit pack is switched to a working circuit pack by the `SW-TOWKG-EQPT` or is inhibited from switching to protection by the `INH-SW-EQPT` command. To clear this condition, use the following procedure.

1. Determine the reason for inhibited switching of equipment by checking with your system administrator or next level of support.
2. If instructed to do so by your system administrator or next level of support, allow the circuit pack associated with the INHSWPR condition to switch to protection by entering the following command:

   `ALW-SW-EQPT:`*[a]*`:`*b*`::PROTN;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `[ SWIF-[1-64]-[1-8], MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15], SWCS-[1,2]-[1-16], SWIO-[1-4]-[1-16] ]`

Clearing INHSWWKG Conditions

The condition type INHSWWKG occurs when an interface (SWIF, MUX, or SMUX) or switch (SWCS or SWIO) circuit pack is inhibited from switching to a working state because:

- The interface or switch circuit pack is autonomously switched to protection and locked (exceeding the autolock value) .
- The interface or switch circuit pack is switched to protection by the `SW-TOPROTN-EQPT` command .
- The interface or switch circuit pack is inhibited from switching to a working state by the `INH-SW-EQPT` command. To clear this condition, perform the following procedure:

1. Determine the reason for inhibited switching of equipment by checking with your system administrator or next level of support.

2. If instructed to do so by your system administrator or next level of support, allow the circuit pack associated with the INHSWWKG condition to switch to working by entering the following command:

   `ALW-SW-EQPT:`*[a]*`:`*b*`::WKG;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: { `SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16}` }

3. If the `INHSWWKG` condition reoccurs and the interface or switch circuit pack is autonomously switched to protection and locked, replace the working circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary. After replacing the circuit pack, go to Step 1 to clear the autolock.

4. If replacing the circuit pack fails to clear the `INHSWWKG` condition, go to the section titled "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) to replace the failed circuit pack associated with the `INHSWWKG` condition.

Clearing T-BER and T-BERL Conditions

For T1 and T3 facilities, the condition type T-BER occurs when degradation of the incoming signal has been detected. For EC-1 facilities, the condition type T-BERL occurs when degradation of the incoming signal has been detected. When the DACS IV-2000 is indicating one of these conditions, perform the following procedure.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of signal degradation so that the trouble can be isolated and cleared.

Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions

The condition types AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, and IDLE occur when the DACS IV-2000 is receiving an abnormal signal from far-end equipment. These conditions usually indicate that the far-end equipment has detected an abnormal signal and is transmitting a signal that indicates the type of condition detected to the DACS IV-2000. Once the problems at the far-end have been cleared, a normal signal is restored. The condition YEL is transmitted to the DACS IV-2000 from other equipment to indicate an error condition that occurred at the far-end equipment or facility (that is, the incoming signal is good but somewhere a failure occurred). When the DACS IV-2000 is indicating one of these conditions, perform the following procedure.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of the condition that you are detecting or transmitting so that the trouble can be isolated and cleared.

Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, OOF, SLMF, or SWSLMF Conditions

Depending on the type of facility indicating the alarm condition, the typical causes are:

- T1 facilities — the condition types LOF, LOS, and OOF (MUX3 only) occur when there is a problem with line coding and/or framing type provisioning, with the incoming signal, or with the cable connected to the frame.
- T2 and T3 facilities — the condition types DS3FRMTMISMATCH, LOS, and OOF occur when there is a problem with the signal format provisioning, with the incoming signal, or with the cable connected to the frame. The condition type SWSLMF (MUX3 only) occurs when there is a problem with the port provisioning information (that is, the provisioned DS3 mode value of the `ED-PORT` command does not match the received signal mode).
- EC-1 facilities — the condition types LOF, LOP, and LOS occur when there is a problem with the port provisioning, with the incoming signal, or with the cable connected to the frame. The condition type SLMF occurs when there is a problem with the port provisioning information (that is, the provisioned signal label [VTMAP and/or EC1MAP value of the `ED-PORT` command] does not match the received signal label).
- VT1.5 facilities — the condition type LOP occurs when there is a problem with the port provisioning, with the incoming signal, or with the cable connected to the frame.

A flashing red alarm LED on interface circuit packs indicate an incoming signal failure. When the DACS IV-2000 is indicating one of the above conditions, perform the following procedure.

⚠ CAUTION:
The 120V AC and the DC meter Buzzers must ***not*** *be used for continuity checking of the ring and tip leads because of the 100 ohms impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-2), for more information, if necessary.*

1. From office records, determine all necessary information concerning the line code, framing type, signal formats, and facility types of the incoming signal associated with the port indicating the alarm.
2. Retrieve the provisioning information of the port associated with the alarm condition by entering one of the following commands:

   T1 Facilities:
   `RTRV-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location:
   DS1 port number: `{ [1-64]-[1-31]-[1-28], DS1GRP-[1-64]-[1-31], UNIT-[1-64] }`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:T1:<BER=j,ISTAT=m,FMT=n,OMODE=u,
   LINECDE=w,FENDNTE=y>"
;
```

   Where:

   g = DS1 port location:
   DS1 port number: `{1-64}-{1-31}-{1-28}`
   VT1.5 group number (STS1 Interface Module):
   `{1-64}-{1-15}-{1-7}-{1-4}`

   j = BER threshold value: `3-9`

   m = Input status: `{ INIT, DRVN, NDRVN, QRSS, DRVN*, NDRVN* }`
   An asterisk (*) indicates the DS3 or STS-1 signal the DS1 is contained in is set to `DRVN` or `NDRVN` and the DS1 is not monitored.

   n = Signal format: `{ ESF, SF, UNFR }`

u = Output mode: { NORM, TERM, AIS, QRSS }

w = DS1 code type: { AMI, B8ZS, AMI*, B8ZS*, INIT }
An asterisk (*) indicates the signal is provisioned through circuit pack insertion rather than through a command.

y = Far-end notification: { ANSI, NOT-ANSI }

T3 Facilities:

RTRV-T3:*[a]*:*b*;

Where:

a = Target ID (optional)

b = DS3 port location: { [1-64]-[1-31], UNIT-[1-64] }

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<> */
   "g: :<BER=j,BERM=l,ISTAT=m,DS3FORMAT=n,IDLE=z,
   RMTMUXC=ab,XPOL=ac,XBITRCV=ad,DS2XTR=ae,
   DS2XRCV=af>"
;
```

Where:

g = DS3 port location: {1-64}-{1-31}

j = BER threshold value: 3-9

l = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }

m = Input status: { INIT, DRVN, NDRVN }

n = Signal format: { ASYNC, CBIT }

z = DS3 IDLE signal: { ON, OFF }

ab = Remote multiplexer communications: { SBIT, FEAC, TR9, NONE }

ac = DS3 X-bits transmit: { 0, 1, ALM0, ALM1 }

ad = DS3 X-bits receive: { ALM0, ALM1, IGNORE }

ae = DS2 X-bits transmit: { 0, 1, ALM0, ALM1 }

af = DS2 X-bits receive: { ALM0, ALM1, IGNORE }

EC-1 Facilities:

RTRV-EC1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = EC-1 port location: { {1-64}-{1-15}, UNIT-{1-64} }

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:h:<BERL=k,ISTAT=m,TRC=o,OMODE=u,SOAKON=ag,
   SOAKCLR=ah>"
;
```

Where:

g = EC-1 port location: {1-64}-{1-15}

h = Active signal type: { EC1, T1, VT1 }

k = Line BER threshold value: { 3, 5-9 }

m = Input status: { INIT, DRVN, NDRVN }

o = Transmit path trace: CLLI 62-character message

u = Output mode: { NORM, TERM, AIS }

ag = SONET condition onset soak time: 1-30

ah = SONET condition clear soak time: 1-20

VT1.5 Facilities:

RTRV-VT1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = VT1.5 port location:
VT1.5 port number: { {1-64}-{1-15}-{1-28}, UNIT-{1-64} }
VT1.5 group number:{1-64}-{1-15}-{1-7}-{1-4}

A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "g:VT1:<ISTAT=m,OMODE=u>"
;
```

Where:

g = VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

m = Input status: { DRVN, NDRVN, DRVN*, NDRVN* }
An asterisk (*) indicates the STS-1 signal the VT1.5 tributary is contained in is set to DRVN or NDRVN and the VT1.5 is not monitored.

u = Output mode: { NORM, TERM, AIS }

From the above responses, note the values for the parameters given.

3. For ports associated with SMUX circuit packs, retrieve the port configuration by entering the following command:

RTRV-PORT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Port location:
EC-1 or MUX 3 port: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: { {1-64}-{1-15}-{1-28}, UNIT-{1-64} }
VT1.5 group number:{ {1-64}-{1-15}-{1-7}-{1-4}, UNIT-{1-64} }

A sample output is:

EC1 or VT1.5 Facilities:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<>:ACTSIG */
   "d:<EC1MAP=e,RCVEC1MAP=f,VTMAP=g,RCVVTMAP=h>:i"
;
```

Where:

d = Port location:
EC-1 or MUX3 port: {1-64}-{1-15}
VT1.5 port location:
VT1.5 port number: {1-64}-{1-15}-{1-28}
VT1.5 group number:{1-64}-{1-15}-{1-7}-{1-4}

e = Provisioned EC-1 format: { UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }
This parameter is omitted if values for VTMAP and RCVVTMAP are given.

f = Received EC-1 format: { UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK }
This parameter is omitted if values for VTMAP and RCVVTMAP are given.

g = Provisioned VT1.5 format: { UNSPEC, ASYN, BIT, BYTE }
This parameter is omitted if values for EC1MAP and RCVEC1MAP are given.

h = Received VT1.5 format: { UNSPEC, ASYN, BIT, BYTE }
This parameter is omitted if values for EC1MAP and RCVEC1MAP are given.

i = Active signal type: { EC1, T1, VT1 }

DS3 (MUX3) Facilities:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:<>:ACTSIG:DS3MODE */
    "d:EC1MAP=,RCVEC1MAP=,VTMAP=,RCVVTMAP=::j"
;
```

Where:

d = MUX3 port location: {1-64}-{1-15}

j = DS3 mode: { CC, DS1 }

From the above response, note the values for the parameters given.

4. For ports associated with SMUX or MUX3 circuit packs, if the retrieve port configuration information does not match the configuration of the equipment connected to the SMUX or MUX3 circuit pack, change the configuration by entering the following command:

   ED-PORT:*[a]*:*b*:::*[*EC1MAP=*d*,VTMAP=*e*,DS3MODE=*f]*;**

   Where:

   a = Target ID (optional)

   b = Port location:
   EC-1or MUX3 port: {1-64}-{1-15}
   VT1.5 port:
   VT1.5 port number: {1-64}-{1-15}-{1-28}
   VT1.5 group number: {1-64}-{1-15}-{1-7}-{1-4}

   d = EC-1 port format (SMUX circuit pack only): { UNSPEC, ASYN, SYNC, VTFLOAT, VTLOCK, NOVAL }
   Initial system value: VTFLOAT
   If this parameter is specified (that is, NOVAL is not used) the Active Signal Type becomes EC1 (indicating an STS-1 signal).

e = VT1.5 port format (SMUX circuit pack only): { UNSPEC, ASYN, BIT, BYTE, NOVAL }
Initial system value: ASYN
The Active Signal Type becomes VT1 (indicating a VT1.5 signal) if UNSPEC, BIT, or BYTE is specified or T1 (indicating an DS1 signal) if ASYN is specified.

f = DS3 mode (MUX3 circuit pack only): { DS1, CC }
Initial system value: DS1
Specifies whether the MUX3 circuit pack processes a clear-channel DS3 signal (CC) or processes the 28 DS1 tributaries of the DS3 signal (DS1).

If the alarm condition clears after entering the ED-PORT command, you are done with this procedure. Otherwise, continue with the next step.

5. If the line codes and/or framing types do not match, set the line codes and/or framing types to match the incoming signal by entering one of the following commands:

T1 Facilities:

ED-T1:*[a]*:*b*::::*[*BER=*d*,ISTAT=*g*,FMT=*h*,OMODE=*j*,
LINECDE=*k*,FENDNTE=*l]*;

Where:

a = Target ID (optional)

b = DS1 port location:
DS1 port number: { {1-64}-{1-31}-{1-28}, DS1GRP-{1-64}-{1-31}, UNIT-{1-64} }
VT1.5 group number (STS1 Interface Module): {1-64}-{1-15}-{1-7}-{1-4}

d = BER threshold: { 3-9, CURVAL }
Initial system value: 3

g = Input status: { DRVN, NDRVN, INIT, QRSS, CURVAL }
Initial system value: INIT for DS1 ports or DRVN for DS1 signals within DS3 ports

h = DS1 signal format: { ESF, SF, UNF, CURVAL }
Initial system value: UNF

j = Output mode: { NORM, TERM, AIS, QRSS, CURVAL }
To provision for traffic, set to NORM.

k = DS1 code type: { AMI, B8ZS, INIT, CURVAL }
Initial system value: INIT

l = Far-end notification: { ANSI, NOT-ANSI, CURVAL }
Initial system value: NOT-ANSI
Set to ANSI if parameter *h* is set to ESF. Otherwise, set to NOT-ANSI.

T3 Facilities:

ED-T3:*[a]*:*b*::::*[*BER=*d*,BERM=*f*,ISTAT=*g*,DS3FORMAT=*h*,
IDLE=*m*,RMTMUXC=*n*,XPOL=*o*,XBITRCV=*p*,DS2XTR=*q*,
DS2XRCV=*r]*;

Where:

a = Target ID (optional)

b = DS3 port location: { [1-64]-[1-31], UNIT-[1-64] }

d = BER threshold: { 3-9, CURVAL }
Initial system value: 3

f = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS, CURVAL }
Initial system value: BPV

g = Input status: { DRVN, NDRVN, INIT, CURVAL }
Initial system value: DRVN

h = DS3 signal format: { ASYNC, CBIT, CURVAL }
Initial system value: ASYNC

m = DS3 IDLE signal: { ON, OFF, CURVAL } (optional)
Initial system value: OFF

n = Remote multiplexer type: { SBIT, FEAC, TR9, NONE, CURVAL }
Initial system value: NONE

o = DS3 X-bit transmit: { 0, 1, ALM0, ALM1 } (optional)
Default value: ALM0

p = DS3 X-bit receive: { ALM0, ALM1, IGNORE } (optional)
Default value: IGNORE

q = DS2 X-bit transmit: { 0, 1, ALM0, ALM1 } (optional)
Default value: ALM0

r = DS2 X-bit receive: { ALM0, ALM1, IGNORE } (optional)
Default value: IGNORE

EC-1 Facilities:

ED-EC1:*[a]*:*b*::::*[*BERL=*e*,ISTAT=*g*,TRC=*i*,OMODE=*j*,
SOAKON=*s*,SOAKCLR=*t]*;

Where:

a = Target ID (optional)

b = EC-1 port location: { [1-64]-[1-15], UNIT-[1-64] }

e = Line BER threshold: { 3, 5-9, CURVAL }
Initial system value: 3

g = Input status: { DRVN, NDRVN, INIT, CURVAL }
Initial system value: DRVN

i = STS-1 transmit path trace: <CLLI 62-character message>
Initial system value: NOVAL (62 byte string contains all null characters)

j = Output mode: { NORM, TERM, AIS, CURVAL }
To provision for traffic, set to NORM.

s = SONET condition onset soak time: { 1-30, CURVAL }
Initial system value: 2 (seconds)

t = SONET condition clear soak time: { 1-20, CURVAL }
Initial system value: 10 (seconds)

VT1.5 Facilities:

ED-VT1:*[a]*:*b*::::*[*ISTAT=*g*,OMODE=*j]*;

Where:

a = Target ID (optional)

b = VT1.5 port:
VT1.5 port number: [1-64]-[1-15]-[1-28]
VT1.5 group number: [1-64]-[1-15]-[1-7]-[1-4]

g = Input status: { DRVN, NDRVN, CURVAL }
Initial system value: DRVN

j = Output mode: { NORM, TERM, AIS, CURVAL }
To provision for traffic, set to NORM.

If the alarm condition clears after you enter one of the ED commands, you are done with this procedure. Otherwise, continue with the next step.

6. From office records, determine the source (that is, the specific cable) of the incoming signal.

7. Issue a trouble report to the system administrator of the equipment that is the source of the incoming signal.

   If the incoming signal is determined to be good, contact the system administrator or next level of support for assistance in clearing cabling problems that can be causing the alarm.

Clearing DLI or DLN Conditions

The condition types DLI and DLN occur when the DACS IV-2000 detects a failure of the extended super frame (ESF) data link of a DS1 tributary associated with a DS3 signal of a MUX3 circuit pack. These types of failures occur on DS1 tributaries that are provisioned for ESF format and a far-end notification of 54016 (DS1 performance monitoring is performed via AT&T 54016 standard). The DLI condition occurs when the DACS IV-2000 can not responded to DS1 performance monitoring messages from the far-end and DLN occurs when the DACS IV-2000 does not receive DS1 performance monitoring data from the far-end when requested.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of ESF data link failure, so that the trouble can be isolated and cleared by the far-end personnel.

Clearing IDMISMATCH Conditions

The condition types IDMISMATCH occur when the DACS IV-2000 detects one of the following conditions:

- the expected CLLI or CLFI does not match the received CLLI or CLFI for two consecutive readable values of the received CLLI or CLFI. This conditions clears when the received CLLI or CLFI matches the expected CLLI or CLFI. If this condition does not clear perform the procedure contained in this section.
- the C-bit data link is expected to be an ALL1SIGNAL and a valid path ID is received in the C-bit data link. This conditions clears when the C-bit data link contains an ALL1SIGNAL. If this condition does not clear perform the procedure contained in this section.
- the C-bit data link is expected to contain a valid path ID and an ALL1SIGNAL is received. This conditions clears when the C-bit data link contains a valid path ID. If this condition does not clear perform the procedure contained in this section.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of path ID mismatch so that the trouble can be isolated and cleared.

Clearing IDUNREADABLE Conditions

The condition types IDUNREADABLE occur when the DACS IV-2000 can not detect a valid path ID or ALL1SIGNAL on the C-bit data link for two or more seconds due to the C-bit data link containing more than 28 zeros in a fixed one-second period and there is no valid link access protocol D (LAPD) message on the C-bit data link. This condition is cleared when a path ID can be read or an ALL1SIGNAL can be detected. If the condition does not clear perform the following procedure:

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of unreadable path ID so that the trouble can be isolated and cleared.

Remote Multiplexer Signal Failure

Conditions associated with far-end remote multiplexers (`RTRV-ALM-T1`, `RTRV-ALM-T2`, `RTRV-ALM-T3`, and `RTRV-ALM-EQPT` commands issued with the `FEND` value for the location parameter), indicate failure with the far-end multiplexers or mismatches in the provisioning for far-end multiplexers. When the DACS IV-2000 is indicating one of these conditions perform the following procedure:

1. From office records, determine the remote multiplexer connected to the MUX circuit pack indicating the alarm condition.
2. Retrieve the provisioning information associated with the DS3 port indicating the alarm condition by entering the following command:

   `RTRV-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[ [1-64]-[1-31], UNIT-[1-64] ]`

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<> */
   "g::<BER=j,BERM=l,ISTAT=m,DS3FORMAT=n,IDLE=z,
   RMTMUXC=ab,XPOL=ac,XBITRCV=ad,DS2XTR=ae,
   DS2XRCV=af"
;
```

Where:

g = DS3 port location: `{1-64}-{1-31}`

j = BER threshold value: `3-9`

l = BER metric: `{ BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }`

m = Input status: `{ INIT, DRVN, NDRVN }`

n = Signal format: `{ ASYNC, CBIT }`

z = DS3 IDLE signal: `{ ON, OFF }`

ab = Remote multiplexer communications: `{ SBIT, FEAC, TR9, NONE }`

ac = DS3 X-bits transmit: `{ 0, 1, ALM0, ALM1 }`

ad = DS3 X-bits receive: `{ ALM0, ALM1, IGNORE }`

ae = DS2 X-bits transmit: `{ 0, 1, ALM0, ALM1 }`

af = DS2 X-bits receive: `{ ALM0, ALM1, IGNORE }`

From the above response, note the values for the parameters given.

3. If the provisioning information does not match the far-end multiplexer associated with the failed port, set the necessary parameters to match the far-end multiplexer by entering the following command:

   `ED-T3:`*[a]*`:`*b*`::::[BER=`*d*`,BERM=`*f*`,ISTAT=`*g*`,DS3FORMAT=`*h*`, IDLE=`*m*`,RMTMUXC=`*n*`,XPOL=`*o*`,XBITRCV=`*p*`,DS2XTR=`*q*`, DS2XRCV=`*r*`];`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-64}-{1-31}, UNIT-{1-64} }`

   d = BER threshold: `{ 3-9, CURVAL }`
   Initial system value: `3`

   f = BER metric: `{ BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS, CURVAL }`
   Initial system value: `BPV`

   g = Input status: `{ DRVN, NDRVN, INIT, CURVAL }`
   Initial system value: `DRVN`

   h = DS3 signal format: `{ ASYNC, CBIT, CURVAL }`
   Initial system value: `ASYNC`

   m = DS3 IDLE signal: `{ ON, OFF, CURVAL }` (optional)
   Initial system value: `OFF`

n = Remote multiplexer type: `{ SBIT, FEAC, TR9, NONE, CURVAL }`
Initial system value: `NONE`

o = DS3 X-bit transmit: `{ 0, 1, ALM0, ALM1 }` (optional)
Default value: `ALM0`

p = DS3 X-bit receive: `{ ALM0, ALM1, IGNORE }` (optional)
Default value: `IGNORE`

q = DS2 X-bit transmit: `{ 0, 1, ALM0, ALM1 }` (optional)
Default value: `ALM0`

r = DS2 X-bit receive: `{ ALM0, ALM1, IGNORE }` (optional)
Default value: `IGNORE`

If the alarm condition clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Contact the system administrator of the remote multiplexer of the condition encountered, so that trouble can be resolved. Table 15-11 can be used to associate the alarm condition with possible equipment or facility failures.

Table 15-11. **Remote Multiplexer Alarm Conditions**

Alarm Condition	Remote Multiplexer Type		
	TR9	FEAC	SBIT
ACPWR (EQPT)	NA	NA	AC power feed failure
COM (EQPT)	NA	Equipment failure common to DS3 hardware	Equipment failure common to DS3 hardware
DS1IF (EQPT)	NA	DS1 interface equipment failure	DS1 interface equipment failure
MUX (EQPT)	NA	DS3 hardware failure	DS3 hardware failure
INC (T1)	NA	Single DS1 LOS or high BER at the far-end	Single DS1 LOS or high BER at the far-end
MINC (T1)	NA	Multiple DS1 LOS and/or high BER at the far-end	Multiple DS1 LOS and/or high BER at the far-end
OOF (T2)	DS2 OOF (DS2 X-bits)	DS2 OOF (DS2 X-bits)	DS2 OOF (DS2 X-bits)
AIS (T3)	NA	DS3 AIS received by far-end	DS3 AIS received by far-end (all 7 DS2 OOF)
IDLE (T3)	NA	DS3 Idle received by far-end	DS3 Idle received by far-end
INC (T3)	NA	Incoming DS1 LOS or high BER at the far-end	Incoming DS1 LOS or high BER at the far-end
OOF (T3)	NA	DS3 or DS2 OOF received at the far-end	DS3 or DS2 OOF received at the far-end
SBITFAIL (T3)	NA	NA	Far-end not responding to SBIT protocol
YEL (T3)	DS3 LOF or AIS (DS3 X-bits)	DS3 LOF or AIS (DS3 X-bits)	DS3 LOF or AIS (DS3 X-bits)

NA - Not applicable

Primary Fuses

Switch Complex and Collocated Interface Bays Primary Fuses

Primary fuses are located at the top of Switch Bays (Bays 11 and 13) and the Fuse and Alarm Bays (Bays 5, 10, 14, and 19). The fuses in the Switch Bays are arranged as shown in Figure 15-1. The fuses in the Fuse and Alarm Bays are arranged as shown in Figure 15-2 (fuses are arranged the same in all Fuse and Alarm Bays). Use this procedure only if a red bus alarm LED on any of the alarm and fuse panels are lit. There are up to sixteen bus alarm LEDs (depending on the bay arrangement) in the alarm and fuse panels (these alarms are shaded in Figures 15-1 and 15-2).

⚠ CAUTION:
Only blown fuses (identified by extended stems of indicator fuses) should be extracted. Extracting good fuses may cause loss of service.

1. Check to see if there are any bus alarm LEDs lit.

   If there are any bus alarm LEDs lit, continue Step 2.

   If there are any power circuit pack alarm LEDs lit, go to the section titled "Power Circuit Pack Failure" (page 15-93). Otherwise, go to the section titled "Isolating Failures" (page 15-12) to clear any other alarm.

2. Open the door to the fuse panel with the bus alarm LED lit by pushing where indicated.

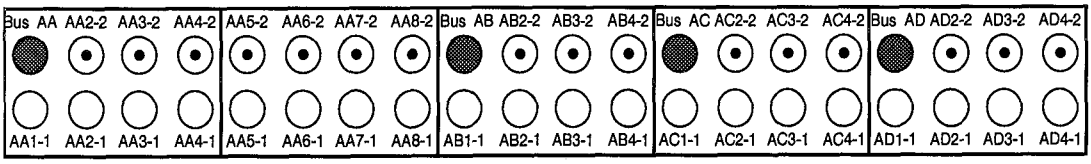
3. Locate the blown primary and indicator fuses (stem of indicator fuse is extended from its base). If more than one, select one at a time.

4. For the primary fuse selected in Step 3, replace the load fuse (identified by the *-1* after the location number) with a new one of the same type first, then the indicator fuse identified by the *-2* with a new one of the same type).

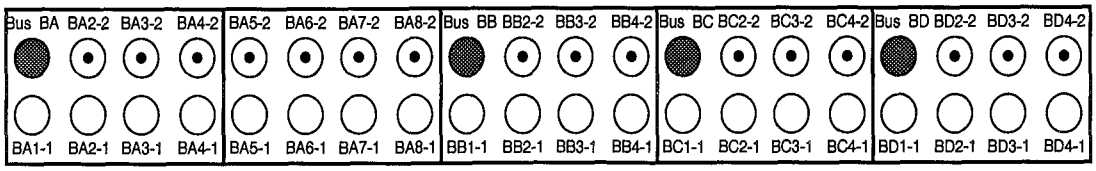
5. If the replaced fuse:

   - Blows again, continue with Step 6
   - Does not blow again and there are other bus alarm LEDs lit, go to Step 3; otherwise go to Step 9

6. Obtain a new power circuit pack associated with the blown fuse in Step 5, and replace the failed one (refer to Chapter 2 for extracting and installing circuit packs, if necessary). Refer to Figures 15-1 and 15-2 and Tables 15-12 and 15-13 to associate the power circuit pack with the blown fuse.



A. Fuse Panel in Bay Position 11



B. Fuse Panel in Bay Position 13

Note: Fuses for all power buses come in pairs with the load fuse labeled with *-1* and the indicator fuse labeled with *-2*.

Figure 15-1. **Main Fuse Panels (Switch Bays)**

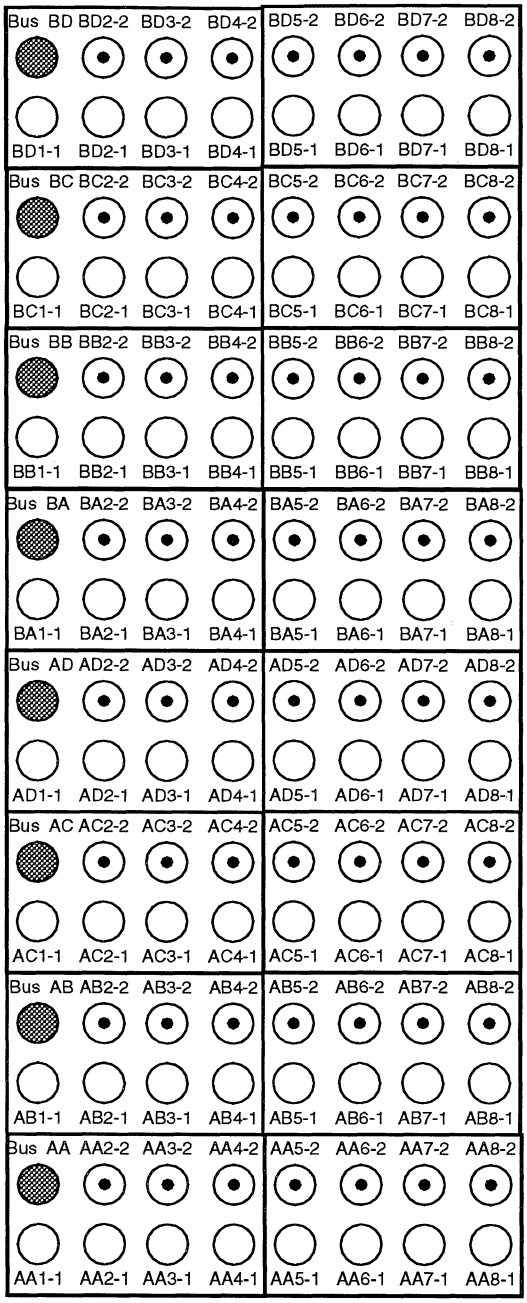
Table 15-12. **Fuse Chart for Switch Bays (Bays 11 and 13)**

Switch Power Module PWRJ Circuit Packs

SW PWR Module	PWR Circuit Pack					
	PWRJ-1	PWRJ-2	PWRJ-3	PWRJ-4	PWRJ-5	PWRJ-6
3	AD2	BD2	AD3	BD3	AD4	BD4
2	AC2	BC2	AC3	BC3	AC4	BC4
1	AB2	BB2	AB3	BB3	AB4	BB4

OPEX Module PWRG Circuit Packs		Fan Assemblies		
PWR Circuit Pack	Fuse	Bay	Main	Auxiliary
PWRG-1	AA2	11	AA4	BA4
PWRG-2	BA2	12	AA6	BA6
		13	AA5	BA5

Note: All load fuses for the PWRJ circuit packs are 20A and load fuses (labeled with *-1*) for PWRG circuit packs and fan assemblies are 10A. All indicator fuses are 0.5A.



Note: Fuses for all power buses come in pairs with the load fuse (10A) labeled with *-1* and the indicator fuse (0.5A) labeled with *-2*.

Figure 15-2. **Main Fuse Panel (Fuse and Alarm Bays)**

Table 15-13. **Fuse Chart for Fuse and Alarm Bays (Bay 5, 10, 14, and 19)**

Shelf	PWR Circuit Pack	Fuse Panel in Bay 5				Fuse Panel in Bay 10			
		Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
4	PWRE-2	BD2	BC3	BD4	BC5	BD2	BC3	BD4	BC5
	PWRE-1	AD2	AC3	AD4	AC5	AD2	AC3	AD4	AC5
3	PWRE-2	BC2	BD3	BC4	BD5	BC2	BD3	BC4	BD5
	PWRE-1	AC2	AD3	AC4	AD5	AC2	AD3	AC4	AD5
2	PWRE-2	BB2	BA3	BB4	BA5	BB2	BA3	BB4	BA5
	PWRE-1	AB2	AA3	AB4	AA5	AB2	AA3	AB4	AA5
1	PWRE-2	BA2	BB3	BA4	BB5	BA2	BB3	BA4	BB5
	PWRE-1	AA2	AB3	AA4	AB5	AA2	AB3	AA4	AB5
Fan	Main	AD6	AC6	AB6	AA6	AD6	AC6	AB6	AA6
	Auxiliary	BD6	BC6	BB6	BA6	BD6	BC6	BB6	BA6
Shelf	PWR Circuit Pack	Fuse Panel in Bay 14				Fuse Panel in Bay 19			
		Bay 15	Bay 16	Bay 17	Bay 18	Bay 20	Bay 21	Bay 22	Bay 23
4	PWRE-2	BC5	BD4	BC3	BD2	BC5	BD4	BC3	BD2
	PWRE-1	AC5	AD4	AC3	AD2	AC5	AD4	AC3	AD2
3	PWRE-2	BD5	BC4	BD3	BC2	BD5	BC4	BD3	BC2
	PWRE-1	AD5	AC4	AD3	AC2	AD5	AC4	AD3	AC2
2	PWRE-2	BA5	BB4	BA3	BB2	BA5	BB4	BA3	BB2
	PWRE-1	AA5	AB4	AA3	AB2	AA5	AB4	AA3	AB2
1	PWRE-2	BB5	BA4	BB3	BA2	BB5	BA4	BB3	BA2
	PWRE-1	AB5	AA4	AB3	AA2	AB5	AA4	AB3	AA2
Fan	Main	AA6	AB6	AC6	AD6	AA6	AB6	AC6	AD6
	Auxiliary	BA6	BB6	BC6	BD6	BA6	BB6	BC6	BD6

7. Replace blown fuses (load fuse first, then indicator fuse).
8. If fuses:
   - Blow again, return the original power circuit pack to the frame

     Failure cannot be cleared by replacing a circuit pack or fuse. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem. If there are other bus alarm LEDs lit, go to Step 3; otherwise, do not continue with this procedure.
   - Do not blow, attach the alarm report to the failed circuit pack

     If there are other bus alarm LEDs lit, go to Step 3. Otherwise, continue with Step 9.
9. Close all fuse panel doors, if you have not already done so.
10. If the MC FAIL LED on the Status Panel is lit, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

11. After all bus alarm LEDs are off, verify that the alarm(s) have cleared by entering the following command:

    `RTRV-ALM-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Power circuit pack location: `{ PWRE-{1-64}-{1,2}, PWRG-{1,2}, PWRJ-{1-3}-{1-6} }`

    The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If you get the above response, you are done with this procedure. If you do not get the above response; refer the problem to your system administrator or your next level of support for assistance.

Remote Complex Primary Fuses

Primary fuses are located at the top of OPEX Bay. The fuses are arranged as shown in Figure 15-3 (ED-2C940-30 Fuse and Alarm Panel) or Figure 15-1 (ED-9C114-30 Fuse and Alarm Panel). Use this procedure only if any of the red bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or red fuse alarm lamps (ED-9C114-30 Fuse and Alarm Panel) are lit. The bus alarm lamps in the ED-2C940-30 Fuse and Alarm Panel are shaded in Figure 15-3.

⚠ CAUTION:
Only blown fuses (identified by extended stems of indicator fuses [ED-2C940-30 Fuse and Alarm Panel] or lit alarm lamp [ED-9C114-30 Fuse and Alarm Panel]) should be extracted. Extracting good fuses may cause loss of service.

1. Check to see if there are any bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or red alarm lamps (ED-9C114-30 Fuse and Alarm Panel) lit.

   If there are any Fuse and Alarm Panel alarm lamps lit, continue with Step 2.

   If there are any power circuit pack alarm LEDs lit, go to the section titled "Power Circuit Pack Failure" (page 15-93). Otherwise, go to the section titled "Isolating Failures" (page 15-12) to clear any other alarm.

2. Check the Status Panel for Major alarms. If there are no Major alarms, only the indicator fuse is blown and not the load fuse. If there is a Major alarm, then the load fuse is also blown. Also check the alarm messages to see if more than one fuse is blown to determine if a blown fuse is causing an alarm.

3. Open the door to the Fuse and Alarm Panel by pushing where indicated.

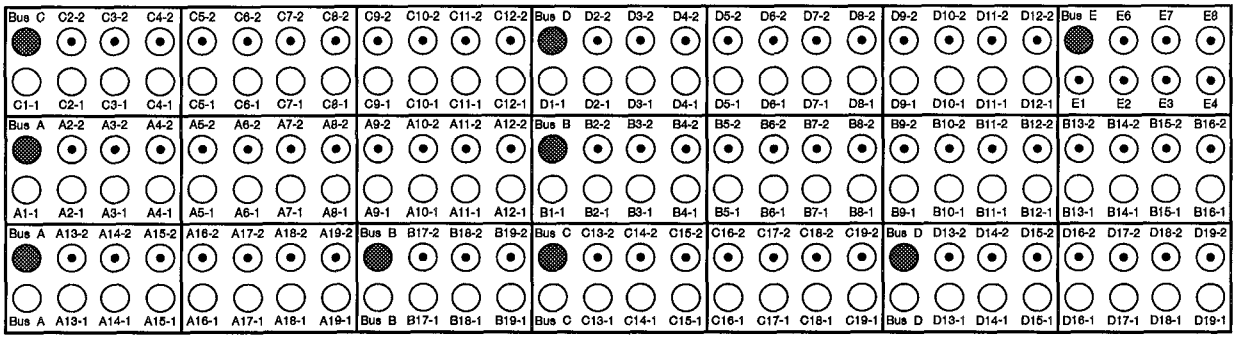
4. Locate the blown fuses (for ED-2C940-30 Fuse and Alarm Panel, the stem of the indicator fuse is extended from its base; for ED-9C114-30 Fuse and Alarm Panel, lit alarm lamp). If there is more than one, select one at a time.

5. For the fuse selected in Step 3, replace the fuse (for ED-2C940-30 Fuse and Alarm Panel, replace the load fuse identified by the *-1* after the location number first, then the indicator fuse identified by the *-2*). For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for replacing fuses, if necessary.

6. If the replaced fuse:

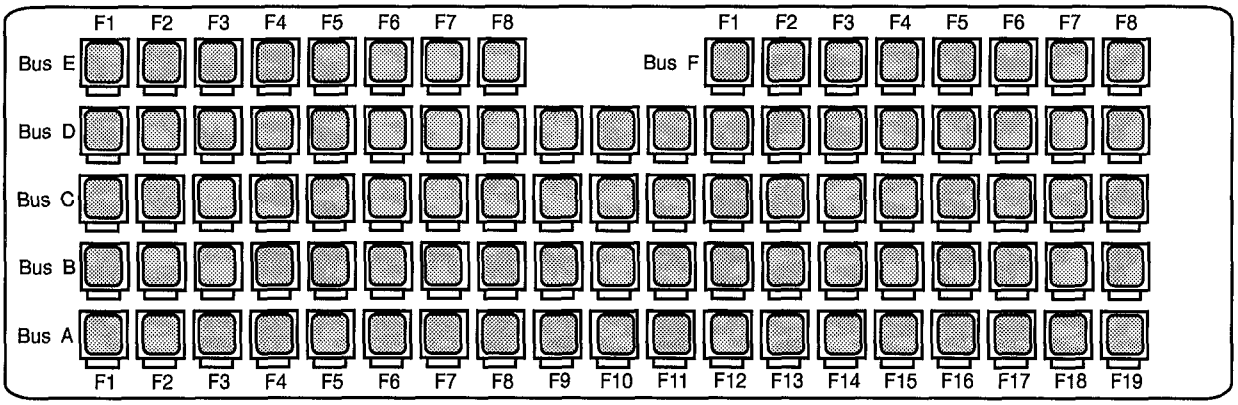
   - Blows again, continue with Step 6
   - Does not blow again and there are other Fuse and Alarm Panel alarm lamps lit, go to Step 3; otherwise, go to Step 9

7. Obtain a new power circuit pack associated with the blown fuse in Step 5, and replace the failed one (refer to Chapter 2 for extracting and installing circuit packs, if necessary). Refer to Figure 15-3 and 15-4 and Tables 15-12 and 15-13 to associate the power circuit pack with the blown fuse.



Note: Fuses for power buses A, B, C, and D come in pairs with the load fuse labeled with *-1* and the indicator fuse labeled with *-2*. Fuses for power bus E do not have dual fuses (one load and one indicator; they are all indicator fuses.

Figure 15-3. **ED-2C940-30 Fuse and Alarm Panel (OPEX Bay)**



Note: Fuse location B1 is not connected. Fuses A1, A2, B2, C1, C2, and D2 are 12A; fuse D1 is 2A; all other fuses are 10A. All fuses have a red alarm lamp to indicate failure.

Figure 15-4. **ED-9C114-30 Fuse and Alarm Panel (OPEX Bay)**

Table 15-14. **Fuse Chart for OPEX Bay (Bay 5 Excluding Fan Assemblies)**

Standard Power (ED-2C940-30 Fuse and Alarm Panel)

Auxiliary Power PWRE		Switch Power PWRA			
1	2	1	2	3	4
B14	D8	A2	B2	C2	D2

Note: Fuses A2-1, B2-1, C2-1, and D2-1 are 12 A, and fuses B14-1 and D8-1 are 10 A. Fuses A2-2, B2-2, B14-2, C2-2, D2-2, and D8-2 (indicator fuses) are 0.5 A.

Duplex Power (ED-9C114-30 Fuse and Alarm Panel)

Auxiliary Power PWRE		Switch Power PWRA			
1	2	1	2	3	4
B14	D8	A2	B2	C2	D2
PWRF-1		PWRF-2		Header Designation Assembly (Top of Bay)	
A1		C1		D1	

Note: Fuses A1, A2, B2, C1, C2, and D2 are 12A; fuses B14 and D8 are 10A; and fuse D1 is 2A. All fuses have a red alarm lamp to indicate failure.

Table 15-15. **Fuse Chart for Remote Complex Interface Bays (Bays 1-4 and 6-9)**

Shelf	PWR Circuit Pack	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse and Alarm Panel)									
4	PWRE-2	C17	D14	D4	D10	C12	D6	B15	C19
	PWRE-1	A17	C15	B4	C10	B12	B6	C8	A19
3	PWRE-2	D16	D13	C4	B10	D12	C6	B8	D18
	PWRE-1	A16	A14	A4	A10	A12	A6	A8	C18
2	PWRE-2	B18	C14	D3	C9	D11	D5	C7	D19
	PWRE-1	A15	B17	C3	B9	B11	C5	B7	A18
1	PWRE-2	D15	C13	B3	D9	C11	B5	D7	D17
	PWRE-1	C16	A13	A3	A9	A11	A5	A7	B19
Note: All load fuses are 10A and all indicator fuses are 0.5A.									
Duplex Power (ED-9C114-30 Fuse and Alarm Panel)									
4	PWRE-2	F4	D14	D4	D10	D12	D6	D17	F8
	PWRE-1	E4	B14	B4	B10	B12	B6	B8	E8
3	PWRE-2	F3	C14	C4	C10	C12	C6	C8	F7
	PWRE-1	E3	A14	A4	A10	A12	A6	A8	E7
2	PWRE-2	D15	D13	D3	D9	D11	D5	D7	D18
	PWRE-1	B15	B13	B3	B9	B11	B5	B7	B18
1	PWRE-2	F2	C13	C3	C9	C11	C5	C7	F6
	PWRE-1	E2	A13	A3	A9	A11	A5	A7	E6
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

8. Replace blown fuses (for ED-2C940-30 Fuse and Alarm Panel, load fuse first, then indicator fuse). For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for replacing fuses, if necessary.
9. If fuses:
   - Blow again, return the original power circuit pack to the frame

     Failure cannot be cleared by replacing a circuit pack or fuse. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem. If there are Fuse and Alarm Panel alarm lamps lit, go to Step 3; otherwise, do not continue with this procedure.
   - Do not blow, attach the alarm report to the failed circuit pack

     If there are other Fuse and Alarm Panel alarm lamps lit, go to Step 3. Otherwise, continue with Step 9.
10. Close all Fuse and Alarm Panel doors, if this is not already done.
11. For ED-9C114-30 Fuse and Alarm Panel, if you replaced fuse A1 (SYNC side 0) or C1 (SYNC side 1), restore the SYNC side associated with the A1 or C1 fuse to service by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Synchronizer side location: `SYNC-[0,1]`

    This command takes up to three minutes to complete.
12. If the FAILURE LED on the Status Panel is lit, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 20 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

13. After Fuse and Alarm Panel alarm lamps are off, verify that the alarm(s) have cleared by entering the following command:

    `RTRV-ALM-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = Power circuit pack location: `{ RPWRA-[1-4], PWRE-[1-64]-[1,2], RPOWERE-SW-[1,2], RPWRF-[1,2] }`

    The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If you get the above response, you are done with this procedure. If you do not get the above response; refer the problem to your system administrator or your next level of support for assistance.

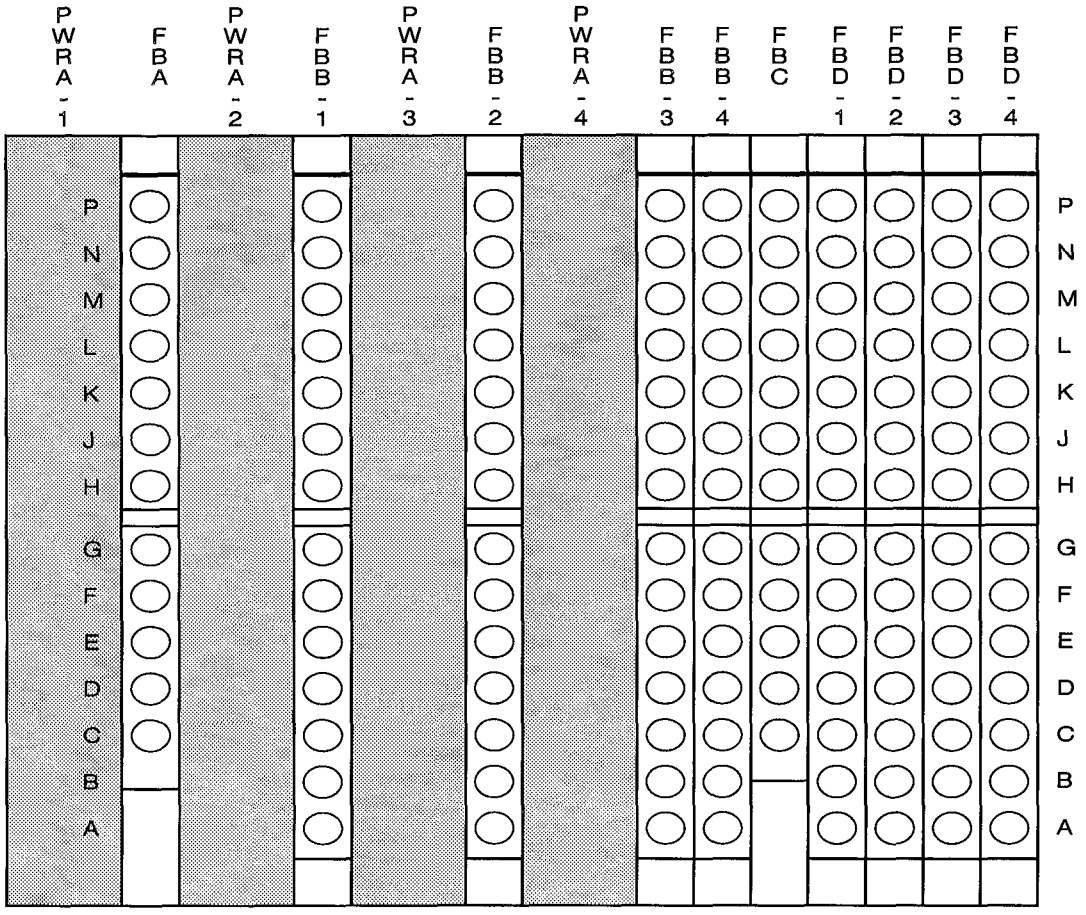
Secondary Fuses in OPEX Power Module

This procedure is applicable for major and minor alarms associated with secondary fuses in the OPEX Power Modules. Major alarms occur if more than one fuse blows or the associated circuit pack is inhibited from switching to protection. Minor alarms occur when only one fuse blows and the associated circuit pack switches to protection.

⚠ CAUTION:
Only blown fuses (identified by a lit red LED) should be extracted. Extracting good fuses may cause loss of service.

1. Check to see if there are any blown fuse indicators (a lit red LED) in any of the fuse boards in the OPEX Power Module (FBA, FBB, FBC, and FBD).
2. Locate the blown secondary fuses (refer to Table 15-16 for fuse locations). If both fuses associated with the same circuit pack are blown, locate both of them together. If more than one circuit pack's fuse(s) have blown, select one circuit pack's fuse(s) at a time.
3. Locate the circuit pack associated with the blown fuse selected in Step 2 by referring to Figure 15-5 and Table 15-16, and partially extract the circuit pack from its slot.
4. Replace the blown fuse selected in Step 2 with a new one of the same type. If both fuses associated with the same circuit pack are blown, replace both fuses with the appropriate fuse types. Use fuse tool (Part Number WP90247,List 201) to extract fuses.

5. If a fuse:
   - Does not blow again, continue with Step 6
   - Blows again, the failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) and return to Step 2.
6. Insert the circuit pack that you partially extracted in Step 3.



Note: A blown fuse is indicated by a lit red LED.

Figure 15-5. **Secondary Fuses for Remote Complex (FBA, FBB, FBC, and FBD)**

Table 15-16. **Secondary Fuse Chart for Remote Complex**

Location*	Type 77D (10A) Fuse for +5V Supply				
	FBA	**FBB-1**	**FBB-2**	**FBB-3**	**FBB-4**
P	OPEX-11	NA	NA	OPEX-21	NA
N	OPEX-10	NA	NA	OPEX-20	NA
M	OPEX-9	NA	NA	OPEX-19	OPEX-32
L	NA	NA	NA	OPEX-18	OPEX-31
K	OPEX-8	NA	NA	OPEX-17	OPEX-30
J	OPEX-7	NA	NA	NA	OPEX-29
H	OPEX-6	NA	NA	NA	OPEX-28
G	OPEX-5	NA	NA	NA	OPEX-27
F	OPEX-4	NA	NA	NA	OPEX-26
E	OPEX-3	OPEX-16	NA	NA	OPEX-25
D	OPEX-2	OPEX-15	NA	NA	CLKGN
C	OPEX-1	OPEX-14	NA	NA	OPEX-24
B	-	OPEX-13	NA	NA	OPEX-23
A	-	OPEX-12	NA	NA	OPEX-22
Location	**Type 78J (7.5A) Fuse for -5V Supply**				
	FBC	**FBD-1**	**FBD-2**	**FBD-3**	**FBD-4**
P	OPEX-11	NA	NA	OPEX-21	NA
N	OPEX-10	NA	NA	OPEX-20	NA
M	OPEX-9	NA	NA	OPEX-19	OPEX-32
L	NA	NA	NA	OPEX-18	OPEX-31
K	OPEX-8	NA	NA	OPEX-17	OPEX-30
J	OPEX-7	NA	NA	NA	OPEX-29
H	OPEX-6	NA	NA	NA	OPEX-28
G	OPEX-5	NA	NA	NA	OPEX-27
F	OPEX-4	NA	NA	NA	OPEX-26
E	OPEX-3	OPEX-16	NA	NA	OPEX-25
D	OPEX-2	OPEX-15	NA	NA	CLKGN
C	OPEX-1	OPEX-14	NA	NA	OPEX-24
B	-	OPEX-13	NA	NA	OPEX-23
A	-	OPEX-12	NA	NA	OPEX-22

OPEX circuit pack physical locations are mapped into software as follows OPEX-{1-16} to OPEX-{1,3}-{1-16} and OPEX-{17-32} to OPEX-{2,4}-{1-16}

7. If the fuse:

   - Does not blow again and there are more blown secondary fuse indicators, return to Step 2; otherwise, continue with Step 8
   - Blows again, obtain a new circuit pack for the circuit pack associated with the blown fuse, and replace the failed circuit pack marking the circuit pack replaced for later reference. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

     If the fuse blows again, the failure cannot be cleared by replacing a fuse and/or its associated circuit pack. Return the original circuit pack to the frame. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem, and do not continue with this procedure.

     If the fuse does not blow, attach the alarm report to the failed circuit pack.

     If there are other blown fuses, make a note of the problem if the fuse blew again (to be referred to your system administrator or your next level of support) and return to Step 2.

8. After all blown secondary fuse indicators are off, verify that the alarm(s) have cleared by entering the following command:

   `RTRV-ALM-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `[ RCLKGN, OPEX-{1-4}-{1-16} ]`

   The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If you get the above response, you are done with this procedure. If you do not get the above response, refer the problem to your system administrator or your next level of support for assistance.

Power Circuit Pack Failure

This section provides procedures for what to do if power circuit packs fail. These procedures include Switch, Collocated, and Remote Complex power circuit pack failures, as well as procedures for single, multiple, and BDFB power feeder failures.

Switch Complex and Collocated Interface Bays Power Circuit Pack Failure

This procedure is used if there is a power circuit pack failure indicator active (lit red LEDs, you receive a response from a **RTRV-ALM** command, or if there is a REPT ALM message).

NOTE:
When PWRE circuit packs fail, both PWRE circuit packs within the same Interface Module may be indicated in the **RTRV-ALM-ALL** response or REPT ALM EQPT message. The alarm LEDs on the PWRE circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

1. If all the alarm LEDs for the power circuit packs are lit and there is no loss of service, go to the section titled "All Power Circuit Pack Alarm LEDs Lit (Switch Complex and Collocated Interface Bays)" (page 15-95).
2. Check to see if any bus alarm LED is lit on any of the fuse and alarm panels in the Switch Bays and the Fuse and Alarm Bays. If there are bus alarm LEDs lit, refer to the section titled "Primary Fuses" (page 15-79) before performing this procedure.
3. If there are no bus alarm LEDs lit, check to see if there are any power circuit packs without their green ON LED lit. If there are any power circuit pack green ON LEDs not lit, refer to the section titled "BDFB Power Feeder Failure" (page 15-99) before continuing this procedure.

4. If there are no power bus ALM LEDs lit and all green ON LEDs on the power circuit packs are lit, check for lit red ALM LEDs on the power circuit packs in the module that contains the circuit pack indicating the alarm condition (from `RTRV-ALM` command or `REPT ALM` message). If there are no ALM LEDs lit, perform the following procedure. Otherwise, go to Step 5.

    a. Initiate the LED lamp test by pressing the LED/Lamp Test button on the status panel or entering the following command:

    `EX-EQPT:`*[a]*`;`

    Where:

    a = Target ID (optional)

    This command takes up to 20 minutes to complete.

    b. Identify the power circuit pack(s) that the alarm LED does not illuminate and continue with Step 5.

5. If a red ALM LED is lit on only one power circuit pack or only one power circuit pack is identified in Step 4b within the module, use the section titled "Single Power Circuit Pack Failure" (page 15-106). If there is more than one red ALM LED lit on power circuit packs or more than one power circuit pack is identified in Step 4, within the module, use the section titled "Multiple Power Circuit Pack Failures" (page 15-114).

    If the red ALM LEDs are not lit on the power circuit packs or no power circuit packs are identified in Step 4b go to the section indicated below:

    - "High Capacity Controller Failure" (page 15-145) for High-Capacity Controller Module circuit packs (CPU, MTC, SSC, ECI, SCI, UI, and PRI)
    - "Unit Controller Failure" (page 15-152) for UC circuit packs
    - "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) for interface module and SWIO and SWCS Module circuit packs (CLKGN, CLKDR, DS1IF, DS1IP, SWIF, MUX, SMUX, SWCS, and SWIO)
    - "Protection Circuit Pack Failures" (page 15-167) for protection and protection switch circuit packs (DS1IP, SWIF-P [protection], DS1RY, MUXP, SMUXP, and MUXPS)

All Power Circuit Pack Alarm LEDs Lit (Switch Complex and Collocated Interface Bays)

Use this procedure when all alarm LEDs associated with the power circuit packs are lit and there is no loss-of-service. If there is any loss of service (SA type of alarms), go to the section titled "Prioritizing Alarms" (page 15-12) to identify alarms and clear them.

1. Clear the Main Controller's LED exercise bit by entering the following command:

   `EX-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

   This command takes up to 20 minutes to complete. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise, continue with Step 2.

2. Remove the Main Controller from service after the `EX-EQPT` command completes by entering the following command:

   `RMV-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

⚠ CAUTION:
Do not execute the `RMV-EQPT` *command while the* `EX-EQPT` *command is executing.*

3. Extract the CPU circuit pack associated with the active control complex. Refer to Chapter 2 for extracting circuit packs, if necessary.

   An alarm is generated when you extract the CPU circuit pack.

4. Reinstall the CPU circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

   The alarm generated in Step 2 clears when you reinstall the CPU circuit pack.

5. Restore the Main Controller to service by entering the following command:

   `RST-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

   This command takes up to five minutes to complete.

6. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise, refer the problem to your system administrator or your next level of support for assistance.

Remote Complex Power Circuit Pack Failure

This procedure is used if there is a power circuit pack failure indicator active (lit red LEDs, response from `RTRV-ALM` command, or `REPT ALM` message).

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the `RTRV-ALM-ALL` output response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

1. If all the alarm LEDs for the power circuit packs are lit and there is no loss of service, go to the section titled "All Power Circuit Pack Alarm LEDs Lit (Remote Complex)" (page 15-98).
2. For PWRA, PWRE, and PWRF circuit packs, check to see if any bus alarm lamp (ED-2C940-30 Fuse and Alarm Panel) or fuse alarm lamp (ED-9C114-30 Fuse and Alarm Panel) is lit on the Fuse and Alarm Panel. If there are alarm lamps lit, refer to the section titled "Primary Fuses" (page 15-79) before performing this procedure.
3. For PWRF circuit packs, check fuse board FBI (RUI Power Module) for any blown fuse indicators. If there are blown fuse indicators active, refer to the section titled "Fuses in RUI Power Module" (page 15-141) before performing this procedure.
4. If there are no bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or no fuse alarm lamps (ED-9C114-30 Fuse and Alarm Panel) lit or the FBI fuse board ALM LED is not lit, check to see if there are any power circuit packs without their green ON LED lit. If there are any power circuit pack green ON LEDs not lit, refer to the section titled "BDFB Power Feeder Failure" (page 15-99) before continuing this procedure.

5. If there are no power bus ALM LEDs lit and all green ON LEDs on the power circuit packs are lit, check for lit red ALM LEDs on the power circuit packs in the module that contains the circuit pack indicating the alarm condition (from `RTRV-ALM` command or `REPT ALM` message). If there are no ALM LEDs lit, perform the following procedure. Otherwise, go to Step 5.

    a. Initiate the LED lamp test by pressing the LED/Lamp Test button on the status panel or entering the following command:

    `EX-EQPT:`*[a]*`;`

    Where:

    a = Target ID (optional)

    This command takes up to 20 minutes to complete.

    b. Identify the power circuit pack(s) that the alarm LED does not illuminate and continue with Step 5.

6. If a red ALM LED is lit on only one power circuit pack or only one power circuit pack is identified in Step 4b within the module, use the section titled "Single Power Circuit Pack Failure" (page 15-106). If there is more than one red ALM LED lit on power circuit packs or more than one power circuit pack is identified in Step 4b within the module, use the section titled "Multiple Power Circuit Pack Failures" (page 15-114).

    If the red ALM LEDs are not lit on the power circuit packs or no power circuit packs are identified in Step 4, go to the section indicated below:

    - "Remote Unit Interface Failure" (page 15-151) for RUI Module circuit packs (UIA, UIB, SCI, and CLKGN)
    - "Unit Controller Failure" (page 15-152) for UC circuit packs
    - "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) for interface module and OPEX Module circuit packs (CLKDR, DS1IF, DS1IP, SWIF, MUX, SMUX, and OPEX)
    - "Protection Circuit Pack Failures" (page 15-167) for protection and protection switch circuit packs (DS1IP, SWIF-P [protection], DS1RY, MUXP, SMUXP, and MUXPS)

All Power Circuit Pack Alarm LEDs Lit (Remote Complex)

Use this procedure when all alarm LEDs associated with the power circuit packs are lit and there is no loss of service. If there is any loss of service (SA type of alarms), go to the section titled "Prioritizing Alarms" (page 15-12) to identify alarms and clear them.

1. Clear the Main Controller's LED exercise bit by entering the following command:

   `EX-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

   This command takes up to 20 minutes to complete. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise, continue with Step 2.

2. Remove the Remote Complex's RUI from service after the `EX-EQPT` command completes by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-{1,2}`

3. Extract the UIA circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

4. Reinstall the UIA circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

5. Restore the Remote Complex's RUI from service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-{1,2}`

6. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise, refer the problem to your system administrator or your next level of support for assistance.

BDFB Power Feeder Failure

Switch Complex and Collocated Interface Bays BDFB Power Feeder Failure

This procedure is used if there is possible Battery Distribution Feeder Board (BDFB) power feed failures. Possible BDFB power feed failures are indicated by power circuit packs not having their green ON LED lit and no power bus ALM LEDs lit.

1. Using the information in Table 15-17, attempt to identify a power feeder that all the power circuit packs without their green ON LED lit have in common.

NOTE:
In Table 15-17, BDFB-A supplies feeders AA, AB, AC, and AD and BDFB-B supplies feeders BA, BB, BC, and BD. The left-hand column identifies feeders A, B, C, and D for both BDFBs.

2. If a power feeder is identified, refer to your local -48V power troubleclearing procedures to correct the problem. If a single power feeder cannot be identified, refer the problem to your system administrator or next level of support for assistance.
3. If there is a fan assembly alarm associated with the power feed identified in this procedure, go to the procedure in the section titled "Fan Assembly Failure" (page 15-169) to clear it.

Table 15-17. **Power Circuit Pack and BDFB Power Feeder Associations — Switch Complex and Collocated Interface Bays**

Power Feeder	Battery Distribution Feeder Board	
	A	B
Power Feeders to Switch Bays 11 and 13		
A	PWRG-1	PWRG-2
B	PWRJ-1-1 PWRJ-1-3 PWRJ-1-5	PWRJ-1-2 PWRJ-1-4 PWRJ-1-6
C	PWRJ-2-1 PWRJ-2-3 PWRJ-2-5	PWRJ-2-2 PWRJ-2-4 PWRJ-2-6
D	PWRJ-3-1 PWRJ-3-3 PWRJ-3-5	PWRJ-3-2 PWRJ-3-4 PWRJ-3-6
Power Feeders to Fuse and Alarm Bay 5		
A	PWRE-1-1 PWRE-6-1 PWRE-9-1 PWRE-14-1	PWRE-1-2 PWRE-6-2 PWRE-9-2 PWRE-14-2
B	PWRE-2-1 PWRE-5-1 PWRE-10-1 PWRE-13-1	PWRE-2-2 PWRE-5-2 PWRE-10-2 PWRE-13-2
C	PWRE-3-1 PWRE-8-1 PWRE-11-1 PWRE-16-1	PWRE-3-2 PWRE-8-2 PWRE-11-2 PWRE-16-2
D	PWRE-4-1 PWRE-7-1 PWRE-12-1 PWRE-15-1	PWRE-4-2 PWRE-7-2 PWRE-12-2 PWRE-15-2

Table continued on next page.

Table 15-17. **Power Circuit Pack and BDFB Power Feeder Associations — Switch Complex and Collocated Interface Bays (Continued)**

Power Feeder	Battery Distribution Feeder Board	
	A	B
Power Feeders to Fuse and Alarm Bay 10		
A	PWRE-17-1 PWRE-22-1 PWRE-25-1 PWRE-30-1	PWRE-17-2 PWRE-22-2 PWRE-25-2 PWRE-30-2
B	PWRE-18-1 PWRE-21-1 PWRE-26-1 PWRE-29-1	PWRE-18-2 PWRE-21-2 PWRE-26-2 PWRE-29-2
C	PWRE-19-1 PWRE-24-1 PWRE-27-1 PWRE-32-1	PWRE-19-2 PWRE-24-2 PWRE-27-2 PWRE-32-2
D	PWRE-20-1 PWRE-23-1 PWRE-28-1 PWRE-31-1	PWRE-20-2 PWRE-23-2 PWRE-28-2 PWRE-31-2
Power Feeders to Fuse and Alarm Bay 14		
A	PWRE-34-1 PWRE-37-1 PWRE-42-1 PWRE-45-1	PWRE-34-2 PWRE-37-2 PWRE-42-2 PWRE-45-2
B	PWRE-33-1 PWRE-38-1 PWRE-41-1 PWRE-46-1	PWRE-33-2 PWRE-38-2 PWRE-41-2 PWRE-46-2
C	PWRE-36-1 PWRE-39-1 PWRE-44-1 PWRE-47-1	PWRE-36-2 PWRE-39-2 PWRE-44-2 PWRE-47-2
D	PWRE-35-1 PWRE-40-1 PWRE-43-1 PWRE-48-1	PWRE-35-2 PWRE-40-2 PWRE-43-2 PWRE-48-2

Table continued on next page.

Table 15-17. **Power Circuit Pack and BDFB Power Feeder Associations — Switch Complex and Collocated Interface Bays (Continued)**

Power Feeder	Battery Distribution Feeder Board	
	A	B
Power Feeders to Fuse and Alarm Bay 19		
A	PWRE-50-1 PWRE-53-1 PWRE-58-1 PWRE-61-1	PWRE-50-2 PWRE-53-2 PWRE-58-2 PWRE-61-2
B	PWRE-49-1 PWRE-54-1 PWRE-57-1 PWRE-62-1	PWRE-49-2 PWRE-54-2 PWRE-57-2 PWRE-62-2
C	PWRE-52-1 PWRE-55-1 PWRE-60-1 PWRE-63-1	PWRE-52-2 PWRE-55-2 PWRE-60-2 PWRE-63-2
D	PWRE-51-1 PWRE-56-1 PWRE-59-1 PWRE-64-1	PWRE-51-2 PWRE-56-2 PWRE-59-2 PWRE-64-2

Remote Complex BDFB Power Feeder Failure

This procedure is used if Battery Distribution Feeder Board (BDFB) power feeder failure is suspected. Possible BDFB power feeder failure is indicated by power circuit packs not having their green ON LED lit and Fuse and Alarm Panel alarm lamps (bus or fuse alarm lamps) not being lit.

1. Using the information in Table 15-17, attempt to identify a power feeder that all the power circuit packs without their green ON LED lit have in common.

NOTE:
Table 15-17 shows the power buses distribution to the different power circuit packs. For frames wired for duplex power (power buses A, B, C, D, E, and F), the second and third columns of Table 15-17 show that BDFB-A supplies power buses A, B, and E; and BDFB-B supplies power buses C, D, and F. For frames using standard power, the fourth (rightmost) column of Table 15-17 shows that the same BDFB supplies all power buses (A, B, C, D, E, F, and G).

2. If a power feeder is identified, refer to your local -48V power trouble clearing procedures to correct the problem. If a single power feeder cannot be identified, refer the problem to your system administrator or next level of support for assistance.

3. If there is a fan assembly alarm associated with the power feeder identified in this procedure, refer to the procedure in the section titled "Fan Assembly Failure" (page 15-169) to clear it.

Table 15-18. Power Circuit Pack and BDFB Power Feeder Associations — Remote Complex

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
A	RPWRA-1 PWRE-5-1 PWRE-7-1 PWRE-9-1 PWRE-11-1 PWRE-13-1 PWRE-15-1 PWRE-17-1 PWRE-19-1 PWRE-21-1 PWRE-23-1 PWRE-25-1 PWRE-27-1 RPWRF-1		RPWRA-1 PWRE-2-1 PWRE-3-1 PWRE-4-1 PWRE-5-1 PWRE-7-1 PWRE-9-1 PWRE-11-1 PWRE-13-1 PWRE-15-1 PWRE-17-1 PWRE-19-1 PWRE-21-1 PWRE-23-1 PWRE-25-1 PWRE-27-1 PWRE-30-1 PWRE-32-1
B	RPWRA-2 PWRE-2-1 PWRE-6-1 PWRE-8-1 PWRE-10-1 PWRE-12-1 PWRE-14-1 PWRE-16-1 PWRE-18-1 PWRE-20-1 PWRE-22-1 PWRE-24-1 PWRE-26-1 PWRE-28-1 PWRE-30-1 RPOWERE-SW-1		RPWRA-2 PWRE-2-2 PWRE-6-1 PWRE-9-2 PWRE-12-1 PWRE-14-1 PWRE-15-2 PWRE-18-1 PWRE-20-1 PWRE-21-2 PWRE-24-1 PWRE-26-1 PWRE-27-2 PWRE-28-2 PWRE-29-1 RPOWERE-SW-1

Table continued on next page.

Table 15-18. **Power Circuit Pack and BDFB Power Feeder Associations — Remote Complex (Continued)**

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
C		RPWRA-3 PWRE-5-2 PWRE-7-2 PWRE-9-2 PWRE-11-2 PWRE-13-2 PWRE-15-2 PWRE-17-2 PWRE-19-2 PWRE-21-2 PWRE-23-2 PWRE-25-2 PWRE-27-2 RPWRF-2	RPWRA-3 PWRE-1-1 PWRE-4-2 PWRE-5-2 PWRE-6-2 PWRE-8-1 PWRE-10-1 PWRE-11-2 PWRE-14-2 PWRE-16-1 PWRE-17-2 PWRE-20-2 PWRE-22-1 PWRE-23-2 PWRE-26-2 PWRE-28-1 PWRE-31-1 PWRE-32-2
D		RPWRA-4 PWRE-2-2 PWRE-6-2 PWRE-8-2 PWRE-10-2 PWRE-12-2 PWRE-14-2 PWRE-16-2 PWRE-18-2 PWRE-20-2 PWRE-22-2 PWRE-24-2 PWRE-26-2 PWRE-28-2 PWRE-30-2 RPOWERE-SW-2	RPWRA-4 PWRE-1-2 PWRE-3-2 PWRE-7-2 PWRE-8-2 PWRE-10-2 PWRE-12-2 PWRE-13-2 PWRE-16-2 PWRE-18-2 PWRE-19-2 PWRE-22-2 PWRE-24-2 PWRE-25-2 PWRE-29-2 PWRE-30-2 PWRE-31-2 RPOWERE-SW-2

Table continued on next page.

Table 15-18. **Power Circuit Pack and BDFB Power Feeder Associations — Remote Complex (Continued)**

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
E	PWRE-1-1 PWRE-3-1 PWRE-4-1 PWRE-29-1 PWRE-31-1 PWRE-32-1		
F		PWRE-1-2 PWRE-3-2 PWRE-4-2 PWRE-29-2 PWRE-31-2 PWRE-32-2	RPWRF-1
G			RPWRF-2

Single Power Circuit Pack Failure

This procedure is for single power circuit pack failure in the PWRJ circuit pack group, single PWRG circuit pack (MEM Module) failure, OPEX Power Module, RUI Power Module, or failure of a single PWRE circuit pack within an interface module. The eighteen PWRJ circuit packs within the three Switch Power Modules are divided into nine groups of two PWRJ circuit packs. These groups consist of PWRJ 1 and 2, PWRJ 3 and 4, and PWRJ 5 and 6 in each Switch Power Module. If there are multiple power circuit pack failures (indicated by more than one lit red ALM LED on power circuit packs) within the same group or module, refer to the section titled "Multiple Power Circuit Pack Failures" (page 15-114).

NOTE:
When PWRE circuit packs fail, both PWRE circuit packs within the same Interface Module may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the PWRE circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

NOTE:
On the PWRJ circuit packs, two sets of test points are provided (see Figure 15-8 for location of the testpoints). These test points are used for measuring the output voltage and current. Table 15-19 (no Remote Complexes) and Table 15-20 (with one or two Remote Complexes) list the voltage levels and maximum current levels. The maximum current levels assume that all SWIO Modules contain 16 SWIO/OSWIO circuit packs.

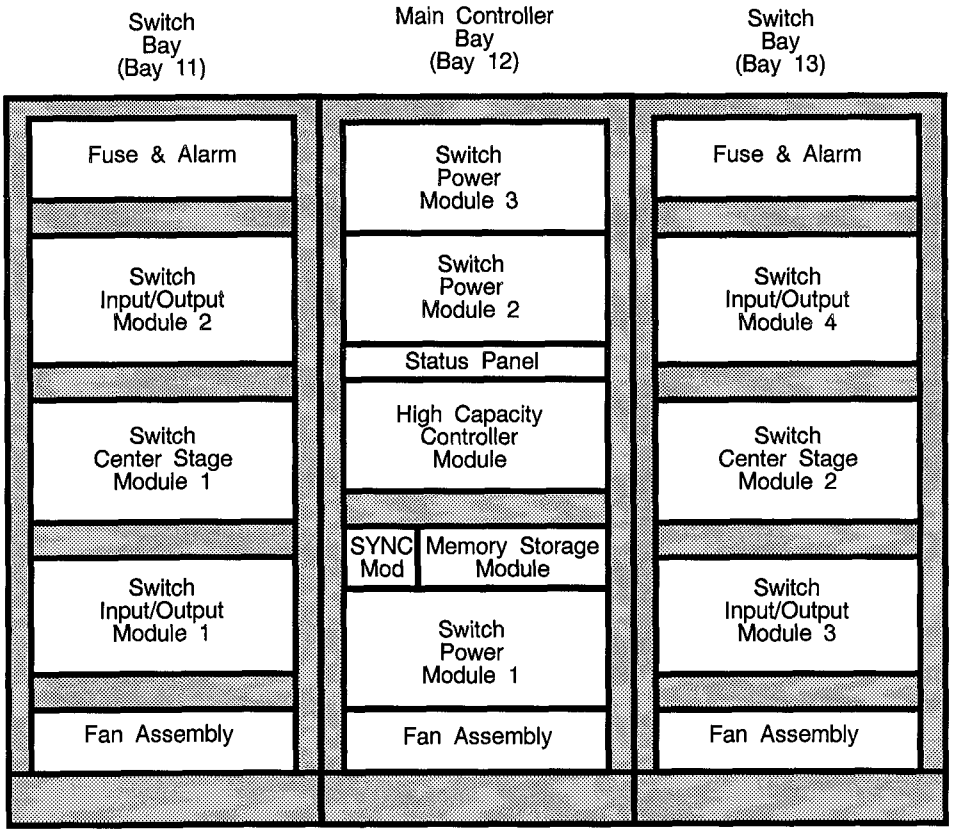


Figure 15-6. **Module Locations in Switch and Main Controller Bays**

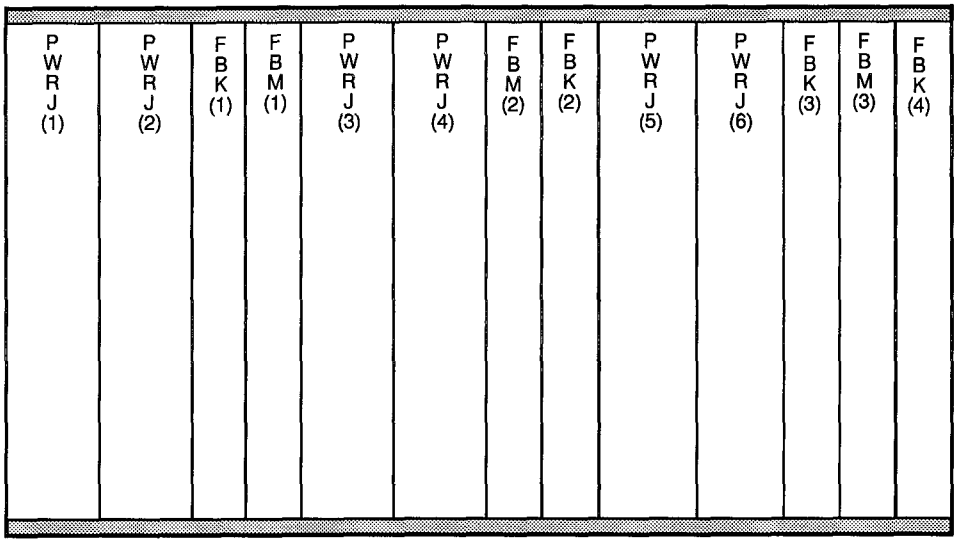


Figure 15-7. **PWRJ Circuit Pack Locations Within Switch Power Modules**

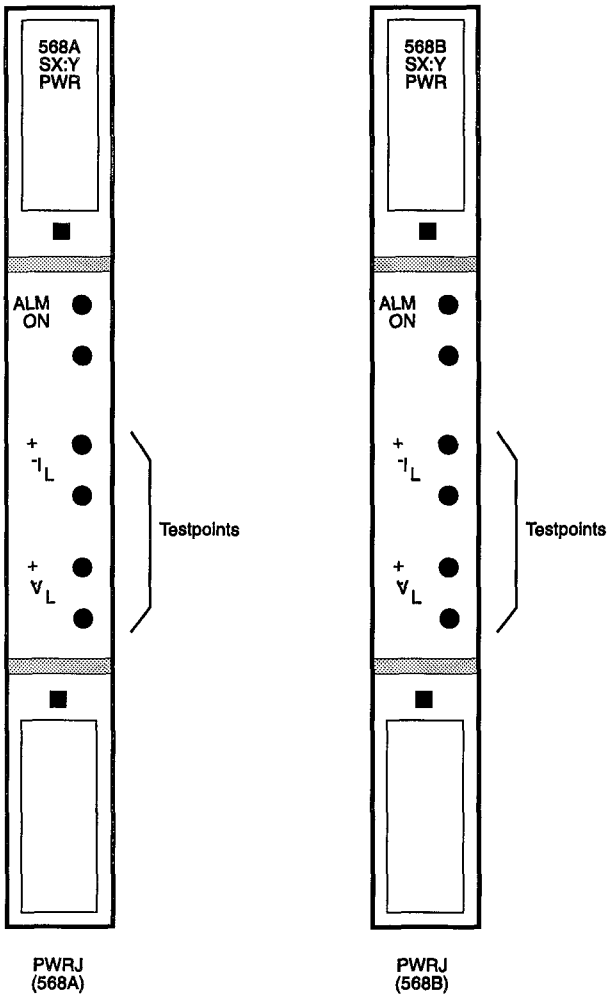
1. Locate the power circuit pack indicating the alarm (lit alarm LED, `RTRV-ALM` command, or `REPT ALM` message). Refer to Figures 15-6 and 15-7 for locations of PWRJ circuit packs. PWRJ-1-{1-6} are in Switch Power Module 1, PWRJ-2-{1-6} are in Switch Power Module 2, and PWRJ-3-{1-6} are in Switch Power Module 3.
2. Check to make sure that the latch on the power circuit pack is fully secured. If not, it can be causing intermittent power circuit pack failures.

   If securing the latch causes the alarm to clear, you are done with this procedure.
3. If the power circuit pack located in Step 1 is a PWRJ circuit pack, perform the following procedure to check output voltage and current levels:
   a. Obtain a recently calibrated digital multimeter, which has a DC volt and millivolt scale and a recommended precision of ± (.25% of reading plus one digit).
   b. With the digital multimeter set to the DC volt scale, measure the output voltage (V_L) between testpoints V_L+ and V_L- for the PWRJ circuit pack located in Step 1 and its mate. PWRJ circuit packs 1 and 2, 3 and 4, and 5 and 6 in each Switch Power Module work in groups. Refer to Figure 15-8 for testpoint location.

      Normal output voltage levels for PWRJ-{1-3}-{1,2,5,6} are between 4.845V and 5.355V and for PWRJ-{1-3}-{3,4} are between 5.035V and 5.565V.

c. With the digital multimeter set to the DC millivolt scale, measure the output current (I_L) between testpoints I_L+ and I_L- for the PWRJ circuit pack located in Step 1 and its mate. The output current level is determined by dividing the voltage reading by 10 (for example, if the voltage reading is 455 mV, the output current is 45.5 amps).

   The PWRJ circuit pack indicating the failure should have a reading of zero and its mate should have a reading of the total current provided the circuit pack group (refer to Table 15-19 (no Remote Complexes) or Table 15-20 (with one or two Remote Complexes) for maximum current loads).



Note: The notation X:Y refers to the series number (X) and the version number (Y) of the PWRJ circuit pack.

Figure 15-8. **PWRJ Circuit Pack Testpoint Locations**

Table 15-19. **PWRJ Groups, Output Voltage and Current Loads — No Remote Complexes**

PWRJ Circuit Pack Group	Current Load Description		Output Voltage	Maximum Current Load†
	Circuit Pack Location*	Amp Load		
Switch Power Module 1 (SW PWR MOD 1)				
PWRJ-1-1 PWRJ-1-2	SWIO-1-{1-16}	64.0A	4.845V (min) 5.355V (max)	91.2A
	SWIO-3-{1-6}	24.0A		
	SYNC-0	3.23A		
PWRJ-1-3 PWRJ-1-4	SWIO-1-{1-16}	25.7A	-5.035 (max) -5.565 (min)	52.1A
	SWIO-3-{1-16}	25.7A		
	SYNC-0	0.64A		
PWRJ-1-5 PWRJ-1-6	SWIO-3-{7-16}	40.0A	4.845V (min) 5.355V (max)	89.2A
	HCC-0	49.2A		
Switch Power Module 2 (SW PWR MOD 2)				
PWRJ-2-1 PWRJ-2-2	SWCS-1-{1-16}, CLKGN-0	75.0A	4.845V (min) 5.355V (max)	83.5A
	PRI-1, SEC	8.5A		
PWRJ-2-3 PWRJ-2-4	SWCS-1-{1-16}, CLKGN-0	45.29A	-5.035 (max) -5.565 (min)	90.6A
	SWCS-2-{1-16}, CLKGN-1	45.29A		
PWRJ-2-5 PWRJ-2-6	SWCS-2-{1-16}, CLKGN-1	75.0A	4.845V (min) 5.355V (max)	79.0A
	PRI-2	4.0A		
Switch Power Module 3 (SW PWR MOD 3)				
PWRJ-3-1 PWRJ-3-2	SWIO-2-{1-16}	64.0A	4.845V (min) 5.355V (max)	91.2A
	SWIO-4-{1-6}	24.0A		
	SYNC-1	3.23A		
PWRJ-3-3 PWRJ-3-4	SWIO-2-{1-16}	25.7A	-5.035 (max) -5.565 (min)	52.1A
	SWIO-4-{1-16}	25.7A		
	SYNC-1	0.64A		
PWRJ-3-5 PWRJ-3-6	SWIO-4-{7-16}	40.0A	4.845V (min) 5.355V (max)	89.2A
	HCC-1	49.2A		

* Failure of both PWRJ circuit packs within a group causes the associated circuit packs to lose service.

† For PWRJ-{1-3}-{1,2,5,6}, 4A per SWIO circuit pack not installed are deducted from the maximum current load. For PWRJ-{1-3}-{3,4}, 1.61A per SWIO circuit pack not installed are deducted from the maximum current load. For example, using PWRJ-1-{1,2} with an empty SWIO Mod 3, the current load is 67.2A (91.2-24)

Table 15-20. **PWRJ Groups, Output Voltage and Current Loads — Remote Complexes**

PWRJ Circuit Pack Group	Current Load Description		Output Voltage	Maximum Current Load†
	Circuit Pack Location*	Amp Load		
Switch Power Module 1 (SW PWR MOD 1)				
PWRJ-1-1 PWRJ-1-2	SWIO-1-{1-16}	72.0A	4.845V (min) 5.355V (max)	102.2A
	SWIO-3-{1-6}	27.0A		
	SYNC-0	3.23A		
PWRJ-1-3 PWRJ-1-4	SWIO-1-{1-16}	25.7A	-5.035 (max) -5.565 (min)	52.1A
	SWIO-3-{1-16}	25.7A		
	SYNC-0	0.64A		
PWRJ-1-5 PWRJ-1-6	SWIO-3-{7-16}	45.0A	4.845V (min) 5.355V (max)	98.0A
	HCC-0	53.0A		
Switch Power Module 2 (SW PWR MOD 2)				
PWRJ-2-1 PWRJ-2-2	SWCS-1-{1-16}, CLKGN-0	75.0A	4.845V (min) 5.355V (max)	83.5A
	PRI-1, SEC	8.5A		
PWRJ-2-3 PWRJ-2-4	SWCS-1-{1-16}, CLKGN-0	45.29A	-5.035 (max) -5.565 (min)	90.6A
	SWCS-2-{1-16}, CLKGN-1	45.29A		
PWRJ-2-5 PWRJ-2-6	SWCS-2-{1-16}, CLKGN-1	75.0A	4.845V (min) 5.355V (max)	79.0A
	PRI-2	4.0A		
Switch Power Module 3 (SW PWR MOD 3)				
PWRJ-3-1 PWRJ-3-2	SWIO-2-{1-16}	72.0A	4.845V (min) 5.355V (max)	102.2A
	SWIO-4-{1-6}	27.0A		
	SYNC-1	3.23A		
PWRJ-3-3 PWRJ-3-4	SWIO-2-{1-16}	25.7A	-5.035 (max) -5.565 (min)	52.1A
	SWIO-4-{1-16}	25.7A		
	SYNC-1	0.64A		
PWRJ-3-5 PWRJ-3-6	SWIO-4-{7-16}	45.0A	4.845V (min) 5.355V (max)	98.0A
	HCC-1	53.2A		

* Failure of both PWRJ circuit packs within a group causes the associated circuit packs to lose service.

† For PWRJ-{1-3}-{1,2,5,6}, 4.5A per SWIO circuit pack not installed are deducted from the maximum current load. For PWRJ-{1-3}-{3,4}, 1.61A per SWIO circuit pack not installed are deducted from the maximum current load. For example, using PWRJ-1-{1,2} with an empty SWIO Mod 3, the current load is 75.2A (102.2-27)

d. If the PWRJ circuit pack indicating the failure does not have an output current reading of zero or the output voltage reading of its mate PWRJ circuit pack is not within the acceptable range, refer the problem to your system administrator or next level of support for assistance before continuing this procedure.

4. Obtain a power circuit pack of the same type and series as the circuit pack located in Step 1.

5. If you are replacing a PWRF circuit pack, remove the RUI Module from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

6. Replace the power circuit pack located in Step 1 and mark the replaced circuit pack for later reference. Refer to Chapter 2 for extracting and installing circuit packs.

   After replacing the power circuit pack, the ALM LED should go off. If the ALM LED stays off, attach the alarm report to the failed circuit pack. If you replaced a PWRE or PWRG circuit pack, you are done with this procedure. If you replaced a PWRF circuit pack, perform Step 7 to restore the RUI Module. If you replaced a PWRJ circuit pack, perform Step 8 to verify output voltage and current levels.

   If the ALRM LED stays on, continue with Step 9.

7. If you are replacing a PWRF circuit pack, restore the RUI Module to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

   This command takes up to 5 minutes to complete. After this command completes, you are done with this procedure.

8. Perform the following procedure only after the alarm clears for PWRJ circuit pack located in Step 1:

   a. With the digital multimeter set to the DC volt scale, measure the output voltage (V_L) between testpoints V_L+ and V_L- for the PWRJ circuit pack located in Step 1 and its mate. PWRJ circuit packs 1 and 2, 3 and 4, and 5 and 6 in each Switch Power Module work in groups. Refer to Figure 15-8 for testpoint location.

Normal output voltage levels for PWRJ-{1-3}-{1,2,5,6} are between 4.845V and 5.355V and for PWRJ-{1-3}-{3,4} are between 5.035V and 5.565V.

b. With the digital multimeter set to the DC millivolt scale, measure the output current (I_L) between testpoints I_L+ and I_L- for the PWRJ circuit pack located in Step 1 and its mate. The output current level is determined by dividing the voltage reading by 10 (for example, if the voltage reading is 455 mV, the output current is 45.5 amps).

   Normal output current levels for the PWJR circuit pack located in Step 1 and its mate are between 40% and 60% of the total current supplied by both PWRJ circuit packs. For example, if the total output current is 90A, it is acceptable for one PWRJ to indicate 36A and the other PWRJ to indicate 54A.

c. If output voltage and/or current levels for the PWRJ circuit pack measured in Steps 8a and 8b are not within acceptable levels, refer the problem to your system administrator or next level of support for assistance. If the levels are acceptable, you are done with this procedure.

9. If the ALM LED is still lit, return the original power circuit pack to the module.

   If the problem is located in the:

   - Interface Module, Memory Storage Module, or RUI Power Module — You cannot clear the problem by replacing a circuit pack. Refer the problem to your system administrator or your next level of support for assistance.
   - Switch Power Module or OPEX Power Module — If there is a blown fuse in the Switch Power Modules, go to the section titled "Switch Complex Secondary Fuses" (page 15-123). If there is a blown fuse in the OPEX Power Module, go to the section titled "Secondary Fuses in OPEX Power Module" (page 15-89). If there are no blown fuses, you cannot clear the problem by replacing a circuit pack. Refer the problem to your system administrator or your next level of support for assistance.

Multiple Power Circuit Pack Failures

Contact your system administrator or next level of support to notify them of multiple power circuit pack failure and get their assistance in performing this procedure. Use this procedure if there are multiple power circuit pack failures within a PWRJ circuit pack group, Memory Module, RUI Power Module, OPEX Power Module, or interface module. The eighteen PWRJ circuit packs within the three Switch Power Modules are divided into nine groups of two PWRJ circuit packs. These groups consist of PWRJ 1 and 2, PWRJ 3 and 4, and PWRJ 5 and 6 in each Switch Power Module. If there is only a single power circuit pack failure within any one group or module, refer to the previous section titled "Single Power Circuit Pack Failure" (page 15-106).

⚠ CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

For the module containing the multiple power circuit pack failure, refer to the section indicated:

- "Multiple PWRJ Circuit Pack Failures" (page 15-115) for PWRJ circuit pack group failures.
- "Multiple PWRG Circuit Pack Failures in Memory Storage Module" (page 15-118) for PWRG circuit packs.
- "Multiple Power Circuit Pack Failures in OPEX Power or Auxiliary Power Module" (page 15-119) for OPEX and Auxiliary Power Module power circuit packs.
- "Multiple Power Circuit Pack Failures in RUI Power Module" (page 15-120) for RUI Power Module power circuit packs.
- "Multiple PWRE Circuit Pack Failures in Interface Module" (page 15-121) for PWRE circuit packs.

Multiple PWRJ Circuit Pack Failures

Perform this procedure to clear multiple PWRJ circuit pack failures within a PWRJ circuit pack group. The eighteen PWRJ circuit packs within the three Switch Power Modules are divided into nine groups of two PWRJ circuit packs. These groups consist of PWRJ 1 and 2, PWRJ 3 and 4, and PWRJ 5 and 6 in each Switch Power Module. If only one of the PWRJ circuit packs (within a single group) has a lit red ALM LED, go to the section titled "Single Power Circuit Pack Failure" (page 15-106).

⚠ CAUTION:
Never disengage or extract more than one PWRJ circuit pack at a time. Extracting more than one PWRJ circuit pack may cause loss of service.

⇒ NOTE:
On the PWRJ circuit packs, two sets of test points are provided [see Figure 15-8 in the section titled "Single Power Circuit Pack Failure" (page 15-106) for location of the testpoints]. These test points are used for measuring the output voltage and current. Table 15-19 (no Remote Complexes) or Table 15-20 (with one or two Remote Complexes) [at the end of the section titled "Single Power Circuit Pack Failure" (page 15-106)] lists the voltage levels and maximum current levels. The maximum current levels assume that all SWIO Modules contain 16 SWIO/OSWIO circuit packs.

1. Locate the PWRJ circuit packs indicating the alarm (lit alarm LED, `RTRV-ALM` command, or `REPT ALM` message). Refer to Figures 15-6 and 15-7 in the section titled "Single Power Circuit Pack Failure" (page 15-106) for locations of PWRJ circuit packs. PWRJ-1-{1-6} are in Switch Power Module 1, PWRJ-2-{1-6} are in Switch Power Module 2, and PWRJ-3-{1-6} are in Switch Power Module 3.

   For PWRJ circuit pack group having both PWRJ circuit packs indicating an alarm, continue with this procedure for those groups. If, at most, only one PWRJ circuit pack for any group is indicating an alarm refer to the section titled "Single Power Circuit Pack Failure" (page 15-106).

2. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of possible service outages due to multiple PWRJ circuit pack failure within Switch Power Modules.

3. Identify the group (choose one if multiple groups) of two PWRJ circuit packs that indicate an alarm.

4. Check to make sure that the latch on the PWRJ circuit packs identified in Step 3 are fully secured. If not, it can be causing intermittent PWRJ circuit pack failures.

   If securing all the latches causes the alarms to clear for the group of two PWRJ circuit packs and there are not other groups with alarms, you are done with this procedure. If there are other groups of PWRJ circuit packs

indicating an alarm, go back to Step 3. If only one red ALM LED within any group remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106). If the ALM LED on both PWRJ circuit packs within a group remains lit, continue with this procedure.

5. Obtain new PWRJ circuit packs of the same series for the group identified in Step 3.
6. Choose one of the PWRJ circuit packs identified in Step 3 and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
7. Verify the output voltage and current of the new PWRJ and mate PWRJ circuit packs by performing the following procedure:
    a. Obtain a recently calibrated digital multimeter, which has a DC volt and millivolt scale and a recommended precision of ±0.25% of reading plus one digit).
    b. With the digital multimeter set to the DC volt scale, measure the output voltage (V_L) between testpoints V_L+ and V_L- for the PWRJ circuit pack identified in Step 3 and its mate. PWRJ circuit packs 1 and 2, 3 and 4, and 5 and 6 in each Switch Power Module work in groups. Refer to Figure 15-8 for testpoint location.

       Normal output voltage levels for PWRJ-{1-3}-{1,2,5,6} are between 4.845V and 5.355V and for PWRJ-{1-3}-{3,4} are between 5.035V and 5.565V.
    c. With the digital multimeter set to the DC millivolt scale, measure the output current (I_L) between testpoints I_L+ and I_L- for the PWRJ circuit pack identified in Step 3 and its mate. The output current level is determined by dividing the voltage reading by 10 (for example, if the voltage reading is 455 mV, the output current is 45.5 amps).

       The new PWRJ circuit pack should have a reading of the total current provided the circuit pack group if only the alarm for the replaced PWRJ circuit pack clears (refer to Table 15-19 (no Remote Complexes) or Table 15-20 (with one or two Remote Complexes) for maximum current loads). If the mate PWRJ circuit pack alarm also clears, the current readings for both PWRJ circuit packs should be within 40% to 60% of the total current supplied by the group.
    d. If the output voltage and current reading are not within the acceptable ranges, go back to Step 6 and replace the mate PWJR circuit pack. If the output voltage and current reading are within the acceptable ranges for the replaced PWRJ circuit pack, continue with Step 8.

       If, after replacing both PWRJ circuit packs within the group, and the output voltage and/or current is not an acceptable reading, or If the ALM LED on either of the PWRJ circuit packs within the replaced group does not turn off, refer the problem to your system administrator or next level of support for assistance before continuing this pro-

cedure. If the output voltage and current readings of both PWRJ circuit packs within the group are acceptable and the ALM LEDs are off, attach the alarm report to the failed circuit pack(s) and continue with Step 8.

8. Check to see if there are any other groups with both red ALM LEDs lit on the PWRJ circuit packs. If so, repeat this procedure from Step 3.
9. If the MC FAIL LED remains lit, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

NOTE:
If multiple switch PWRJ circuit packs failed, multiple switch circuit packs (SWCS or SWIO) may alarm when power is restored. The switch circuit pack alarms can take up to 30 minutes to clear autonomously.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

10. Wait to see if all alarms and trouble indicators go off (about 30 seconds).

    If single ALM LEDs within any of the groups remain lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106) to clear single PWRJ circuit pack within a group failure. If both ALM LEDs in any PWRJ circuit pack group remains lit, refer the problem to your system administrator or next level of support for assistance.

Multiple PWRG Circuit Pack Failures in Memory Storage Module

Perform this procedure only if both PWRG circuit packs are failed. If only one PWRG circuit pack has its red ALM LED lit, refer to the section titled "Single Power Circuit Pack Failure" (page 15-106) for each failed PWRG circuit pack(s).

⚠ CAUTION:
Never disengage or extract more than one PWRG circuit pack at a time. Extracting more than one PWRG circuit pack may cause loss of service.

1. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of service outages due to multiple PWRG circuit pack failure within the Memory Storage Module.
2. Check to make sure that the latch on the PWRG circuit packs are fully secured. If not, it can be causing intermittent PWRG circuit pack failures.

   If securing all the latches causes the alarms to clear for all PWRG circuit packs within a module, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106). Otherwise, continue with this procedure.
3. Obtain two new PWRG circuit packs.
4. Choose one of the PWRG circuit packs with the red ALM LED lit and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
5. Check to see if the red ALM LED is lit on the other PWRG circuit pack you haven't replaced. If the LED is lit, repeat this procedure from Step 4.
6. Check to see if the red ALM LEDs are off, and green LEDs are on for the replacement High-Capacity Controller power circuit packs.

   If the red ALM LEDs do not turn off, do not continue with this procedure. Refer the problem to your system administrator or your next level of support for assistance.

   If the ALM LED is off, attach the alarm report to the failed circuit pack.
7. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

Multiple Power Circuit Pack Failures in OPEX Power or Auxiliary Power Module

Perform this procedure to clear multiple power circuit pack failures within the OPEX or Auxiliary Power Modules. If only one of the power circuit packs (within a single module) has a lit red ALM LED, go to the section titled "Single Power Circuit Pack Failure" (page 15-106).

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one PWRA (RPWRA) or PWRE (POWERE-SW) circuit pack at a time. Extracting more than one PWRA or PWRE circuit pack may cause loss of service.

1. Locate the two PWRA (RPWRA) or two PWRE (RPOWERE-SW) circuit packs indicating the alarm (lit alarm LED).
2. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of possible service outages due to multiple power circuit pack failures within OPEX Power and Auxiliary Power Modules.
3. Check to make sure that the latch on the power circuit packs identified in Step 1 are fully secured. If not, it can be causing intermittent power circuit pack failures.

   If securing all the latches causes the alarms to clear for the power circuit packs, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106). Otherwise, continue with this procedure.
4. Obtain new power circuit packs of the same series for the circuit packs identified in Step 1.
5. Choose one of the power circuit packs identified in Step 1 and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
6. Check to see if the red ALM LED on the replacement power circuit pack is off.

   If the ALM LED does not turn off, refer the problem to your system administrator or your next level of support for assistance.

   If the ALM LED is off, attach the alarm report to the failed circuit pack.

7. Check to see if there are any other red ALM LEDs lit on any of the OPEX Power or Auxiliary Power Modules. If so, repeat this procedure from Step 5.
8. Wait to see if all alarms and trouble indicators go off (about 30 seconds).

   If any ALM LEDs remain lit, refer the trouble to your system administrator or next level of support.

NOTE:
If multiple OPEX power circuit packs failed, multiple OPEX circuit packs may alarm when power is restored. The OPEX circuit pack alarms can take up to 30 minutes to clear autonomously.

Multiple Power Circuit Pack Failures in RUI Power Module

Perform this procedure only if both PWRF circuit packs are failed. If only one PWRF circuit pack has its red ALM LED lit, refer to the section titled "Single Power Circuit Pack Failure" (page 15-106) for the failed PWRF circuit pack.

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one PWRF (RPWRF) circuit pack at a time. Extracting more than one PWRF circuit pack may cause loss of service.

1. Locate the PWRF (RPWRF) circuit packs indicating the alarm (lit alarm LED).
2. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of service outages due to multiple power circuit pack failures within the RUI Power Module.
3. Check to make sure that the latch on the power circuit packs is fully secured. If not, it can be causing intermittent power circuit pack failures.

   If securing all the latches causes the alarms to clear for all power circuit packs within a module, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106). Otherwise, continue with this procedure.
4. Obtain new PWRF circuit packs (if necessary).
5. Choose one of the power circuit packs identified in Step 1 and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

6. Check to see if there are any other red ALM LEDs lit on any of the RUI power circuit packs you have not replaced. If there are, repeat this procedure from Step 4.
7. Check to see if the red ALM LEDs are off, and green LEDs are on for the replacement RUI power circuit packs.

   If the red ALM LEDs do not turn off, do not continue with this procedure. Refer the problem to your system administrator or your next level of support for assistance.

   If the ALM LED is off, attach the alarm report to the failed circuit pack.
8. Restore the RUI Module to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

Multiple PWRE Circuit Pack Failures in Interface Module

Perform this procedure to clear multiple PWRE circuit pack failures within an interface module. If only one of the PWRE circuit packs has a lit red ALM LED, go to the section titled "Single Power Circuit Pack Failure" (page 15-106).

NOTE:
When PWRE circuit packs fail, both PWRE circuit packs within the same Interface Module may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the PWRE circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one PWRE circuit pack at a time. Extracting more than one PWRE circuit pack may cause loss of service.

1. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of service outages due to multiple PWRE circuit pack failure within an interface module.
2. Check to make sure that the latch on the PWRE circuit packs within the single interface module is fully secured. If not, it can be causing intermittent PWRE circuit pack failures.

   If securing all the latches causes the alarms to clear for all PWRE circuit packs within an interface module, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 15-106). Otherwise, continue with this procedure.

3. Obtain new PWRE circuit packs.
4. For each failed PWRE circuit pack within an interface module:
   a. Replace a PWRE circuit pack with its red ALM LED lit. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
   b. Check to see if the red ALM LED on the replacement PWRE circuit pack is off.

      If the ALM LED does not turn off, refer the problem to your system administrator or your next level of support before continuing.

      If the ALM LED is off, attach the alarm report to the failed PWRE circuit pack.
5. Restore the interface module's associated unit controller and DS3PM (if installed) circuit pack by entering the following command for each circuit pack:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-[1-64]`
   DS3PM circuit pack location: `DS3PM-[1-64]`

   This command takes up to five minutes to complete.
6. Check to see if there are any other red ALM LEDs lit on any of the interface modules' PWRE circuit packs.

   If any ALM LEDs are still lit, repeat this procedure from Step 3.
7. If the red ALM LED on any unit controller remains lit, go to the section titled "Unit Controller Failure" (page 15-152).

Switch Complex Secondary Fuses

This procedure is applicable for major and minor alarms associated with secondary fuses in the Switch Power Modules and the Memory Storage Module. Major alarms occur if more than one fuse blows or the associated circuit pack is inhibited from switching to protection. Minor alarms occur when only one fuse blows and the associated circuit pack switches to protection.

⚠ CAUTION:
Only blown fuses (identified by a lit red LED) should be extracted. Extracting good fuses may cause loss of service.

⚠ CAUTION:
The locations FBK-1-2 (P and N), FBK-1-4 (B and A), FBM-1-3 (B and A), FBK-2-2 (P and N), FBK-2-4 (B and A), FBM-2-3 (B and A), FBK-3-2 (P and N), FBK-3-4 (B and A), and FBM-3-3 (B and A) are power circuit pack sensory straps. These straps must ***not*** *be extracted. If any of these straps are extracted, a loss of service may occur.*

1. Check to see if there are any blown fuse indicators (a lit red LED) in any of the fuse boards in the Switch Power Modules (FBK and FBM) or the fuse boards in the Memory Storage Module (FBJ and FBL). Refer to Figures 15-9 (Switch Power Module [SW PWR MOD] locations), 15-10 (FBK and FBM locations), and 15-11 (FBJ and FBL locations).
2. If there are no blown fuse indicators active, go to the section titled "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) for alarms due to SWIO, SWCS, and CLKGN failures or go to the section titled "High Capacity Controller Failure" (page 15-145) for High-Capacity Controller Module circuit pack failure. For the circuit pack indicating the alarm (refer to Tables 15-21, 15-22, and 15-23 and Figure 15-11 for circuit pack locations), perform the appropriate procedure:
   - "SWIO, SWCS, and CLKGN Fuses" (page 15-131) for SWIO, SWCS, and CLKGN circuit packs
   - "ECI Fuses" (page 15-133) for either ECI circuit pack
   - "Control Complex (CPU/MTC/SSC/SCI/UI) Fuses" (page 15-135) for High-Capacity Controller Module circuit packs (excluding ECI circuit packs)

- "Disk Drive Fuses" (page 15-137) for either PRI disk drive
- "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177) for the SEC disk drive
- For +5V LED, +5V SYNC, and -5.2V SYNC fuses, go to Step 3 of this procedure

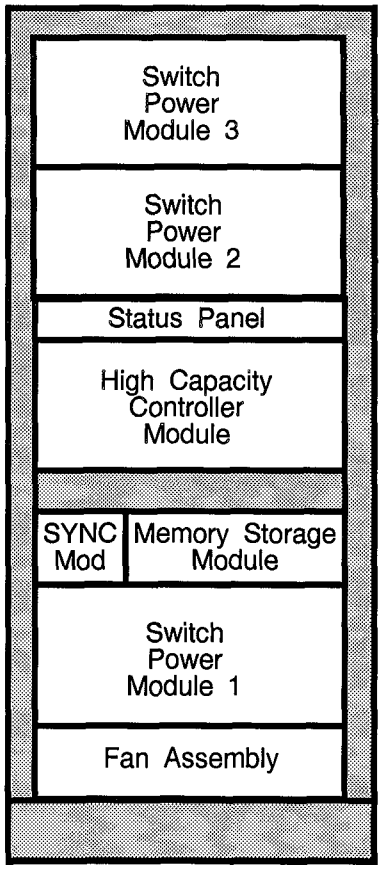
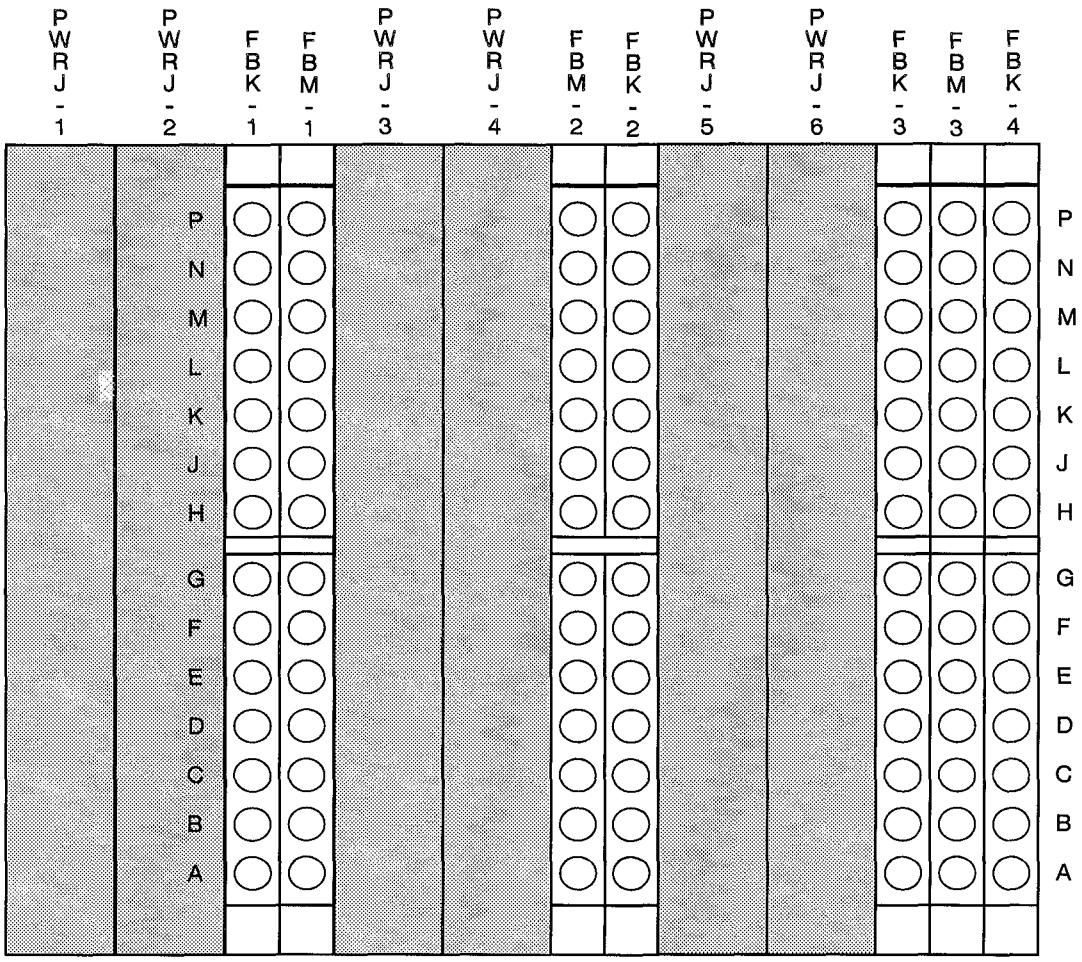


Figure 15-9. **Switch Power Module Locations in Main Controller Bay**



Note: A blown fuse is indicated by a lit red LED.

Figure 15-10. **Switch Power Module Secondary Fuses (FBK and FBM)**

Table 15-21. **Secondary Fuse Chart for SW PWR MOD 1 (Bottom of Bay 12)**

Location	Type 77H (4A), Type 77J (7.5A), and Type 77E (15A) Fuses for +5V Supply			
	FBK-1	**FBK-2**	**FBK-3**	**FBK-4**
P	SWIO-1-14 (77J)	PWRJ-1-1† (SNSEPAX)	NC (77J)	NC (77E)
N	SWIO-1-13 (77J)	PWRJ-1-2† (SNSEPBX)	NC (77J)	NC (77H)
M	SWIO-1-12 (77J)	SWIO-1-16 (77J)	SWIO-3-16 (77J)	+5V STPNL‡ (77H
L	SWIO-1-11 (77J)	SWIO-1-15 (77J)	SWIO-3-15 (77J)	+5V LED* (77H)
K	SWIO-1-10 (77J)	+5V SYNC-0 (77J)	SWIO-3-14 (77J)	MTC-0-2 (77J)
J	SWIO-1-9 (77J)	NC (77J)	SWIO-3-13 (77J)	MTC-0-1 (77J)
H	SWIO-1-8 (77J)	NC (77J)	SWIO-3-12 (77J)	UI-0 (77E)
G	SWIO-1-7 (77J)	NC (77J)	SWIO-3-11 (77J)	SCI-0-2 (77E)
F	SWIO-1-6 (77J)	SWIO-3-6 (77J)	SWIO-3-10 (77J)	SCI-0-1 (77E)
E	SWIO-1-5 (77J)	SWIO-3-5 (77J)	SWIO-3-9 (77J)	CPU-0 (77J)
D	SWIO-1-4 (77J)	SWIO-3-4 (77J)	SWIO-3-8 (77J)	SSC-0 (77J)
C	SWIO-1-3 (77J)	SWIO-3-3 (77J)	SWIO-3-7 (77J)	ECI-1 (77E)
B	SWIO-1-2 (77J)	SWIO-3-2 (77J)	NC (77J)	PWRJ-1-6† (SNSEPBZ)
A	SWIO-1-1 (77J)	SWIO-3-1 (77J)	NC (77J)	PWRJ-1-5† (SNSEPAZ)

Location	Type 78H (4A) Fuses for -5V Supply		
	FBM-1	**FBM-2**	**FBM-3**
P	SWIO-1-14 (78H)	NC (78H)	NC (78H)
N	SWIO-1-13 (78H)	NC (78H)	NC (78H)
M	SWIO-1-12 (78H)	SWIO-1-16 (78H)	SWIO-3-16 (78H)
L	SWIO-1-11 (78H)	SWIO-1-15 (78H)	SWIO-3-15 (78H)
K	SWIO-1-10 (78H)	-5V SYNC-0 (78H)	SWIO-3-14 (78H)
J	SWIO-1-9 (78H)	NC (78H)	SWIO-3-13 (78H)
H	SWIO-1-8 (78H)	NC (78H)	SWIO-3-12 (78H)
G	SWIO-1-7 (78H)	NC (78H)	SWIO-3-11 (78H)
F	SWIO-1-6 (78H)	SWIO-3-6 (78H)	SWIO-3-10 (78H)
E	SWIO-1-5 (78H)	SWIO-3-5 (78H)	SWIO-3-9 (78H)
D	SWIO-1-4 (78H)	SWIO-3-4 (78H)	SWIO-3-8 (78H)
C	SWIO-1-3 (78H)	SWIO-3-3 (78H)	SWIO-3-7 (78H)
B	SWIO-1-2 (78H)	SWIO-3-2 (78H)	PWRJ-1-4† (SNSEPBY)
A	SWIO-1-1 (78H)	SWIO-3-1 (78H)	PWRJ-1-3† (SNSEPAY)

* - Provides fused power to LEDs of CC-0 circuit packs
† - Power sensory strap (does not carry load voltages, only sensory voltages). These straps must not be extracted. The sensory straps are provided by a Type 77H fuse.
‡ - CC-0 status panel fuse
NC - Not Connected (Spare)

Table 15-22. **Secondary Fuse Chart for SW PWR MOD 2 (Middle of Bay 12)**

Location	Type 77H (4A) and Type 77J (7.5A) Fuses for +5V Supply			
	FBK-1	FBK-2	FBK-3	FBK-4
P	SWCS-1-13 (77J)	PWRJ-2-1† (SNSEPAX)	PRI-1 (77H)	NC (77J)
N	SWCS-1-12 (77J)	PWRJ-2-2† (SNSEPBZ)	SEC (77H)	NC (77J)
M	SWCS-1-11 (77J)	SWCS-1-16 (77J)	NC (77H)	NC (77J)
L	SWCS-1-10 (77J)	SWCS-1-15 (77J)	SWCS-2-16 (77J)	NC (77J)
K	SWCS-1-9 (77J)	SWCS-1-14 (77J)	SWCS-2-15 (77J)	NC (77J)
J	SWCS-1-8 (77J)	NC (77H)	SWCS-2-14 (77J)	NC (77J)
H	SWCS-1-7 (77J)	SWCS-2-7 (77J)	SWCS-2-13 (77J)	NC (77J)
G	SWCS-1-6 (77J)	SWCS-2-6 (77J)	SWCS-2-12 (77J)	NC (77J)
F	SWCS-1-5 (77J)	SWCS-2-5 (77J)	SWCS-2-11 (77J)	NC (77J)
E	SWCS-1-4 (77J)	SWCS-2-4 (77J)	SWCS-2-10 (77J)	NC (77J)
D	SWCS-1-3 (77J)	SWCS-2-3 (77J)	SWCS-2-9 (77J)	NC (77H)
C	SWCS-1-2 (77J)	SWCS-2-2 (77J)	SWCS-2-8 (77J)	NC (77H)
B	SWCS-1-1 (77J)	SWCS-2-1 (77J)	+5V LED* (77H)	PWRJ-2-6† (SNSEPBZ)
A	CLKGN-0 (77H)	CLKGN-1 (77H)	PRI-2 (77H)	PWRJ-2-5† (SNSEPAZ)

Location	Type 78H (4A) and Type 78E (15A) Fuses for -5V Supply		
	FBM-1	FBM-2	FBM-3
P	SWCS-1-13 (78H)	NC (78E)	NC (78H)
N	SWCS-1-12 (78H)	NC (78H)	NC (78H)
M	SWCS-1-11 (78H)	SWCS-1-16 (78H)	NC (78H)
L	SWCS-1-10 (78H)	SWCS-1-15 (78H)	SWCS-2-16 (78H)
K	SWCS-1-9 (78H)	SWCS-1-14 (78H)	SWCS-2-15 (78H)
J	SWCS-1-8 (78H)	NC (78H)	SWCS-2-14 (78H)
H	SWCS-1-7 (78H)	SWCS-2-7 (78H)	SWCS-2-13 (78H)
G	SWCS-1-6 (78H)	SWCS-2-6 (78H)	SWCS-2-12 (78H)
F	SWCS-1-5 (78H)	SWCS-2-5 (78H)	SWCS-2-11 (78H)
E	SWCS-1-4 (78H)	SWCS-2-4 (78H)	SWCS-2-10 (78H)
D	SWCS-1-3 (78H)	SWCS-2-3 (78H)	SWCS-2-9 (78H)
C	SWCS-1-2 (78H)	SWCS-2-2 (78H)	SWCS-2-8 (78H)
B	SWCS-1-1 (78H)	SWCS-2-1 (78H)	PWRJ-2-4† (SNSEPBY)
A	CLKGN-0 (78E)	CLKGN-1 (78E)	PWRJ-2-3† (SNSEPAY)

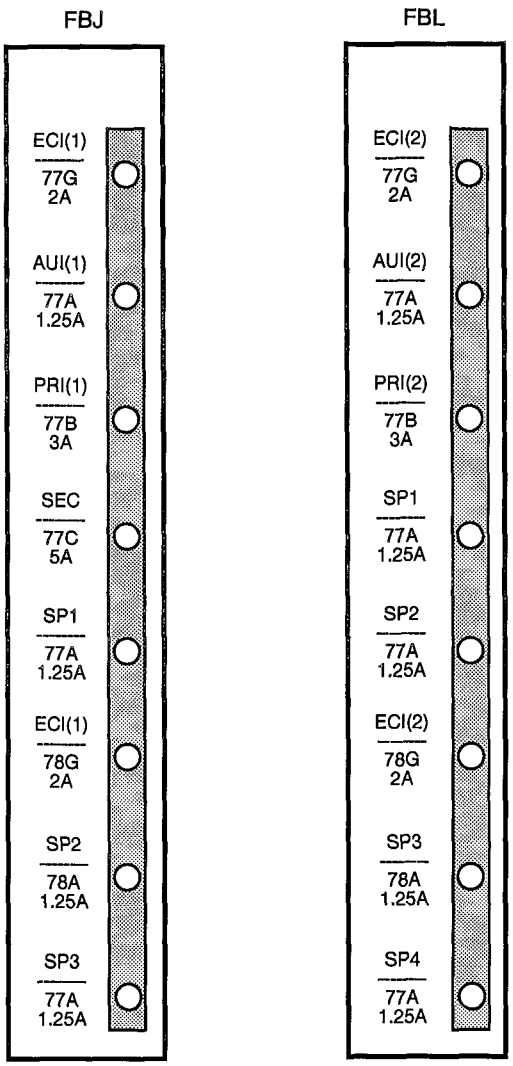
* - Provides fused power to LEDs of Memory Module circuit packs
† - Power sensory strap (does not carry load voltages, only sensory voltages). These straps must not be extracted. The sensory straps are provided by a Type 77H fuse.
NC - Not Connected (Spare)

Table 15-23. **Secondary Fuse Chart for SW PWR MOD 3 (Top of Bay 12)**

Location	Type 77H (4A), Type 77J (7.5A), and Type 77E (15A) Fuses for +5V Supply			
	FBK-1	**FBK-2**	**FBK-3**	**FBK-4**
P	SWIO-2-14 (77J)	PWRJ-3-1† (SNSEPAX)	NC (77J)	NC (77E)
N	SWIO-2-13 (77J)	PWRJ-3-2† (SNSEPBZ)	NC (77J)	NC (77H)
M	SWIO-2-12 (77J)	SWIO-2-16 (77J)	SWIO-4-16 (77J)	+5V STPNL‡ (77H)
L	SWIO-2-11 (77J)	SWIO-2-15 (77J)	SWIO-4-15 (77J)	+5V LED* (77H)
K	SWIO-2-10 (77J)	+5V SYNC-1 (77J)	SWIO-4-14 (77J)	MTC-1-2 (77J)
J	SWIO-2-9 (77J)	NC (77J)	SWIO-4-13 (77J)	MTC-1-1 (77J)
H	SWIO-2-8 (77J)	NC (77J)	SWIO-4-12 (77J)	UI-1 (77E)
G	SWIO-2-7 (77J)	NC (77J)	SWIO-4-11 (77J)	SCI-1-2 (77E)
F	SWIO-2-6 (77J)	SWIO-4-6 (77J)	SWIO-4-10 (77J)	SCI-1-1 (77E)
E	SWIO-2-5 (77J)	SWIO-4-5 (77J)	SWIO-4-9 (77J)	CPU-1 (77J)
D	SWIO-2-4 (77J)	SWIO-4-4 (77J)	SWIO-4-8 (77J)	SSC-1 (77J)
C	SWIO-2-3 (77J)	SWIO-4-3 (77J)	SWIO-4-7 (77J)	ECI-2 (77E)
B	SWIO-2-2 (77J)	SWIO-4-2 (77J)	NC (77J)	PWRJ-3-6† (SNSEPBZ)
A	SWIO-2-1 (77J)	SWIO-4-1 (77J)	NC (77J)	PWRJ-3-5† (SNSEPAZ)

Location	Type 78H (4A) Fuses for -5V Supply		
	FBM-1	**FBM-2**	**FBM-3**
P	SWIO-2-14 (78H)	NC (78H)	NC (78H)
N	SWIO-2-13 (78H)	NC (78H)	NC (78H)
M	SWIO-2-12 (78H)	SWIO-2-16 (78H)	SWIO-4-16 (78H)
L	SWIO-2-11 (78H)	SWIO-2-15 (78H)	SWIO-4-15 (78H)
K	SWIO-2-10 (78H)	-5V SYNC-1 (78H)	SWIO-4-14 (78H)
J	SWIO-2-9 (78H)	NC (78H)	SWIO-4-13 (78H)
H	SWIO-2-8 (78H)	NC (78H)	SWIO-4-12 (78H)
G	SWIO-2-7 (78H)	NC (78H)	SWIO-4-11 (78H)
F	SWIO-2-6 (78H)	SWIO-4-6 (78H)	SWIO-4-10 (78H)
E	SWIO-2-5 (78H)	SWIO-4-5 (78H)	SWIO-4-9 (78H)
D	SWIO-2-4 (78H)	SWIO-4-4 (78H)	SWIO-4-8 (78H)
C	SWIO-2-3 (78H)	SWIO-4-3 (78H)	SWIO-4-7 (78H)
B	SWIO-2-2 (78H)	SWIO-4-2 (78H)	PWRJ-3-4† (SNSEPBY)
A	SWIO-2-1 (78H)	SWIO-4-1 (78H)	PWRJ-3-3† (SNSEPAY)

* - Provides fused power to LEDs of CC-1 circuit packs
† - Power sensory strap (does not carry load voltages, only sensory voltages). These straps must not be extracted. The sensory straps are provided by a Type 77H fuse.
‡ - CC-1 status panel fuse
NC - Not Connected (Spare)



Notes:

- Numbers in parentheses are circuit pack position numbers in the High-Capacity and Memory Storage Modules. Fuse ratings are listed below the circuit pack identifier and fuse type (77X or 78X label).
- The 2-amp fuses associated with the ECI circuit packs are for +12V and -12V supplied to the CILINKs. When these fuses blow, communication with the CILINKs can be interrupted.
- The 5A fuse for the SEC disk drive is for the +12V supply.
- The 3A fuses for the PRI disk drives are for the +12V supply.
- The labels SP1, SP2, SP3, and SP4 denote spare fuses that are not connected to any circuit pack.

Figure 15-11. **Memory Storage Module Fuses (FBJ and FBL)**

3. Locate the blown +5V or -5.2V fuses. If both fuses associated with the same SYNC side are blown, locate both of them together. Otherwise, If more than one fuse has blown, select one at a time.
4. If a SYNC fuse was blown, locate the DPLL circuit pack associated with the blown SYNC fuse selected in Step 3 by referring to Figure 15-10 and Tables 15-21, 15-22, and 15-23; and partially pull out the DPLL circuit pack from its slot.
5. Replace the blown fuse chosen in Step 3 with a new one of the same type. If both fuses associated with the same SYNC side are blown, replace both fuses with the appropriate fuse types. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.

   If a fuse blows again, the failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure.

   If the fuse does not blow, and you replaced a SYNC fuse, continue with Step 6.

   If the fuse does not blow, and there are other +5V or -5.2V fuses blown, go to Step 3 to replace the other +5V or -5.2V fuses. Otherwise, you are done with this procedure.
6. Insert the DPLL circuit pack that you pulled out in Step 4.
7. Restore the synchronizer side associated with the blown SYNC fuse to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to one minute to complete.

   If the `RST-EQPT` fails to restore the specified equipment, refer to the section titled "Synchronizer Module Failure" (page 15-40) for further instructions about clearing a synchronizer failure.

8. If a SYNC fuse:

   - Does not blow again, and there are other +5V or -5.2V fuses blown, go to Step 3 to replace the other +5V or -5.2V fuses. Otherwise, you are done with this procedure.
   - Blows again, refer to the section titled "Synchronizer Module Failure" (page 15-40) to clear circuit pack failures before continuing with this procedure.

     If the fuse blows again, the failure cannot be cleared by replacing a fuse and/or its associated circuit pack. Return the original circuit pack to the frame. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure.

     If the fuse does not blow, attach the alarm report to the failed circuit pack.

SWIO, SWCS, and CLKGN Fuses

This procedure is used for clearing blown secondary fuses associated with SWIO, SWCS, and CLKGN circuit packs (all fuse boards FBK and FBM in the Switch Power Modules). For other blown secondary fuses refer to the section titled "Switch Complex Secondary Fuses" (page 15-123).

1. Locate the blown secondary fuses. (If there is more than one, select one at a time.)
2. Locate the circuit pack associated with the blown fuse selected in Step 1 by referring to Figure 15-10 and Tables 15-21, 15-22, and 15-23; and partially pull out the circuit pack from its slot.
3. Replace the blown fuse chosen in Step 1 with a new one of the same type. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
4. If the fuse:

   - Does not blow again, continue with Step 5
   - Blows again, return the original circuit pack to the frame

     Failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) and return to Step 1.

5. Insert the circuit pack that you pulled out in Step 2.

6. If the fuse:

   - Does not blow again and there are more blown secondary fuse indicators, return to Step 1; otherwise, continue with Step 7.
   - Blows again, obtain a new circuit pack for the circuit pack associated with the blown fuse, and replace the failed circuit pack marking the circuit pack replaced for later reference. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

     If the fuse blows again, the failure cannot be cleared by replacing a fuse and/or its associated circuit pack. Return the original circuit pack to the frame. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure.

     If the fuse does not blow, attach the alarm report to the failed circuit pack.

     If there are other blown fuses, make a note of the problem if the fuse blew again (to be referred to your system administrator or your next level of support), and return to Step 1.

7. After all blown secondary fuse indicators are off, verify that the alarm(s) have cleared by entering the following command:

   `RTRV-ALM-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `{ CLKGN-{0,1}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16} }`

   The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If you get the above response, you are done with this procedure. If you do not get the above response, refer the problem to your system administrator or your next level of support for assistance.

ECI Fuses

Perform this procedure only if there is a major alarm and there are blown secondary fuses associated with ECI circuit packs. If there is a minor alarm and there are blown fuses associated with control complex circuit packs, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177).

1. Locate the blown fuses in fuse boards FBK-4 in Switch Power Modules 1 and 3 associated with the ECI circuit pack(s). If there is more than one, select one.

NOTE:
The 2-amp fuses associated with the ECI circuit packs in fuse boards FBJ and FBL are connected to the CILINKs. When these fuses blow, a minor alarm is issued and loss of communications with the CILINKs can occur. The section titled "Link Communication Failures" (page 15-33) provides procedures for reestablishing communications with the CILINKs.

2. Partially extract the ECI circuit pack associated with the fuse chosen in Step 1.
3. Replace the blown fuse chosen in Step 1 with a new one of the same type. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
4. Reinsert the ECI circuit pack pulled in Step 2.
5. If the fuse:
   - Does not blow, repeat Steps 1 through 4 for any additional blown fuses associated with ECI circuit packs (fuse boards FBK-4 in Switch Power Modules 1 and 3), and continue with Step 6.
   - Blows again, obtain a new ECI circuit pack associated with the blown fuse and replace the ECI circuit pack associated with the fuse chosen in Step 1 (refer to Chapter 2 for extracting and installing circuit packs, if necessary). After replacing the ECI circuit pack, mark it for later reference, and replace the fuse chosen in Step 1 again.

     If the fuse blows again, return the original ECI circuit pack to the module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem before continuing with this procedure.

     If the fuse does not blow again, attach the alarm report to the failed circuit pack.

     If there are any other blown fuses associated with ECI circuit packs (fuse boards FBK-4 in Switch Power Modules 1 and 3), go to Step 1. If there are other blown secondary fuses associated with the High-Capacity Controller power module, continue with the next section titled "Control Complex (CPU/MTC/SSC/SCI/UI) Fuses" (page 15-135) to replace additional secondary fuses.

6. If the only blown fuse was associated with one of the ECI circuit packs, perform the following procedure; otherwise, if both ECI circuit packs and/or fuses were replaced, go to Step 7.

   a. If ECI-1 has failed, the frame is connected to a GTP using the TABS link on CILINK-1-4, and your office procedures require you to use CILINK-1-4 for the GTP connection, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel. Otherwise, go to Step 6b.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

If other links were in service before ECI circuit pack failure, go to Step 9; otherwise, you are done with this procedure.

   b. If your terminal is connected to the ECI circuit pack that encountered a blown fuse and there is no terminal connected to the other ECI circuit pack, switch your terminal to one of the available Snider links on the active ECI circuit pack [refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary].

   c. At the terminal on the active ECI circuit pack, log into the DACS IV-2000. If you cannot log in, refer to the section titled "Link Communication Failures" (page 15-33).

   d. Restore the out-of-service ECI circuit pack by entering the following command (after restoring the ECI circuit pack, go to Step 9):

      RST-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = ECI circuit pack location: **ECI-{1,2}**

      The ECI circuit pack takes up to two minutes to restore.

NOTE:
The ECI circuit pack restored with the **RST-EQPT** command becomes the slave for the TABS link. When the system is reset, ECI-1 becomes the master and ECI-2 becomes the slave.

7. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. After a system reset, ECI-1 becomes the master and ECI-2 becomes the slave for the associated TABS links.
8. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

When the MC returns to service, only CILINKs 1-1 and 2-1 are restored to service. If other links were in service before ECI circuit pack failure, go to Step 9; otherwise, you are done with this procedure.

9. Restore all links that were in service (refer to office records) by entering the following command for each link:

   `RST-LINK:[a]:b;`

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{1-8}`

This command takes up to one minute to complete

Control Complex (CPU/MTC/SSC/SCI/UI) Fuses

Perform this procedure only if there is a major alarm and there are blown secondary fuses associated with control complex (CPU/MTC/SSC/SCI/ UI) circuit packs. If there is a minor alarm and there are blown fuses associated with control complex circuit packs, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177).

1. Locate the blown fuses in fuse boards FBK-4 in Switch Power Modules 1 and 3 (exclude ECI fuses). If more than one, select one.
2. Partially extract the circuit pack associated with the fuse chosen in Step 1.
3. Replace the blown fuse chosen in Step 1 with a new one of the same type. Use fuse tool (COMCODE WP90247, List 201) to extract fuses.
4. Reinsert the circuit pack pulled in Step 2.

5. If the fuse:

   - Does not blow, repeat Steps 1 through 4 for any additional blown fuses in fuse boards FBK-4 in Switch Power Modules 1 and 3 (exclude ECI fuses), and continue with Step 6.

   - Blows again, obtain a new circuit pack associated with the blown fuse (specific circuit packs are panel stamped next to the associated fuse) and replace that circuit pack (refer to Chapter 2 for extracting and installing circuit packs). After replacing the failed circuit pack, mark the circuit pack for later reference and replace the fuse again.

   - If the fuse blows again, return the original circuit pack to the module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem before continuing with this procedure.

   - If the fuse did not blow again, attach the alarm report to the failed circuit pack.

   - If there are any other blown fuses in fuse boards FBK-4 in Switch Power Modules 1 and 3 (exclude ECI fuses), go to Step 1. If there are other blown secondary fuses associated with the High-Capacity Controller Module or Memory Module circuit packs, continue with the next section titled "Disk Drive Fuses" (page 15-137) to replace additional fuses.

6. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

7. If there are any blown PRI disk drives fuses, refer to the next section titled "Disk Drive Fuses" (page 15-137).

If the major alarm LED stays lit and there are red ALM LEDs lit on any of the control complex circuit packs, refer to the section titled "High Capacity Controller Failure" (page 15-145).

Disk Drive Fuses

Perform this procedure only if both PRI disk drives are OOS-FLT due to fuses blowing. If one PRI disk drive is still in service and the other PRI disk drive's fuse blew, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177). If there are other blown secondary fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) to replace blown fuses.

1. Locate the blown PRI fuses in fuse boards FBJ, FBK, and FBL. Select one PRI disk drive to replace fuses for.
2. Partially extract the PRI disk drive chosen in Step 1.
3. Replace the blown fuse(s) associated with the disk drive chosen in Step 1 with new one(s) of the same type. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
4. Reinsert the PRI disk drive pulled in Step 2.
5. If the fuse(s):
   - Does not blow, repeat Steps 1 through 4 for the other PRI disk drive, and continue with Step 6.
   - Blows again, obtain a new PRI disk drive and replace the PRI disk drive chosen in Step 1. After replacing the PRI disk drive, mark the PRI disk drive with the TID of the frame and replace the fuse(s) again.

     If the fuse(s) blow again, return the original PRI disk drive to the Memory Storage Module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem before continuing with this procedure.

     If the fuse does not blow again, attach the alarm report to the failed PRI disk drive.
6. Repeat Steps 1 through 5, if necessary, until all PRI blown fuse problems are cleared.
7. If you replace one PRI disk drive, go to Step 8. If you replaced both PRI disk drives, go to Step 9. If you did not replace any PRI disk drives, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

8. If you replaced one PRI disk drive, perform the following procedure to restore the replaced disk drive:

   a. Initialize the replaced PRI disk drive by entering the following command:

      `CPY-MEM:`*[a]*`:::INIT,`*d*`,`*e*`;`

      Where:

      a = Target ID (optional)

      d = PRI disk drive location: `PRI-{1,2}`

      e = Memory class: `{ FORMAT, HEADER }`

⚠ CAUTION:
The preferable memory class type is `FORMAT`*. If time constraints exist where the normal format procedure cannot be used, then the memory class of* `HEADER` *may be used. Using* `FORMAT` *reformats the entire disk and using* `HEADER` *only reformats the disk header information.*

This command takes up to 15 minutes using `FORMAT` *and up to two minutes using* `HEADER` *to complete.*

   b. Restore the PRI disk drive that was replaced to service by entering the following command:

      `RST-EQPT:`*[a]*`:`*b*`;`

      Where:

      a = Target ID (optional)

      b = PRI disk drive location: `PRI-{1,2}`

      This command takes up to three minutes to complete.

      After completion, the contents of the in-service PRI disk drive are copied to the new PRI disk drive, and you are done with this procedure.

9. If you replaced both PRI disk drives, perform the following procedure to restore the disk drives:

   a. Initialize the new PRI disk drives by entering the following command for each PRI disk drive:

      `CPY-MEM:`*[a]*`:::INIT,`*d*`,`*e*`;`

      Where:

      a = Target ID (optional)

      d = PRI disk drive location: `PRI-{1,2}`

e = Memory class: { FORMAT, HEADER }
Since, both PRIs failed, your office procedure may require that you use the HEADER memory class.

CAUTION:
The preferable memory class type is FORMAT. *If time constraints exist where the normal format procedure cannot be used, then the memory class of* HEADER *may be used. Using* FORMAT *reformats the entire disk and using* HEADER *only reformats the disk header information.*

This command takes up to 15 minutes using FORMAT *and up to two minutes using* HEADER *to complete.*

b. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

RST-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = PRI disk drive location: PRI-[1,2]

This command takes up to three minutes to complete.

c. Remove the SEC disk drive from service by entering the following command:

RMV-EQPT:*[a]*:SEC;

Where:

a = Target ID (optional)

This command takes up to one minute to complete. After completion, the green ON LED extinguishes.

d. Load a Release 5.0 optical disk in the SEC disk drive. If necessary, refer to the procedure titled "Extracting/Installing Optical Disk Cartridge" (page 8-29).

e. Restore the SEC disk drive to service by entering the following command:

RST-EQPT:*[a]*:SEC;

Where:

a = Target ID (optional)

This command takes up to five minutes to complete. After completion, the green ON LED lights.

If this command fails, check and/or replace the optical disk and/or SEC disk drive, as necessary.

f. Copy the programs from the optical disk to the PRI disk drives by entering the following command:

   `CPY-MEM:[a]:::SEC,PRI,PROG:Y;`

   Where:

   a = Target ID (optional)

   This command takes up to two minutes to complete.

g. Copy working memory to the PRI disk drives by entering the following command:

   `CPY-MEM:[a]:::WKG,PRI,DBASE::FRCD;`

   Where:

   a = Target ID (optional)

   This command takes up to five minutes to complete.

   If the `CPY-MEM` command is denied with the error code `SNDB`, the system was booted but remained in the `OOS-MCOND` state. If this condition occurs, refer to the procedure titled "Restoring Databases From SEC Disk to PRI Disk" (page 8-38).

h. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

Fuses in RUI Power Module

Perform the procedure in this section only if a major alarm is present and there is one or more red ALM LEDs lit on the fuse boards in the RUI Power Module. Figure 15-12 shows the fuse boards associated with the RUI Power Module. The location of the fuses are panel stamped on the Remote Complex frame.

1. Locate the blown fuses in the RUI Power Module fuse boards (FBF, FBG, FBH, and FBI).
2. For the circuit pack indicating the alarm, perform the appropriate procedure:
   - "RUI Power Circuit Pack Fuses" (page 15-141) for RUI Power Module power circuit packs (PWRF)
   - "RUI Module Fuses" (page 15-143) for RUI Module circuit packs

RUI Power Circuit Pack Fuses

This procedure is used for clearing blown fuses associated with RUI power circuit packs (fuse board FBI). For other blown fuses in the RUI Power Module, refer to the previous section titled "Fuses in RUI Power Module" (page 15-141).

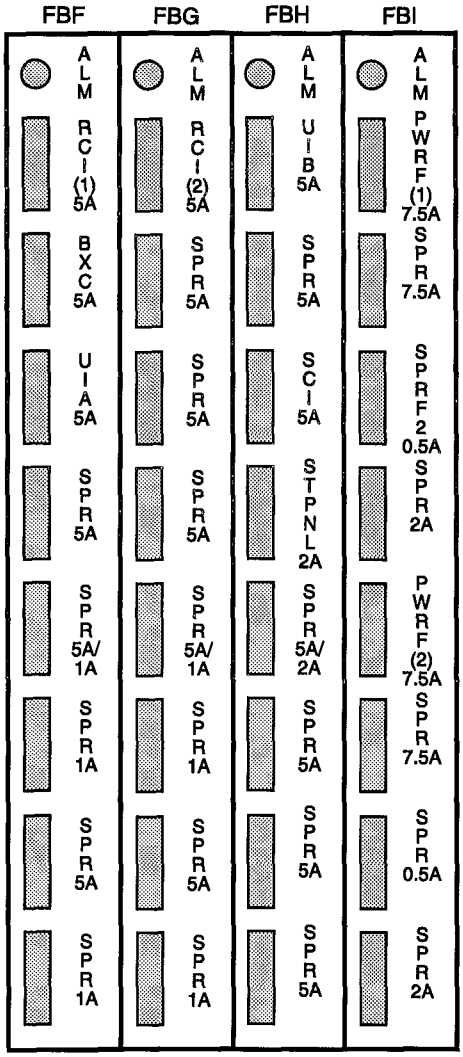
1. If the frame has an ED-9C114-30 Fuse and Alarm Panel, check fuse locations A1 and C1 for a lit alarm lamp. If either alarm lamp is lit, refer to the section "Primary Fuses" (page 15-79) before continuing with this procedure.
2. Check for blown fuses in fuse board FBI. If there are blown fuses, continue with this procedure; otherwise, go to the section titled "Power Circuit Pack Failure" (page 15-93).
3. Remove the RUI from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`
4. Locate the blown fuses in fuse board FBI. If there is more than one, select one.
5. Extract the circuit pack associated with the fuse chosen in Step 4.
6. Replace the fuse chosen in Step 4. Use the fuse tool (Part Number WP90247,List 201) to extract fuses.
7. Reinsert the circuit pack pulled in Step 5.



Notes:

- Numbers in parentheses are circuit pack position numbers in the RUI Module. Fuse ratings are listed below the circuit pack identifier.
- The 7.5A fuses are the load fuses to the PWRF power circuit packs.
- The 5A (2A for the Status Panel) fuses are the secondary fuses (or the +5V supply) to the circuit packs contained in the RUI Module.
- The 1A fuses associated with the RCI circuit packs are for +12V and -12V supplied to the CILINKs. When these fuses blow, communication with the CILINKs can be interrupted.
- The labels SPR, SPRF, and SPRG denote spare fuses that are not connected to any circuit pack.

Figure 15-12. **Remote Unit Interface Power Module Fuses (FBF, FBG, FBH, and FBI)**

8. If the fuse:
   - Does not blow, repeat Steps 4 through 7 for any additional blown fuses in fuse board FBI, then continue with Step 9.
   - Blows again, obtain a new circuit pack associated with the blown fuse (specific circuit packs are panel stamped next to the associated fuse), replace that circuit pack (mark the extracted circuit pack for later reference), and replace the fuse again. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

     If the fuse blows again, return the original circuit pack to the module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem.

     If the fuse does not blow again, attach the alarm report to the failed circuit pack.

     If there are any other blown fuses in fuse board FBI, go to Step 4. Otherwise, continue with the next step.
9. If there are any other blown fuses in fuse boards FBF, FBG, or FBH, refer to the next section titled "ECI Fuses" (page 15-133) for replacing additional fuses.

   If an ALM LED on any of the PWRF circuit packs is lit, refer to the section titled "Power Circuit Pack Failure" (page 15-93).

   If the blown fuses were associated with at most one of each PWRF power circuit pack and all of the ALM LEDs go out and the green LEDs on the PWRF circuit packs are lit, continue with Step 10.
10. Restore the RUI Module to service by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = RUI location: `RUI-[1,2]`

    This command takes up to 5 minutes to complete.

RUI Module Fuses

Perform this procedure if there are blown fuses associated with the RUI Module.

1. If there are blown fuses in fuse board FBI, refer to the previous section titled "Fuses in RUI Power Module" (page 15-141) before performing the rest of this procedure.
2. Locate the blown 5A fuses in fuse boards FBF, FBG, and FBH. If there is ore than one, select one.

3. Remove the RUI from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

4. Partially extract the circuit pack associated with the fuse chosen in Step 1.
5. Replace the fuse chosen in Step 1. Use fuse tool (Part Number WP90247,List 201) to extract fuses.
6. Reinsert the circuit pack pulled in Step 2.
7. If the fuse:

   - Does not blow, repeat Steps 1 through 4 for any additional blown fuses in fuse boards FBF, FBG, and FBH, and continue with Step 6.
   - Blows again, obtain a new circuit pack associated with the blown fuse (specific circuit packs are panel stamped next to the associated fuse) and replace that circuit pack (refer to Chapter 2 for extracting and installing circuit packs). After replacing the failed circuit pack, mark the circuit pack for later reference and replace the fuse again.

     If the fuse blows again, return the original circuit pack to the module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem before continuing with this procedure.

     If the fuse did not blow again, attach the alarm report to the failed circuit pack.

     If there are any other blown fuses in fuse boards FBF, FBG, and FBH, go to Step 1.

8. Restore the RUI Module to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

   This command takes up to 5 minutes to complete.

High Capacity Controller Failure

Perform this procedure if a major alarm indicator is present for a High-Capacity Controller Module circuit pack. If there is only a minor alarm and any ALM LED is lit in the High Capacity Controller Module, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177).

1. Check for blown fuses in the Switch Power Modules 1 and 3 (red ALM LED lit on the fuse boards FBK-4). If there are blown fuses, refer to the section titled "Switch Complex Secondary Fuses" (page 15-123) before performing this procedure.

   Check the PWRJ circuit packs in the Switch Power Modules 1 and 3 to see if any ALM LEDs are lit. If there are any ALM LEDs lit, refer to the section titled "Power Circuit Pack Failure" (page 15-93) before performing this procedure.

2. Locate the circuit packs in the High-Capacity Controller Module with their ALM LED lit.

3. For the circuit pack indicating the error, refer to the appropriate section:

   - "ECI Circuit Pack Failure" (page 15-146) for ECI circuit packs
   - "Control Complex (CPU/MTC/SSC/SCI/UI) Circuit Pack Failure" (page 15-149) for all High-Capacity Controller Module circuit packs excluding ECI, PRI, and SEC
   - "Replacing Both PRI Disk Drives" (page 17-7) if both PRI disk drives (PRIs) have failed
   - "Replacing One PRI Disk Drive" (page 17-5) if only one PRI disk drive has failed

ECI Circuit Pack Failure

Perform this procedure if there is a major alarm associated with the ECI circuit pack(s).

NOTE:
Failure of an ECI circuit pack causes its associated CILINKs to enter the OOS-MTCE state. This procedure instructs you to restore the CILINKs that were not in the OOS-MTCE state before the ECI circuit pack failure by using the `RST-LINK` command, or, if your office procedures require you to, to reset the frame.

1. Locate the ECI circuit pack(s) indicated by a failure message and/or a lit ALM LED.

NOTE:
The loss of the time and the date due to both ECI circuit packs entering the OOS-FLT state causes two `REPT EXCPTN SYS` messages to be output and a minor alarm to be issued.

2. Obtain a new ECI circuit pack for each failed ECI circuit pack.
3. Extract the failed ECI circuit pack identified in Step 1, and attach the alarm report to it. If both ECI circuit packs failed, pick the one with the communications interface terminal (CIT) connected to it (for example, if the CIT is connected to the TTY1-1 connector on the front of the frame, choose ECI-1). Refer to Chapter 2 for extracting circuit packs, if necessary.
4. Install an ECI circuit pack in place of the one extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
5. Repeat Steps 3 and 4 for the other ECI circuit pack if both ECI circuit packs failed.

   If both control complexes indicate failure (ALM LED lit), go to the next section titled "Control Complex (CPU/MTC/SSC/SCI/UI) Circuit Pack Failure" (page 15-149).

   If both ECI circuit packs were replaced and at least one control complex (CPU/MTC/SSC/SCI/UI set) does not indicate a failure (ALM LEDs not lit), go to Step 6. If only one ECI circuit pack was replaced, go to Step 8.
6. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. After a system reset, ECI-1 becomes the master and ECI-2 becomes the slave for the associated TABS links.

7. If both ECI circuit packs were replaced, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

After the reset, the CILINKs are restored to the states they were in before the ECI failures and you are done with this procedure.

8. Perform the following procedure only if one ECI circuit pack was replaced.

NOTE:
When one of the ECI circuit packs fails, an autonomous restart of the other ECI circuit pack is performed, bringing the links associated with the working ECI into service. This restart takes about two minutes to complete. During this time there is no communications with the CILINKs available. After the restart is completed, X.25 PAD networks supporting call redirect are autonomously redirected to the working ECI circuit pack. In addition, TTY1 of the working ECI circuit pack is put into service and the working ECI circuit pack becomes the master side for the TABS link. If your X.25 PAD network does not support call redirect, you must use a terminal connected to the PAD network connected to the working ECI circuit pack to continue this procedure.

   a. If ECI-1 has failed and your office procedures require you to use ECI-1 as the communications circuit pack or master side, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel. Otherwise, go to Step 8b. After the reset, the CILINKs are restored to the states they were in before the ECI-1 failure.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

After the reset, you are done with this procedure and the CILINKs are restored to the states they were in before the ECI failure.

b. If the frame is connected to a GTP using one of the TABS links (CIL-INK-{1,2}-4), make sure it is connected to link 4 of the ECI circuit pack that is working. Remove the GTP connection from the failed ECI circuit pack and connect it to the working ECI circuit pack, if necessary.

CAUTION:
Ground yourself by wearing the wrist strap provided with the equipment when working with link connections.

c. If your terminal is connected to the ECI circuit pack that was replaced and there is no terminal connected to the other ECI circuit pack's TTY1 connector (check front and back of frame), switch your terminal to TTY1 of the working ECI circuit pack [refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21)]. If TTY1 already has a connection, determine which terminal is connected to that link or disconnect the terminal from the frame and switch your terminal to TTY1 [refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary], and perform the rest of this procedure using the new terminal configuration.

d. At the terminal on the working ECI circuit pack, log into the DACS IV-2000. If you cannot log in, refer to the section titled "Link Communication Failures" (page 15-33).

e. Restore the ECI circuit pack that failed by entering the following command:

RST-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = ECI circuit pack location: **ECI-{1,2}**

The ECI circuit pack takes up to two minutes to be restored. A REPT RST EQPT *message appears when the ECI circuit pack is restored.*

NOTE:
The ECI circuit pack restored with the **RST-EQPT** command becomes the slave for the TABS link. When the system is reset, ECI-1 becomes the master and ECI-2 becomes the slave.

f. Set the **AUTOREL** parameter of the **ED-NE** command to the desired **ON** or **OFF** setting by entering the following command:

ED-NE:*[a]*::::**AUTOREL=***aa*;

Where:

a = Target ID (optional)

aa = Auto release of link association: **{ ON, OFF, CURVAL }** Specifies whether the system allows link association for loopback and test access connections. Specifying **OFF**, preserves all loopback and test access connections.

g. Restore all links (one at a time) that are connected to service by entering the following command for each link:

RST-LINK:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Administrative link location: **CILINK-{1,2}-{1-8}**

CILINKs take up to one minute to be restored.

h. If you disconnected a terminal in Step 8c, disconnect your terminal and reconnect the disconnected terminal. Refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary.

i. Reconnect your terminal to the TTY1 of the ECI circuit pack you removed it from in Step 8c. Refer to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary.

Control Complex (CPU/MTC/SSC/SCI/UI) Circuit Pack Failure

Perform this procedure if there is a major alarm associated with control complex circuit pack(s). If there is only a minor alarm indication and one control complex indicating a failure, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177). If either ECI circuit pack's ALM LED is lit, refer to the previous section "ECI Circuit Pack Failure" (page 15-146) before performing this procedure.

NOTE:
If the active control complex fails, the main controller failure (MC FAIL) and major alarm LEDs are lit. If the standby control complex is not in the OOS-FLT or OOS-MTCE state, a restart (side switch) of the standby control complex is performed. This side switch takes about five minutes to complete. After completion, the main controller failure (MC FAIL) LED turns off and if the major alarm is caused only by the active control complex failing, a minor alarm is activated for the failed control complex. If the major alarm is downgraded to a minor alarm, refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177) instead of this procedure.

1. If you replaced both ECI circuit packs and/or both control complexes ALM LEDs are lit, skip to the next step; otherwise using the active ECI (change your terminal to the active ECI referring to the section titled "Adding a Terminal to a Snider Link" (page 9-21), if necessary), determine the state of all the circuit packs in the High-Capacity Controller Module by entering the following command:

   RTRV-STATE-EQPT:*[a]*:MC;**

   Where:

   a = Target ID (optional)

   If there were no alarms, the normal response is:

```
RTRV STATE EQPT::MC::ALL COMPLD
/* LOC:STATE */
MC: IS
CC-0: ACT
CC-1: STBY
CPU-0: IS
CPU-1: IS
MTC-0-1: IS
MTC-0-2: IS
MTC-1-1: IS
MTC-1-2: IS
SSC-0: IS
SSC-1: IS
SCI-0-1: IS
SCI-0-2: IS
SCI-1-1: IS
SCI-1-2: IS
PRI-1: IS
PRI-2: IS
ECI-1: IS
ECI-2: IS
UI-0: IS
UI-1: IS
```

   Depending on the type of failure, the above message can return a combination of OOS-FLT, OOS-MTCE, IS, ACT, and STBY states. Use the output of the **RTRV-STATE-EQPT** command to aid in clearing the remaining High-Capacity Controller Module failures.

2. If you were able to enter the RTRV-STATE-EQPT command, replace only those circuit packs (one at a time) that are indicated with the OOS-FLT state and attach a copy of the alarm report to the failed circuit packs. For OUI circuit packs, the optical fiber connector on the front of the OUI circuit pack needs to be disconnected from the failed circuit pack and reconnected to the new circuit pack. Refer to Chapter 2 for extracting and installing circuit packs and fiber optic cables, if necessary.

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

3. If you were not able to enter the RTRV-STATE-EQPT command, replace the CPU, SSC, MTC, SCI, and UI circuit packs (one at a time) of one of the control complexes and attach the alarm report to the replaced circuit packs. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
4. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

NOTE:
If the system attempts an autonomous reset (for example, replacing a failed UI/OUI circuit pack), it is recommended that you still perform a manual reset to ensure system integrity.

The system takes up to 15 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

Remote Unit Interface Failure

Perform this procedure if an alarm indicator is present for a Remote Unit Interface Module circuit pack.

1. Check for blown fuses in the RUI Power Module (red ALM LED lit on the fuse boards FBF, FBG, FBH, and FBI). If there are blown fuses, refer to the section titled "Fuses in RUI Power Module" (page 15-141) before performing this procedure.

   Check the PWRF circuit packs in the RUI Power Module to see if any ALM LEDs are lit. If there are any ALM LEDs lit, refer to the section titled "Power Circuit Pack Failure" (page 15-93) before performing this procedure.

2. Locate the circuit packs in the RUI Module with their ALM LEDs lit.
3. Restore the RUI by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

   This command takes up to five minutes to complete.

   If you receive a `COMPLD` message, the problem is cleared and you are done with this procedure. If you receive a denial message, continue with Step 4.
4. Obtain a new circuit pack of the same type of the failed circuit pack located in Step 2.
5. Replace the failed circuit pack located in Step 2. Refer to Chapter 2 for extracting and installing circuit packs, if necessary. After extracting the failed circuit pack, attach the alarm report to it.
6. Restore the RUI to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-[1,2]`

   This command takes up to five minutes to complete.

   If you receive a `COMPLD` message, you are done with this procedure. If you receive a denial message, refer the problem to your system administrator or your next level of support for assistance in clearing the problem.

Unit Controller Failure

This procedure is used to clear UC circuit pack failures.

1. Check to see if any of the bus fuse alarms are lit (red LEDs on the alarm and fuse panel at the top of the switch bay). If there are any LEDs lit that are associated with the power circuit packs, refer to the section titled "Primary Fuses" (page 15-79) before performing the rest of this procedure.
2. Check to see if there is a red ALM LED lit on a power circuit pack in the interface module containing the failed unit controller. If there are any ALM LEDs lit, refer to the section titled "Power Circuit Pack Failure" (page 15-93) before performing the rest of this procedure.

3. Determine all circuit packs that are in the alarm state by entering the following command:

   RTRV-ALM-EQPT:*[a]*:ALL;**

   Where:

   a = Target ID (optional)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
    "h:i,...,IMPROPRMVL,..."
;
```

   Where:

   h = Equipment location: { CLKGN-{0,1},
   SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16},
   CLKDR-{1-64}-{1-4}, MUX-{1-64}-{1-31},
   MUXP-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64},
   MUXPS-{1-64}, SWIF-{1-64}-{1-8,P},
   DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB},
   DS1RY-{1-64}-{1-4} }

   i = Notification Code: { MJ, MN }

4. Locate the failed unit controller (red LED lit).

5. Restore the unit controller by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: UC-{1-64}

   This command takes up to five minutes to complete.

   If you receive a COMPLD message, the problem is cleared and you are done with this procedure. If you receive a denial message, continue with Step 6.

6. Obtain a new UC circuit pack for the failed one.

7. Replace the failed UC circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary. After extracting the failed UC circuit pack, attach the alarm report to it.

8. Restore the unit controller to service by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-[1-64]`

   This command takes up to five minutes to complete.

   If you receive a `COMPLD` message, you are done with this procedure. If you receive a denial message, refer the problem to your system administrator or your next level of support for assistance in clearing the problem.

Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures

CAUTION:
Do not leave circuit packs with faults in the frame. Even though faulty circuit packs have been taken out of service, if they are left in the frame with fault conditions, the system continues to run diagnostics on them in an effort to restore them to service. Leaving faulted circuit packs in the frame impedes the DACS IV-2000 software from detecting new switch and clock errors.

When a circuit pack is in the FLT (fault) state, there are three indications that the circuit pack has failed. A red ALM LED (constantly lit for circuit pack failures) is lit on the front of the circuit pack, a major or minor (if the circuit pack was in the standby mode or is protected) alarm LED is lit on the status panel, and a `REPT ALM EQPT` message is generated by the system.

If the circuit pack was carrying service (ACT) and is now protected, its status becomes OOS-FLT (out-of-service fault). If the system cannot protect the circuit pack, its status becomes ACT-FLT and it can still be carrying full or partial service. If the circuit pack was not carrying service before failing, its status becomes POS-FLT (provisioned out-of-service fault). If its original state was STBY, its status becomes OOS-FLT.

If a circuit pack is replaced and it still shows a fault indication, the `DGN-DET-EQPT` command is used to provide a more detailed diagnosis. This command instructs the system to run tests and (if the failure involves another circuit pack other than the one being diagnosed) to print a brief message explaining the failure. For a complete listing of this command, refer to the document titled *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Some faults cannot be isolated to a single circuit pack by the system. When data signals are transmitted from one circuit pack to another circuit pack, parity is calculated over a frame of data and a parity bit is inserted to make the parity odd. When this signal is received, parity is checked to be sure it is still odd. A parity error is a failure in transmission from one circuit pack to another. It can be created by a failure on either circuit pack, connector pins, or the wires carrying signals

between them. A similar situation exists with the transmission of clock signals from circuit pack to circuit pack.

The system software isolates and removes circuit packs from service in a way that best protects service.

⚠ CAUTION:
Do not remove a circuit pack if it is unprotected (that is, in the ACT-FLT state). It can still be carrying service , and removing it disrupts service. A circuit pack must not be active (that is, in the OOS-FLT, POS-FLT, or EQPD-FLT state) before extracting it from the frame.

This procedure is used to clear alarms associated with interface, switch, and clock generator circuit packs. The majority of the alarms indicate a failure on a single circuit pack and the replacement of the circuit pack clears the alarm. There can also be multiple circuit pack failures which require the replacement of more than one circuit pack to clear the alarm. There can be some instances where replacement of the circuit pack with the alarm indication does not clear the alarm. When this occurs, you are directed to contact your system administrator or your next level of support for assistance. Causes for these types of trouble are:

- No signal from standby clock
- No signal from active clock
- CLKGN not sending clock signals
- N-Rate parity failures (SWIO and SWCS circuit packs)
- N-Rate clock failure (CLKDR to SWIO)
- N-Rate parity failure (SWIO to interface circuit packs)
- Fiber link between the OSWIO and OPEX circuit packs
- MUX, SMUX, or SWIF faults (N-Rate parity failure to/from SWIO)

Constantly Lit Red ALM LED on Interface, SWIO, SWCS, or OPEX Module Circuit Packs

This procedure clears all working (non-protection) circuit packs in the OOS-FLT, POS-FLT, EQPD-FLT, IS-FLT, and ACT-FRCD-FLT (circuit packs inhibited from switching to protection) states within the module containing the circuit pack indicating the alarm in the `RTRV-ALM-EQPT` command. For circuit packs in the ACT-FLT state, these circuit pack alarms are cleared as other circuit packs are removed from the OOS-FLT state. As you clear alarms, some period of time is needed to switch circuit packs to protection from the ACT-FLT state. Repeat this procedure until all working circuit packs are out of the fault (FLT) state. If there is a protection circuit pack indicating an alarm, refer to the section titled "Protection Circuit Pack Failures" (page 15-167).

If there are multiple circuit pack failures within an interface module, clear the failed circuit pack that is being protected first. As circuit packs are switched to

protection, other failures can be cleared. Clear failures within the same module one at a time until all failures have been cleared.

NOTE:
Failures of SWIO, SWCS, and OPEX circuit packs must be cleared first before clearing failures of interface circuit packs (that is, MUXs, DS1IFs, SWIFs, and MUXs).

For MUX, DS1IF, and SMUX circuit packs, failure can be due to the provisioned and circuit pack LBO and EQL settings not matching. Therefore, before replacing these circuit packs, the LBO or EQL settings must be checked and verified that they match. You are instructed in this procedure to check the settings before replacing MUX, DS1IF, or SMUX circuit packs.

For MUX and SMUX circuit packs, failure can be due to provisioned circuit packs having an unsourced port (that is, nothing being input to the MUX or SMUX circuit pack). Establishing a loopback on provisioned MUX or SMUX circuit packs that have unsourced input can, in some cases, cause the alarm to clear. You are instructed in this procedure to check for unsourced input ports.

CAUTION:
Never extract two circuit packs at the same time. This could cause damage to the circuit packs and/or the system or could cause loss of service.

CAUTION:
The 120V AC and the DC meter buzzers must ***not*** *be used for continuity checking of the ring and tip leads because of the 100 ohms of impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-2), for more information, if necessary.*

If the equipment location indicating the alarm is SWIO or SWCS and the alarm condition is CONTBUS, refer to the section titled "Clearing CONTBUS Conditions" (page 15-164) to clear the alarm. If the equipment location indicating the alarm is SWIO or SWCS and the alarm condition is SYNCCLK0 or SYNCCLK1, refer to the section titled "Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 15-165) to clear the alarm.

1. Check to see if any bus alarm LED (alarm and fuse panel at the top of the switch bay) is lit. If there is a bus alarm LED lit, refer to the procedure titled "Primary Fuses" (page 15-79) before performing this procedure.
2. Check to see if a red ALM LED is lit on any of the power circuit packs within the module containing the circuit pack indicating the alarm. If there is a red ALM LED lit, refer to the procedure titled "Power Circuit Pack Failure" (page 15-93) before performing this procedure.

3. Determine the state of all the circuit packs within the module containing the circuit pack indicating the alarm by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, SWIO-{1-4}-{1-16}, SWCS-{1,2}-{1-16}, OPEX-{1-4}-{1-16}, CLKGN-{0,1}, CLKDR-{1-64}-{1-4} }`

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = Circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, SWIO-{1-4}-{1-16}, SWCS-{1,2}-{1-16}, OPEX-{1-4}-{1-16}, CLKGN-{0,1}, CLKDR-{1-64}-{1-4} }`

   f = Equipment state: failure states are `ACT-FRCD-FLT, EQPD-FLT, IS-FLT, OOS-FLT,` and `POS-FLT`

4. Choose any circuit pack that is in the OOS-FLT (clear circuit packs in OOS-FLT state first), EQPD-FLT, IS-FLT or POS-FLT states, and go to Step 6.

   If there are no circuit packs in the OOS-FLT, EQPD-FLT, POS-FLT, or IS-FLT state and the state of any circuit pack is ACT-FLT or ACT-FRCD-FLT, switch the circuit pack to protection by entering one of the following commands:

   ACT-FLT state:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   ACT-FRCD-FLT state:

   `ALW-SW-EQPT:`*[a]*`:`*b*`::PROTN;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}, SWIF-{1-64}-{1-8}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16} }`

5. If the circuit pack chosen in Step 4 is a CLKGN circuit pack and it is in the OOS-FLT state, perform the following procedure:

   a. Check the clock mode of both CLKGN circuit packs by entering the following command:

      `RTRV-EQPT:[a]:CLKGN-0&-1;`

      Where:

      a = Target ID (optional)

      A sample output is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: : ...CLKMODE=w: ..."
;
```

      Where:

      d = Circuit pack location: `CL4KGN-{0,1}`

      w = Clock mode: `{ ASYNC, SYNC }`

   b. If the clock mode of the two CLKGN circuit packs are the same, continue with Step 8. Otherwise, set the clock mode of the CLKGN circuit pack chosen in Step 4 to match the clock mode of the working CLKGN circuit pack by entering the following command:

      `ED-EQPT:[a]:b: : : :CLKMODE=o;`

      Where:

      a = Target ID (optional)

      b = CLKGN circuit pack location: `CLKGN-{0,1}`

      o = Clock mode: `{ ASYNC, SYNC }`

      If the red ALM LED on the CLKGN circuit pack does not turn off, continue with Step 8.

      If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

6. If the circuit pack chosen in Step 4 is a MUX circuit pack and it is in the EQPD-FLT or POS-FLT state, retrieve the port state by entering the following command:

   `RTRV-T3:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `[1-64]-[1-31]`

A sample output response is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e::<LSTATE=y>"
;
```

Where:

e = DS3 port location: `{1-64}-{1-31}`

y = DS3 loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`

If the DS3 loopback state (parameter *y*) is set to `NONE`, establish a line loopback by referring to the section titled "Operating Near-End DS3 Loopbacks" (page 13-13). Otherwise, continue with Step 8.

If the red ALM LED on the MUX circuit pack does not turn off (approximately 20 seconds) after establishing the loopback, continue with Step 8.

If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

7. If the circuit pack chosen in Step 4 is an SMUX circuit pack and it is in the EQPD-FLT or POS-FLT state, retrieve the port state by entering the following command:

   `RTRV-STATE-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{1-64}-{1-15}`

   A sample output is (only the pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:IN-STATE,OUT-STATE */
   "e:...,g"
;
```

   Where:

   e = EC-1 port location: `{1-64}-{1-15}`

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

   If the output state (parameter *g*) is set to `IDLE-REL`, establish a line loopback by referring to the section titled "Operating Near-End STS-1 Loopbacks" (page 13-21). Otherwise, continue with the next step.

If the red ALM LED on the SMUX circuit pack does not turn off (approximately 20 seconds) after establishing the loopback, continue with the next step.

If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

8. Obtain a diagnostic report for the circuit pack selected in Step 4 by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Circuit pack location: `[ SWCS-[1,2]-[1-16], SWIO-[1-4]-[1-16], OPEX-[1-4]-[1-16], CLKGN-[0,1], MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15], SWIF-[1-64]-[1-8,P], DS1IF-[1-64]-[1A-8B] ]`

NOTE:
CLKDR circuit packs cannot be diagnosed. The SWIO, MUX, SMUX, or SWIF circuit pack associated with the CLKDR can be diagnosed.

Diagnostics take up to 15 minutes to complete.

This report is used for further reference and/or trouble report generation. Refer to the appendix on "Diagnostics Tests" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for information on diagnostic tests that are performed.

9. Obtain a new circuit pack of the same type as the circuit pack selected in Step 4.

10. If the failed circuit pack selected in Step 4 is not a MUX, DS1IF, or SMUX circuit pack, go to Step 11. For MUX, DS1IF, or SMUX circuit packs, perform the following procedure:

    a. Retrieve the provisioned and circuit pack LBO or EQL setting by entering the following command:

       `RTRV-EQPT:`*[a]*`:`*b*`;`

       Where:

       a = Target ID (optional)

       b = MUX or DS1IF circuit pack location: `[ MUX-[1-64]-[1-31], SMUX-[1-64]-[1-15], DS1IF-[1-64]-[1A-8B] ]`

b. Determine the provisioned and circuit pack LBO or EQL settings from the output of the `RTRV-EQPT` command. A sample output is (only pertinent parameters are shown):

- **MUX or SMUX circuit pack:**

```
   TID YY-MM-DD HH:MM:SS
M  c COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: :...PLBO=h,CLBO=i..."
;
```

Where:

d = Circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15} }`

h = Provisioned line build-out: `{ INIT, OUT, IN }`

i = Circuit pack line build-out: `{ OUT, IN }`

Check the values of parameters *h* and *i*.

- **DS1IF circuit pack:**

```
   TID YY-MM-DD HH:MM:SS
M  c COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: :...PEQL=j,CEQL=k..."
;
```

Where:

d = DS1IF circuit pack location: `DS1IF-{1-64}-{1A-8B}`

j = Provisioned Equalizer: `{ INIT, 20, 40, 60, 80, 100, 20*, 40*, 60*, 80*, 100* }`
An asterisk (*) indicates the value was provisioned through circuit pack insertion.

k = Circuit pack line build-out: `{ INIT, 20, 40, 60, 80, 100, INVALID }`

Check the values of parameters *j* and *k*.

If the values match, set the value of the new MUX, DS1IF, or SMUX circuit pack to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-34) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-43) for DS1IF circuit packs] and continue with Step 11.

If the values do not match, continue with Step 10c.

c. Extract the MUX, DS1IF, or SMUX circuit pack selected in Step 4. Refer to Chapter 2 for extracting circuit packs, if necessary.

d. Set the circuit pack LBO or EQL settings by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-34) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-43) for DS1IF circuit packs].

e. Reinstall the MUX, DS1IF, or SMUX circuit pack extracted in Step 10c. Refer to Chapter 2 for installing circuit packs, if necessary.

   If the red ALM LED on the MUX, DS1IF, or SMUX circuit pack does not turn off (approximately 20 seconds), set the value of the new MUX, DS1IF, or SMUX circuit pack obtained in Step 9 to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-34) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-43) for DS1IF circuit packs] and continue with Step 11.

   If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

11. Replace the failed circuit pack selected in Step 4 and attach the alarm report to the failed circuit pack. For OSWIO and OPEX circuit packs, the optical fiber connector on the front of the circuit pack needs to be disconnected from the failed circuit pack and reconnected to the new circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

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

12. If the red ALM LED on the circuit pack replaced in Step 11 does not turn off (approximately 20 seconds), continue with Step 13.

    If the red ALM LED turns off on the circuit pack replaced in Step 11 and you switch the circuit pack to protection with the `SW-TOPROTN-EQPT` command in Step 4, allow the circuit pack to switch to working by entering the following command:

    `ALW-SW-EQPT:`*[a]*`:`*b*`::WKG;`

    Where:

    a = Target ID (optional)

    b = Circuit pack location: `{ MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-15}, SWIF-{1-64}-{1-8}, SWCS-{1,2}-{1-16}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16} }`

If there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

13. If the circuit pack you replaced in Step 11 is a SWIO circuit pack, continue with Step 14. Otherwise, go to Step 18.

NOTE:
The CLKDR circuit pack is an extension of the SWIO circuit pack and can be contributing to the SWIO circuit pack failure.

14. Obtain a new CLKDR circuit pack
15. Replace the failed CLKDR circuit pack. After extracting the failed CLKDR circuit pack, attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    If the red ALM LED on the CLKDR circuit pack does not turn off, continue with Step 16.

    If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.
16. Replace the CLKDR circuit pack that you extracted in Step 15 with the original CLKDR circuit pack (the one with the alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
17. Replace the SWIO circuit pack that you extracted in Step 11 with the original SWIO circuit pack (the ne with the alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
18. Since replacing the circuit pack with its ALM LED lit does not clear the alarm, the failure is most likely due to backplane, N-rate cable problems, or fiber cable problems. Refer this problem to your system administrator or your next level of support (along with the results of the `DGN-DET-EQPT` command issued in Step 8) for assistance. If there are any other interface and switch circuit pack failures, return to Step 3.

Clearing CONTBUS Conditions

The CONTBUS alarm condition is caused by a failure associated with the serial control bus between the SWIO or SWCS circuit pack indicating the alarm and its associated SCI circuit pack (SCI-0-1 or SCI-1-1 for SWCS-{1,2}-{1-16} and SWIO-1-{1-16} and SCI-0-2 or SCI-1-2 for SWIO-{2-4}-{1-16}). To clear the CONTBUS condition, perform the following procedure.

1. Obtain a diagnostic report for the SWIO or SWCS circuit pack indicating the alarm by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIO/SWCS circuit pack location: `[ SWCS-[1,2]-[1-16], SWIO-[1-4]-[1-16] ]`

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified SWIO or SWCS circuit pack passes, go to Step 4. Otherwise, continue with Step 2.

2. Obtain a new SWIO or SWCS circuit pack.

3. Replace the SWIO or SWCS circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Obtain a diagnostic report for the SCI circuit pack associated with the SWIO or SWCS circuit pack, indicating the alarm by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SCI circuit pack location: `SCI-[0,1]-[1,2]`
   SCI-0-1 or SCI-1-1 is associated with SWCS-{1,2}-{1-16} and SWIO-1-{1-16} circuit packs and SCI-0-2 or SCI-1-2 is associated with SWIO-{2-4}-{1-16} circuit packs.

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified SCI circuit pack passes, go to Step 7. Otherwise, continue with Step 5.

5. Obtain a new SCI circuit pack.
6. Replace the SCI circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 7.
7. If the alarm does not clear after replacing and/or diagnosing circuit packs, the failure is most likely due to cabling or backplane problems. Contact the system administrator or next level of support for assistance in clearing the problem.

Clearing SYNCCLK0 and SYNCCLK1 Conditions

The SYNCCLK0 and SYNCCLK1 alarm conditions are caused by a failure associated with the connection between the SWIO or SWCS circuit pack indicating the alarm and the associated CLKGN circuit pack (CLKGN-0 for SYNCCLK0 and CLKGN-1 for SYNCCLK1). To clear SYNCCLK conditions, perform the following procedure.

1. Obtain a diagnostic report for the SWIO or SWCS circuit pack indicating the alarm by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIO/SWCS circuit pack location: `[ SWCS-[1,2]-[1-16], SWIO-[1-4]-[1-16] ]`

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified SWIO or SWCS circuit pack passes, go to Step 4. Otherwise, continue with Step 2.
2. Obtain a new SWIO or SWCS circuit pack
3. Replace the SWIO or SWCS circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Obtain a diagnostic report for the CLKGN circuit pack associated with the clock indicating the failure by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CLKGN circuit pack location: `CLKGN-{0,1}`
   CLKGN-0 is associated with the condition SYNCCLK0, and CLKGN-1 is associated with the condition SYNCCLK1.

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified CKLGN circuit pack passes, go to Step 7. Otherwise, continue with Step 5.

5. Obtain a new CLKGN circuit pack.

6. Replace the CLKGN circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 7.

7. If the alarm does not clear after replacing and/or diagnosing circuit packs, the failure is most likely due to cabling or backplane problems. Contact the system administrator or next level of support for assistance in clearing the problem.

Protection Circuit Pack Failures

This procedure clears an alarm condition caused by the failure of the DS1RY or MUXPS circuit pack to switch traffic to the MUXP circuit pack, SMUX circuit pack, or DS1 protection circuit packs (two DS1IPs and a SWIF). Usually, there is an alarm condition and the green LED on the DS1RY or MUXPS circuit pack is *not* lit.

If the red ALM LED is lit on one of the MUXP, SMUXP, or DS1 protection (either DS1IP or SWIF) circuit packs, go to the section titled "Failed MUXP, SMUXP, or DS1 Protection Circuit Packs" (page 15-167). If the red ALM LED is lit on one of the DS1RY or MUXPS circuit packs, go to the section titled "Failed DS1RY or MUXPS Circuit Packs" (page 15-168).

Failed MUXP, SMUXP, or DS1 Protection Circuit Packs

1. Generate a diagnostic report for the failed circuit pack by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Interface protection circuit pack location: `[ MUXP-[1-64], SMUXP-[1-64], DS1IP-[1-64]-[PA,PB], SWIF-[1-64]-P ]`

   Diagnostics take up to 15 minutes to complete.

   This report is used for further reference and/or trouble report generation.

2. Obtain a new interface protection circuit pack

3. Replace the failed interface protection circuit pack. After extracting the failed circuit pack, attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

4. Check to see if the red ALM LED on the circuit pack is off.

   If it is off, you are done with this procedure.

   If the red ALM LED does not turn off, replace the original circuit pack (the one with the alarm report attached to it) in the slot and refer the problem, along with the output of the `DGN-DET-EQPT` command, to your system administrator or your next level of support for assistance.

Failed DS1RY or MUXPS Circuit Packs

NOTE:
DS1RY circuit pack diagnostics can fail because of slightly degraded incoming DS1 signals. Depending on how performance monitoring is set up on the incoming DS1 port, the system may not report any problems with the incoming signal. If DS1RY circuit pack diagnostics fail and changing the DS1RY circuit pack does not correct the problem, check the associated DS1 port for a degraded incoming signal. DS1RY circuit pack problems can also be caused by BXA1 circuit packs. If the system software declares a DS1RY circuit pack failure and diagnostics on the specified circuit pack passes, check all DS1RY circuit pack slots in the interface bay for the presence of BXA1 (AKM64) circuit packs. If a BXA1 circuit pack is found in a DS1RY circuit pack slot, remove it and replace it with a DS1RY circuit pack (refer to Chapter 2 for extracting and installing circuit packs, if necessary).

1. Generate a diagnostic report for the failed circuit pack by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUXPS or DS1RY circuit pack location: `[ MUXPS-[1-64], DS1RY-[1-64]-[1-4] ]`

   Diagnostics take up to 15 minutes to complete.

   This report is used for further reference and/or trouble report generation.

2. Obtain a new DS1RY or MUXPS circuit pack

3. Replace the failed DS1RY or MUXPS circuit pack. After extracting the failed circuit pack, attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

4. Check to see if the red ALM LED on the circuit pack is off.

   If it is off, you are done with this procedure.

   If the red ALM LED does not turn off, replace the original circuit pack (one with the alarm report attached to it) in the slot and refer the problem, along with the output of the `DGN-DET-EQPT` command, to your system administrator or your next level of support for assistance.

Fan Assembly Failure

The system indicates a fan assembly failure with an autonomous message and/or alarm LED. An alarm for a fan assembly (WP-92310L4 or ED-9C130-30) is caused by main or auxiliary power being lost (blown fuse or circuit breaker), fan failure, or dirty or clogged air filter. An alarm for OPEX Bay fan assemblies ED-2C816-30,G1 or ED-2C906-30 are caused by power being lost (blown fuse or circuit breaker) or fan failure. Figure 15-13 (WP-92310L4 or ED-9C130-30 fan assemblies) or Figure 15-14 (ED-2C816-30,G1 or ED-2C906-30 fan assemblies) shows the location of the alarm LEDs and other functional buttons.

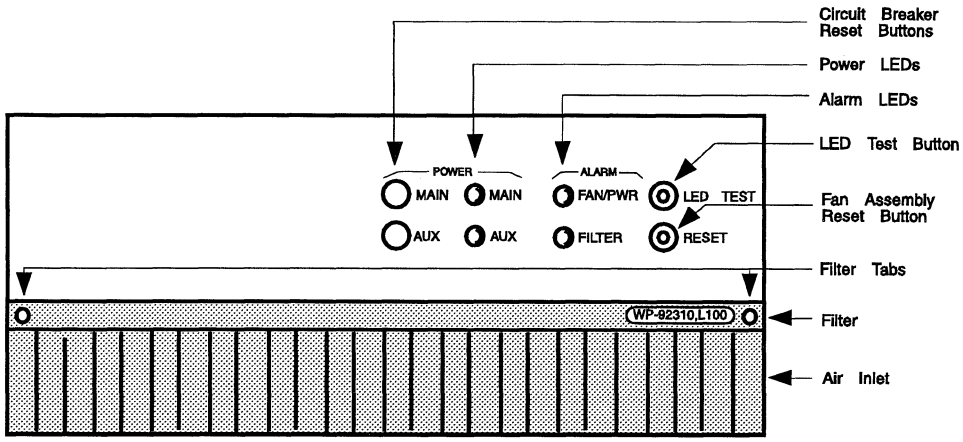


Figure 15-13. **WP-92310L4 or ED-9C130-30 Fan Assembly**

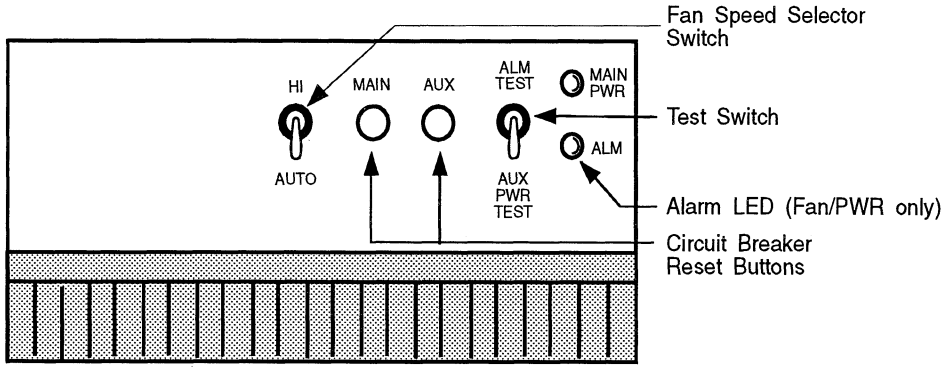


Figure 15-14. **ED-2C816-30,G1 or ED-2C906-30 Fan Assembly**

1. Determine which fan assemblies has an alarm LED lit. If more than one, choose one.
2. If the yellow FILTER LED is lit, perform the procedure in the next section titled "Fan Filter Alarm" (page 15-173) before continuing with Step 3.
3. In the fuse and alarm panel, check for blown fuses (stem extended from base of fuse holder) associated with the fan assembly selected in Step 1. Refer to Tables 15-24 and 15-25 for fuse locations. Replace blown fuses.
4. Check the fan assembly for triggered circuit breakers (circuit breaker reset button pops up). If a circuit breaker triggered, press the circuit breaker reset button (MAIN and/or AUX) on the fan assembly.

Table 15-24. **Fuse Chart for Fan Assemblies in Switch Complex and Collocated Interface Bays**

Power Source	Fuse Panel in Bay 5				Fuse Panel in Bay 10			
	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
Main	AD6	AC6	AB6	AA6	AD6	AC6	AB6	AA6
Auxiliary	BD6	BC6	BB6	BA6	BD6	BC6	BB6	BA6

Power Source	Fuse Panel in Bays 11 and 13		
	Bay 11	Bay 12	Bay 13
Main	AA4	AA6	AA5
Auxiliary	BA4	BA6	BA5

Power Source	Fuse Panel in Bay 14				Fuse Panel in Bay 19			
	Bay 15	Bay 16	Bay 17	Bay 18	Bay 20	Bay 21	Bay 22	Bay 23
Main	AA6	AB6	AC6	AD6	AA6	AB6	AC6	AD6
Auxiliary	BA6	BB6	BC6	BD6	BA6	BB6	BC6	BD6

Note: All load fuses are 10A and all indicator fuses are 0.5A

Table 15-25. **Fuse Chart for Fan Assemblies in Remote Complexes**

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse and Alarm Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—
Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8, and 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.									
Duplex Power (ED-9C114-30 Fuse and Alarm Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

5. If the FAN/PWR alarm LED remains lit and/or the MAIN or AUX LED is not lit, press the RESET button on the fan assembly to attempt to clear the alarm on the fan assembly.

   If the alarm can be cleared by pressing the RESET button, within two minutes the FAN/PWR LED turns off and the system responds with the following messages:

- For main power failure

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=coie FILE= DP=0\",
    c,
    \" 40974156 04010000 2083000f 00000000 00000000 0ff0ffff
     ff000000\""
    /* LOSS OF MAIN POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANMAIN,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

- Auxiliary power failure

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \"407655b6 04010000 2083000a 00000000 00000000 0ff5ffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANAUX,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

- Remote Complex power failure

```
    TID YY-MM-DD HH:MM:SS
A   b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "RFAN:CL,INT,NSA,,,NEND::,NIMAN"
;
```

Where:

b = Autonomous sequence number: `001-999`

6. If the FAN/PWR alarm clears and the yellow FILTER LED is not lit, you are done with this procedure.

   If the FAN/PWR alarm clears and the yellow FILTER LED is lit, go to the procedure in the next section titled "Fan Filter Alarm" (page 15-173).

7. If after replacing the fuse(s), resetting the circuit breakers, and if necessary the fan filter and/or resetting the fan assembly, the alarm remains or the FAN/PWR LED remains lit, replace the fan assembly by referring to the section titled "Replacing a Fan Assembly" (page 17-17).

Fan Filter Alarm

This procedure is used to replace the WP-92310L4 or ED-9C130-30 fan assembly air filter.

You need a fan assembly air filter WP-92310L100 (COMCODE 406747972) for each fan assembly with its yellow FILTER alarm LED lit or for fan filters being replaced for routine maintenance. If the fan filter is being replaced for routine maintenance, after performing this procedure, record the date in the Routine Maintenance Checklist (Table 3-1).

CAUTION:
The fan assembly contains no protection guard from the fan blades. Use caution when extracting and inserting the air filter.

1. Locate the fan assembly with its yellow FILTER alarm LED lit.
2. Extract the air filter from the fan assembly selected in Step 1 by pulling on the tabs on both ends of the filter. Refer to Figure 15-15.

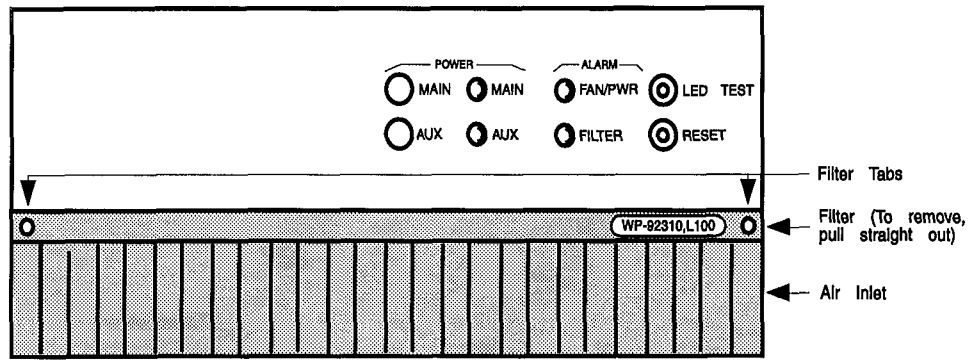


Figure 15-15. **WP-92310L4 or ED-9C130-30 Fan Assembly — Air Filter Location**

3. Clean visible dirt from area that air filter was extracted from.
4. Make sure the new air filter is flat (that is, is not warped or bowed).

   If the air filter is warped or bowed, obtain a new one.
5. Insert the new air filter into the fan assembly selected in Step 1, making sure it agrees with the directed air flow as marked on the metal edge of the air filter.
6. Be sure the air inlet below the fan assembly is unobstructed. Refer to Figure 15-15.

7. Push the reset button on the fan assembly selected in Step 1 to clear the fan filter alarm within two minutes the FILTER turns off and the system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \" 407655b604010000 20830008 00000000 00000000 0ff7ffff
     ff000000\""
    /* FAN FILTER ERROR */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANFILTER,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

8. If the FILTER alarm LED remains lit, make sure the filter is installed properly and reset the fan assembly again.

   If the FILTER alarm LED remains lit, contact the system administrator or next level of support for assistance.

9. If there are any other fan assemblies with their yellow FILTER alarm LED lit, return to Step 1.

External Timing Reference (BITS) Failure

This procedure is used to clear alarms associated with external timing references (BITS). When a minor alarm is raised with an equipment location associated with the Synchronizer Module, any of the following alarm conditions indicates a BITS timing failure: EOR, EXJIT, EXPHR, FRQOF, LOS, LOF, PHSTP, TRBER, and TRMNBER. When a major alarm is raised with an equipment location associated with the Synchronizer Module and an alarm condition ALLREFFAIL, all BITS timing references have failed. For all other alarm conditions and equipment locations, refer to the section titled "Prioritizing Alarms" (page 15-12) for clearing the alarm.

NOTE:
For EOR (end-of-range) alarm processing, if the DS1TX2 circuit pack detects LOS (loss-of-signal) or LOF (loss-of-frame) conditions, the EOR processing is inhibited on the timing reference. However, when these higher priority alarms are cleared, the DACS IV-2000 takes up to 60 seconds to determine whether a timing reference is EOR or within range. During this time, the timing reference is not used as a reference (reference is in ACT state, but no EOR is declared on that reference). If the reference is found to be within range, it is considered valid and normal reference handling occurs. If the link is determined to be EOR, the DACS IV-2000 declares an EOR alarm and the reference is not used.

When a TBS32 circuit pack is warming up initially (warm up time is up to 30 minutes during which time the synchronizer remains in the `FST` mode), EOR alarms on both references may occur indicating that the synchronizer is not yet in a stable state. After the warm-up period if the timing references are within range, the EOR alarms clear.

1. Contact your system administrator or next level of support to coordinate the effort to clear the external timing reference failure.
2. Retrieve the synchronizer mode of operation by entering the following command:

   `RTRV-SYNCN:` *[a]*`;`

   Where:

   a = Target ID (optional)

   The following output response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SMODE,ACTIVE_REF*/
   "c:..."
   ;
```

Where:

c = Synchronizer mode: { NORM, HLDOVR, FST, FRNG }

If the synchronizer mode is HLDOVR, go to Step 4. Otherwise, continue with Step 3.

3. When instructed to do so, change the synchronizer mode to holdover mode by referring to the section titled "Changing Synchronizer Mode" (page 8-24).
4. Have the personnel responsible for the BITS timing reference fix the indicated failure at the timing source.
5. If version 2 Synchronizer Module circuit packs (DS1TX2, DPLL2, and TBS32) are used, go to Step 6. Otherwise, for version 1 Synchronizer Module circuit packs (DS1TX1, DPLL1, and TBS31), perform the following procedure:

   a. Remove the DS1TX (TX) circuit pack associated with the failed timing reference (EOR alarm condition) from service by entering the following command:

      RMV-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = Timing extractor port locations: TX-{0,1}

      An alarm associated with the DS1TX occurs with the condition set to MAN.

   b. Restore the DS1TX circuit pack removed in Step 5a by entering the following command:

      RST-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = Timing extractor port location: TX-{0,1}

      This command takes up to one minute to complete. The MAN *alarm clears.*

6. When instructed to do so, change the synchronizer mode to phase-locked mode (normal mode) by referring to the section titled "Changing Synchronizer Mode" (page 8-24).

Minor Alarms Due to High-Capacity Controller Failure

Perform this procedure if a minor alarm indication is for a failed control complex, one of the PRI disk drives, or SEC disk drive fuses.

If there is a major alarm indication and there is a failure in the High-Capacity Controller Module, refer to the section titled "High Capacity Controller Failure" (page 15-145).

NOTE:
After the standby control complex becomes active, the MC FAIL and MJ alarms clear and a MN alarm is issued for the failed control complex.

1. Check for blown fuses associated with the failed control complex, PRI disk drive, or SEC disk drive. Fuses for control complexes, PRI disk drives, and the SEC disk drive are located in fuse boards FBK-4, FBJ, and FBL.

   If the only alarm condition is associated with the SEC disk drive (SEC) and the SEC fuses are not blown, refer to the section titled "CPY-MEM Command Failure" (page 16-9).

   If there are no blown fuses, go to Step 3; otherwise, continue with Step 2.

2. For each blown fuse, perform the following procedure:

   a. Pick one of the blown fuses (or the one that blew if only one) to replace.

   b. Partially extract the circuit pack associated with the blown fuse chosen in Step 2a.

   c. Replace the blown fuse.

   d. If the fuse:

      - Does not blow again, continue with Step 2e
      - Blows again, reinstall the circuit pack that you extracted in Step 2b

      Failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) , and return to Step 2a.

   e. Reinstall the circuit pack that you extracted in Step 2b.

f. If the fuse:

- Does not blow again and there are more blown fuses, return to Step 2a; otherwise, go to Step 2g.
- Blows again, obtain a new circuit pack for the circuit pack associated with the blown fuse, and replace the failed circuit pack. After extracting the failed circuit pack, attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

  If the fuse blows again, the failure cannot be cleared by replacing a fuse or its associated circuit pack. Return the original circuit pack (one with the alarm report attached to it) to the frame. If there are no other blown fuses, refer all problems associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem, and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) and return to Step 2a.

g. If the ALM LED of all circuit packs turn off, continue with Step 4; otherwise, continue with Step 3.

3. If the lit ALM LEDs are associated with a PRI disk drive and/or the SEC disk drive, continue with Step 4; otherwise, perform the following procedure:

   a. Determine the state of all the circuit packs in the High-Capacity Controller Module by entering the following command:

      RTRV-STATE-EQPT:*[a]*:MC;**

      Where:

      a = Target ID (optional)

      If there were no alarms, the normal response is:

```
RTRV STATE EQPT::MC::ALL COMPLD
/* LOC:STATE */
MC: IS
CC-0: ACT
CC-1: STBY
CPU-0: IS
CPU-1: IS
MTC-0-1: IS
MTC-0-2: IS
MTC-1-1: IS
MTC-1-2: IS
SSC-0: IS
SSC-1: IS
SCI-0-1: IS
```

```
SCI-0-2: IS
SCI-1-1: IS
SCI-1-2: IS
PRI-1: IS
PRI-2: IS
ECI-1: IS
ECI-2: IS
UI-0: IS
UI-1: IS
```

Depending on the type fault, the above message can return a combination of OOS-FLT, OOS-MTCE, IS, ACT, and STBY states. Use the output of the **RTRV-STATE-EQPT** command to aid in clearing the remaining High-Capacity Controller Module failures.

NOTE:
Circuit packs that are in the OOS-MTCE state have been manually removed and only need to be restored to service.

b. If the state of the circuit packs in one of the control complexes (CPU/MTC/SSC/SCI/UI) is OOS-FLT or OOS-MTCE, attempt to restore the control complex in the OOS state by entering the following command:

RST-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Failed control complex location: CC-[0,1]

The restore command takes up to five minutes to complete.

This command is used to run the diagnostics on the failed control complex. If the **RST-EQPT** command is denied, continue with Step 3d. Otherwise, continue with Step 4.

c. Put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

Where:

a = Target ID (optional)

After this command completes, the red MAJOR and red FAILURE ALM LEDs on the status panel turn on.

d. Replace control complex circuit pack in the OOS-FLT state as indicated by the response of the `RTRV-STATE-EQPT` command entered in Step 3a. If more than one control complex circuit pack is OOS-FLT, choose one of the circuit packs and replace it. After extracting a failed circuit pack attach the alarm report to it. For OUI circuit packs, the optical fiber connector on the front of the OUI circuit pack needs to be disconnected from the failed circuit pack and reconnected to the new circuit pack. Refer to Chapter 2 for extracting and installing circuit packs and fiber-optic cables, if necessary.

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

e. Restore the failed control complex by entering the following command:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Control complex location: `CC-[0,1]`

The failed control complex takes about five minutes to restore.

If the `RST-EQPT` command is denied and there are more circuit packs in the OOS-FLT state that haven't been replaced, choose one of the remaining circuit packs, replace it, and perform this step again. If all of the control complex circuit packs have been replaced and the `RST-EQPT` command is still denied, refer the problem to your system administrator or next level of support for assistance.

f. Restore the MC to service by entering the following command:

`RST-EQPT:`*[a]*`:MC;`

Where:

a = Target ID (optional)

The restore command takes up to five minutes to complete.

4. If an ALM LED remains lit that is associated with a PRI disk drive, retrieve the state of the PRI disk drive by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = PRI disk drive location: **PRI-{1,2}**

   A sample output response:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "e:f"
;
```

   Where:

   e = PRI disk drive location: PRI-{1,2}

   f = Equipment state

   If the state of the PRI disk drive is OOS-MTCE, go to Step 5. Otherwise, refer to the section titled "Replacing One PRI Disk Drive" (page 17-5).

5. If the state of the PRI disk drive is OOS-MTCE, restore the PRI disk drive to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = PRI disk drive location: **PRI-{1,2}**

   This command takes up to 15 minutes to complete. After completion of this command, the contents of the in-service PRI disk drive are copied to the PRI disk drive you restored.

   If the ALM LED remains lit on the PRI disk drive you restored, refer to the section titled "Replacing One PRI Disk Drive" (page 17-5). Otherwise, you are done with this procedure.

PMGR1 and DS3PM2 Circuit Pack Failures

This procedure clears all DS3PM2 circuit packs in the OOS-FLT state or all PMGR1 circuit packs in the ACT-FLT or POS-FLT state. Repeat this procedure until all PMGR1 and DS3PM2 circuit packs are out of the fault (FLT) state.

TABS link connections to the DS3PM2 circuit pack are made by 2-wire pair cables that are connectorized and connected to pins P51 and P52 on the backplane. The last DS3PM2 circuit pack in the series has only one cable connected to it, and it is connected on pin P51. P52 is not connected. This is the DS3PM2 circuit pack that must have two option switches set to the IN position. All others on that side of the switch complex must be set to the OUT position.

1. If a DS3PM2 circuit pack (failure indicated in the `RTRV-ALM-EQPT` response) and its red ALM LED is not lit, check the DS3PM2 multipoint asynchronous interface TABS link (P links) connection to pins P51 and P52 on the backplane associated with the DS3PM2 circuit pack.

   If the TABS link is not connected to pins P51 and P52 on the backplane, make the connection and continue with Step 8 [refer to the introductory information of the section titled "Provisioning DS3PM2 Circuit Packs" (page 5-49) for P link arrangements and connections]. If the TABS link is connected to pins P51 and P52 on the backplane, continue with Step 2.

2. Determine the state for each PMGR1 or DS3PM2 circuit pack indicating a failure (red ALM LED lit or by the `RTRV-ALM-EQPT` command) by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`
   DS3PM circuit pack location: `DS3PM-{1-64}`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = PMGR1 circuit pack location: `{ MUX-{1-64}-{1-31}, SWIF-{1-64}-{1-8} }`
   DS3PM circuit pack location: `DS3PM-{1-64}`

   f = Equipment state

3. Choose any circuit pack that is in the OOS-FLT, POS-FLT, or ACT-FLT state.

4. Obtain a diagnostic report for the PMGR1 circuit pack that failed, or attempt to restore the DS3PM2 circuit pack that failed by entering the appropriate command:

   - **PMGR1 Circuit Pack:**

     `DGN-DET-EQPT:`*[a]*`:`*b*`;`

     Where:

     a = Target ID (optional)

     b = PMGR1 circuit pack location: `{ MUX-{1-6}-{1-31}, SWIF-{1-64}-{1-8} }`

     Diagnostics take up to 15 minutes to complete. This report is used for further reference and/or trouble report generation.

   - **DS3PM2 Circuit Pack:**

     `RST-EQPT:`*[a]*`:`*b*`;`

     Where:

     a = Target ID (optional)

     b = DS3PM2 circuit pack location: `DS3PM-{1-64}`

     This command takes up to five minutes to complete.

     If the failed DS3PM2 circuit pack restores without indicating failure and there are no other PMGR1 and DS3PM2 circuit pack failures, you are done with this procedure. Otherwise, continue with Step 5.

5. Obtain a new circuit pack of the same type as the failed circuit pack.
6. If you are replacing a DS3PM2 circuit pack, make sure the TABS link jumpers of the new circuit pack are in the same position of the failed DS3PM2 circuit pack. Refer to Figure 15-16 for the location of TABS link option switches.
7. Replace the failed circuit pack selected in Step 3. After extracting the failed circuit pack, attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If you replaced a DS3PM2 circuit pack, continue with Step 8.

   If you replaced a PMGR1 circuit pack and its red ALM LED does not turn off, continue with Step 9.

   If you replaced a PMGR1 circuit pack and its red ALM LED turned off and there are no more failed PMGR1 and DS3PM2 circuit packs, you are done with this procedure. If there are more PMGR1 or DS3PM2 circuit packs that have failed, go to Step 1.

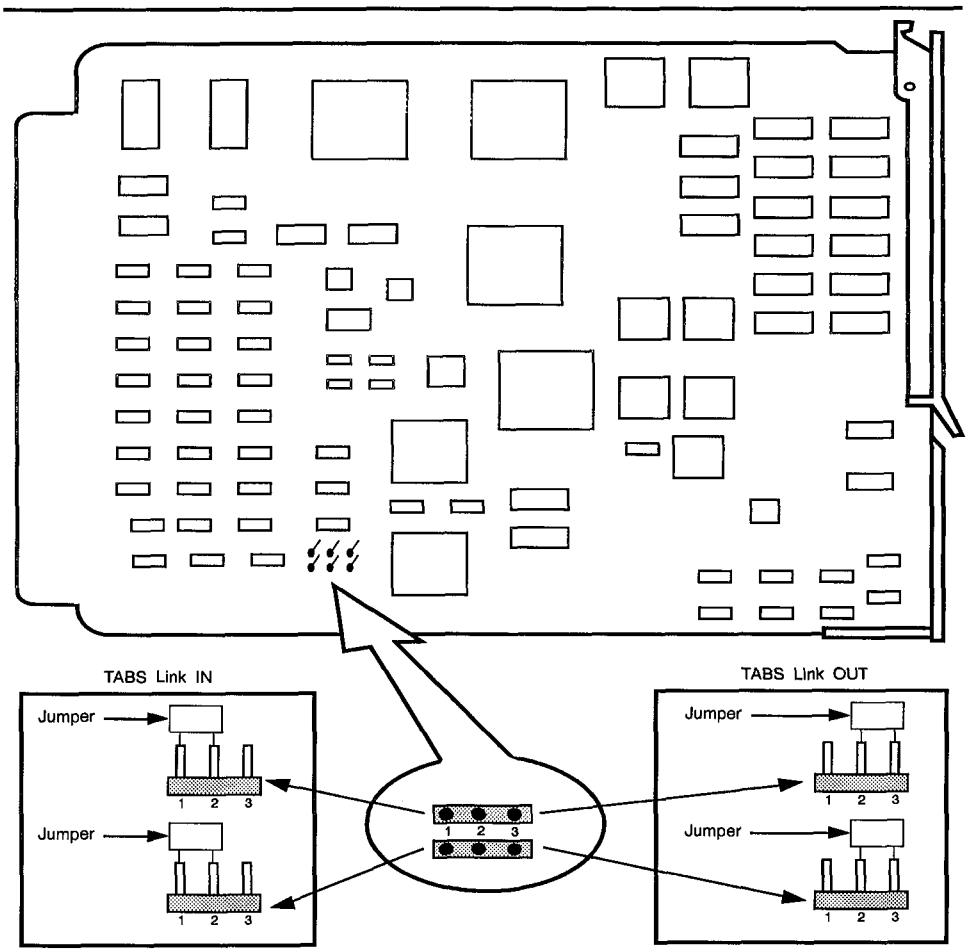


Figure 15-16. **Location of TABS Link Option Switches on DS3PM2 (AKM89)**

8. If you replaced a DS3PM2 circuit pack or connected the TABS link to the DS3PM2 circuit pack, restore the DS3PM2 circuit pack to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3PM circuit pack location: `DS3PM-[1-64]`

   If the red ALM LED on a DS3PM2 circuit pack does not go off, refer the problem to your local system administrator or your next level of support for further assistance and, if there are any other ALM LEDs lit on PMGR1 or DS3PM2 circuit packs, go to Step 1. Otherwise, you are done with this procedure.

9. Since replacing the PMGR1 circuit pack with its ALM LED lit does not clear the alarm, the failure is most likely due to backplane or N-rate cable problems. Refer this problem to your system administrator or your next level of support along with the results of the `DGN-DET-EQPT` command issued in Step 4 for assistance. If there are any other PMGR1 or DS3PM2 circuit pack failures, return to Step 1. Otherwise, you are done with this procedure.

Time of Day Clock Failure

Perform this procedure only if you received a minor alarm and the ALM LEDs on the ECI circuit packs are lit. If you received a major alarm, refer to the section titled "Prioritizing Alarms" (page 15-12) to clear all major alarms.

NOTE:
The time of day clock failure causes two `REPT EXCPTN SYS` messages. This is a normal occurrence.

1. Log into the DACS IV-2000. If you cannot log in, refer to the procedure titled "Link Communication Failures" (page 15-33).
2. Reset the time of day clock by entering the following command:

   `ED-DATE:`*[a]*`:::`*c*`,`*d*`;`

   Where:

   a = Target ID (optional)

   c = Date: `[00-39,81-99][01-12][01-31]`

   d = Time: `[00-23][00-59][00-59]`

Diagnostic Messages

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Contents

Diagnostic Messages

16

This chapter consists of procedures required to clear problems that are indicated by diagnostic messages generated by the DACS IV-2000 in response to user- or system-generated diagnostics.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Diagnose Equipment Failures (DGN-DET-EQPT)

This procedure is used to manually diagnose equipment.

1. Diagnose the failed equipment by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`:::`*[d]*`;`

   Where:

   a = Target ID (optional)

   b = Failed equipment location: `{ MC, CC-{0,1}, PRI-{1,2}, SEC, UI-{0-1}, RUI-{1,2}, MTC-{0,1}-{1,2}, SSC-{0,1}, SCI-{0,1}-{1,2}, MEM, CILINK-{1,2}-{1-8}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1,2}-{1-16}, CPU-{0,1}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, RUIA-{1,2}, RUIB-{1,2}, RSCI-{1,2}, RCLKGN-{1,2}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4}, DPLL-{0,1}, TB-{0,1}, TX-{0,1}, SYNC-{0,1} }`

NOTE:
CLKDR circuit packs are an extension of the SWIO circuit packs and are not therefore valid locations for this parameter. Diagnostics cannot be performed on CLKDR circuit packs.

The `DGN-DET-EQPT` command can be performed on the MC and MC equipment while the MC is out-of-service (OOS). The MC equipment locations are: `CPU-{0,1}`, `CC-{0,1}`, `UI-{0,1}`, `MTC-{0,1}-{1,2}`, `SSC-{0,1}`, `ECI-{1,2}`, `SCI-{0,1}-{1,2}`, and `CILINK-{1,2}-{1-8}`.

Diagnostics can be performed on the Memory Storage Module entity `MEM`, which contains the entities `PRI-{1,2}` and `SEC`. The `PRI-{1,2}` and `SEC` can also be diagnosed discretely with the MC in the IS or OOS state.

The `PRI-{1,2}` and `SEC` can be diagnosed discretely with the MC in the IS or OOS state.

For the `MUX-{1-64}-{1-31}` (DS3 Interface-16 and DS3 Interface-32 Modules only) and `SWIF-{1-64}-{1-8}` slots, a PMGR1 circuit pack can be present.

Unit controller circuit packs cannot be diagnosed using the `DGN-DET-EQPT` command if they fail. However, the `RST-EQPT::UC-{1-64};` command causes diagnostics to be run. If the diagnostics fail, a `REPT DGN EQPT` message is output.

d = Diagnostic phases: `{` <4-digit hex number>, `ALL }`
Default: `ALL`
Refer to the appendix on "Diagnostic Test" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for detailed information.

Diagnostics can take up to 15 minutes to complete.

2. Determine the equipment location and results from the output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

Where:

e = Equipment location: `{ MC, CC-{0,1}, PRI-{1,2}, SEC, UI-{0-1}, RUI-{1,2}, MTC-{0,1}-{1,2}, SSC-{0,1}, SCI-{0,1}-{1,2}, MEM, CILINK-{1,2}-{1-8}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1,2}-{1-16}, CPU-{0,1}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, RUIA-{1,2}, RUIB-{1,2}, RSCI-{1,2}, RCLKGN-{1,2}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4}, DPLL-{0,1}, TB-{0,1}, TX-{0,1}, SYNC-{0,1} }`

f = Actual/Failed diagnostic phases: < 4-digit hex number >

g = Diagnostics result: `{ PASS, FAIL, TNR }`

h = Expected diagnostic data: < "1-40 legal characters" >

i = Measured diagnostic data: < "1-40 legal characters" >

If parameter *g* contains `FAIL` on any line of the output response, determine the failed equipment from parameter *e* and perform the procedure listed in Table 16-1 to clear the failed equipment. If parameter *g* contains TNR, see the appendix on "Diagnostic Tests" in the *DACSIV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine which conditions you are required to run.

NOTE:
DS1RY circuit pack diagnostics can fail because of slightly degraded incoming DS1 signals. Depending on how performance monitoring is set up on the incoming DS1 port, the system may not report any problems with the incoming signal. If DS1RY circuit pack diagnostics fail and changing the DS1RY circuit pack does not correct the problem, check the associated DS1 port for a degraded incoming signal. DS1RY circuit pack problems can also be caused by BXA1 circuit packs. If the system software declares a DS1RY circuit pack failure and diagnostics on the specified circuit pack passes, check all DS1RY circuit pack slots in the interface bay for the presence of BXA1 (AKM64) circuit packs. If a BXA1 circuit pack is found in a DS1RY circuit pack slot, remove it and replace it with a DS1RY circuit pack (refer to Chapter 2 for extracting and installing circuit packs, if necessary).

Table 16-1. **Clearing Diagnostic Failures**

Equipment	Procedure
CC CPU UI/OUI MTC SSC SCI ECI	Go to the section titled "Replacing Main Controller Circuit Packs (Diagnostic Failures)" (page 17-12).
PRI	Go to the section titled "Replacing One PRI Disk Drive" (page 17-5) for single disk drive failures or the section titled "Replacing Both PRI Disk Drives" (page 17-7) for failures of both disk drives.
SEC	Go to the section titled "Replacing the SEC Disk Drive" (page 17-11).
DPLL SYNC TB (TBS3) TX (DS1TX)	Go to the section titled "Synchronizer Module Failure" (page 15-40).
UC	Go to the section titled "Unit Controller Failure" (page 15-152).

Table continued on next page.

Table 16-1. **Clearing Diagnostic Failures (Continued)**

Equipment	Procedure
CLKGN (SWCS Module) CLKDR SWCS SWIO/OSWIO OPEX MUX SMUX SWIF* CILINK DS1IF DS1IP DS1RY DS3PM MUXPS MUXP SMUXP	Go to the section titled "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154).
RUI RUIA RUIB RSCI RCLKGN	Go to the section titled "Replacing Main Controller Circuit Packs (Diagnostic Failures)" (page 17-12).

* Includes protection circuit packs.

REPT DGNDET EQPT Message

The system generates this message autonomously to provide detailed information about the autonomous detection of a failed circuit pack. This procedure defines the method for clearing the failure. If this message appears frequently and/or repeatedly, contact your system administrator or your next level of supervision for technical assistance.

1. Determine the equipment location from the `REPT DGNDET EQPT` output message:

```
   TID YY-MM-DD HH:MM:SS
A  a COMPLD
   /* LOC:ITER,PHASES,RESULT,EXPECTED,MEASURED */
   "b:1,d,FAIL,f,g"
;
```

Where:

b = *0*Equipment location: `{ MC, CC-{0,1}, PRI-{1,2}, SEC, UI-{0-1}, RUI-{1,2}, MTC-{0,1}-{1,2}, SSC-{0,1}, SCI-{0,1}-{1,2}, MEM, CILINK-{1,2}-{1-8}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1,2}-{1-16}, CPU-{0,1}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, RUIA-{1,2}, RUIB-{1,2}, RSCI-{1,2}, RCLKGN-{1,2}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4}, DPLL-{0,1}, TB-{0,1}, TX-{0,1}, SYNC-{0,1} }`

d = Failed diagnostic phases: < 4-digit hex number >

f = Expected diagnostic data: < "1-40 legal characters" >

g = Measured diagnostic data: < "1-40 legal characters" >

NOTE:

For details about the contents of parameter *c*, see the appendix on "Diagnostic Tests" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

If the standby `CLKGN-{0,1}` is specified as the equipment location and the measured diagnostic data is

`"SWIO-{1-4}-{1-16} DOES NOT DETECT CLKGN-{0,1}"`

and the SWIO circuit pack is active, a failure within the SWIO circuit pack can cause the CLKGN diagnostics to fail. If the CLKGN circuit pack is switched and/or the alarm clears on the CLKGN circuit pack, the SWIO circuit pack specified contains the failure. This SWIO circuit pack is used in the rest of this procedure instead of the CLKGN circuit pack.

2. Diagnose the failed equipment by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`:::`*[d]*`;`

   Where:

   a = Target ID (optional)

   b = Equipment location: equipment specified in parameter *b* of the `REPT DGNDET EQPT` message.

   d = Diagnostic phases: specify diagnostic phase only if parameter *b* of the `REPT DGNDET EQPT` message is `MC`.

   Diagnostics can take up to 15 minutes to complete.

3. Determine equipment location and results from the following output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

   Where:

   e = Equipment location: `{ MC, CC-{0,1}, PRI-{1,2}, SEC, UI-{0-1}, RUI-{1,2}, MTC-{0,1}-{1,2}, SSC-{0,1}, SCI-{0,1}-{1,2}, MEM, CILINK-{1,2}-{1-8}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1,2}-{1-16}, CPU-{0,1}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, RUIA-{1,2}, RUIB-{1,2}, RSCI-{1,2}, RCLKGN-{1,2}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4}, DPLL-{0,1}, TB-{0,1}, TX-{0,1}, SYNC-{0,1} }`

   f = Actual/Failed diagnostic phases: < 4-digit hex number >

   g = Diagnostics result: `{ PASS, FAIL, TNR }`

   h = Expected diagnostic data: < "1-40 legal characters" >

   i = Measured diagnostic data: < "1-40 legal characters" >

   If parameter *g* contains `FAIL` on any line of the output message, determine the failed equipment from parameter *e* and perform the procedure listed in Table 16-1 to clear the failed equipment. If parameter *g* contains TNR, see the appendix on "Diagnostic Tests" in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) to determine which conditions you are required to run.

   If the results did not identify a failed test, contact your system administrator or your next level of support for further technical assistance.

REPT EXCPTN SYS Message

This message indicates an abnormal condition in the system and requires action to clear an alarm or a fault. The system generates this message autonomously to report detailed information related to the following:

- Software detected problems and abnormal conditions (PROGFLT)
- Processor exception conditions (CONTR)
- Internal hardware exception or hardware interrupt conditions (INT)
- PRI, SEC, or SSC error conditions (SS ERROR)

1. Record the contents of the REPT EXCPTN SYS message:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT EXCPTN SYS
   /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
   /* EIDDET, */
   /* MEASURED (MULTI-LINE) */
   "b:c,"[ECASE=g, RC=h, SEQ=i, PROC=j, FILE=k, DP=l]",
   e,
   "f"
   [/* PLEASE RECORD THE INFORMATION ABOVE AND */]
   [/* IMMEDIATELY CONTACT AT&T TECHNICAL SUPPORT. */]
```

   If a REPT EXCPTN SYS message is output with the additional information message, /* LOSS OF POWER TO LED */, a +5 V LED secondary fuse has blown. Refer to the section titled "Secondary Fuses in OPEX Power Module" (page 15-89) for replacing the fuse(s).

   If a REPT EXCPTN SYS message is output with **CPY-MEM** command denial, go to the next section titled "CPY-MEM Command Failure" (page 16-9). Otherwise, continue with the next step.

   If there is a time of day clock failure, two REPT EXCPTN SYS messages are output with a LOC (parameter *b*) of ECI-1 (for the first message) and ECI-2 (for the second message) and a EIDDET (parameter e) of TODC (for both messages). If this occurs, set the time of day clock by referring to the section titled "Time of Day Clock Failure" (page 15-185).

   If a REPT EXCPTN SYS message is output after a **RTRV-SYSID** command with the condition type PROGFLT, the SEC disk drive is in the OOS-FLT state due to a blown fuse. Refer to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177) to replace the blown fuse associated with the SEC disk drive.

   Refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for a detailed description of the REPT EXCPTN SYS command.

2. Contact your system administrator or your next level of support for technical assistance.

CPY-MEM Command Failure

This procedure is used when you get a REPT EXCPTN SYS message after entering a CPY-MEM command. Types of conditions that can cause a REPT EXCPTN SYS message to be output for a CPY-MEM command denial are:

- The optical disk is bad or the contents are corrupted
- SSC circuit pack failed
- The SEC failed
- One PRI failed
- Both PRIs failed

In addition to the condition type (CTYPE) and detailed equipment location (EIDDET) parameters of the REPT EXCPTN SYS message, Table 16-2 shows exceptions for PRI and SEC locations associated with the return code (RC) parameter.

Table 16-2. **PRI and SEC Error Information — RC Parameter of REPT EXCPTN SYS Message**

RC Hex Code (Last 8 Digits)	Error Condition
fffffd00	Header failed although sector number matched
fffffd01	Data field error
ffffd02	Sector not found
ffffd03	Sector overrun
fffffd04	No data synchronization
fffffd05	First in first out (FIFO) data lost
fffffd06	Correction failed
fffffe1f	PRI disk seek error
fffffe20	Optical disk seek error

1. If you did not specify the SEC disk drive in the `CPY-MEM` command or if parameter *f* of the `REPT EXCPTN SYS` message does not begin with `000007f0` (`7f0` indicates SEC failure and `7f8/7f9` indicates PRI-1/PRI-2 failure, respectively), go to Step 2. Otherwise, perform the following procedure:

   a. Retrieve the state of the SEC disk drive by entering the following command:

      `RTRV-STATE-EQPT:`*`[a]`***`:SEC;`**

      Where:

      a = Target ID (optional)

      A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SEC:f"
;
```

      Where:

      f = Equipment state: `{ IS, OOS-FLT, OOS-MTCE }`

      If the SEC disk drive is in the OOS-FLT state, clear the failure by referring to the section titled "Minor Alarms Due to High-Capacity Controller Failure" (page 15-177) before performing this procedure. If the SEC disk drive is in the OOS-MTCE state, go to Step 1b. Otherwise, continue with Step 1d.

   b. Attempt to restore the SEC disk drive to service by entering the following command:

      `RST-EQPT:`*`[a]`***`:SEC;`**

      Where:

      a = Target ID (optional)

      If the command is denied with the error code `SCCF` (secondary cartridge checksum failure), go to Step 1c (the optical disk cartridge has been corrupted and needs to be reformatted). If this command completes (up to one minute and the green ON LED lights), go to Step 1g.

c. Format the optical disk cartridge by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,SEC,FORMAT;`

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete. After the command completes go to Step 1g.

This command takes up to 15 minutes using `FORMAT` *and up to two minutes using* `HEADER` *to complete. After the command completes go to Step 1g.*

d. Remove the SEC disk drive from service by entering the following command:

`RMV-EQPT:`*[a]*`:SEC;`

Where:

a = Target ID (optional)

This command takes up to one minute to complete. After completion, the green ON LED extinguishes.

e. Load a different Release 5.0 optical disk into the tape drive (refer to "Extracting/Installing Optical Disk Cartridge" (page 8-29), if necessary).

f. Restore the SEC disk drive to service by entering the following command:

`RST-EQPT:`*[a]*`:SEC;`

Where:

a = Target ID (optional)

This command takes up to one minute to complete. After completion, the green ON LED lights.

If this command fails, check and/or replace the optical disk and/or SEC disk drive, as necessary.

g. Reenter the `CPY-MEM` command that caused the `REPT EXCPTN SYS` message.

If the `REPT EXCPTN SYS` reappears, continue with Step 2. Otherwise, the condition causing the `REPT EXCPTN SYS` message has been cleared and do not continue with this procedure.

2. Retrieve the state of the MC by entering the following command:

   RTRV-STATE-EQPT:*[a]*:MC;

   Where:

   a = Target ID (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "MC:f"
   ...
;
```

   Where:

   f = Equipment state: [IS, OOS-MCOND, OOS-FLT, OOS-MTCE]

   If the MC is in the OOS-MCOND state, go to Step 4. Otherwise, continue with Step 3.

3. If parameter *f* of the REPT EXCPTN SYS message begins with 000007f8 and PRI-1 is in the OOS-FLT state, or if parameter *f* begins with 000007f9 and PRI-2 is in the OOS-FLT state, perform the following procedure; otherwise, go to Step 4.

   a. Replace the failed disk drive using the section titled "Replacing One PRI Disk Drive" (page 17-5).

      If the restoration completes successfully, you are done with this procedure; otherwise, continue with Step 3b.

   b. Put the MC in the OOS-MCOND state by entering the following command:

      ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

      Where:

      a = Target ID (optional)

4. Perform a control complex side switch so that the standby control complex becomes the active control complex by entering the following command:

   RST-EQPT:*[a]*:MC:,:*[e]*;

   Where:

   a = Target ID (optional)

   e = Control complex (to become active) location: CC-[0,1]

   This command takes up to five minutes to complete.

5. Log on to the DACS IV-2000. Refer to Chapter 4 for logging in procedures, if necessary.

6. If the MC needs to be in the IS state for the CPY-MEM command that caused the REPT EXCPTN SYS message, go to Step 7. Otherwise, put the MC in the OOS-MCOND state by entering the following command:

   ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

   Where:

   a = Target ID (optional)

7. Reenter the CPY-MEM command that caused the REPT EXCPTN SYS message.

   If the REPT EXCPTN SYS reappears, continue with Step 8. Otherwise, the condition causing the REPT EXCPTN SYS message has been cleared and the following procedure should be performed to replace the SSC circuit pack of the standby control complex:

   a. Remove the standby control complex from service by entering the following command:

      RMV-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = Standby control complex location: CC-{0,1}

      A minor (MN) alarm occurs for the removed control complex.

   b. Obtain a new SSC circuit pack.

   c. Replace the SSC circuit pack of the control complex removed in Step 7a with a new one. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   d. Restore the control complex removed in Step 7a to standby by entering the following command:

      RST-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = Standby control complex location: CC-{0,1}

      The minor alarm for the removed control complex clears (CL) and you are done with this procedure.

8. If you did not specify the SEC disk drive in the CPY-MEM command, go to Step 9. Otherwise, perform the following procedure:

   a. Replace the SEC disk drive by using the section titled "Replacing the SEC Disk Drive" (page 17-11). The optical disk that is loaded into the SEC disk drive in the "Replacing the SEC Disk Drive" procedure must be the one you used for the CPY-MEM command.

b. Make sure the MC is in the appropriate state (IS or OOS-MCOND) so that you can reenter the CPY-MEM command that caused the REPT EXCPTN SYS message by entering one of the following commands, if necessary:

To put in IS state:

RST-EQPT:*[a]*:MC;

To put in OOS-MCOND state:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

Where:

a = Target ID (optional)

The MC takes up to five minutes to restore if you entered the RST-EQPT *command.*

c. Reenter the CPY-MEM command that caused the REPT EXCPTN SYS message.

If the REPT EXCPTN SYS reappears, continue with Step 9. Otherwise, the condition causing the REPT EXCPTN SYS message has been cleared and you are done with this procedure.

9. If you did not specify the PRI disk drive in the CPY-MEM command, go to Step 10. Otherwise, perform the following procedure:

a. Retrieve the state of the MC by entering the following command:

RTRV-STATE-EQPT:*[a]*:MC;

Where:

a = Target ID (optional)

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "MC:f"
;
```

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

If the MC is in the OOS-MCOND state, go to Step 9b. Otherwise, continue with Step 9c.

b. Put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

Where:

a = Target ID (optional)

c. Remove the SEC disk drive from service by entering the following command:

`RMV-EQPT:`*[a]*`:SEC;`

a = Target ID (optional)

This command takes up to one minute to complete. After completion, the green ON LED extinguishes.

d. Load an optical disk that has been formatted for Release 5.0, and contains the Release 5.0 programs and the latest copy of the database, into the tape drive. Refer to the section titled "Extracting/ Installing Optical Disk Cartridge" (page 8-29), if necessary.

e. Restore the SEC disk drive to service by entering the following command:

`RST-EQPT:`*[a]*`:SEC;`

Where:

a = Target ID (optional)

This command takes up to one minute to complete. After completion, the green ON LED lights.

If this command fails, check and/or replace the optical disk and/or SEC disk drive, as necessary [(refer to the section titled "Replacing the SEC Disk Drive" (page 17-11) for replacing the SEC disk drive].

f. Remove both of the PRI disk drives from service by entering the following command:

`RMV-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Disk drive location: `PRI-[1,2]`

This command takes up to five minutes to complete.

g. Partially extract one of the PRI disk drives from its slot.

h. Format the remaining PRI disk drive by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-[1,2]`

This command takes up to 15 minutes using `FORMAT` *and up to two minutes using* `HEADER` *to complete.*

If this command is denied, go to Step 10.

i. Copy the Release 5.0 programs onto the PRI disk by entering the following command:

`CPY-MEM:[a]:::SEC,PRI,PROG:Y;`

Where:

a = Target ID (optional)

This command takes up to 11 minutes to complete.

If this command is denied, go to Step 10.

j. Copy the database onto the PRI disk drive by entering the following command:

`CPY-MEM:[a]:::SEC,PRI,DBASE,Y;`

Where:

a = Target ID (optional)

This command takes up to 12.5 minutes to complete.

If this command is denied, go to Step 10.

k. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

`INIT-SYS:[a]::::9;`

Where:

a = Target ID (optional)

The system takes about 20 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 8-7).

l. If the MC needs to be in the IS state for the `CPY-MEM` command that caused the `REPT EXCPTN SYS` message, go to Step 9m. Otherwise, put the MC in the OOS-MCOND state by entering the following command:

`ED-STATE-EQPT:[a]:MC::OOS-MCOND;`

Where:

a = Target ID (optional)

m. Reenter the CPY-MEM command that caused the REPT EXCPTN SYS message.

If the REPT EXCPTN SYS reappears, continue with Step 10. Otherwise, perform the following procedure:

- Insert the PRI disk drive extracted in Step 9g.
- Restore the PRI disk drive to service by entering the following command:

RST-EQPT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Disk drive location: PRI-[1,2]

This command takes up to three minutes to complete.

If PRI disk drive restores, you are done with this procedure. Otherwise, replace this disk drive using the section titled "Replacing One PRI Disk Drive" (page 17-5).

10. Perform the following procedure using the PRI disk drive that was extracted in Step 9g:

a. Retrieve the state of the MC by entering the following command:

RTRV-STATE-EQPT:*[a]*:MC;

Where:

a = Target ID (optional)

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "MC:f"
;
```

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

If the MC is in the OOS-MCOND state, go to Step 10c. Otherwise, continue with Step 10b.

b. Put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

Where:

a = Target ID (optional)

c. Remove the in-service (IS) PRI disk drive from service by entering the following command:

`RMV-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = Disk drive location: `PRI-[1,2]`

This command takes up to one minute to complete.

d. Extract the PRI disk drive you removed in Step 10c from its slot, and insert the disk drive extracted in Step 9g into its slot.

e. Format the PRI disk drive inserted in Step 10d by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-[1,2]`

This command takes up to 15 minutes using `FORMAT` *and up to two minutes using* `HEADER` *to complete.*

If this command is denied, go to Step 11.

f. Restore the PRI disk drive inserted in Step 10d to service by entering the following command:

`RST-EQPT:`*[a]*`:`*b*`;`

a = Target ID (optional)

b = Disk drive location: `PRI-[1,2]`

This command takes up to three minutes to complete.

If this command is denied, go to Step 11.

g. Copy the Release 5.0 programs onto the PRI disk drive by entering the following command:

`CPY-MEM:`*[a]*`:::SEC,PRI,PROG:Y;`

Where:

a = Target ID (optional)

This command takes up to 11 minutes to complete.

If this command is denied, go to Step 11.

h. Copy the database onto the PRI disk drive by entering the following command:

`CPY-MEM:[a]:::SEC,PRI,DBASE:Y;`

Where:

a = Target ID (optional)

This command takes up to 12.5 minutes to complete.

If this command is denied, go to Step 11.

i. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

`INIT-SYS:[a]::::9;`

Where:

a = Target ID (optional)

The system takes about 15 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 8-7).

j. If the MC needs to be in the IS state for the `CPY-MEM` command that caused the `REPT EXCPTN SYS` message, go to Step 10k. Otherwise, put the MC in the OOS-MCOND state by entering the following command:

`ED-STATE-EQPT:[a]:MC::OOS-MCOND;`

Where:

a = Target ID (optional)

k. Reenter the `CPY-MEM` command that caused the `REPT EXCPTN SYS` message.

If the `REPT EXCPTN SYS` reappears, continue with Step 11. Otherwise, the condition has been cleared and do not continue with this procedure.

11. Record the contents of the `REPT EXCPTN SYS` message and contact your system administrator or your next level of support for technical assistance.

REPT CMPR MEM Message

The REPT CMPR MEM message indicates memory comparison mismatches.

1. Determine the first and second entity locations from the REPT CMPR MEM output message:

```
   TID#0 YY-MM-DD HH:MM:SS
A  a REPT CMPR MEM
   /* MEM1,LOC1,MEM2,LOC2:DTYPE,DATA1,DATA2 */
   "WKG,c,d,e:f,g,h"
;
```

   Where:

   c = First entity location: { CPU-{0,1}, ECI-{1,2}, UC-{1-64}, DS3PM-{1-64} }

   d = Second memory type: { WKG, PRI }

   e = Second entity location: { MC, CPU-{0,1}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1-2}-{1-16}, SWIO-{1-4}-{1-16}, UC-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, SWIF-{1-64}-{1-8,P}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, {1-64}-{1-8}-{1-28}, {1-64}-{1-31}, SMUX-{1-64}-{1-15}, SMUXP-{1-64} }

   f = Data type: Refer to the REPT CMPR MEM command entry in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for valid data types.

   g = First memory data: <4- to 8-digit hex number >

   h = Second memory data: <4- to 8-digit hex number >

   If parameter *c* (LOC1) is UC-{1-64} and parameter *e* (LOC2) is an interface circuit pack (DS1IF, SWIF, MUX, or SMUX), go to Step 3. If parameter *c* (LOC1) is CPU-{0,1} and parameter *e* (LOC2) is a circuit pack, go to Step 2. Otherwise, go to Step 5.

2. For the circuit pack identified in parameter *e* (LOC2), perform the following procedure:

   a. Diagnose the circuit pack specified in parameter *e* of the REPT CMPR MEM message by entering the following command:

      DGN-DET-EQPT:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = Equipment location: equipment specified in parameter *e* of the REPT CMPR MEM message.

      Diagnostics can take up to 15 minutes to complete.

b. Determine the equipment location and results from the following output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

Where:

e = Equipment location: `{ MC, CC-{0,1}, PRI-{1,2}, SEC, UI-{0-1}, RUI-{1,2}, MTC-{0,1}-{1,2}, SSC-{0,1}, SCI-{0,1}-{1,2}, MEM, CILINK-{1,2}-{1-8}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1,2}-{1-16}, CPU-{0,1}, SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16}, UC-{1-64}, DS3PM-{1-64}, MUX-{1-64}-{1-31}, MUXP-{1-64}, MUXPS-{1-64}, SMUX-{1-64}-{1-15}, SMUXP-{1-64}, SWIF-{1-64}-{1-8,P}, RUIA-{1,2}, RUIB-{1,2}, RSCI-{1,2}, RCLKGN-{1,2}, DS1IF-{1-64}-{1A-8B}, DS1IP-{1-64}-{PA,PB}, DS1RY-{1-64}-{1-4}, DPLL-{0,1}, TB-{0,1}, TX-{0,1}, SYNC-{0,1} }`

f = Actual/Failed diagnostic phases: < 4-digit hex number >

g = Diagnostics result: `{ PASS, FAIL, TRN }`

h = Expected diagnostic data: < "1-40 legal characters" >

i = Measured diagnostic data: < "1-40 legal characters" >

If parameter *g* contains `FAIL` on any line of the output message, go to Step 2c. If all phases pass, go to Step 2f.

c. Obtain a new circuit pack of the same type that failed diagnostics identified in Step 2b.

d. Extract the failed circuit pack and attach the diagnostic report to the circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

e. Install the new circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

If you installed a UC circuit pack, go to Step 4. Otherwise, go to Step 5.

f. If the circuit pack identified in Step 2b is a UC circuit pack, remove the UC from service by entering the following command:

`RMV-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = UC circuit pack location: `UC-[1-64]`

A major (MJ) alarm is issued when you remove a UC from service.

g. Extract the circuit pack identified in Step 2b. Refer to Chapter 2 for extracting circuit packs, if necessary.

h. Install the circuit pack extracted in Step 2g. Refer to Chapter 2 for installing circuit packs, if necessary.

If you installed a UC circuit pack, go to Step 4. Otherwise, go to Step 5.

3. Remove the unit controller from service by entering the following command:

`RMV-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = UC circuit pack location: `UC-[1-64]`

A major (MJ) alarm is issued when you remove a UC from service.

4. Restore the unit controller to service by entering the following command:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = UC circuit pack location: `UC-[1-64]`

This command takes up to five minutes to complete. The major alarm clears (CL) after the UC is restored. If, after restoring the UC, an alarm occurs on the interface circuit pack identified in Step 1, after finishing this procedure refer to the section titled "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) to clear the interface circuit pack failure.

5. Verify that the MC is in the IS state by entering the following command:

`RTRV-STATE-EQPT:`*[a]*`:MC;`

Where:

a = Target ID (optional)

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "MC:f"
;
```

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

6. If the MC is not in the IS state, restore the MC to service before continuing with this procedure by entering the following command:

   RST-EQPT:*[a]*:MC;**

   Where:

   a = Target ID (optional)

   The MC takes up to five minutes to restore.

7. Make certain that all databases are current by entering the following command:

   CPY-MEM:*[a]*::::WKG,PRI,DBASE;**

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete.

8. If the REPT CMPR MEM message is not cleared after entering the **CPY-MEM** command (for example, this can indicate bad RAM on the CPU), contact your system administrator or next level of support for technical assistance to clear the trouble.

Replacing Failed Components

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Contents

Replacing Failed Components

17

This chapter provides procedures for replacing certain failed components (found as the result of the trouble clearing activities described in Chapters 15 and 16).

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedures in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Replacing Failed CLKGN

This procedure is used to replace a failed clock generator (CLKGN) in a SWCS Module. The CLKGN circuit packs are installed in pairs (one in each SWCS Module) and one protects the other in case of a failure. In normal operation one of the CLKGN circuit packs is standby (STBY) and the other is active (ACT). Under normal operations when one of the CLKGN circuit packs fails, it goes into the OOS-FLT state and a red alarm LED appears.

⚠ CAUTION:
Always retrieve the state of CLKGN with the `RTRV-STATE-EQPT` *command before removing a CLKGN from the frame. Never remove a CLKGN that is in the ACT state. It must be in the STBY or OOS-FLT state before being removed.*

1. Verify that the CLKGN with the alarm indication is in the OOS-FLT state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:CLKGN-0&-1;`

   Where:

   a = Target ID (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = CLKGN circuit pack location: `CLKGN-{0,1}`

   f = Equipment state

   If the CLKGN with the alarm indication is not in the OOS-FLT state, refer the problem to your system administrator or next level of support for assistance in clearing the trouble.

2. Obtain the diagnostic report for the failed CLKGN by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CLKGN circuit pack location: `CLKGN-[0,1]`

   Diagnostics take up to 15 minutes to complete. This report is used for further reference and/or trouble report generation.

3. Obtain a new CLKGN circuit pack.
4. Extract the CLKGN circuit pack that failed. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the new CLKGN circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The red ALM LED on the new CLKGN circuit pack turns off within 10 seconds.

   If the red ALM LED on the CLKGN circuit pack that you replaced does not turn off, refer to the section titled "Interface, SWIO, SWCS, and OPEX Module Circuit Pack Failures" (page 15-154) to clear the alarm.

Replacing One PRI Disk Drive

CAUTION:
Replace a PRI disk drive only if directed to do so by your system administrator, or by trouble clearing procedures in Chapters 15 and 16.

The following procedure is used to replace a system PRI disk drive that has failed while its mate PRI disk drive is still in service.

If both PRI disk drives have failed, refer to the next section titled "Replacing Both PRI Disk Drives" (page 17-5).

1. Obtain a new PRI disk drive.

NOTE:
Inserting a pre-PRI5 disk drive causes the main controller (MC) to be placed in the OOS-MCOND state and a major alarm associated with the MC.

2. Determine the state of the two PRI disk drives by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:PRI-1&-2;`

   Where:

   a = Target ID (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = PRI disk drive location: `PRI-{1,2}`

   f = Equipment state

   The failed PRI disk drive is in the OOS-FLT state, and the PRI disk drive's red ALM LED is turned on.

3. Extract the failed PRI disk drive from the slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out to remove the PRI disk drive from the slot.

4. To insert the new PRI disk drive, hold the PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into the slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch.

5. Initialize the new PRI disk drive by entering the following command:

   `CPY-MEM:`*[a]*`:::INIT,`*d*`,`*e*`;`

   Where:

   a = Target ID (optional)

   d = PRI disk drive location: `PRI-{1,2}`

   e = Memory class: `{ FORMAT, HEADER }`

⚠ CAUTION:
The preferable memory class type is `FORMAT`*. If time constraints exist where the normal format procedure cannot be used, then the memory class of* `HEADER` *may be used. Using* `FORMAT` *reformats the entire disk, and using* `HEADER` *only reformats the disk header information.*

This command takes up to 15 minutes using `FORMAT` *and up to two minutes using* `HEADER` *to complete.*

6. Restore the replaced PRI disk drive to service by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = PRI disk drive location: `PRI-[1,2]`

   This command takes up to five minutes to complete.

   During execution of this command, the contents of the in-service PRI disk drive are copied to the new PRI disk drive, and you are done with this procedure.

Replacing Both PRI Disk Drives

CAUTION:
Replace PRI disk drives only if directed to do so by trouble clearing procedures in Chapters 15 and 16 or your system administrator.

If both PRI disk drives fail (the DACS IV-2000 enters the OOS-MCOND state), perform this procedure to replace both failed PRI disk drives and restore the MC to the in-service (IS) state.

If only one PRI disk drive has failed, refer to the previous section titled "Replacing One PRI Disk Drive" (page 17-3).

1. Obtain two new PRI5 disk drives.

NOTE:
Inserting a pre-PRI5 disk drive causes unexpected operation problems.

2. Extract one of the failed PRI disk drives from its slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out to remove the PRI disk drive from its slot.
3. Repeat Step 2 for the other failed PRI disk drive.
4. Determine the contents of the optical disk in the SEC disk drive by entering the following command:

   `RTRV-SYSID:[a];`

   Where:

   a = Target ID (optional)

The following response appears (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
    CALCK,HEADCK,INTEGCK */
    ...
    "SEC,PROG,...,5-00-1-m,,,,,,,"
    "SEC,DBASE,...,5-00-1-m,h,i,j,,,,"
    ...
;
```

Where:

h = Target ID of the DACS IV-2000 backup

i = Date of backup

j = Time of backup

If the output message does show that the official Release 5.0 software and the latest backup database (associated with the proper TID) is present, go to Step 10. Otherwise, continue with Step 5 (incorrect optical disk is inserted).

5. Remove the SEC disk drive from service by entering the following command:

   RMV-EQPT:*[a]*:SEC;

   Where:

   a = Target ID (optional)

   This command takes up to one minute to complete.After completion, the green ON LED extinguishes.

6. Obtain the official Release 5.0 optical disk, which also contains the latest database backup disk associated with the DACS IV-2000's target ID (TID).

7. Remove the wrong optical disk from the SEC disk drive.

8. Insert the correct optical disk drive (obtained in Step 6) into the SEC disk drive.

9. Restore the SEC disk drive to service by entering the following command:

   RST-EQPT:*[a]*:SEC;

   Where:

   a = Target ID (optional)

   This command takes up to five minutes to complete. After completion, the green ON LED lights.

10. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

`INIT-SYS:`*[a]*`::::9;`

Where:

a = Target ID (optional)

The system takes up to 20 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 8-7).

11. Log in to the DACS IV-2000. Refer to Chapter 4 for logging in procedures, if necessary.
12. Install only one new PRI5 disk drive. To insert the new PRI disk drive, hold the new PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into its slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch. Repeat this step for the other failed PRI disk drive.
13. Initialize the new PRI disk drives by entering the following command for each PRI disk drive:

`CPY-MEM:`*[a]*`::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-[1,2]`

This command takes up to 15 minutes to complete.

14. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = PRI disk drive location: `PRI-[1,2]`

This command takes up to five minutes to complete.

15. Copy the programs from the optical disk to the PRI disk drives by entering the following command:

    `CPY-MEM:[a]:::SEC,PRI,PROG;`

    Where:

    a = Target ID (optional)

    This command takes up to 11 minutes to complete.

16. Copy the database from the optical disk to the PRI disk drives by entering the following command:

    `CPY-MEM:[a]:::SEC,PRI,DBASE;`

    Where:

    a = Target ID (optional)

    This command takes up to 12.5 minutes to complete.

17. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

`INIT-SYS:[a]::::9;`

Where:

a = Target ID (optional)

The system takes up to 20 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 8-7).

18. Log in to the DACS IV-2000. Refer to Chapter 4 for logging in procedures, if necessary.

19. Install the other new PRI5 disk drive. To insert the new PRI disk drive, hold the new PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into its slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch. Repeat this step for the other failed PRI disk drive.

20. Initialize the new PRI disk drives by entering the following command for each PRI disk drive:

    `CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

    Where:

    a = Target ID (optional)

    d = PRI disk drive location: `PRI-[1,2]`

    This command takes up to 15 minutes to complete.

21. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = PRI disk drive location: `PRI-[1,2]`

    This command takes up to five minutes to complete.

    After completion the second PRI disk drive is updated with the software and latest database.

Replacing the SEC Disk Drive

Replace the SEC disk drive *only* if directed to do so by your system administrator, next level of support, or if indicated in trouble clearing procedures in Chapters 15 and 16.

1. Obtain a new SEC disk drive.
2. Remove the SEC disk drive from service by entering the following command:

   `RMV-EQPT:`*[a]*`:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to one minute to complete.After completion, the green ON LED extinguishes.

3. Disengage the SEC disk drive from the slot by carefully operating the latch. Extract the SEC disk drive with one slow, continuous motion.

4. Insert the new SEC disk drive into the slot. Raise the latch and push on the bottom part of the SEC disk drive until the latch engages the slot (do not push with the latch). Close the latch (push down) to secure the SEC disk drive.

   The LED on the SEC disk drive indicates access or usage of the SEC disk drive and does not indicate a failure condition.

5. Load a DACS IV-2000 (512) Release 5.0 optical disk in the SEC disk drive. If necessary, refer to "Extracting/Installing Optical Disk Cartridge" (page 8-29).

6. Restore the SEC disk drive to service by entering the following command:

   `RST-EQPT:`*[a]*`:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to five minutes to complete.After completion, the green ON LED lights.

Replacing Main Controller Circuit Packs (Diagnostic Failures)

These procedures are used to replace failed Main Controller circuit packs. One procedure is provided for circuit packs located in a High Capacity Controller Module in the Main Controller Bay. A second procedure is provided for circuit packs located in a Remote Interface Unit Module in a Remote Complex OPEX Bay.

Replacing High-Capacity Controller Circuit Packs

Perform this procedure only in response to a failed diagnostic message. Do *not* use this procedure to replace the PRI disk drive or the SEC disk drive. Use the sections titled "Replacing One PRI Disk Drive" (page 17-3), "Replacing Both PRI Disk Drives" (page 17-5), or "Replacing the SEC Disk Drive" (page 17-9).

⚠ CAUTION:
This procedure is used only to replace a main controller circuit pack that failed diagnostics.

1. If there is a red ALM LED on a power supply circuit pack in the Memory Storage Module that is lit, go to the section titled "Power Circuit Pack Failure" (page 15-93).

2. Locate the circuit pack in the High-Capacity Controller Module that failed diagnostics.
3. If both control complexes (CC) have failed diagnostics, refer to the section titled "Control Complex (CPU/MTC/SSC/SCI/UI) Circuit Pack Failure" (page 15-149). If only one circuit pack (CPU, MTC, SSC, SCI, UI) in one control complex has failed diagnostics, perform the following procedure. Otherwise, go to Step 4.
    a. Retrieve the state of the control complex which contains the circuit pack that failed diagnostics by entering the following command:

    RTRV-STATE-EQPT:*[a]*:*b*;

    Where:

    a = Target ID (optional)

    b = Control complex location: CC-{0,1}

    A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

    Where:

    e = Control complex location: CC-{0,1}

    f = Equipment state

    If the state of the control complex is OOS, go to Step 3e. If the state of the control complex is STBY, go to Step 3d. Otherwise, go to Step 3b (control complex in ACT state).

    b. Put the MC in the OOS-MCOND state by entering the following command:

    ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

    Where:

    a = Target ID (optional)

    After this command completes, the red MAJOR and red FAILURE ALM LEDs on the status panel turn on.

c. Perform a control complex side switch so that the standby control complex becomes the active control complex by entering the following command:

`RST-EQPT:[a]:MC:::e;`

Where:

a = Target ID (optional)

e = Control complex (to become active) location: `CC-{0,1}`

This command takes up to five minutes to complete.

d. Remove the control complex which contains the circuit pack that failed diagnostics by entering the following command:

`RMV-EQPT:[a]:b;`

Where:

a = Target ID (optional)

b = Control complex location: `CC-{0,1}`

e. Replace the failed circuit pack with a new one of the same type. For OUI circuit packs, the optical fiber connector on the front of the OUI circuit pack needs to be disconnected from the failed circuit pack and reconnected to the new circuit pack. Refer to Chapter 2 for extracting and installing circuit packs and fiber-optic cables, if necessary.

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

f. Restore the control complex removed in Step 3d to service by entering the following command:

`RST-EQPT:[a]:b;`

Where:

a = Target ID (optional)

b = Control complex location: `CC-{0,1}`

This command takes up to five minutes to complete.

4. If only one ECI circuit pack has failed diagnostics, perform the following procedure. Otherwise, go to Step 5.

a. Replace the ECI circuit pack that failed diagnostics with a new ECI circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

b. Restore the ECI circuit pack replaced in Step 4a to service by entering the following command:

```
RST-EQPT:[a]:b;
```

Where:

a = Target ID (optional)

b = ECI circuit pack location: ECI-{1,2}

This command takes up to five minutes to complete.

c. Restore any links to service which were in-service before the failure on the ECI circuit pack replaced in Step 4a by entering the following command:

```
RST-LINK:[a]:b;
```

Where:

a = Target ID (optional)

b = Administrative link location: CILINK-{1,2}-{1-8}

5. If both ECI circuit packs or circuit packs in both control complexes have failed diagnostic messages, perform the following procedure. Otherwise, go to Step 6.

   a. Replace the circuit pack(s) [one at a time if more than one] that failed diagnostics with a new one of the same type. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   b. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 15 minutes to reset. For more information on booting, refer to the section titled "Reset and Boot" (page 8-7).

6. If you receive two REPT EXCPTN SYS messages indicating that the time-of-day clock (TODC) needs to be reset, edit the date and time by entering the following command.

```
ED-DATE : [a]:::c,d;
```

Where:

a = Target ID (optional)

c = Date: {00-39,81-99}{01-12}{01-31}

d = Time: {00-23}{00-59}{00-59}

Replacing Remote Unit Interface Circuit Packs

Perform this procedure only in response to a failed diagnostic message associated with a Remote Complex.

⚠ CAUTION:
This procedure is used only to replace a Remote Unit Interface Module or remote CLKGN circuit pack that failed diagnostics.

1. If there is a red ALM LED lit on a power supply circuit pack in the Remote Unit Interface Power Module, go to the section titled "Power Circuit Pack Failure" (page 15-93).

2. Locate the circuit pack in the RUI Module or remote CLKGN that failed diagnostics.

3. Remove the Remote Complex RUI which contains the circuit pack that failed diagnostics by entering the following command:

   ```
   RMV-EQPT:[a]:b;
   ```

   Where:

   a = Target ID (optional)

   b = RUI location: `RUI-{1,2}`

4. Replace the failed circuit pack with a new one of the same type. For UIA or UIB circuit packs, the optical fiber connector on the front of the circuit pack needs to be disconnected from the failed circuit pack and reconnected to the new circuit pack. Refer to Chapter 2 for extracting and installing circuit packs and fiber-optic cables, if necessary.

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

5. Restore the RUI removed in Step 3 to service by entering the following command:

   RST-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = RUI location: **RUI-{0,1}**

   This command takes up to five minutes to complete.

Replacing a Fan Assembly

Perform this procedure to replace a fan assembly if instructed to do so by your system administrator or a procedure in Chapter 15.

Replacing a WP-92310L4 or ED-9C130-30 Fan Assembly

This procedure is used to replace Main Controller, Switch, Interface Bay, or OPEX Bay fan assemblies.

1. Obtain a replacement fan assembly that matches the type of failed fan assembly; WP-92310L4 (Comcode - 407257914), front-mounted Main Controller, Switch, OPEX, STS1/DS3, Enhanced DS1, and Enhanced STS1/DS3/DS1 Interface Bay fan assemblies.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

⚠ CAUTION:
Fan assembles must be replaced within 40 minutes of failure to prevent any other system failures.

2. Pull the Main Fan Assembly Fuse on the fuse panel of the failed fan assembly. Refer to Table 17-1 or 17-2 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.

The red FAN/PWR LED on the fan assembly turns on and the system responds with the following messages:

```
   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
   "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=fafa FILE= DP=0\",
   c,
   \"40974074 04010000 2083000e 00000000 00000000 0ffeffff
    ff000000\""
   /* LOSS OF AUXILIARY POWER TO FAN */
;

<


   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
   c:MJ,FANMAIN,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

3. Pull the AUX Fan Assembly fuse on the fuse panel of the failed fan assembly. Refer to Table 17-1 or 17-2 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.

   The red FAN/PWR LED on the fan assembly turns on and the system responds with the following messages:

```
   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
   "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=fafa FILE= DP=0\",
   c,
   \"40974074 04010000 2083000e 00000000 00000000 0ffeffff
    ff000000\""
   /* LOSS OF AUXILIARY POWER TO FAN */
;

<


   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
   c:MJ,FANAUX,NSA,,,NEND::,NIMAN
;
```

   Where:

   b = Autonomous sequence number: `001-999`

   c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

4. Before performing any maintenance function on the fan assembly, check to be sure the fans are no longer spinning by listening for noise and feeling for vibrations.

5. Remove the lower backplane cover from the rear of the bay containing the failed fan assembly.
6. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 17-1.
7. Remove the right and left stile strips from the front of the bay containing the failed fan assembly.
8. At the front of the fan assembly, remove the four mounting screws holding the fan assembly in the bay (two screws on each side, as shown in Figure 17-2).
9. From the front of the frame, slide out the failed fan assembly.

⚠ CAUTION:
When extracting the fan assembly, be careful with the N-rate cables.

10. Install the new fan assembly by referring to the section titled "Installing a WP-92310L4 Fan Assembly" (page 17-19).

Table 17-1. **Fuse Chart for Fan Assemblies in Remote Complexes**

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—
Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8, and 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.									
Duplex Power (ED-9C114-30 Fuse Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

Table 17-2. **Fuse Chart for Fan Assemblies in Switch Complex and Collocated Interface Bays**

Power Source	Fuse Panel in Bay 5				Fuse Panel in Bay 10			
	Bay 1	**Bay 2**	**Bay 3**	**Bay 4**	**Bay 6**	**Bay 7**	**Bay 8**	**Bay 9**
Main	AD6	AC6	AB6	AA6	AD6	AC6	AB6	AA6
Auxiliary	BD6	BC6	BB6	BA6	BD6	BC6	BB6	BA6

Power Source	Fuse Panel in Bays 11 and 13		
	Bay 11	**Bay 12**	**Bay 13**
Main	AA4	AA6	AA5
Auxiliary	BA4	BA6	BA5

Power Source	Fuse Panel in Bay 14				Fuse Panel in Bay 19			
	Bay 15	**Bay 16**	**Bay 17**	**Bay 18**	**Bay 20**	**Bay 21**	**Bay 22**	**Bay 23**
Main	AA6	AB6	AC6	AD6	AA6	AB6	AC6	AD6
Auxiliary	BA6	BB6	BC6	BD6	BA6	BB6	BC6	BD6

Note: All load fuses are 10A and all indicator fuses are 0.5A.

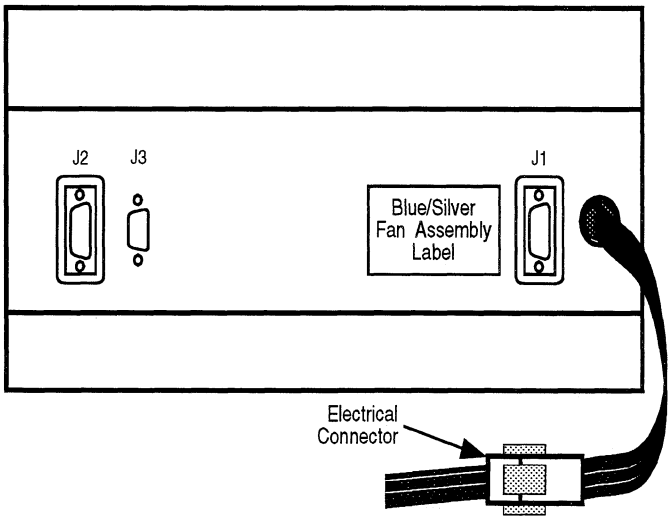


Figure 17-1. **WP-92310L4 Fan Assembly (Rear View)**

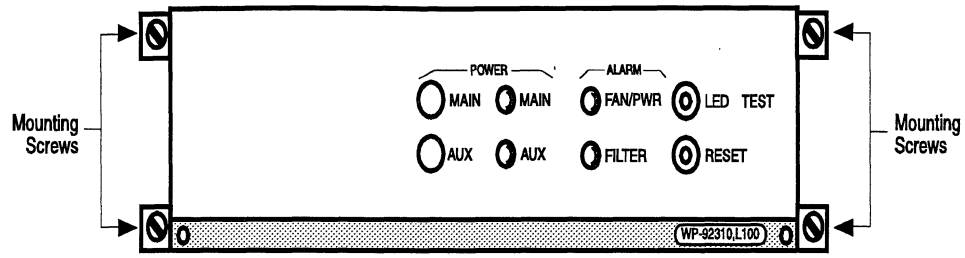


Figure 17-2. **WP-92310L4 Fan Assembly (Front View)**

Installing a WP-92310L4 Fan Assembly

1. Insert the new fan assembly three quarters of the way into the frame.

CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

CAUTION:
When installing the new fan assembly, handle the N-rate cables with care.

2. At the back of the frame, make sure the power cable from the fan assembly is accessible (that is, the power cable is not pinched between the fan assembly and the frame).
3. At the front of the frame, slide the fan assembly all the way in and secure it with the four mounting screws. Refer to Figure 17-2.
4. Reinstall the right and left stile strips to the front of the bay containing the new fan assembly.
5. Reconnect the electrical connector in the back of the fan assembly. The connector plug is keyed to attach only one way. Refer to Figure 17-1.
6. Reinstall the lower backplane cover to the rear of the bay containing the new fan assembly.
7. At the front of the fan assembly, make sure that the fan filter is installed properly.

   If the fan filter is missing, obtain a fan filter (WP-92310,L100) and install it.
8. Make sure that the air inlet below the fan assembly is unobstructed.

9. Reinsert the AUX Fan Assembly Fuse for the new fan assembly. Refer to Table 17-1 or 17-2 for fuse location.For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.
10. Reinsert the Main Fan Assembly Fuse for the new fan assembly. Refer to Table 17-1 or 17-2 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.

WP-92310L4 Fan Assembly Initialization

NOTE:
The fan assembly provides constant cooling to the system by measuring the system impedance and setting the fan speed accordingly. The following steps are required for the fan to learn about the system airflow impedance.

CAUTION:
It is important to perform the following steps with the system in its normal running condition to ensure constant cooling capability for the system. If the fan filter is removed or if airflow impedance around the system is changed in any way during initialization (for example, a cover is removed), the initialization will be bad. If this happens, the initialization must be run again. An initialization of the fan assembly **cannot** *be stopped, it must be allowed to run to its completion and run again correctly.*

1. Make sure a clear filter is installed in the fan assembly.
2. Make sure all covers are installed on the system.
3. Make sure all doors (if applicable) are closed except as necessary for access to the reset button on the fan assembly.
4. Make sure there is no constriction of airflow around the system (no boxes or other obstructions around the air inlet of the fan assembly).
5. Press and hold the reset button on the fan assembly. Refer to Figure 17-2, if necessary.

   After five seconds, the yellow FILTER LED starts blinking.
6. Continue holding the reset button until the FILTER LED begins blinking faster. Release the reset button when the FILTER LED blinks faster.

   There is a two minute delay until the initialization process begins. During this delay you must perform the next step.

7. Close all doors or covers that were opened for access to the reset button.

   When the FILTER LED begins blinking slowly again (about two minutes), initialization has begun. The initialization process takes between 8 and 30 minutes, depending on the system's airflow impedance, to complete. Initialization ends when the FILTER LED stops blinking. After initialization, the green MAIN and the green AUX power LEDs are lit and the FAN/PWR and the FILTER LEDs are not lit.

   If the initialization fails, contact the system administrator or next level of support for assistance.

WP-92310L4 Fan Assembly Power, Alarm, and LED Test

NOTE:
The default power source for the fan assembly is the main power source. The fan assembly switches from the main to the auxiliary power source if the main power source shuts down. The fan assembly alarms if either the main or auxiliary power sources shut down.

The LED TEST button on the front panel of the fan assembly provides test capability of the fan assembly's LEDs to ensure they are in working order.

The following steps test the main and auxiliary power alarm capabilities, power source switching, and LED functionality.

1. Pull the main fuse from the Fuse and Alarm panel at the top of the switch bay for the fan assembly being tested. Refer to Table 17-1 or 17-2.

   The red FAN/PWR LED on the fan assembly turns on, and the system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=lmlm FILE= DP=0\",
    c,
    \"409177c0 04010000 20830001 00000000 00000000 0fffffff
     ff000000\""
    /* LOSS OF MAIN POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:MJ,FANMAIN,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

If the alarm LED does not turn on, contact your system administrator or next level of support for assistance.

2. Replace the main fuse pulled in Step 1 in the Fuse and Alarm panel.
3. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 17-2, if necessary.

The system responds with the following messages:

```
   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
   "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=coie FILE= DP=0\",
   c,
   \" 40974156 04010000 2083000f 00000000 00000000 0ff0ffff
    ff000000\""
   /* LOSS OF MAIN POWER TO FAN */
;

<


   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
   c:CL,FANMAIN,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

The FAN/PWR LED turns off.

If the LED does not turn off, contact your system administrator or next level of support for assistance.

4. Pull the auxiliary fuse for the fan assembly being tested from the Fuse and Alarm panel. Refer to Table 17-1 or 17-2.

The red FAN/PWR LED on the fan assembly turns on and the system responds with the following messages:

```
   TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
   "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=fafa FILE= DP=0\",
   c,
   \"40974074 04010000 2083000e 00000000 00000000 0ffeffff
    ff000000\""
   /* LOSS OF AUXILIARY POWER TO FAN */
;

<
```

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:MJ,FANAUX,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

If the alarm LED does not turn on, contact your system administrator or next level of support for assistance.

5. Replace the auxiliary fuse pulled in Step 4 in the Fuse and Alarm panel.
6. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 17-2, if necessary.

   The system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \"407655b6 04010000 2083000a 00000000 00000000 0ff5ffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANAUX,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: `001-999`

c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

The FAN/PWR LED turns off.

If the LED does not turn off, contact your system administrator or next level of support for assistance.

7. Press and release the LED TEST button on the fan assembly. Refer to Figure 17-2, if necessary.

   All four LEDs on the fan assembly turn off for two seconds, turn on for two seconds, and return to normal operating state (that is, the green MAIN and AUX POWER LEDs are on and the FAN/PWR and FILTER alarm LEDs are off).

   If the alarm LEDs do not turn off and/or the power LEDs do not turn on, contact your system administrator or next level of support for assistance. Otherwise, you are done with this procedure.

Replacing LEDs in a WP-92310L4 or ED-9C130-30 Fan Assembly

This procedure is used to replace the alarm (FAN/PWR and FILTER) and power on (MAIN and AUX) LEDs of a WP-92310L4 or ED-9C130-30 fan assembly. Replacement LEDs can be ordered from McLean Engineering, Inc., Princeton Junction, New Jersey.

CAUTION:
This procedure must be completed within 40 minutes to prevent any damage to circuit packs.

CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Obtain the necessary LEDs (green, red, and/or yellow), a flat-head screwdriver, needle-nose plier, and a 1/8-inch and 1/4-inch nut drivers.

NOTE:
If your office procedures require you to replace all LEDs at the same time, obtain two green, one red, and one yellow LED.

2. Remove the fan assembly by performing Steps 1 through 8 of the procedure in the section titled "Replacing a WP-92310L4 or ED-9C130-30 Fan Assembly" (page 17-15).
3. Place the fan assembly upside-down with the front facing you on a flat surface (as shown in Figure 17-3).
4. Remove the fan filter, using the tabs, by sliding it toward the front of the fan assembly.
5. Remove the bolts from the fan on the left side (closest to the LEDs) using a 1/4-inch nut driver. Refer to Figure 17-3.
6. Move the fan out of the way of the LEDs, making sure not to disconnect any wiring.

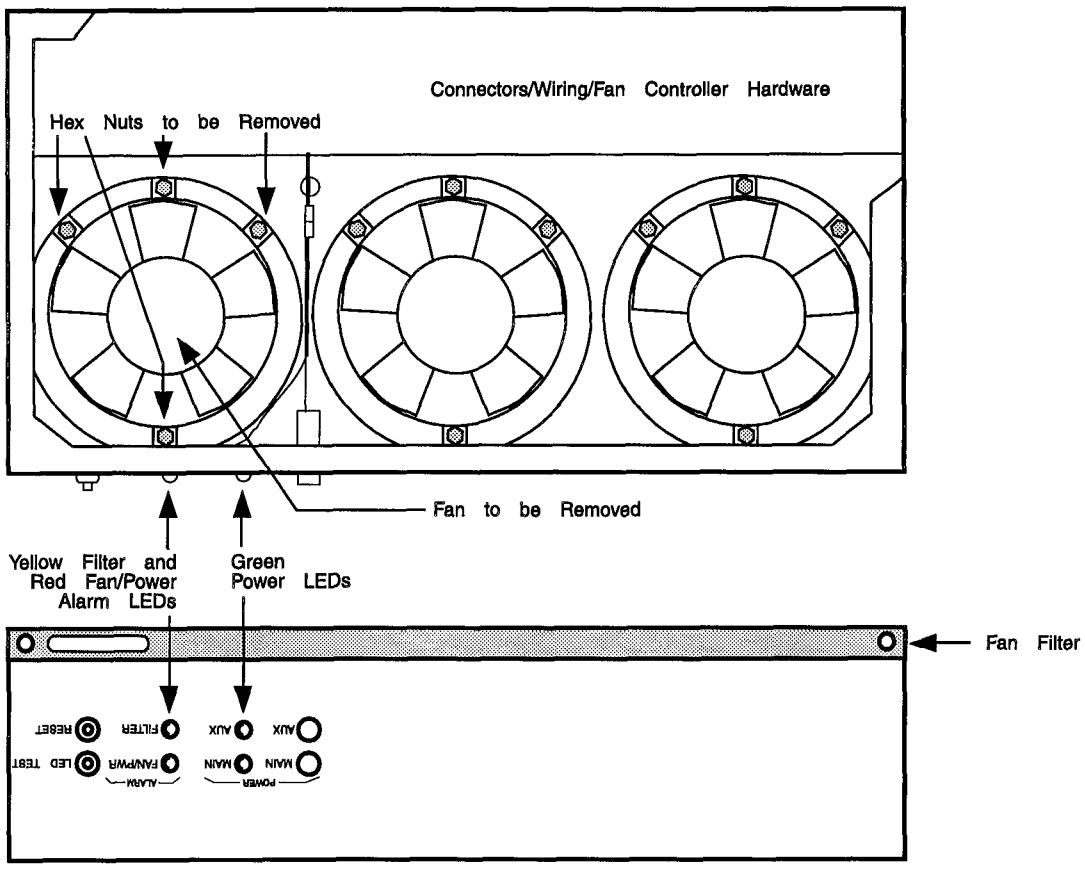


Figure 17-3. **Fan to be Removed Location, WP-92310L4 or ED-9C130-30 Fan Assembly**

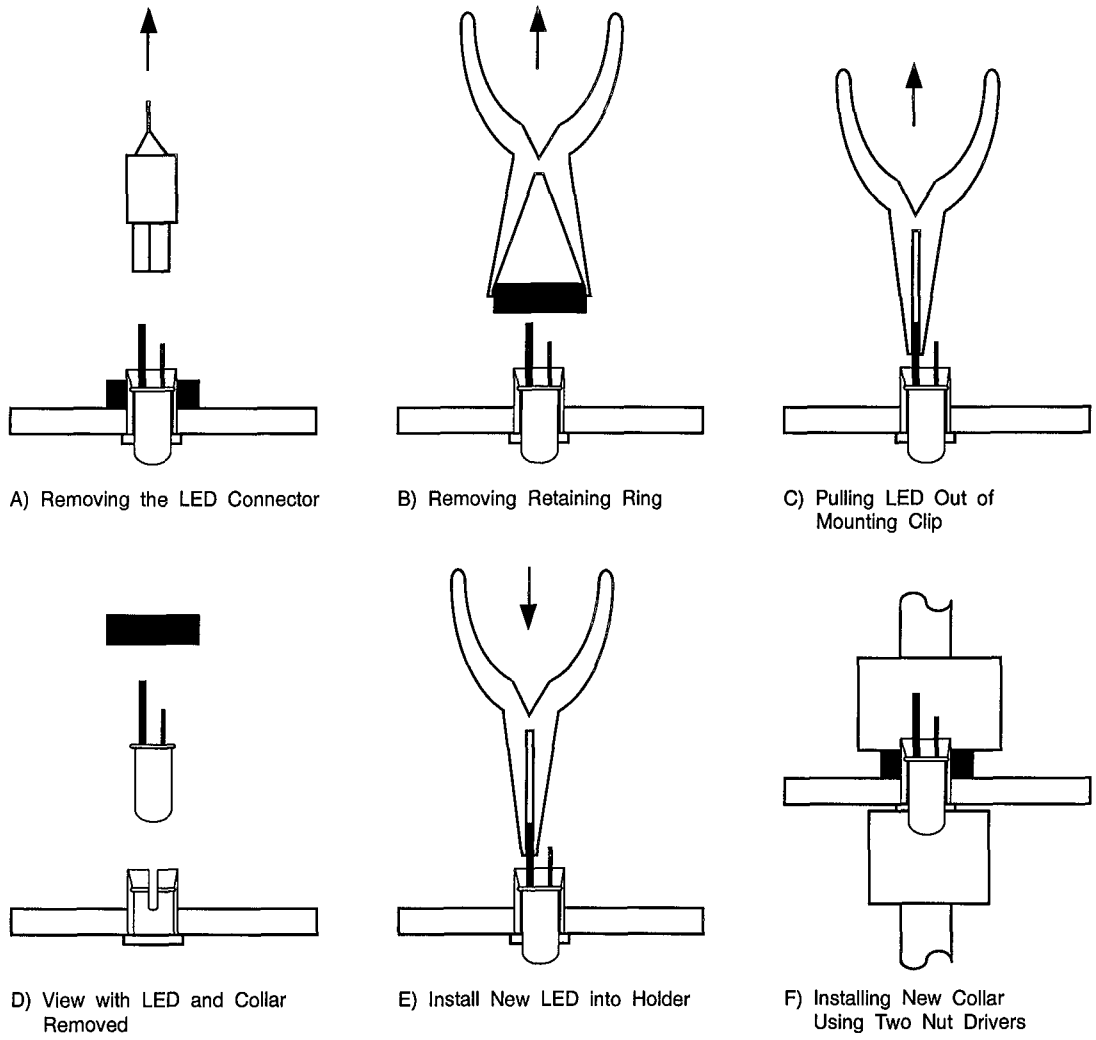


Figure 17-4. **Replacing an LED in a WP-92310L4 or ED-9C130-30 Fan Assembly**

7. Note the position of the connector on the failed LED and remove the connector. Refer to Figure 17-4A.
8. Note the position of the wires (long and short) extending from the LED. When reconnecting the LED, reversing the connection causes the LED not to function.

9. Using a needle-nose plier, remove the black LED retaining ring. Refer to Figure 17-4B.
10. Using a needle-nose plier, remove the failed LED from the LED mounting clip by pulling (with moderate pressure) on the long wire of the LED. Refer to Figure 17-4C.
11. Using a needle-nose plier, insert the new LED (of the same color) into the LED mounting clip with the short and long wires in the same position as the failed LED. Apply pressure until it *snaps* into place. Refer to Figure 17-4E.
12. Using a 1/8-inch nut driver from the front of the fan assembly and a 1/4-inch driver from inside the fan assembly, reinstall the LED retaining ring. Refer to Figure 17-4F.
13. Reinstall the connector with the white/black wire attached to the short LED wire.

CAUTION:
Reversing the connection to the LED causes the LED not to function.

14. Repeat Steps 7 through 13 for any remaining LEDs that need to be replaced.
15. Reposition the fan moved in Step 6 back in to place, being careful not to pinch or disconnect any wiring (that is, make sure all wiring is between the fan and the frame of the fan assembly).
16. Using a 1/4-inch nut driver and starting with the bolt nearest the LEDs, reinstall the four bolts removed in Step 5.
17. Reinstall or replace the air filter (depending on condition of removed air filter) into the fan assembly. Be sure to install the filter with the correct air flow indication.
18. Install the fan assembly by performing Steps 1 through 4 of the procedure in the section titled "Installing a WP-92310L4 Fan Assembly" (page 17-18).

19. Press and release the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 17-2, if necessary.

    The system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \"407655b6 04010000 2083000a 00000000 00000000 0ff5ffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANAUX,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

    c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

    The FAN/PWR LED turns off.

    If the LED does not turn off, contact your system administrator or next level of support for assistance.

20. Press and release the LED TEST button on the fan assembly. Refer to Figure 17-2, if necessary.

    All four LEDs on the fan assembly turn off for two seconds, turn on for two seconds and return to normal operating state (that is, the green MAIN and AUX POWER LEDs are on and the FAN/PWR and FILTER alarm LEDs are off).

    If any of the LEDs fail to light during the test, the connection to the LED may have been reversed. This procedure needs to be redone (except the LEDs do not need to be removed) 30 minutes later (to allow equipment to cool before removing fan again) to switch the polarity of the LED connector. If the LEDs fail to light after checking the LED connector, contact your system administrator or next level of support for assistance.

    If the alarm LEDs do not turn off and/or the power LEDs do not turn on, contact your system administrator or next level of support for assistance. Otherwise, you are done with this procedure.

Replacing Firmware in a WP-92310L4 or ED-9C130-30 Fan Assembly

This procedure is used to replace the fan controller firmware EPROM of a WP-92310L4 or ED-9C130-30 fan assembly. This firmware is used to automate the reset and clearing of alarm indicators of the fan assembly when power is restored. Fan assemblies without this firmware upgrade require that the reset button be pushed after power is restored to the fan assembly to clear alarm indicators. Replacement firmware kits (J98786A-1,List 115) are available from AT&T. Each kit contains a replacement EPROM, control board label (WP92310L2A), and rear panel label (WP92310L4A).

⚠ CAUTION:
For each fan assembly being upgraded with new controller firmware, this procedure must be completed in 40 minutes to prevent any damage to circuit packs.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Check the blue/silver label on the rear of each WP-92310L4 fan assembly to verify that it needs to be updated. If all of the fan assembly labels have the model number WP92310L4A, you are done with this procedure. For each fan assembly with the model number WP92310L4, perform this procedure starting with Step 2.
2. Obtain the necessary number of fan firmware replacement kits (J98786A-1,List 115) and a flat-head screwdriver.
3. Remove the fan assembly by performing Steps 1 through 8 of the procedure in the section titled "Replacing a WP-92310L4 or ED-9C130-30 Fan Assembly" (page 17-15).
4. Place the fan assembly upside-down with the front facing you on a flat surface.
5. Remove the fan filter, using the tabs, by sliding it toward the front of the fan assembly.
6. Remove the 26-pin connector from the fan assembly control board. Refer to Figure 17-5 for location.
7. Remove the EPROM from the fan assembly control board. Refer to Figure 17-5 for location.
8. Install the new EPROM into its socket, ensuring that the notch on the center of the EPROM is located as indicated in Figure 17-5.

9. Install the new WP92310L2A label on the control board in the location shown in Figure 17-5.

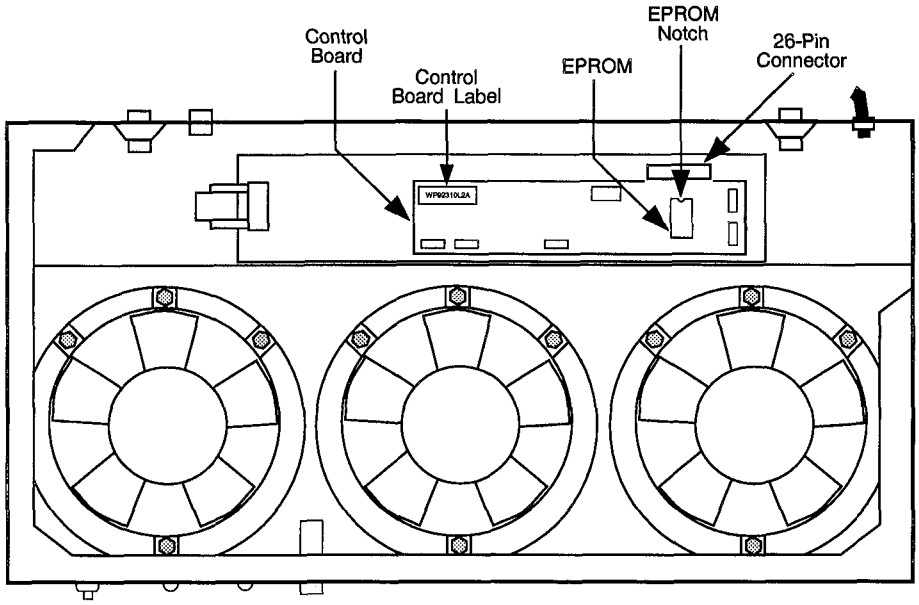


Figure 17-5. **WP-92310L4 Fan Assembly EPROM Location**

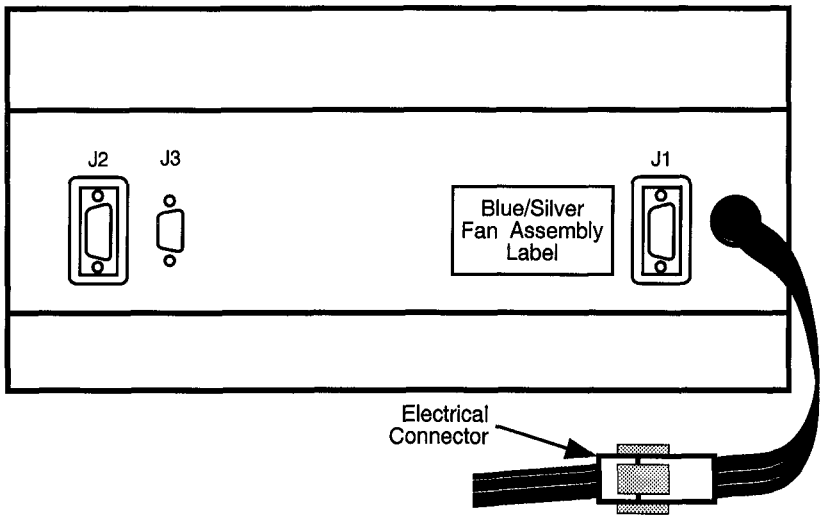


Figure 17-6. **Rear Label Location for WP-92310L4 Fan Assembly**

10. Re-install the 26-pin connector to the fan assembly control board. Refer to Figure 17-5 for location.
11. Reinstall or replace the air filter (depending on condition of removed air filter) into the fan assembly.
12. Remove (peel off) the blue/silver label from the rear of the fan assembly and replace it with the new label (WP92310L4A). Refer to Figure 17-6 for location of fan assembly label.
13. Install the fan assembly by performing Steps 1 through 4 of the procedure in the section titled "Installing a WP-92310L4 Fan Assembly" (page 17-18).
14. Press and release the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 17-2, if necessary.

    The system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \"407655b6 04010000 2083000a 00000000 00000000 0ff5ffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANAUX,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

    c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

    The FAN/PWR LED turns off.

    If the LED does not turn off, contact your system administrator or next level of support for assistance.

    If there are any more fan assemblies that need to be upgraded, return to Step 3 for the next fan assembly.

Replacing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly (Remote Complex)

This procedure is used to replace older fan assemblies (ED-2C816-30,G1 [rear mounted] or ED-2C906-30 [front mounted]) contained in the OPEX Bay.

1. Pull the main Fan Assembly Fuse on the fuse panel (Fuse E6).
2. Pull the AUX Fan Assembly fuse on the fuse panel (Fuse B13-2).
3. Before performing any maintenance function on the fan assembly, check to be sure the fans are no longer spinning by listening for noise and feeling for vibrations.

Removing an ED-2C816-30,G1 Fan Assembly

1. Remove the right and left stile strips and the lower backplane cover from the rear of the OPEX Bay.
2. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 17-7.
3. At the back of the fan assembly, remove the four mounting screws holding the fan assembly in the bay (two screws on each side as shown in Figure 17-7).

NOTE:
One of the screws holds the electrical ground wire.

4. From the back of the frame, slide out the failed fan assembly.

CAUTION:
When extracting the fan assembly, do not cut, crimp, or disconnect N-rate cables.

5. Install the new fan assembly by referring to the section titled "Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 17-35).

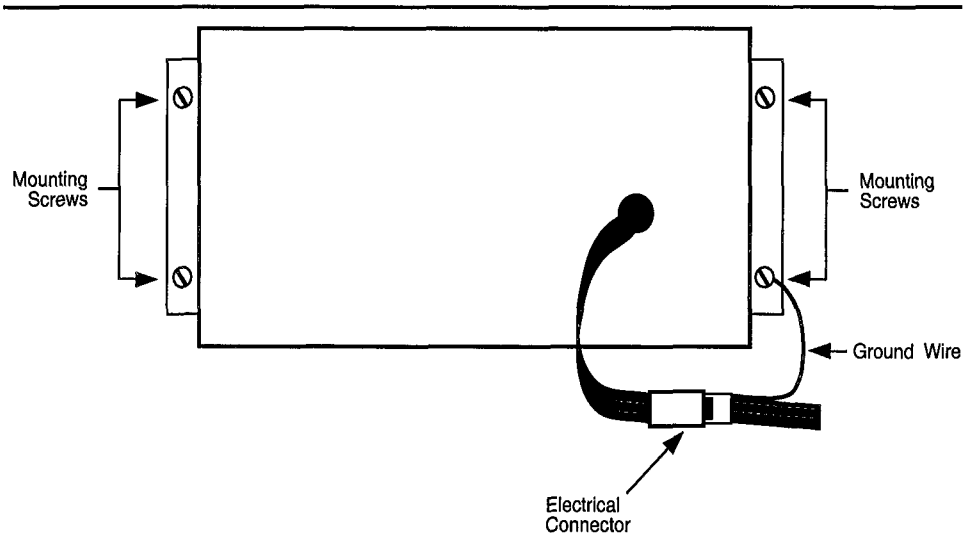


Figure 17-7. **ED-2C816-30,G1 Fan Assembly (Rear View)**

Removing an ED-2C906-30 Fan Assembly

1. Remove the lower backplane cover from the rear of the OPEX Bay.
2. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 17-8.
3. Remove the right and left stile strips from the front of the OPEX Bay.
4. At the front of the fan assembly, remove the four mounting screws holding the fan assembly in the bay (two screws on each side as shown in Figure 17-9).
5. From the front of the frame, slide out the failed fan assembly.

CAUTION:
When extracting the fan assembly, do not cut, crimp, or disconnect N-rate cables.

6. Install the new fan assembly by referring to the section titled "Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 17-35).

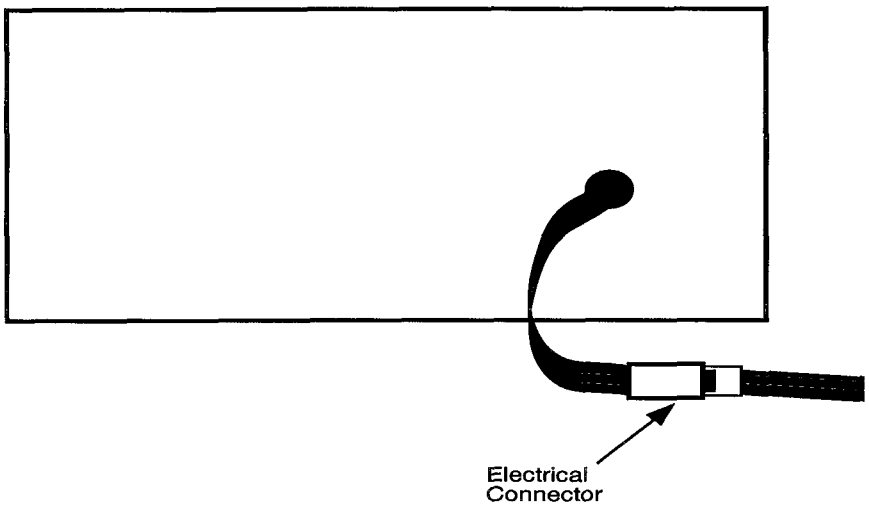


Figure 17-8. ED-2C906-30 Fan Assembly (Rear View)

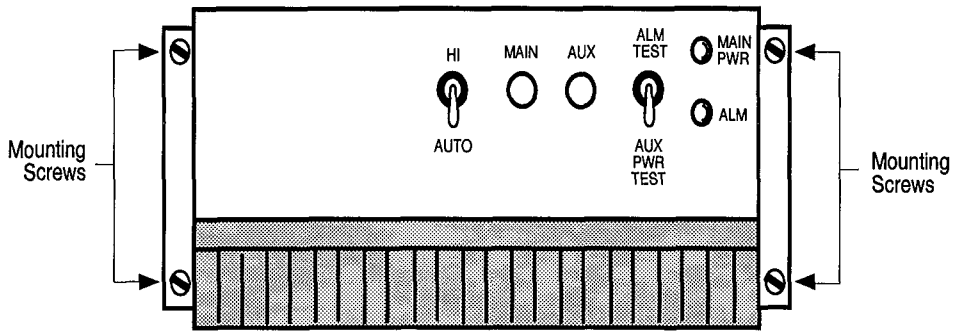


Figure 17-9. ED-2C906-30 Fan Assembly (Front View)

Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly

1. Insert the new fan assembly and secure with the four mounting screws. For the ED-2C906-30 fan assembly (front mounted), before securing the mounting screws, make sure the power cable is accessible in the rear. For the ED-2C816-30,G1 fan assembly, make sure one of the screws secures the ground wire (refer to Figure 17-7).

CAUTION:
When installing the new fan assembly, do not cut, crimp, or disconnect N-rate cables.

2. Reconnect the electrical connector in the back of the fan assembly. The connector plug is keyed to attach only one way.
3. Reinstall the lower backplane cover and the right and left stile strips to the OPEX Bay.
4. Make sure that the air inlet below and in front of the fan assembly is unobstructed.
5. Reinsert the AUX Fan Assembly Fuse (Fuse B13-2).
6. Check to see that the red ALM LED is on and the fans are operating at *high* speed.
7. Reinsert the Main Fan Assembly Fuse (Fuse E6).
8. Check to see that the green MAIN PWR LED is on, the red ALM LED is off, the major alarm (MJ) is cleared, and the fans are operating at its reduced speed (switch in AUTO position).
9. Check to see that the fan assembly is operational in both the AUTO and HI speed positions (refer to Figure) of the fan speed selector switch. Place the switch in the AUTO position, then the HI position, and return the switch to the AUTO position.

   When the switch is in the AUTO position, the fans operate at a reduced speed if the air temperature is 90° F or below. When the switch is in the HI position, the fans operate at maximum speed continuously.

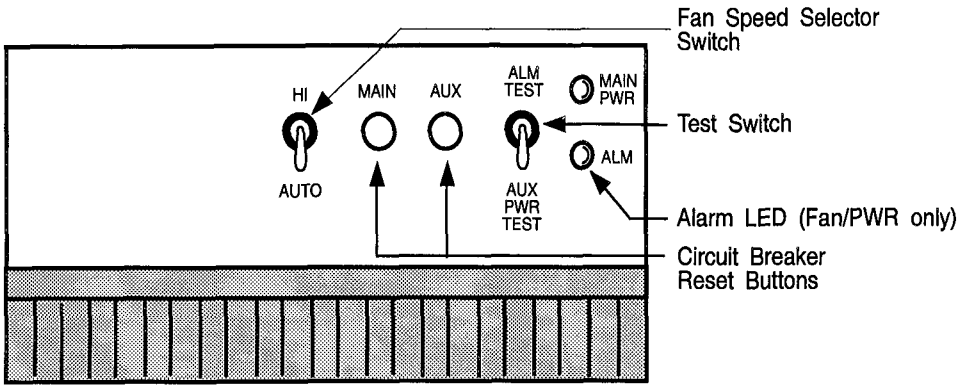


Figure 17-10. **ED-2C816-30,G1 and ED-2C906-30 Fan Assembly — Test Switch and Alarm LED**

10. Perform the alarm failure test by placing the test switch (refer to Figure 17-10) in the ALM TEST position and holding it (approximately 20 seconds) while observing the following:

    - After approximately 10 seconds:
      - — The fan assembly red ALM LED turns on.
      - — The fan assembly green MAIN PWR LED remains lit.
      - — The fans start operating at high speed.
      - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE */
    "CPU-{0,1}:INT"
    FAN,
    (0 - 512 bytes of hexadecimal data)
;
```

      Where:

      a = Autonomous sequence number: `001-999`

- After approximately 20 seconds:
  - — The red MAJOR alarm LED on the status panel turns on.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "FAN:MJ,INT,NSA,,,NEND::,NIMAN"
;
```

    Where:

    b = Autonomous sequence number: `001-999`

- Approximately five seconds after the switch is released:
  - — The red MAJOR alarm LED on the status panel turns off.
  - — The fans return to the reduced speed (fan speed selector switch set to AUTO position).
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "FAN:CL,INT,NSA,,,NEND::,NIMAN"
;
```

    Where:

    b = Autonomous sequence number: `001-999`

11. Perform the auxiliary power test by placing the test switch (refer to Figure 17-10) in the AUX PWR TEST position and holding it (approximately 15 seconds) while observing the following:
    - Immediately:
      - — The fan assembly red ALM LED turns on.
      - — The fan assembly green MAIN PWR LED turns off.
      - — The fans start operating at high speed.
      - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE */
    "CPU-{0,1}:INT,
    FAN,
    (0 - 512 bytes of hexadecimal data)
;
```

      Where:

      a = Autonomous sequence number: `001-999`

- After approximately 10 seconds:
  - — The red MAJOR alarm LED on the status panel turns on.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "FAN:MJ,INT,NSA,,,NEND::,NIMAN"
;
```

Where:

b = Autonomous sequence number: `001-999`

- After approximately five seconds after the switch is released:
  - — The red MAJOR alarm LED on the status panel turns off.
  - — The fans return to the reduced speed (fan selector switch set to AUTO position).
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
A   b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    "FAN:CL,INT,NSA,,,NEND::,NIMAN"
;
```

Where:

b = Autonomous sequence number: `001-999`

Equipping Modules

18

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Contents

Equipping Modules

18

This chapter provides procedures for equipping the synchronizer module and the interface modules.

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Equipping the Synchronizer Module

This procedure is used to equip a Synchronizer Module in a DACS IV-2000 (512) frame that is running Release 5.0 (512) software. The Synchronizer Module circuit packs must be equipped before adding any STS1 or DS3 Clear-Channel Interface Modules. Table 18-1 lists the needed circuit packs for equipping the Synchronizer Module.

Table 18-1. **Synchronizer Module Equipage Requirements**

Equipment	Code	Quantity
DPLL1/DPLL2	AWP9/AWP15	2
DS1TX1/DS1TX2	AWS5/AWS9	2
TBS31/TBS32	AWS3/AWS8	2
AWS-type filler assemblies	846960664	2

NOTE:
This procedure assumes that the Synchronizer Module backplane and wiring have been installed. If this has not been done, contact your system administrator or next level of support for further assistance and do **not** perform this procedure until instructed.

CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs, making connections to the SYNC-0 and SYNC-1 connectors, or removing chassis covers.

1. Obtain the necessary DPLL, DS1TX, and TBS3 circuit packs (all circuit packs must be of the same version, 1 or 2) and filler assemblies. Refer to Table 18-1 for circuit pack codes and quantities.
2. In order to provide network timing, two DS1 references from the Building Integrated Timing Supply (BITS), or equivalent, must be terminated to both sides of the Synchronizer Module. Therefore, each synchronizer (SYNC) side must use the same references from the BITS source. Figure 18-1 shows how the DS1 references must be provided to the timing reference terminal blocks (SYNC-0 and SYNC-1) on the top rear of the Switch Bays (bay positions 11 and 13). The Synchronizer Module is already wired to the connectors at the top rear of the Switch Bays.

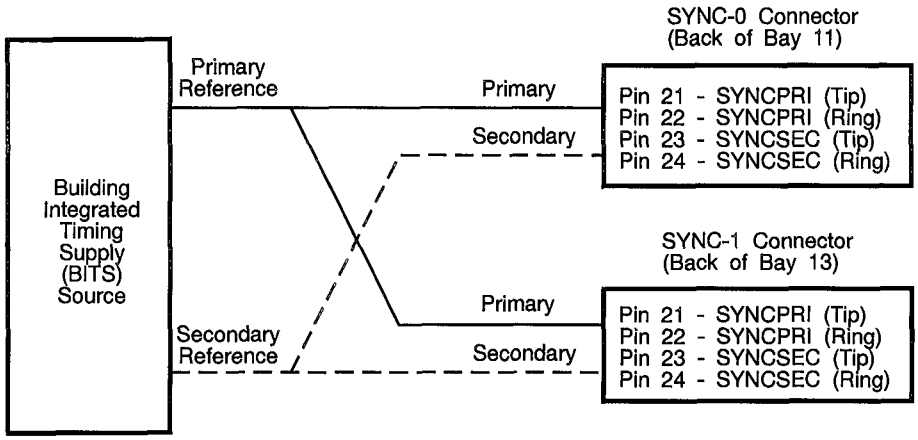


Figure 18-1. **Example of DS1 Timing References From the BITS Source**

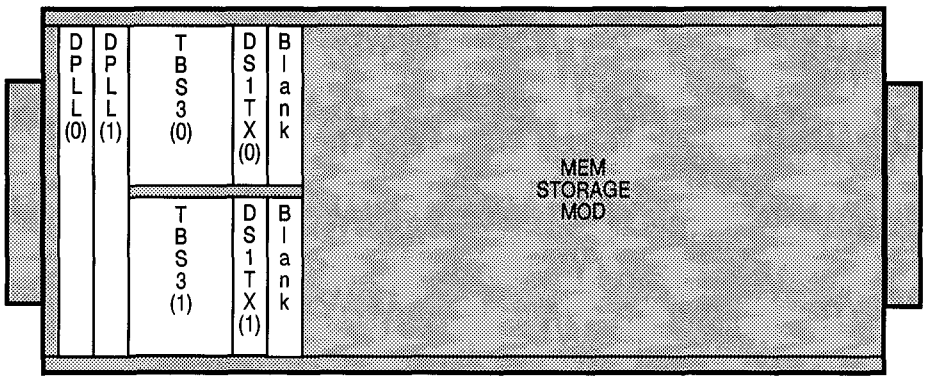


Figure 18-2. **Synchronizer Module Circuit Pack Locations**

3. From the front of the Synchronizer Module, remove the chassis covers.
4. Install, one at a time, the DPLL, TBS3, DS1TX, and AWS-type filler assembly (blanks) circuit packs into the Synchronizer Module (refer to Figure 18-2 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

   The red ALM LEDs on the DPLL2, TBS32, and DS1TX2 circuit packs are lit.
5. Allow the TBS3 circuit packs to temperature stabilize by waiting for 30 minutes before continuing with this procedure.

6. Provision the Synchronizer Module and BITS timing references and change the CLKGN circuit packs' timing mode by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26).

Equipping Interface Modules

The procedures in this section are used to equip blank STS1, DS3, and DS1 Interface Modules.

Equipping STS1 Interface Modules

This procedure is used to equip an STS1/DS3 Interface-16 Shelf within an STS1/DS3/DS1 or STS1/DS3 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position).

1. For STS1 Interface-16 Modules, up to 15 SMUX1 circuit packs are installed and one N-rate cable is connected to the shelf position. The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group. Obtain the necessary circuit packs. For collocated interface bays, only SWIO circuit packs are needed; for remote complexes, both OSWIO and OPEX circuit packs are needed. Refer to Table 18-2 for circuit pack codes and quantities.
2. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:
    a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

Table 18-2. **STS1 Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4 (Collocated), UC4B (Remote)	AKM88 (Collocated), AKM88B (Remote)	1
CLKDR2	AKM90	2
MUXPS1	AKM53	1
SMUXP1	AKM85	1
SMUX1	AKM84	1-15*
BXA1	AKM64	14-0†
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* A total of 15 SMUX1 and BXA1 circuit packs are required (for example, if only five SMUX1 circuit packs are needed, 10 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused SMUX circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

b. Check to see if the Synchronizer Module is active by entering the following command:

`RTRV-STATE-EQPT:`*[a]*`:SYNC-0&SYNC-1;`

Where:

a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

Where:

f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

3. Update the Interface Modules Provisioning Worksheet [Figure 5-1 and 5-2, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new STS1 Interface-16 Module information.

   This information is used for SWIO/OSWIO circuit pack location, cable testing, and provisioning.

CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

4. At the SWIO Module (identified in Step 3), extract the two BXB2 circuit packs associated with the SWIO circuit pack slots of the STS1 Interface-16 Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the two SWIO2 circuit packs (collocated interface bays) or two OSWIO1 circuit packs (Remote Complex interface bays) into the slots where the BXB2 circuit packs were extracted in Step 4. Refer to Chapter 2 for installing circuit packs and fiber optic cables, if necessary.
6. It you installed OSWIO1 circuit packs is Step 5, install the fiber-optic cables to the faceplate of the OSWIO1 circuit pack. Refer to Chapter 2 for installing fiber-optic cables, if necessary.

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

7. If you are equipping a Remote Complex interface module, perform the following procedure:
   a. At the OPEX Module, extract the two BXB2 circuit packs associated with the OPEX circuit pack slots of the STS1 Interface-16 Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
   b. Install the two OPEX1 circuit packs into the slots where the BXB2 circuit packs were extracted in Step 7a. Refer to Chapter 2 for installing circuit packs, if necessary.

c. Connect the associated fiber cables to the face plates of the newly installed OSWIO and OPEX circuit packs.

8. From the front of the STS1 Interface-16 Module, remove the chassis covers from the lower half of the module.
9. From the front of the STS1 Interface-16 Module, remove the chassis cover from the PWRE-2 circuit pack slot.
10. Install the two PWRE3 circuit packs into their slots (refer to Figure 18-3 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
11. Install the two CLKDR2 circuit packs into their slots (refer to Figure 18-3 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the UC4 circuit pack into its slot (refer to Figure 18-3 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

⚠ CAUTION:
Inserting UC circuit packs in any other slot other than a UC circuit pack slot can cause multiple alarms.

13. Install the MUXPS1 circuit pack into its slot (refer to Figure 18-3 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
14. Install the SMUXP1 circuit pack into its slot (refer to Figure 18-3 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
15. Install the SMUX1 circuit packs into their slots, starting with the lowest numbered position first and installing the SMUX1 circuit packs in sequential order (refer to Figure 18-3 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
16. If there are any empty SMUX circuit pack slots, install the BXA1 circuit packs into the remaining SMUX circuit pack slots (refer to Figure 18-3 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
17. Test the UC control cable by performing the following procedure:

    a. Put the MC into the OOS-MCOND state by entering the following command:

    `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

    Where:

    a = Target ID (optional)

b. Test the UC control cable by entering the following command:

`TEST-UNIT-CABLE:`*[a]*`::`*c*`;`

Where:

a = Target ID (optional)

c = Control cable ID: `J[1-64]`
Same number as the unit number of the STS1 Interface-16 Module.

During the test, the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

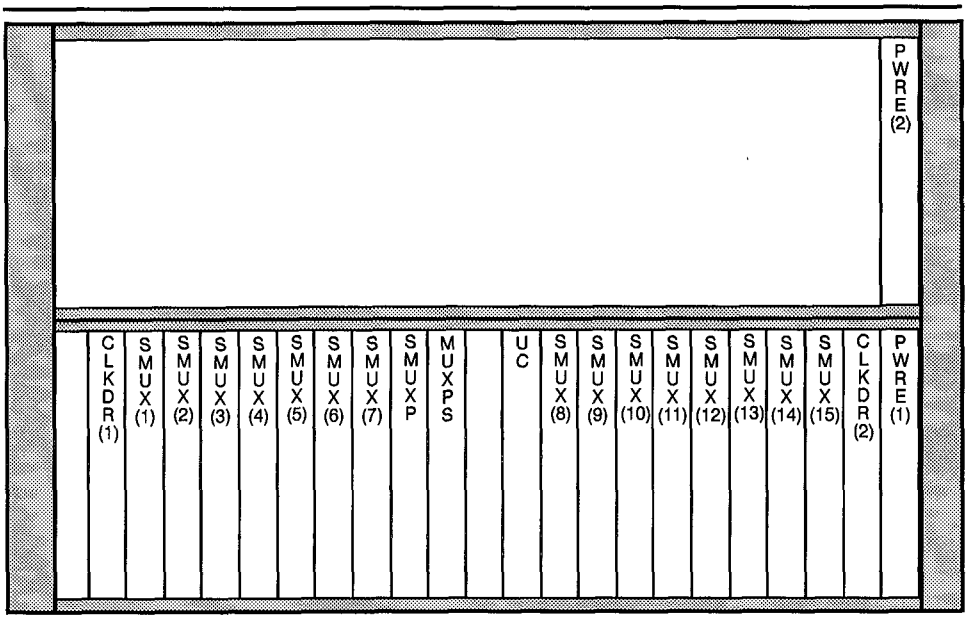
In addition, after the test, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

Where:

d = Control cable ID: `J[1-64]`

e = Test result: { `PASS, FAIL` }



Note: Number in parentheses is circuit pack position in module.

Figure 18-3. **STS1 Interface-16 Module Circuit Pack Locations**

c. Restore the MC to service by entering the following command:

`RST-EQPT:[a]:MC;`

Where:

a = Target ID (optional)

This command takes up to five minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

18. Provision the STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
19. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
20. For Remote Complex interface modules, test the optical fiber cable between the OSWIO and OPEX circuit packs by referring to the section titled "Optical Fiber Cables" (page 20-20).

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

21. Test the N-rate cable connections to the STS1 Interface-16 Module by referring to the section titled "Interbay (N-rate) Cables" (page 20-13).

⇒ NOTE:
N-rate cables are installed to all interface module shelf position at the time of installation of new frames or added interface bays.

If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

22. Test the external cable connections to the STS1 Interface-16 Module by referring to the section titled "External Cables" (page 20-15).

    If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

23. Test the protection switch function of the STS1 Interface-16 Module by referring to the section titled "Protection Switch Function" (page 20-28).

    If any of the tests fail, refer the failures to the system administrator or next level of support.

    After all tests have passed, the STS1 Interface-16 Module equipped in this procedure is ready for service.

Equipping DS3 Interface Modules

This procedure is used to equip an STS1/DS3 Interface-16 Shelf or a DS3 Interface-32 Shelf within an STS1/DS3/DS1, STS1/DS3, or DS3 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position).

NOTE:
For Enhanced DS3 Interface-16, DS3 Interface-16, and DS3 Interface-32 Modules, up to 31 MUX2 circuit packs are installed and two N-rate cables are connected to the shelf position. For DS3 Interface-16 Modules, up to 15 MUX2 circuit packs are installed and one N-rate cable is connected to the shelf position. The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group.

Table 18-3. **DS3 Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4	AKM88	1
CLKDR2	AKM90	2
MUXPS1	AKM53	1
MUXP2	AKM70	1
MUX2	AKM68B or AKM91	1-15*
DS3PM2 (optional)	AKM89	0-1†
BXA1	AKM64	15-0‡
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* A total of 15 MUX2 and BXA1 circuit packs are required (for example, if only five MUX2 circuit packs are needed, 10 BXA1 circuit packs are required).

† DS3PM circuit packs can only be used in collocated interface modules. If the DS3 Interface-16 Module is not equipped with a DS3PM2 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

Table 18-4. **Enhanced DS3 Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4 (Collocated), UC4B (Remote)	AKM88 (Collocated), AKM88B (Remote)	1
CLKDR2	AKM90	2
MUXPS1	AKM53	1
MUXP3	AKM92	1
MUX2/MUX3	AKM68B/AKM91	1-15*
DS3PM2 (optional)	AKM89	0-1†
BXA1	AKM64	15-0†‡
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* A total of 15 MUX2/MUX3 and BXA1 circuit packs are required (for example, if only five MUX2/MUX3 circuit packs are needed, 10 BXA1 circuit packs are required).

† DS3PM circuit packs can only be used in collocated interface modules. If the DS3 Interface-16 Module is not equipped with a DS3PM2 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

Table 18-5. **DS3 Clear-Channel Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4	AKM88	1
CLKDR2	AKM90	2
MUXPS1	AKM53	1
MUXP3	AKM92	1
MUX3	AKM91	1-15*
DS3PM2 (optional)	AKM89	0-1†
BXA1	AKM64	15-0†‡
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* A total of 15 MUX3 and BXA1 circuit packs are required (for example, if only five MUX3 circuit packs are needed, 10 BXA1 circuit packs are required).

† DS3PM circuit packs can only be used in collocated interface modules. If the DS3 Interface-16 Module is not equipped with a DS3PM2 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

Table 18-6. DS3 Interface-32 Module Equipage Requirements

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4	AKM88	1
CLKDR2	AKM90	4
MUXPS1	AKM53	1
MUXP2	AKM70	1
MUX2	AKM68B	1-31*
DS3PM2 (optional)	AKM89	0-1†
BXA1	AKM64	31-0‡
SWIO2 (SWIO Module) Collocated	ERA4	4
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	4 4

* A total of 31 MUX2 and BXA1 circuit packs are required (for example, if only five MUX2 circuit packs are needed, 26 BXA1 circuit packs are required).

† DS3PM circuit packs can only be used in collocated interface modules If the DS3 Interface-32 Module is not equipped with a DS3PM2 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

1. Obtain the necessary circuit packs. Refer to Table 18-3 (for DS3 Interface-16 Modules), Table 18-4 (for Enhanced DS3 Interface-16 Modules), Table 18-5 (for DS3 Clear-Channel Interface-16 Modules), or Table 18-6 (for DS3 Interface-32 Modules) for circuit pack codes and quantities.
2. If you are provisioning any DS3 Clear-Channel Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:
    a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

b. Check to see if the Synchronizer Module is active by entering the following command:

`RTRV-STATE-EQPT:`*[a]*`:SYNC-0&SYNC-1;`

Where:

a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

Where:

f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

3. Update the Interface Modules Provisioning Worksheet [Figure 5-1 and 5-2, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new DS3 Interface-16 or DS3 Interface-32 Module information.

   This information is used for SWIO circuit pack location, cable testing, and provisioning.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

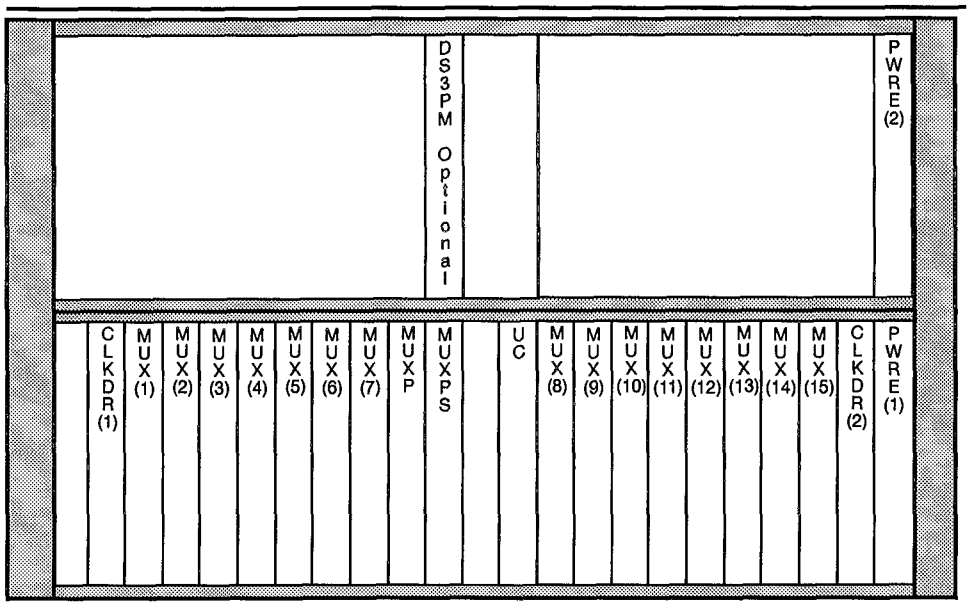
4. At the SWIO Module (identified in Step 3), extract the two BXB2 circuit packs associated with the SWIO circuit pack slots of the DS3 Interface-16 Module or the four BXB2 circuit packs associated with the SWIO circuit pack slots of the DS3 Interface-32 Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the two or four SWIO2 circuit packs (collocated interface module) or OSWIO1 circuit packs (Remote Complex interface module) into the slots where the BXB2 circuit packs were extracted in Step 4. Refer to Chapter 2 for installing circuit packs and fiber optic cables, if necessary.

6. It you installed OSWIO1 circuit packs is Step 5, install the fiber-optic cables to the faceplate of the OSWIO1 circuit pack. Refer to Chapter 2 for installing fiber-optic cables, if necessary.

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

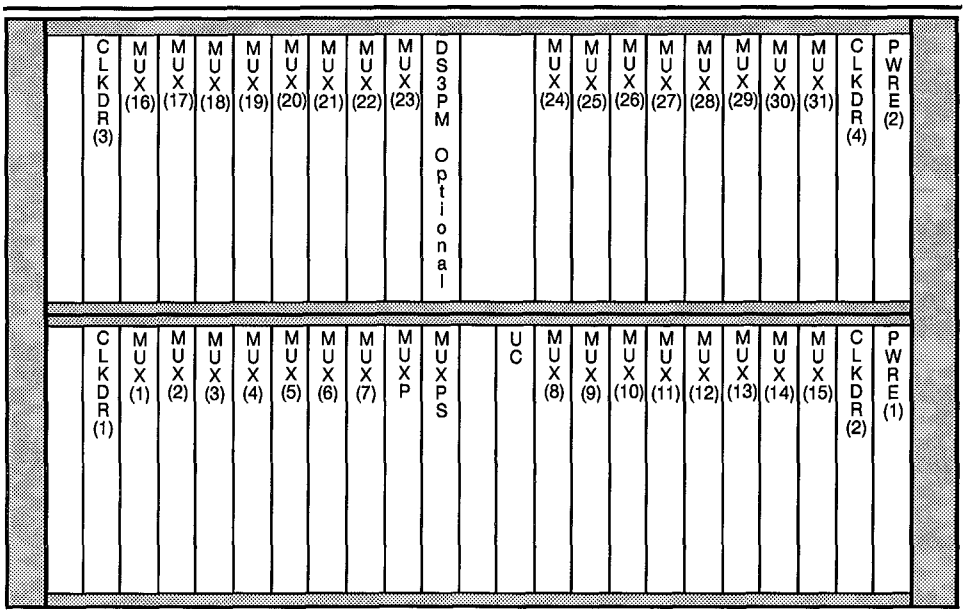
7. If you are equipping a Remote Complex interface module, perform the following procedure:
    a. At the OPEX Module, extract the two or four BXB2 circuit packs associated with the OPEX circuit pack slots of the DS3 Interface Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
    b. Install the two or four OPEX1 circuit packs into the slots where the BXB2 circuit packs were extracted in Step 7a. Refer to Chapter 2 for installing circuit packs, if necessary.
    c. Connect the associated fiber cables to the face plates of the newly installed OSWIO and OPEX circuit packs.
8. From the front of the DS3 Interface Module, remove the chassis covers from the lower half of the module.
9. If you are equipping a DS3 Interface-16 Module, remove the chassis cover from the PWRE-2 and DS3PM circuit pack slots.
10. If you are equipping a DS3 Interface-32 Module, remove the chassis covers from the upper half of the module.
11. Install the two PWRE3 circuit packs into their slots (refer to Figure 18-4 or 18-5 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the two or four CLKDR2 circuit packs into their slots (refer to Figure 18-4 or 18-5 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
13. Install the UC4 circuit pack into its slot (refer to Figure 18-4 or 18-5 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

⚠ CAUTION:
Inserting UC circuit packs in any other slot other than a UC circuit pack slot can cause multiple alarms.



Note: Number in parentheses is circuit pack position in module.

Figure 18-4. **DS3 Interface-16 Module Circuit Pack Locations**



Note: Number in parentheses is circuit pack position in module.

Figure 18-5. **DS3 Interface-32 Module Circuit Pack Locations**

14. Install the MUXPS1 circuit pack into its slot (refer to Figure 18-4 or 18-5 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
15. Install the MUXP2 circuit pack into its slot (refer to Figure 18-4 or 18-5 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
16. Install the MUX circuit packs into their slots, starting with the lowest numbered position first and installing the MUX2 circuit packs in sequential order (refer to Figure 18-4 or 18-5 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
17. If there are any empty MUX circuit pack slots, install the BXA1 circuit packs into the remaining MUX circuit pack slots (refer to Figure 18-4 or 18-5 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
18. If you are not equipping the DS3 Interface Module with a DS3PM2 circuit pack, install a BXA1 circuit pack into the DS3PM circuit pack slot (refer to Figure 18-4 or 18-5 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
19. If you are equipping the DS3 Interface Module with a DS3PM2 circuit pack, adjust the TABS link connections by performing Steps 1 and 2 of the procedure in the section titled "Provisioning DS3PM2 Circuit Packs" (page 5-49).
20. If you are equipping the DS3 Interface Module with a DS3PM2 circuit pack, install the DS3PM2 circuit pack adjusted in Step 19 into the DS3PM circuit pack slot (refer to Figure 18-4 or 18-5 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
21. Test the UC control cable by performing the following procedure:
    a. Put the MC into the OOS-MCOND state by entering the following command:

       `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

       Where:

       a = Target ID (optional)

    b. Test the UC control cable by entering the following command:

       `TEST-UNIT-CABLE:`*[a]*`::`*c*`;`

       Where:

       a = Target ID (optional)

       c = Control cable ID: `J[1-64]`
       Same number as the unit number of the STS1 Interface-16 Module.

During the test, the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

In addition after the test the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

Where:

d = Control cable ID: `J[1-64]`

e = Test result: { `PASS, FAIL` }

c. Restore the MC to service by entering the following command:

`RST-EQPT:`*`[a]`***`:MC;`**

Where:

a = Target ID (optional)

This command takes up to five minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

22. Provision the DS3 Interface Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
23. Provision the MUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
24. If you are equipping the DS3 Interface Module with an DS3PM circuit pack, provision the DS3PM circuit pack by performing Steps 3 and 4 of the procedure in the section titled "Provisioning DS3PM2 Circuit Packs" (page 5-49).
25. For Remote Complex interface modules, test the optical fiber cable between the OSWIO and OPEX circuit packs by referring to the section titled "Optical Fiber Cables" (page 20-20).

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

26. Test the N-rate cable connections to the DS3 Interface Module by referring to the section titled "Interbay (N-rate) Cables" (page 20-13).

NOTE:
N-rate cables are installed to all interface module shelf positions at the time of installation of new frames or added interface bays.

If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

27. Test the external cable connections to the DS3 Interface Module by referring to the section titled "External Cables" (page 20-15).

    If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

28. Test the protection switch function of the DS3 Interface Module by referring to the section titled "Protection Switch Function" (page 20-28).

    If any of the tests fail, refer the failures to the system administrator or next level of support.

    After all tests have passed, the DS3 Interface Module equipped in this procedure is ready for service.

Equipping DS1 Interface Modules

This procedure is used to equip a DS1 Interface Shelf or a DS1 Interface-Protection Shelf within an STS1/DS3/DS1 or DS1 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position). DS1 Interface-Protection Shelves within an interface bay must be equipped first before any of the associated DS1 Interface Shelves.

NOTE:
For DS1 Interface Modules, up to eight DS1 interface groups (DS1IF/SWIF circuit packs) are installed. For DS1 Interface-Protection Modules, up to seven DS1 interface groups (DS1IF/SWIF circuit packs) and one DS1 interface protection group (DS1IP/SWIF circuit packs) are installed. Both DS1 Interface and DS1 Interface-Protection Modules are serviced by half an N-rate cable (that is, one N-rate cable is connected to two DS1 Interface Shelves). The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group.

Table 18-7. **DS1 Interface-Protection Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4 (Collocated), UC4B (Remote)	AKM88 (Collocated), UC4B (Remote)	1
CLKDR2	AKM90	2
DS1RY1	AKM48	4
DS1IP1	AKM47	2
DS1IF1	AKM46	2-14*
SWIF2	AKM50	2-8*
BXA1	AKM64	19-0†
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* For each unused DS1 interface group (DS1IF/SWIF circuit packs), three BXA circuit packs are required (for example, if only three DS1 interface groups are needed, 13 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused DS1IF and SWIF circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

Table 18-8. **DS1 Interface Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC4 (Collocated), UC4B (Remote)	AKM88 (Collocated), AKM88B (Remote)	1
CLKDR2	AKM90	2
DS1RY1	AKM48	4
DS1IF1	AKM46	2-16*
SWIF2	AKM50	1-8*
BXA1	AKM64	22-0†
SWIO2 (SWIO Module) Collocated	ERA4	2
OSWIO1 (SWIO Module) OPEX1 (OPEX Module Remote Complex	ERY1 ERW3	2 2

* For each unused DS1 interface group (DS1IF/SWIF circuit packs), three BXA circuit packs are required (for example, if only three DS1 interface groups are needed, 16 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused DS1IF and SWIF circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

1. Obtain the necessary circuit packs. Refer to Table 18-7 (for DS1 Interface-Protection Modules) or Table 18-8 (for DS1 Interface Modules) for circuit pack codes and quantities.
2. Update the Interface Modules Provisioning Worksheet [Figure 5-1 and 5-2, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new DS1 Interface-Protection or DS1 Interface Module information.

   This information is used for SWIO circuit pack location, cable testing, and provisioning.

CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

3. At the SWIO module (identified in Step 2), if there are two BXB2 circuit packs in the SWIO circuit pack slots associated with the DS1 Interface Module being equipped, extract them. Refer to Chapter 2 for extracting circuit packs, if necessary.

NOTE:
Since two DS1 Interface Modules are associated with one SWIO circuit pack pair, SWIO circuit packs are installed for a pair of adjacent DS1 Interface Modules (upper two or lower two DS1 Interface Module shelf positions in an interface bay).

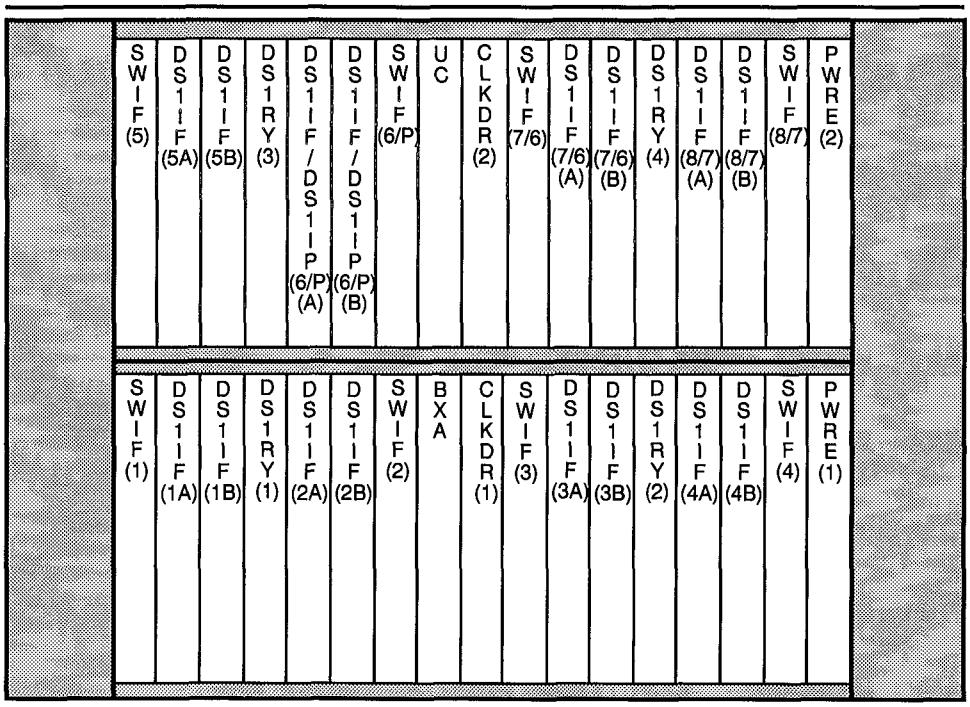
4. Install the two SWIO2 circuit packs (collocated interface modules) or OSWIO1 circuit packs (Remote Complex interface modules) into the slots where the BXB2 circuit packs were extracted in Step 3. Refer to Chapter 2 for installing circuit packs and fiber optic cables, if necessary
5. It you installed OSWIO1 circuit packs is Step 4, install the fiber-optic cables to the faceplate of the OSWIO1 circuit pack. Refer to Chapter 2 for installing fiber-optic cables, if necessary.

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

6. If you are equipping a Remote Complex interface module, perform the following procedure:
    a. At the OPEX Module, extract the two BXB2 circuit packs associated with the OPEX circuit pack slots of the DS1 Interface- Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
    b. Install the two OPEX1 circuit packs into the slots where the BXB2 circuit packs were extracted in Step 6a. Refer to Chapter 2 for installing circuit packs, if necessary.
    c. Connect the associated fiber cables to the face plates of the newly installed OSWIO and OPEX circuit packs.
7. From the front of the DS1 Interface Module, remove the chassis covers from the lower and upper halves of the module.
8. Install the two PWRE3 circuit packs into their slots (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
9. Install the two CLKDR2 circuit packs into their slots (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
10. Install the UC4 circuit pack into its slot (refer to Figure 18-6 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

CAUTION:
Inserting UC circuit packs in any other slot other than a UC circuit pack slot can cause multiple alarms.

11. Install the MUXPS1 circuit pack into its slot (refer to Figure 18-4 or 18-5 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the four DS1RY circuit packs into their slots (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.



Note: Number in parentheses is circuit pack position in module. For entries with slashes (/), the entry before the slash corresponds to the DS1 Interface Module and the entry after the slash corresponds to the DS1 Interface-Protection Module.

Figure 18-6. **DS1 Interface and Interface-Protection Module Circuit Pack Locations**

13. For DS1 Interface-Protection Modules, install the two DS1IP circuit packs into their slots (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
14. For DS1 Interface-Protection Modules, install a SWIF2 circuit pack into the SWIF protection slot (refer to Figure 18-6 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

15. Install the DS1IF circuit packs into their slots, starting with the lowest numbered position first and installing the DS1IF1 circuit packs in sequential order (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
16. Install the SWIF2 circuit packs into their slots, starting with the lowest numbered position first and installing the SWIF2 circuit packs in sequential order (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
17. If there are any empty DS1IF and SWIF (beside the protection slot) circuit pack slots, install the BXA1 circuit packs into the remaining DS1IF and SWIF circuit pack slots (refer to Figure 18-6 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
18. Install a BXA circuit pack into the slot between SWIF-2 and CLKDR-1 circuit pack slots (refer to Figure 18-6 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
19. Test the UC control cable by performing the following procedure:
    a. Put the MC into the OOS-MCOND state by entering the following command:

       `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

       Where:

       a = Target ID (optional)

    b. Test the UC control cable by entering the following command:

       `TEST-UNIT-CABLE:`*[a]*`::`*c*`;`

       Where:

       a = Target ID (optional)

       c = Control cable ID: `J[1-64]`
       Same number as the Unit number of the STS1 Interface-16 Module.

       During the test, the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

       In addition, after the test, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

       Where:

       d = Control cable ID: `J[1-64]`

       e = Test result: { `PASS, FAIL` }

c. Restore the MC to service by entering the following command:

`RST-EQPT:[a]:MC;`

Where:

a = Target ID (optional)

This command takes up to five minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

20. Provision the DS1 Interface Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
21. Provision the DS1IF and SWIF circuit packs as needed by referring to the section titled "Provisioning SWIF and DS1IF Circuit Packs" (page 5-39).
22. For Remote Complex interface modules, test the optical fiber cable between the OSWIO and OPEX circuit packs by referring to the section titled "Optical Fiber Cables" (page 20-20).

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

23. Test the N-rate cable connections to the DS1 Interface Module by referring to the section titled "Interbay (N-rate) Cables" (page 20-13).

⇒ NOTE:
N-rate cables are installed to all interface module shelf positions at the time of installation of new frames or added interface bays.

If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

24. Test the external cable connections to the DS1 Interface Module by referring to the section titled "External Cables" (page 20-15).

    If any of the tests fail, refer the failures to the system administrator or next level of support before continuing with this procedure.

25. Test the protection switch function of the DS1 Interface Module by referring to the section titled "Protection Switch Function" (page 20-28).

    If any of the tests fail, refer the failures to the system administrator or next level of support.

    After all tests have passed, the DS1 Interface Module equipped in this procedure is ready for service.

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Upgrading Equipment

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This chapter provides procedures for replacing older versions of circuit packs with newer versions (for example, MUX1 to MUX2).

Chapter 2 gives general precautions about working with the DACS IV-2000 frame. If you are unfamiliar with these precautions, refer to that chapter before performing any of the procedures in this chapter.

You must log in before performing any procedure in this chapter. For information on logging in, refer to Chapter 4.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Procedures included in this chapter for changing older version equipment to newer versions are:

- Synchronizer module: version 1 circuit packs to version 2 circuit packs
- Power: PWRE2 (556B) circuit pack to PWRE3 (556C) circuit pack
- Switch interface: SWIF1 (AKM49) to SWIF2 (AKM50)
- Switch interface-protection: SWIF1 (AKM49) to SWIF2 (AKM50)
- Multiplexer-protection: MUXP1 (AKM55) to MUXP2 (AKM70)
- Multiplexer-protection: MUXP2 (AKM70) to MUXP3 (AKM92)
- Multiplexer: MUX1 (AKM52) to MUX2 (AKM68B)
- Multiplexer: MUX2 (AKM68B) to MUX3 (AKM91)

- Interface module: DS3 Interface-32 Module to an Enhanced DS3 Interface-16 Module
- Interface module: DS3 Interface-16 Module to an Enhanced DS3 Interface-16 Module
- Interface module: Enhanced DS3 Interface-16 Module to DS3 Clear- Channel Interface-16 Module
- Interface module: DS3 Interface-32 Module to STS1 Interface-16 Module
- Interface module: DS3 Interface-16 Module to STS1 Interface-16 Module

Changing Synchronizer Module Circuit Packs From Version 1 to Version 2

This procedure allows you to change Synchronizer Module circuit packs from DS1TX1/DPLL1/TBS31 (AWS5/AWP9/AWS3) to DS1TX2/DPLL2/TBS32 (AWS9/AWP15/AWS8). This change is required to enable the use of LEDs (on version 2 circuit packs) to aid in alarm isolation and maintenance activities. This procedure takes about 1.5 to 2 hours to complete.

1. Make sure there are no alarms active by entering the following command:

   `RTRV-ALM-ALL:`*[a]*`;`

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 15-12) before performing this procedure.

2. Obtain two each of the DS1TX2 (AWS9), DPLL2 (AWP15), and TBS32 (AWS8) circuit packs.

3. Place the synchronizer (SYNCN) in the holdover mode by entering the following command:

   `SET-SYNCN:`*[a]*`:SYNCN:::HLDOVR;`

   Where:

   a = Target ID (optional)

   A Major (MJ) alarm (MAN condition) occurs on the DS1TX circuit packs.

4. Check to see if the Synchronizer Module is active by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SYNC-0&SYNC-1;

   Where:

   a = Target ID (optional)

   A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "SYNC-0:f"
    "DPLL-0:f"
    "TB-0:f"
    "SYNC-1:f"
    "DPLL-1:f"
    "TB-1:f"
;
```

   Where:

   f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

   If any of the entities are not in the ACT or STBY state, contact your system administrator or next level of support for assistance before continuing with this procedure.

   If synchronizer side-0 (SYNC-0) is in the ACT state, continue with Step 6. Otherwise, continue with Step 5.

5. Make SYNC-0 the active side by entering the following command:

   SW-DX-EQPT:*[a]*:SYNC-0;

   Where:

   a = Target ID (optional)

   This command takes less than one minute to complete.

   After the switch is complete, all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

   Executing the SW-DX-EQPT command can result in REPT ALM EQPT messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

6. Remove SYNC-1 from service by entering the following command:

   `RMV-EQPT:[a]:SYNC-1;`

   Where:

   a = Target ID (optional)

   An alarm occurs on the synchronizer side with the condition set to MAN.

7. Extract the SYNC-1 DPLL1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

8. Install a DPLL2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   The DPLL2 circuit pack's red ALM LED is lit.

9. Extract the SYNC-1 TBS31 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

10. Install a TBS32 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The TBS32 circuit pack's red ALM LED is lit.

11. Extract the SYNC-1 DS1TX1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

12. Install a DS1TX2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DS1TX2 circuit pack's red ALM LED is lit.

13. Edit the hardware ID of the SYNC-1 DPLL circuit pack slot by entering the following command:

    `ED-EQPT:[a]:DPLL-1:::AWP15;`

    Where:

    a = Target ID (optional)

14. Edit the hardware ID of the SYNC-1 TBS3 (TB) circuit pack slot by entering the following command:

    `ED-EQPT:[a]: TB-1:::AWS8;`

    Where:

    a = Target ID (optional)

15. Edit the hardware ID of the SYNC-1 DS1TX (TX) circuit pack slot by entering the following command:

    `ED-EQPT:[a]:TX-1:::AWS9;`

    Where:

    a = Target ID (optional)

16. Verify the SYNC-1 TBS32 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TB-1;

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "TB-1:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWS8 is setting for TBS32 circuit packs

    g = Circuit pack code: AWS8 is setting for TBS32 circuit packs

    If the circuit pack codes do not match, reenter the **ED-EQPT** command to make sure the codes match.

17. Verify the SYNC-1 DPLL2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:DPLL-1;

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "DPLL-1:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWP15 is setting for DPLL2 circuit packs

    g = Circuit pack code: AWP15 is setting for DPLL2 circuit packs

    If the circuit pack codes do not match, reenter the **ED-EQPT** command to make sure the codes match.

18. Verify the SYNC-1 DS1TX2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TX-1;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
       /* LOC:UTYPE:<>:CLEI:STATE */
       "TX-1:...:PCODE=f,CCODE=g,..."
    ;
    ```

    Where:

    f = Provisioned circuit pack code: AWS9 is setting for DS1TX2 circuit packs

    g = Circuit pack code: AWS9 is setting for DS1TX2 circuit packs

    If the circuit pack codes do not match reenter the **ED-EQPT** command to make sure the codes match.

19. Let the TBS32 circuit pack temperature stabilize for 30 minutes before continuing with this procedure.

20. Restore SYNC-1 by entering the following command:

    RST-EQPT:*[a]*:SYNC-1:::::FRCD;**

    Where:

    a = Target ID (optional)

    This command takes up to three minutes to complete. After completion, alarm messages for the DPLL-1, TBS3-1, and DS1TX-1 circuit packs appear, the green ACT LEDs on the DPLL-1 and TBS3-1 circuit packs light, an alarm indicating the SYNCN is in free running mode appears, and SYNC-0 enters the OOS-FLT state.

    If the SYNC-1 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 21.

21. Retrieve the firmware ID of the DPLL-1 circuit pack by entering the following command:

    RTRV-FWID:*[a]*:DPLL-1;**

    Where:

    a = Target ID (optional)

    A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:FWID */
   "DPLL-1:e"
;
```

    Where:

    e = Firmware ID

    Make a note of the value of the firmware ID for the associated frame in the office records.

22. Restore the DS1TX-1 circuit pack to allow timing from the building integrated timing supply (BITS) by entering the following command:

    RST-EQPT:*[a]*:TX-1;**

    Where:

    a = Target ID (optional)

    This command takes up to one minute to complete.

    The DS1TX-1 circuit pack's LEDs extinguish.

23. Place the synchronizer in the phase-locked (normal) mode by entering the following command:

    SET-SYNCN:*[a]*:SYNCN:::NORM;**

    Where:

    a = Target ID (optional)

    The DS1TX-1 circuit pack's red ALM LED turns off and the green ACT LED lights. The major (MJ) alarm remains on SYNC-0 and DS1TX-0 circuit packs.

24. Remove SYNC-0 from service by entering the following command:

    RMV-EQPT:*[a]*:SYNC-0;**

    Where:

    a = Target ID (optional)

    An alarm occurs on the synchronizer side with the condition set to MAN.

25. Extract the SYNC-0 DPLL1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
26. Install a DPLL2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DPLL2 circuit pack's red ALM LED is lit.
27. Extract the SYNC-0 TBS31 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
28. Install a TBS32 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The TBS32 circuit pack's red ALM LED is lit.
29. Extract the SYNC-0 DS1TX1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
30. Install a DS1TX2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DS1TX2 circuit pack's red ALM LED is lit.
31. Edit the hardware ID of the SYNC-0 DPLL circuit pack slot by entering the following command:

    `ED-EQPT:`*[a]*`:DPLL-0:::AWP15;`

    Where:

    a = Target ID (optional)
32. Edit the hardware ID of the SYNC-0 TBS3 (TB) circuit pack slot by entering the following command:

    `ED-EQPT:`*[a]*`: TB-0:::AWS8;`

    Where:

    a = Target ID (optional)
33. Edit the hardware ID of the SYNC-0 DS1TX (TX) circuit pack slot by entering the following command:

    `ED-EQPT:`*[a]*`:TX-0:::AWS9;`

    Where:

    a = Target ID (optional)

34. Verify the SYNC-0 TBS32 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TB-0;

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "TB-0:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWS8 is setting for TBS32 circuit packs

    g = Circuit pack code: AWS8 is setting for TBS32 circuit packs

    If the circuit pack codes do not match, reenter the **ED-EQPT** command to make sure the codes match.

35. Verify the SYNC-0 DPLL2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:DPLL-0;

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "DPLL-0:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWP15 is setting for DPLL2 circuit packs

    g = Circuit pack code: AWP15 is setting for DPLL2 circuit packs

    If the circuit pack codes do not match, reenter the **ED-EQPT** command to make sure the codes match.

36. Verify the SYNC-0 DS1TX2 circuit pack's provisioned parameters by entering the following command:

    `RTRV-EQPT:[a]:TX-0;`

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "TX-0:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: `AWS9` is setting for DS1TX2 circuit packs

    g = Circuit pack code: `AWS9` is setting for DS1TX2 circuit packs

    If the circuit pack codes do not match, reenter the **ED-EQPT** command to make sure the codes match.

37. Let the SYNC-0 TBS32 circuit pack temperature stabilize for 30 minutes before continuing with this procedure.

38. Restore SYNC-0 by entering the following command:

    `RST-EQPT:[a]:SYNC-0;`

    Where:

    a = Target ID (optional)

    This command takes up to three minutes to complete. After completion, SYNC-0 enters the stand-by (STBY) state.

    If the SYNC-0 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 39.

39. Retrieve the firmware ID of the DPLL-0 circuit pack by entering the following command:

    `RTRV-FWID:[a]:DPLL-0;`

    Where:

    a = Target ID (optional)

A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:FWID */
    "DPLL-0:e"
;
```

Where:

e = Firmware ID

Make a note of the value of the Firmware ID for the associated frame in the office records.

40. Restore the DS1TX-0 circuit pack to allow timing from the BITS by entering the following command:

    RST-EQPT:*[a]*:TX-0;**

    Where:

    a = Target ID (optional)

    This command takes up to one minute to complete.

41. Make SYNC-0 the active side by entering the following command:

    SW-DX-EQPT:*[a]*:SYNC-0;**

    Where:

    a = Target ID (optional)

    This command takes less than one minute to complete. After completion, the green ACT LEDs on TBS3-0, DPLL-0, and DS1TX-0 are lit and the green ACT LEDs on TBS3-1, DPLL-1, and DS1TX-1 turn off.

    All alarms associated with the synchronizer clear, and all synchronizer circuit pack red ALM LEDs turn off.

    After the switch is complete all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

    Executing the **SW-DX-EQPT** command can result in REPT ALM EQPT messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms. Also, executing the **SW-DX-EQPT** command on the synchronizer will cause the synchronizer mode to change to FST, then to NORM for the version 2 circuit packs.

    If there are any alarms associated with the synchronizer, contact your system administrator or next level of support for assistance in clearing the trouble. If there are no alarms, you are done with this procedure.

Upgrading Synchronizer Module Version 2 Circuit Pack Firmware

This procedure allows you to upgrade the firmware of the Synchronizer Module version 2 circuit packs. Version 1 circuit packs do not allow upgrades of firmware.

This procedure takes about 1.5 to 2 hours to complete.

1. Make sure there are no alarms active by entering the following command:

   RTRV-ALM-ALL:*[a]*;

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 12-11) before performing this procedure.

2. Retrieve the firmware ID of both DPLL circuit packs by entering the following command for each DPLL circuit pack:

   RTRV-FWID:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DPLL circuit pack location: **DPLL-[0,1]**

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:FWID */
   "d: e"
;
```

   Where:

   d = DPLL circuit pack location: DPLL-{0,1}

   e = Firmware ID

   Make a note of the value of the Firmware ID.

3. Check to see if the Synchronizer Module is active by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SYNC-0&SYNC-1;**

   Where:

   Target ID (optional)

   A sample output is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "SYNC-0:f"
    "DPLL-0:f"
    "TB-0:f"
    "SYNC-1:f"
    "DPLL-1:f"
    "TB-1:f"
;
```

   Where:

   f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

   If any of the entities are not in the ACT or STBY state, contact your system administrator or next level of support for assistance before continuing with this procedure.

   If synchronizer side-0 (SYNC-0) is in the ACT state, continue with Step 5. Otherwise, continue with Step 4.

4. Make SYNC-0 the active side by entering the following command:

   SW-DX-EQPT:*[a]*:SYNC-0;**

   Where:

   a = Target ID (optional)

   This command takes up to one minute to complete.

   After the switch is complete, all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

   Executing the **SW-DX-EQPT** command can result in REPT ALM EQPT messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

5. Remove SYNC-1 from service by entering the following command:

   RMV-EQPT:*[a]*:SYNC-1;**

   Where:

   a = Target ID (optional)

   An alarm occurs on the synchronizer side with the condition set to MAN.

6. Remove DS1TX-0 (active side sync) from service by entering the following command:

   RMV-EQPT:*[a]*:TX-0;**

   Where:

   a = Target ID (optional)

   *The Synchronizer Module is placed in the holdover (*HLDOVR*) mode.*

7. Restore SYNC-1 by entering the following command:

   RST-EQPT:*[a]*:SYNC-1;**

   Where:

   a = Target ID (optional)

   This command takes up to three minutes to complete. After completion, the green ACT LEDs on the DPLL-1 and TBS3-1 circuit packs light.

   The following message appears only when the DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

   Where:

   a = Autonomous sequence number: 001-999

   Upon completion of the **RST-EQPT** command, the firmware is upgraded on DPLL-1.

   If the SYNC-1 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 8.

8. Retrieve the firmware ID of the DPLL-1 circuit pack by entering the following command:

   RTRV-FWID:*[a]*:DPLL-1;**

   Where:

   a = Target ID (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:FWID */
   "DPLL-1:e"
;
```

   Where:

   e = Firmware ID

   Update the Firmware ID for the associated frame in the office records.

9. Restore DS1TX-1 to service by entering the following command:

   RST-EQPT:*[a]*:TX-1;**

   Where:

   a = Target ID (optional)

   *This command takes up to one minute to complete. After completion, the Synchronizer Module is in the normal (*NORM*) mode.*

10. Remove SYNC-0 from service by entering the following command:

    RMV-EQPT:*[a]*:SYNC-0;**

    Where:

    a = Target ID (optional)

    An alarm occurs on the synchronizer side with the condition set to MAN*.*

11. Restore SYNC-0 by entering the following command:

    RST-EQPT:*[a]*:SYNC-0;**

    Where:

    a = Target ID (optional)

    This command takes up to three minutes to complete. After completion, the green ACT LEDs on the DPLL-1 and TBS3-1 circuit packs light.

The following message appears only when the DPLL2 circuit pack firmware has been upgraded from a previous version:

```
   TID YY-MM-DD HH:MM:SS
A  a REPT RST EQPT
   /* LOC:STATE */
   "MC:BOOTMSG"
   /* UPGRADING SYNC-{0,1} FIRMWARE */
```

Where:

a = Autonomous sequence number: 001-999

Upon completion of the **RST-EQPT** command, the firmware is upgraded on DPLL-0.

If the SYNC-0 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 12.

12. Retrieve the firmware ID of the DPLL-0 circuit pack by entering the following command:

    RTRV-FWID:*[a]*:DPLL-0;**

    Where:

    a = Target ID (optional)

    A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:FWID */
   "DPLL-0:e"
;
```

    Where:

    e = Firmware ID

    Update the Firmware ID for the associated frame in the office records.

13. Restore DS1TX-0 to service by entering the following command:

    RST-EQPT:*[a]*:TX-0;**

    Where:

    a = Target ID (optional)

    This command takes up to one minute to complete.

14. Make SYNC-0 the active side by entering the following command:

    SW-DX-EQPT:*[a]*:SYNC-0;**

    Where:

    a = Target ID (optional)

    This command takes less than one minute to complete.

After the switch is complete, all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

Upgrading OSWIO/OPEX Circuit Pack Firmware

This procedure allows you to upgrade the firmware of the OSWIO/OPEX circuit packs.

NOTE:
The OSWIO/OPEX circuit pack pairs need to be upgraded one at a time in order to avoid a service outage.

1. Load the latest software release, which includes the downloadable FPGA software, onto the system by following the procedures contained in the software release description provided with the software.
2. For each OSWIO/OPEX circuit pack pair, perform Steps 3 through 8 to upgrade the FPGA software.
3. Start from the lowest numbered OSWIO/OPEX circuit pack pair (for example, OSWIO-1-1 for RX-1 and OSWIO-3-1 for RX-2).
4. Switch the traffic from the odd-numbered OSWIO circuit pack to it's even-numbered mate OSWIO circuit pack by entering the following command:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = OSWIO circuit pack location: `SWIO-[1-4]-[1-16}`
5. Once the switch has completed successfully, partially extract (do not disconnect the fiber optic cable when partially extracting the circuit packs) the OSWIO circuit pack from the SWIO Module and the OPEX from the associated Remote Complex. Refer to Chapter 2 for procedures on extracting circuit packs, if necessary.

6. Reinstall the OSWIO circuit pack into the SWIO Module and the OPEX circuit pack into the Remote Complex. Refer to Chapter 2 for procedures on installing circuit packs, if necessary.

   This causes the OSWIO/OPEX circuit pack pair to be downloaded with the new FPGA downloadable software. Autonomous output messages indicate whether the OSWIO/OPEX circuit pack pair was successfully downloaded and brought back to a provisioned state.

7. Confirm that the OSWIO/OPEX circuit pack pair is operating correctly by entering the following command twice for the OSWIO and OPEX circuit pack locations:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = OSWIO or OPEX circuit pack location: `{ SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16} }`

   Diagnostics can take up to 15 minutes to complete.

   A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
    "e:f,g,h,i"
;
```

   Where:

   e = OSWIO or OPEX circuit pack location: `{ SWIO-{1-4}-{1-16}, OPEX-{1-4}-{1-16} }`

   f = Actual/Failed diagnostic phases: < 4-digit hex number >

   g = Diagnostics result: `{ PASS, FAIL, TNR }`

   h = Expected diagnostic data: < "1-40 legal characters" >

   i = Measured diagnostic data: < "1-40 legal characters" >

   Make sure both the OSWIO and OPEX circuit packs pass the diagnostic tests before proceeding. If the circuit packs fail, contact your system administrator or next level of support for assistance.

8. Allow the traffic to be switched back onto the OSWIO/OPEX circuit pack pair by entering the following command:

   `ALW-SW-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = OSWIO circuit pack location: `SWIO-{1-4}-{1-16}`

   Wait for the COMPLD message to appear before continuing. If the command fails, contact your system administrator or next level of support for assistance.

9. If all the OSWIO/OPEX circuit pack pairs associated with all SWIO Modules have been upgraded, then you are done with this procedure. If you are not finished with the current SWIO Module, go to Step 3 for the next OSWIO/OPEX circuit pack pair. Otherwise, continue with the next SWIO Module by going to Step 2.

Changing PWRJ (568A) to PWRJ (568B)

For Release 5.0 when Remote Complexes are used, Switch Power Modules 1 and 3 require higher rated PWRJ (568B) circuit packs to support the increased current demand of OSWIO circuit packs. Because of the power distribution scheme, eight (PWRJ-{1,2}-{1,2,5,6}) of the twelve power circuit packs within Switch Power Modules 1 and 3 must be replaced if at least one Remote Complex is provisioned. As a result, the addition of a second Remote Complex does not require PWRJ circuit pack replacement.

This procedure allows you to change PWRJ (568) circuit packs to PWRJ (568B) circuit packs within Switch Power Modules 1 and 3.

1. Obtain at least 8 PWRJ (568B) circuit packs for Switch Power Modules 1 and 3. If you are required to do so, obtain 12 PWRJ (568B) circuit packs so that all 12 PWRJ circuit packs within Switch Power Modules 1 and 3 can be replaced.

2. Make sure there are no alarms active by entering the following command:

   `RTRV-ALM-ALL:`*[a]*`;`

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 15-12) before performing this procedure.

3. Extract one of the PWRJ (568A) circuit packs (PWRJ-{1,3}-{1,2,5,6} or one of the twelve if required to replace all PWRJ [568A] circuit packs) from one of the Switch Power Modules being upgraded. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Extracting all PWRJ circuit packs from the same Switch Power Module at the same time causes loss of service. Therefore, only one PWRJ circuit pack must be extracted at a time.

A major (MJ) alarm is issued when the PWRJ (568A) circuit pack is extracted.

4. Install one of the PWRJ (568B) circuit packs into the slot where the PWRJ (568A) circuit pack was extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm clears (CL) when the PWRJ (568B) circuit pack is installed.

5. Repeat Steps 3 and 4 to replace the remaining PWRJ (568A) circuit packs in Switch Power Modules 1 and 3 with PWRJ (568B) circuit packs.

Changing PWRE2 (556B) to PWRE3 (556C)

This procedure allows you to change PWRE2 (556B) circuit packs to PWRE3 (556C) circuit packs within an interface module.

1. Obtain two PWRE3 (556C) circuit packs for the interface module to be upgraded.
2. Make sure there are no alarms active by entering the following command:

   `RTRV-ALM-ALL:`*[a]*`;`

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 15-12) before performing this procedure.

3. Extract one of the PWRE2 (556B) circuit packs from the interface module being upgraded. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Extracting both PWRE circuit packs from the same interface module at the same time causes loss of service.

A major (MJ) alarm is issued when the 556B circuit pack is extracted.

4. Install one of the PWRE3 (556C) circuit packs into the slot where the 556B circuit pack was extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm clears (CL) when the 556C circuit pack is installed.

5. Extract the other PWRE2 (556B) circuit pack from the interface module being upgraded. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Extracting both PWRE circuit packs from the same interface module at the same time causes loss of service.

A major (MJ) alarm is issued when the 556B circuit pack is extracted.

6. Install the other PWRE3 (556C) circuit pack into the slot where the 556B circuit pack was extracted in Step 5. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm clears (CL) when the 556C circuit pack is installed.

Changing Switch Interface From SWIF1 (AKM49) to SWIF2 (AKM50)

This procedure allows you to change a switch interface (SWIF) circuit pack from SWIF1 (AKM49) to SWIF2 (AKM50). Since DS1 performance monitoring functions are not protected, you are **not** required to provision a SWIF2 circuit pack in the DS1 interface protection group.

⚠ CAUTION:
Before performing this procedure, clear any protection switches involving the DS1 protection group being changed. In addition, release any DS1 loopbacks and disconnect any DS1 performance monitoring connections involving the circuit packs being changed.

1. Switch the SWIF1 circuit pack to protection by entering the following command:

   `SW-TOPROTN-EQPT::`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

   The green LEDs on the DS1RY circuit packs are lit to indicate a protection switch is active. A minor (MN) alarm occurs on the SWIF circuit pack when the SWIF circuit pack is switched to protection.

2. Extract the SWIF circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs on the SWIF circuit pack when the SWIF1 circuit pack is extracted.

3. Edit the hardware ID of the SWIF slot by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`::AKM50;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-64}-{1-8}`

4. Install the SWIF2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

5. Allow protection switching to the SWIF2 circuit pack by entering the following command:

   `ALW-SW-EQPT:`*[a]*`:`*b*`::WKG;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-[1-64]-[1-8]`

   The green LEDs on the DS1RY circuit packs turn off to indicate the protection switch is no longer active. If provisioned for manual protection LED, the red ALM LED on the SWIF2 circuit pack turns off. The minor alarm on the SWIF circuit pack clears (CL) when service is switched to the SWIF2 circuit pack.

Changing Switch Interface-Protection From SWIF1 (AKM49) to SWIF2 (AKM50)

This procedure allows you to change a switch interface-protection (SWIF) circuit pack from SWIF1 (AKM49) to SWIF2 (AKM50). Since DS1 performance monitoring functions are not protected, you are **not** required to provision a SWIF2 circuit pack in the DS1 interface protection group.

CAUTION:
Before performing this procedure, clear any protection switches involving the SWIF protection circuit pack being changed.

1. Determine the state of the SWIF protection circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF protection circuit pack location: `SWIF-[1-64]-P`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = SWIF protection circuit pack location: `SWIF-{1-64}-P`

f = Equipment state

CAUTION:
Do not continue with this procedure if the basic state of the SWIF protection circuit pack is ACT. Protection switches must be cleared before performing this procedure. Refer to necessary alarm clearing procedures to clear protection switches.

2. Extract the SWIF protection circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor alarm occurs on the SWIF protection circuit pack when the SWIF1 circuit pack is extracted.

3. Edit the hardware ID of the SWIF slot by entering the following command:

   ED-EQPT:*[a]*:*b*::AKM50;

   Where:

   a = Target ID (optional)

   b = SWIF protection circuit pack location: **SWIF-{1-64}-P**

4. Install the SWIF2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm on the SWIF protection circuit pack clears (CL) when the SWIF2 circuit pack is installed.

5. Verify the circuit pack version information of the MUXP circuit pack by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: **MUXP-{1-64}**

   A sample response is (only pertinent parameters are shown for this procedure):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:: ... PCODE=f, CCODE=g ..."
;
```

Where:

d = MUXP circuit pack location: `MUXP-{1-64}`

f = Provisioned circuit pack code

g = Circuit pack code

If the MUXP circuit pack code is not `AKM70` (parameters *f* and *g*), redo this procedure.

Changing Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)

This procedure allows you to change a multiplexer protection (MUXP) circuit pack from MUXP1 (AKM55) to MUXP2 (AKM70).

The MUXP2 circuit pack supports the functions of the MUX2 (AKM68B) circuit pack. Therefore, the MUXP2 circuit pack must be provisioned before any MUX2 circuit packs are provisioned in a DS3 Interface Module.

CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed.

1. Determine the state of the MUXP1 circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: `MUXP-{1-64}`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = MUXP circuit pack location: `MUXP-{1-64}`

f = Equipment state

CAUTION:
Do not continue with this procedure if the basic state of the MUXP is ACT. Protection switches must be cleared before performing this procedure. Refer to the necessary alarm clearing procedures to clear protection.

2. Extract the MUXP1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A major (MJ) alarm occurs on the MUXP circuit pack when the MUXP1 circuit pack is extracted.

3. Edit the hardware ID of the MUXP slot by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`::AKM70;`

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: `MUXP-{1-64}`

4. Install the MUXP2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm on the MUXP circuit pack clears (CL) when the MUXP2 circuit pack is inserted.

Changing Multiplexer Protection From MUXP2 (AKM70) to MUXP3 (AKM92)

This procedure allows you to change a multiplexer protection (MUXP) circuit pack from MUXP2 (AKM70) to MUXP3 (AKM92).

The MUXP3 circuit pack supports the functions of the MUX3 (AKM91) circuit pack. Therefore, the MUXP3 circuit pack must be provisioned before any MUX3 circuit packs are provisioned in an Enhanced DS3 Interface-16 or DS3 Clear-Channel Interface-16 Module.

⚠ CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed.

1. Determine the state of the MUXP2 circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: `MUXP-[1-64]`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUXP circuit pack location: `MUXP-[1-64]`

   f = Equipment state

⚠ CAUTION:
Do not continue with this procedure if the basic state of the MUXP is ACT. Protection switches must be cleared before performing this procedure. Refer to the necessary alarm clearing procedures to clear protection.

2. Extract the MUXP2 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs on the MUXP circuit pack when the MUXP2 circuit pack is extracted.

3. Edit the hardware ID of the MUXP slot by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`:::AKM92;`

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: `MUXP-{1-64}`

4. Install the MUXP3 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm on the MUXP circuit pack clears (CL) when the MUXP3 circuit pack is inserted.

5. Verify the circuit pack version information of the MUXP circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: `MUXP-{1-64}`

   A sample response is (only pertinent parameters are shown for this procedure):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:: ... PCODE=f, CCODE=g ..."
;
```

   Where:

   d = MUXP circuit pack location: `MUXP-{1-64}`

   f = Provisioned circuit pack code

   g = Circuit pack code

   If the MUXP circuit pack code is not `AKM92` (parameters *f* and *g*), redo this procedure.

Changing Multiplexer From MUX1 (AKM52) to MUX2 (AKM68B)

This procedure allows you to change a multiplexer (MUX) circuit pack from MUX1 (AKM52) to MUX2 (AKM68B).

NOTE:
The MUXP2 (AKM70) circuit pack must be provisioned in the DS3 Interface Module before changing from MUX1 to MUX2. Refer to section titled "Changing Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)" (page 19-25), if necessary.

CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed. In addition, release any DS1 loopbacks and disconnect any DS1 performance monitoring connections involving the MUX circuit packs being changed.

1. Determine the provisioned LBO (PLBO) and the circuit pack LBO (CLBO) of the MUX1 circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-{1-64}-{1-31}`

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...,PLBO=h,CLBO=i,..."
;
```

   Where:

   d = MUX circuit pack location: `MUX-{1-64}-{1-31}`

   h = Provisioned LBO setting: `{ INIT, OUT, IN }`.

   i = Circuit pack LBO setting: `{ OUT, IN }`

2. Switch the MUX1 circuit pack to protection by entering the following command:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-[1-64]-[1-31]`

   The green LED on the MUXPS circuit pack is lit to indicate a protection switch is active. If provisioned for manual protection LED, the red ALM LED on the MUX circuit pack lights. A minor (MN) alarm occurs on the MUX when the MUX1 circuit pack is switched to protection.

3. Extract the MUX1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs on the MUX when the MUX1 circuit pack is extracted.

4. Determine if the LBO setting of the MUX2 circuit pack matches the setting of the MUX1 circuit pack by referring to Figures 5-3 and 5-4 in the section titled "Setting Line Build Out (LBO)" (page 5-34). If necessary, set the LBO setting of the MUX2 circuit pack to match the LBO setting of the MUX1 circuit pack.

5. Edit the hardware ID of the MUX slot by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`::AKM68B;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-[1-64]-[1-31]`

6. Install the MUX2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

7. Verify the circuit pack version information of the MUX2 circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX2 circuit pack location: `MUX-[1-64]-[1-31]`

A sample response is (only pertinent parameters are shown for this procedure):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: : ... PCODE=f, CCODE=g ..."
;
```

Where:

d = MUX2 circuit pack location: `MUX-{1-64}-{1-31}`

f = Provisioned circuit pack code

g = Circuit pack code

If the MUX2 circuit pack code is not `AKM68B` (parameters *f* and *g*), go to Step 5.

8. Allow protection switching to the MUX2 circuit pack by entering the following command:

   `ALW-SW-EQPT:`*`[a]`*`:`*`b`*`: :WKG;`**

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: **`MUX-{1-64}-{1-31}`**

   The green LED on the MUXPS circuit pack turns off to indicate the protection switch is no longer active. If provisioned for manual protection LED, the red ALM LED on the MUX circuit pack lights. The minor alarm on the MUX clears (CL) when service is switched to the MUX2 circuit pack.

Changing Multiplexer From MUX2 (AKM68B) to MUX3 (AKM91)

This procedure allows you to change a multiplexer (MUX) circuit pack from MUX2 (AKM68B) to MUX3 (AKM91).

NOTE:
The MUXP3 (AKM92) circuit pack must be provisioned in the Enhanced DS3 Interface-16 or DS3 Clear-Channel Interface-16 Module before changing from MUX2 to MUX3. Refer to section titled "Changing Multiplexer Protection From MUXP2 (AKM70) to MUXP3 (AKM92)" (page 19-27), if necessary.

CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed. In addition, release any DS1 loopbacks and disconnect any DS1 performance monitoring connections involving the MUX circuit packs being changed.

1. Switch the MUX2 circuit pack to protection by entering the following command:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-[1-64]-[1-15]`

   The green LED on the MUXPS circuit pack is lit to indicate a protection switch is active. If provisioned for manual protection LED, the red ALM LED on the MUX2 circuit pack lights. A minor (MN) alarm occurs on the MUX when the MUX1 circuit pack is switched to protection.

2. Extract the MUX2 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs on the MUX when the MUX2 circuit pack is extracted.

3. Edit the hardware ID of the MUX slot by entering the following command:

   `ED-EQPT:`*[a]*`:`*b*`:::AKM91;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-[1-64]-[1-15]`

4. Install the MUX3 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

5. Verify the circuit pack version information of the MUX3 circuit pack by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX3 circuit pack location: `MUX-{1-64}-{1-15}`

   A sample response is (only pertinent parameters are shown for this procedure):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d: : ... PCODE=f, CCODE=g ..."
;
```

   Where:

   d = MUX3 circuit pack location: `MUX-{1-64}-{1-15}`

   f = Provisioned circuit pack code

   g = Circuit pack code

   If the MUX3 circuit pack code is not `AKM91` (parameters *f* and *g*), go to Step 3.

6. Allow protection switching to the MUX3 circuit pack by entering the following command:

   `ALW-SW-EQPT:`*[a]*`:`*b*`::WKG;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-{1-64}-{1-15}`

   The green LED on the MUXPS circuit pack turns off to indicate the protection switch is no longer active. If provisioned for manual protection LED, the red ALM LED on the MUX3 circuit pack turns off. The minor alarm on the MUX clears (CL) when service is switched to the MUX3 circuit pack.

Changing a DS3 Interface-32 Module to an Enhanced DS3 Interface-16 Module

This procedure allows you to change a DS3 Interface-32 Module to an Enhanced DS3 Interface-16 Module. This procedure entails the removal of the DS3 Interface-32 Module backplane cover. The system administrator must be notified when backplane access is required.

⚠ CAUTION:
This procedure involves removal of a backplane cover and access to the backplane. Make sure that ESD wrist straps are worn and the system administrator is notified prior to removal of any backplane covers.

1. Make two copies of the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).
2. Retrieve the provisioning information for the DS3 Interface-32 Module which is to be converted by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 Interface-32 Module location: `UNIT-{1-64}`

   From the following output response, note the SWIO and J-Cable information for reprovisioning of the Enhanced DS3 Interface-16 Module (only pertinent parameters are shown for this procedure):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:UTYPE:<>:CLEI:STATE */
      "d:32DS3:SWLOC=l CABLEID=m..."
   ;
   ```

   Where:

   d = DS3 Interface-32 Module location: `UNIT-{1-64}`

   l = Switch connection equipment location: `SWIO-{1-64}`
   Lowest numbered SWIO circuit pack location is specified. Four SWIO circuit packs are used for DS3 Interface-32 Modules, while only two are necessary for Enhanced DS3 Interface-16 Modules.

   m = Control Cable (J-Cable) ID: `J1-J32`
3. Deprovision the DS3 Interface-32 Module by referring to the section titled "Deprovisioning DS3 or STS1 Interface Modules" (page 7-14).

4. Remove all circuit packs from the upper half of the DS3 Interface-32 Module, with the exception of the PWRE3 (556C) circuit pack.
5. At the associated Switch Module, remove the higher numbered SWIO/OSWIO circuit pack pair as identified in the information obtained in Step 2. Refer to Chapter 2 for extracting circuit packs and fiber-optic cables.

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

6. Replace the SWIO/OSWIO circuit packs removed in Step 5 with an apparatus blank cover (847055563).
7. For Remote Complex interface modules, perform the following procedure
   a. At the OPEX Module, remove the higher numbered OPEX circuit pack pair as identified in the information obtained in Step 2. Refer to Chapter 2 for extracting circuit packs and fiber-optic cables.

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

   b. Replace the OPEX circuit packs removed in Step 7a with blank AWR-type filler assemblies (846103760).
8. At the DS3 Interface-32 Module being changed, replace any MUX1 circuit packs in the lower half of the module with MUX2 (AKM68B) circuit packs. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
9. Replace the MUXP circuit pack (if present) with the MUXP3 (AKM92) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
10. Verify that the Unit Controller (UC) is a UC4 (AKM88) circuit pack for collocated interface modules or UC4B (AKM88B) circuit pack for Remote Complex interface modules. If not, replace the UC circuit pack with a UC4 (collocated interface module) or UC4B (Remote Complex interface modules) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

⚠ CAUTION:
Make sure the system administrator has been contacted for assistance and that ESD wrist straps are worn when performing Steps 11 through 18.

11. From the back of the DS3 Interface-32 Module, remove the backplane cover from the module.
12. Carefully disconnect and remove the Protection Bus Cables (four connections) from the upper half of the module (connector locations J105 through J108).
13. Carefully disconnect and remove the other end of the Protection Bus Cables (two connections) for the upper half from the bottom half of the module (connector locations J101 and J103).
14. Verify that connector J104 is still in place on the bottom half of the module.
15. Replace the backplane cover on the DS3 Interface-32 Module.
16. From the front of the DS3 Interface-32 Module, place the chassis covers over the upper half of the module that is exposed (list number 846519528 on the left hand side, list number 846519536 on the right hand side).
17. Place the blank cover (list number 846138337) over the open space between the chassis covers installed in Step 16.
18. Remove the old module label from the right hand side of the shelf position and replace it with the new Enhanced DS3 Interface-16 Module label.
19. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new Enhanced DS3 Interface-16 Module information.
20. Provision the interface module as a Enhanced DS3 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
21. Provision the MUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
22. Make two copies of the database using the same optical disks used in Step 1 by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Changing a DS3 Interface-16 Module to an Enhanced DS3 Interface-16 Module

This procedure allows you to change a DS3 Interface-16 Module to an Enhanced DS3 Interface-16 Module.

1. Make two copies of the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).
2. Retrieve the provisioning information for the DS3 Interface-16 Module which is to be converted by entering the following command:

   `RTRV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 Interface-16 Module location: `UNIT-[1-64]`

   From the following output response, note the SWIO and J-Cable information for reprovisioning of the Enhanced DS3 Interface-16 Module (only pertinent parameters are shown for this procedure):

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:UTYPE:<>:CLEI:STATE */
      "d:e: ... TELDISP=o ..."
   ;
   ```

   Where:

   d = DS3 Interface-16 Module location: `UNIT-{1-64}`

   e = Interface module type: `{ DS1, DS1P, 32DS3, 16DS3, 16EDS3, 16DS3CC, 16STS1 }`

   o = Telemetry display: `{ 0-63 }`

   If the interface module type is not `16DS3`, you cannot upgrade the selected interface module and do not continue with this procedure for the selected interface module. If the interface module type is `16DS3`, make a note of the telemetry display setting. This setting is used later in this procedure.

3. Retrieve the threshold values for the performance parameters of the DS1 ports by entering the following command:

   `RTRV-TH-T1:[a]:b;`

   Where:

   a = Target ID (optional)

   b = Port location: `{ {1-64}-{1-15}, UNIT-{1-64}, DS1GRP-{1-64}-{1-15}, SFPATH, ESFPATH, LINE}`

   A sample response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:MONPARM, LOCN,,THLEV,TMPER */
   "g: h, i, j, k"
   .
   .
   .
   "g: h, i, j, k"
;
```

   Where:

   g = DS1 port: `{ {1-64}-{1-31}-{1-28}, SFPATH, ESFPATH, LINE }`

   h = Monitored Parameter
   Specifies the particular monitored parameter for which threshold level is being retrieved.

   i = Location: `{ NEND, FEND }`

   j = Threshold level: `{ 0-134217728 }`

   k = Time period: `{ 15-MIN, 1-HR, 1-DAY }`

   Keep a copy of the above response so that you can later reprovision the threshold values (in Step 20) after the DS3 Interface Module is changed.

4. Check the PWRE circuit pack slots for PWRE3 (556C) circuit packs. If PWRE3 circuit packs are not present in both slots, refer to the section titled "Changing PWRE2 (556B) to PWRE3 (556C)" (page 19-20) to upgrade the PWRE2 to PWRE3 circuit packs.

5. Retrieve the version information for the MUXP circuit pack by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: **MUXP-[1-64]**

   A sample response is (only pertinent parameters are shown for this procedure):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: : ... PCODE=f, CCODE=g ..."
;
```

   Where:

   d = MUXP circuit pack location: MUXP-[1-64]

   f = Provisioned circuit pack code

   g = Circuit pack code

   If the MUXP circuit pack code is AKM55 (parameters *f* and *g*), refer to the section titled "Changing Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)" (page 19-25) to upgrade the MUXP1 to a MUXP2 circuit pack.

6. Check the DS3 Interface-16 Module for MUX1 and PMGR circuit packs by entering the following command for all MUX circuit pack locations within the selected interface module:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: **MUX-[1-64]-[1-15]**

   A sample response is (only pertinent parameters are shown for this procedure):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: : ... PCODE=f, CCODE=g ..."
;
```

Where:

d = MUX circuit pack location: `MUX-{1-64}-{1-15}`

f = Provisioned circuit pack code

g = Circuit pack code

Make a note of the locations of MUX1 (`AKM52B`) and PMGR (`AKM66`) circuit packs.

7. If there are any PMGR (AKM66) circuit packs within the DS3 Interface-16 Module, deprovision the PMGR circuit packs by referring to the section titled "Deprovisioning PMGR Circuit Packs" (page 7-25) and performing Steps 1 through 4.
8. If you are replacing PMGR circuit packs with BXA circuit packs, refer to the section titled "Deprovisioning PMGR Circuit Packs" (page 7-25) and perform Steps 6 through 8.
9. If you are replacing PMGR circuit packs with MUX2 circuit packs, perform the following procedure:
    a. Extract the PMGR circuit packs. Refer to Chapter 2 for extracting circuit packs, if necessary.
    b. Install MUX2 circuit packs. Refer to Chapter 2 for installing circuit packs, if necessary.
    c. Provision the MUX2 circuit packs by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
10. If there are any MUX1 (AKM52B) circuit packs within the DS3 Interface-16 Module, replace all MUX1 with MUX2 circuit packs by referring to the section titled "Changing Multiplexer From MUX1 (AKM52) to MUX2 (AKM68B)" (page 19-29).
11. Remove the UC circuit pack from service by entering the following command:

    `RMV-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-[1-64]`

    A major (MJ) alarm occurs for the UC slot when you remove the UC from service.
12. Extract the MUXP2 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
13. Install a MUXP3 circuit pack into the MUXP circuit pack slot. Refer to Chapter 2 for installing circuit packs, if necessary.

14. Change the interface module type to an Enhanced DS3 Interface-16 Module by entering the following command:

    `ENT-EQPT:`*[a]*`:`*b*`::16EDS3:`*e:f*`::TELDISP=`*h*`;`

    Where:

    a = Target ID (optional)

    b = Enhanced DS3 Interface-16 Module location: `UNIT-[1-64]`

    e = Switch Connection Equipment location: { `SWIO-[1-4]-[1-16]`, `NOVAL` }

    f = Control Cable ID: [`J[1-64]`, `NOVAL`]

    h = Telemetry display: [`0-63`]
    Use the same value noted in Step 2.

15. Restore the UC circuit pack to service by entering the following command:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = UC circuit pack location: `UC-[1-64]`

    This command takes up to three minutes to complete. The major alarm associated with the UC slot is cleared (CL) when you restore the UC to service.

16. Edit the hardware ID of the MUXP slot by entering the following command:

    `ED-EQPT:`*[a]*`:`*b*`:::AKM92;`

    Where:

    a = Target ID (optional)

    b = MUXP circuit pack location: `MUXP-[1-64]`

17. Verify the circuit pack version information of the MUXP circuit pack by entering the following command:

    `RTRV-EQPT:[a]:b;`

    Where:

    a = Target ID (optional)

    b = MUXP circuit pack location: `MUXP-[1-64]`

    A sample response is (only pertinent parameters are shown for this procedure):

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
       /* LOC:UTYPE:<>:CLEI:STATE */
       "d:: ... PCODE=f, CCODE=g ..."
    ;
    ```

    Where:

    d = MUXP circuit pack location: `MUXP-[1-64]`

    f = Provisioned circuit pack code

    g = Circuit pack code

    If the MUXP circuit pack code is not `AKM92` (parameters *f* and *g*), go to Step 16.

18. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new Enhanced DS3 Interface-16 Module information.

19. If necessary, replace MUX2 circuit packs with MUX3 circuit packs by referring to the section titled "Changing Multiplexer From MUX2 (AKM68B) to MUX3 (AKM91)" (page 19-32).

20. Set the threshold values to what was retrieved in Step 3 by entering the following command for the necessary DS1 ports:

    `SET-TH-T1:[a]:b::::d,e,[f],,g;`

    Where:

    a = Target ID (optional)

    b = DS1 port location: `{ {1-64}-{1-15}-{1-28}, DS1GRP-{1-64}-{1-15}, UNIT-{1-64}, SFPATH, ESFPATH, LINE} }`

    d = Monitored Parameter
    Specifies the particular monitored parameter for which threshold level is being retrieved.

    e = Threshold level: `{ 0-134217728 }`

    f = Location: `{ NEND, FEND }`

g = Time period: { 15-MIN, 1-HR, 1-DAY }

21. Make two copies of the database using the same optical disks used in Step 1 by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Changing an Enhanced DS3 Interface-16 Module to a DS3 Clear-Channel Interface-16 Module

This procedure allows you to change an Enhanced DS3 Interface-16 Module to a DS3 Clear-Channel Interface-16 Module. A DS3 Interface-16 Module cannot be directly upgraded to a DS3 Clear-Channel Interface-16 Module. The DS3 Interface-16 Module must first be upgraded to an Enhanced DS3 Interface-16 Module [refer to the section titled "Changing a DS3 Interface-16 Module to an Enhanced DS3 Interface-16 Module" (page 19-37) for upgrading a DS3 Interface-16 Module to an Enhanced DS3 Interface-16 Module]. In addition, to use all of the functions of a DS3CC Interface-16 Module, the Synchronizer Module must be equipped and provisioned.

1. Make two copies of the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).
2. Retrieve the provisioning information for the Enhanced DS3 Interface-16 Module which is to be converted by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 Interface-16 Module location: UNIT-{1-64}

   From the following output response, note the SWIO and J-Cable information for reprovisioning of the Enhanced DS3 Interface-16 Module (only pertinent parameters are shown for this procedure):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:e: ... TELDISP=o ..."
;
```

   Where:

   d = DS3 Interface-16 Module location: UNIT-{1-64}

   e = Interface module type: { DS1, DS1P, 32DS3, 16DS3, 16EDS3, 16DS3CC, 16STS1 }

   o = Telemetry display: { 0-63 }

If the interface module type is not 16EDS3, you cannot upgrade the selected interface module and do not continue with this procedure for the selected interface module. If the interface module type is 16EDS3, make a note of the telemetry display setting. This setting is used later in this procedure.

3. Perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

   a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

   b. Check to see if the Synchronizer Module is active by entering the following command:

      RTRV-STATE-EQPT:*[a]*:**SYNC-0&SYNC-1;**

      Where:

      a = Target ID (optional)

      A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

      Where:

      f = Equipment state: { ACT, AVAIL, OOS, STBY }

      If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

4. Check the Enhanced DS3 Interface-16 Module for MUX2 circuit packs by entering the following command for all MUX circuit pack locations within the selected interface module:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: MUX-[1-64]-[1-15]

A sample response is (only pertinent parameters are shown for this procedure):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: : ... PCODE=f, CCODE=g ..."
;
```

Where:

d = MUX circuit pack location: `MUX-{1-64}-{1-15}`

f = Provisioned circuit pack code

g = Circuit pack code

Make a note of the locations of MUX2 (`AKM68B`) circuit packs.

5. If there are any MUX2 (AKM68/AKM68B) circuit packs within the Enhanced DS3 Interface-16 Module, replace all MUX2 with MUX3 circuit packs by referring to the section titled "Changing Multiplexer From MUX2 (AKM68B) to MUX3 (AKM91)" (page 19-32).

6. Remove the UC circuit pack from service by entering the following command:

   `RMV-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-[1-64]`

   A major (MJ) alarm occurs for the UC slot when you remove the UC from service.

7. Change the interface module type to a DS3CC Interface-16 Module by entering the following command:

   `ENT-EQPT:`*[a]*`:`*b*`::16DS3CC:`*e:f*`::TELDISP=`*h*`;`

   Where:

   a = Target ID (optional)

   b = DS3CC Interface-16 Module location: `UNIT-[1-64]`

   e = Switch Connection Equipment location: { `SWIO-[1-4]-[1-16]`, `NOVAL` }

   f = Control Cable ID: { `J[1-64]`, `NOVAL` }

   h = Telemetry display: { `0-63` }
   Use the same value noted in Step 2.

8. Restore the UC circuit pack to service by entering the following command:

   `RST-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-[1-64]`

   This command takes up to three minutes to complete. The major alarm associated with the UC slot is cleared (CL) when you restore the UC to service.

9. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new DS3 Clear-Channel Interface-16 Module information.

10. Make two copies of the database using the same optical disks used in Step 1 by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Changing a DS3 Interface-32 Module to an STS1 Interface-16 Module

This procedure allows you to change a DS3 Interface-32 Module to an STS1 Interface-16 Module. This procedure entails the removal of the DS3 Interface-32 Module backplane cover. The system administrator must be notified when backplane access is required.

CAUTION:
This procedure involves removal of a backplane cover and access to the backplane. Make sure that ESD wrist straps are worn and the system administrator is notified prior to removal of any backplane covers.

1. Make two copies of the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

2. Retrieve the provisioning information for the DS3 Interface-32 Module which is to be converted by entering the following command:

   `RTRV-EQPT:[a]:b;`

   Where:

   a = Target ID (optional)

   b = DS3 Interface-32 Module location: `UNIT-[1-64]`

From the following output response, note the SWIO and J-Cable information for reprovisioning of the STS1 Interface-16 Module (only pertinent parameters are shown for this procedure):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d:32DS3:<SWLOC=l CABLEID=m..."
;
```

Where:

d = DS3 Interface-32 Module location: `UNIT-{1-64}`

l = Switch connection equipment location: `SWIO-{1-4}-{1-16}` Lowest numbered SWIO circuit pack location is specified. Four SWIO circuit packs are used for DS3 Interface-32 Modules, while only two are necessary for STS1 Interface-16 Modules.

m = Control Cable (J-Cable) ID: `J1-J64`

3. Deprovision the DS3 Interface-32 Module by referring to the section titled "Deprovisioning DS3 or STS1 Interface Modules" (page 7-14).
4. Remove all circuit packs from the upper half of the DS3 Interface-32 Module, with the exception of the PWRE3 (556C) circuit pack.
5. At the associated SWIO Module, remove the higher numbered SWIO/OSWIO circuit pack pair as identified in the information obtained in Step 2. Refer to Chapter 2 for extracting circuit packs and fiber-optic cables.

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

6. Replace the SWIO circuit packs removed in Step 5 with an apparatus blank cover (847055563).
7. For Remote Complex interface modules, perform the following procedure:
    a. At the OPEX Module, remove the higher numbered OPEX circuit pack pair as identified in the information obtained in Step 2. Refer to Chapter 2 for extracting circuit packs and fiber-optic cables.

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

    b. Replace the OPEX circuit packs removed in Step 7a with blank AWR-type filler assemblies (846103760).
8. At the DS3 Interface-32 Module being changed, replace the MUX circuit packs in the lower half of the module with SMUX (AKM84) circuit packs. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

9. Replace the MUXP circuit pack with the SMUXP (AKM85) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
10. Verify that the Unit Controller (UC) is a UC4 (AKM88) circuit pack for collocated interface modules or UC4B (AKM88B) circuit pack for Remote Complex interface modules. If not, replace the UC circuit pack with a UC4 (collocated interface module) or UC4B (Remote Complex interface module) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

⚠ CAUTION:
Make sure the system administrator has been contacted for assistance and that ESD wrist straps are worn when performing Steps 11 through 18.

11. From the back of the DS3 Interface-32 Module, remove the backplane cover from the module.
12. Carefully disconnect and remove the Protection Bus Cables (four connections) from the upper half of the module (connector locations J105 through J108).
13. Carefully disconnect and remove the other end of the Protection Bus Cables (two connections) for the upper half from the bottom half of the module (connector locations J101 and J103).
14. Verify that connector J104 is still in place on the bottom half of the module.
15. Replace the backplane cover on the DS3 Interface-32 Module.
16. From the front of the DS3 Interface-32 Module, place the chassis covers over the upper half of the module that is exposed (list number 846519528 on the left hand side, list number 846519536 on the right hand side).
17. Place the blank cover (list number 846138337) over the open space between the chassis covers installed in Step 16.
18. Remove the old module label from the right hand side of the shelf position and replace it with the new STS1-16/DS3-32 Interface Module label.
19. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:
    a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

b. Check to see if the Synchronizer Module is provisioned properly by entering the following command:

```
RTRV-EQPT:[a]:SYNC-0&-SYNC1;
```

Where:

a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

Where:

f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

20. Update the Interface Modules Provisioning Worksheet [Figures 5-1 and 5-2, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new STS1 Interface-16 Module information.
21. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
22. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
23. Make two copies of the database using the same optical disks used in Step 1 by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Changing a DS3 Interface-16 Module to an STS1 Interface-16 Module

This procedure allows you to change a DS3 Interface-16 Module to an STS1 Interface-16 Module.

1. Make two copies of the database by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).
2. Retrieve the provisioning information for the DS3 Interface-16 Module which is to be converted by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 Interface-16 Module location: **UNIT-[1-64]**

   From the following output response, note the SWIO and J-Cable information for reprovisioning of the STS1 Interface-16 Module (only pertinent parameters are shown for this procedure):

   ```
       TID YY-MM-DD HH:MM:SS
   M   CTAG COMPLD
       /* LOC:UTYPE:<>:CLEI:STATE */
       "d:16DS3:SWLOC=l CABLEID=m..."
   ;
   ```

   Where:

   d = DS3 Interface-16 Module location: UNIT-{1-64}

   l = Switch connection equipment location: SWIO-{1-4}-{1-16} Lowest numbered SWIO circuit pack location is specified. Two SWIO circuit packs are used for DS3 Interface-16 and STS1 Interface-16 Modules.

   m = Control Cable (J-Cable) ID: J1-J64
3. Deprovision the DS3 Interface-16 Module by referring to the section titled "Deprovisioning DS3 or STS1 Interface Modules" (page 7-14).
4. At the DS3 Interface-16 Module being changed, replace the MUX circuit packs in the lower half of the module with SMUX (AKM84) circuit packs. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
5. Replace the MUXP circuit pack with the SMUXP (AKM85) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
6. Verify that the Unit Controller (UC) is a UC4 (AKM88) circuit pack for a collocated interface module or a UC4B (AKM88B) circuit pack for a Remote Complex interface module. If not, replace the UC circuit pack with a UC4

(collocated interface module) or UC4B (Remote Complex interface module) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

7. Remove the old module label from the right hand side of the shelf position and replace it with the new STS1-16/DS3-16 Interface Module label.
8. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

    a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 18-2) before continuing with this procedure.

    b. Check to see if the Synchronizer Module is provisioned properly by entering the following command:

    `RTRV-EQPT:`*[a]*`:`*SYNC-0 & SYNC-1;*

    Where:

    a = Target ID (optional)

    A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

    Where:

    f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

    If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-26) before continuing with this procedure.

9. Update the Interface Modules Provisioning Worksheet [Figures 5-1 and 5-2, in the section titled "Provisioning Interface Modules (Units)" (page 5-13)] with the new STS1 Interface-16 Module information.
10. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-13).
11. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-30).
12. Make two copies of the database using the same optical disks used in Step 1 by referring to the section titled "Backing Up Database to SEC Disk" (page 8-34).

Acceptance Testing

20

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Contents

Acceptance Testing

20

This chapter consists of procedures required for acceptance testing of the DACS IV-2000. There are procedures for testing a complete system or a single bay. These procedures are optional, but if they are performed, they must only be performed after installation or after the system has been moved or rearranged.

⚠ CAUTION:
These procedures must never be performed on a system that is in service with established cross-connections.

If you are unfamiliar with the general safety precautions associated with the DACS IV-2000, refer to Chapter 2 first before performing any of the procedures in this chapter.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Testing the System

Testing of the DACS IV-2000 is performed after installation has been completed. This assures you that the system has been installed properly and is ready to be placed into service. The testing procedures for a new system consist of the following:

- Visual Inspection ["Visual Inspections" (page 20-4)]
- Link Operation ["Link Operation" (page 20-5)]
- Control Complexes ["Operation of Control Complexes" (page 20-8)]
- Frame Alarm Operation ["Frame Alarm Operation" (page 20-9)]
- Interbay (N-rate) cables ["Interbay (N-rate) Cables" (page 20-13)]
- External Cables ["External Cables" (page 20-15)]
- Optical fiber cables for OR/CE features ["Optical Fiber Cables" (page 20-20)]
- Fan Assemblies ["Fan Assemblies" (page 20-22)]
- Protection Switch Function ["Protection Switch Function" (page 20-28)]
- Alarm and Telemetry Outputs ["Alarm and Telemetry Outputs" (page 20-30)]

CAUTION:
Perform these procedures only after initial installation, or after the frame has been moved or rearranged (the frame must not be in service). These procedures must never be performed on a system that is in service with established cross-connections.

These procedures assume that the system has been initialized and that the frame entities have been provisioned (including any Remote Complexes). Procedures for provisioning system entities are located in Chapters 5 and 6 of this document.

If the installation group has established any cross-connections, you must disconnect them before performing this procedure. Always check with the installation group about the state of your system before beginning these procedures.

NOTE:
These procedures must be performed in the sequence given above. Also, obtain office or equipment records for the system you are testing.

Testing Added Interface Bays

Perform these procedures only when adding a new interface bay to an in-service frame. If you are accepting an entirely new frame, go to the procedure for "Testing the System" (page 20-2).

The procedure for testing a new interface bay consists of the following:

- Visual Inspection ["Visual Inspections" (page 20-4)]
- Interbay (N-rate) Cables ["Interbay (N-rate) Cables" (page 20-13)]
- External Cables ["External Cables" (page 20-15)]
- Optical fiber cables for OR/CE features ["Optical Fiber Cables" (page 20-20)]
- Fan Assemblies (if applicable) ["Fan Assemblies" (page 20-22)]
- Protection Switch Function ["Protection Switch Function" (page 20-28)]

These procedures assume that the installation group has provisioned the units in the interface bay. Procedures for provisioning the DACS IV-2000 equipment is located in Chapter 5.

CAUTION:
These procedures must never be performed on interface bays that are in service with established cross-connections.

NOTE:
The procedures must only be performed in the sequence given above. Also, obtain any office or equipment records for the system you are expanding with an interface bay.

Acceptance Testing Procedures

This section contains the procedures referenced in the sections titled "Testing the System" (page 20-2) [new frame orders] and "Testing Added Interface Bays" (page 20-3) [growth interface bays]. Refer to those sections for the procedures to be performed.

Visual Inspections

Refer any problems found in this procedure that are not corrected easily to the installation group.

⚠ CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

1. Check front and back of frame for damage (dents, broken mountings, etc.) resulting from transportation and mounting of equipment.
2. Look over shelf mountings to verify that shelves are aligned properly and mounted securely.
3. Check to see that all circuit packs are completely engaged.
4. Look for broken or bent pins near the edges of each backplane; damage can occur to these pins even with the cover installed.
5. Look over the multicolored cable connectors on the backplane to verify that connectors are neatly terminated and securely mated.
6. Be sure that the metal covers are mounted securely (with screws) over the backplane.
7. Verify that the local terminal is connected to the TTY1-1 or TTY2-1 connector behind the Switch Bays (TTY1-1 is on bay position 11 and TTY2-1 is on bay position 13) **OR** to the TTY1-1 or TTY2-1 connector on the status panel in the front of the bay using an adapter (ED-2C646-30,G2).

⚠ CAUTION:
Never use both of the TTY1-1 or both of the TTY2-1 connectors at the same time.

8. Check that the cable terminations are grounded in accordance with the engineering drawings or office drawings.

9. Verify that the DACS IV-2000 bays and associated cross-connecting bays have been stamped with office relay rack identification per office drawings.
10. If you find any problems (for example, broken backplane pins) during the visual inspection that you cannot easily fix, refer them to the installation group.

    Any existing problems must be corrected before you continue.
11. Check to see that AA, AB, AC, AD, BA, BB, BC, and BD Bus fuse lamps on the fuse and alarm panels are *not* lit.

    If any lamps are lit, have the installation group correct the problem before continuing.
12. For Remote Complexes, check to see that BUSA, BUSB, BUSC, BUSD, and BUSE fuse lamps on an ED-2C940-30 Fuse and Alarm Panel or any fuse alarm lamp on an ED-9C114-30 Fuse and Alarm Panel are *not* lit.

    If any lamps are lit, have the installation group correct the problem before continuing.
13. Verify that the green LEDs are lit and the red LEDs are off on all (PWRE, PWRG, and PWRJ) power supply circuit packs.

    If any red LEDs are lit or green LEDs are out, have the installation group correct the problem before continuing.

Link Operation

This procedure is used to test the administrative link operation and to establish communication with the DACS IV-2000.

⚠ CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

Verify that your terminal is set for the following major characteristics:

Baud: 9600
Duplex: Full
Parity: Even
Data bits: 7
Stop bits: 1
Flow Control:
    DC3 (Terminal connection)
    ACK (Computer connection)
Answerback: NO

NOTE:
Refer to the manual for your terminal to see the terminal setup. Some terminal models do not allow you to set every characteristic listed above. For these terminals, set only the required characteristics.

14. At the `login:` prompt, enter the system login.
15. At the `password:` prompt, enter the system password.

    The password is not *echoed on screen.*
16. Specify your network element (obtained from office records) by entering:

    ED-NE:*[a]*::*c*;

    Where:

    a = Target ID (optional)

    c = Target ID: <1 to 18 characters>
17. Verify that you entered the correct network element by entering the following command:

    RTRV-NE;

    A sample output header response is:

    ```
       TID YY-MM-DD HH:MM:SS
    M  c CTAG COMPLD
       /* NETYPE,NESIZE,SFTWR-VRSN:<> */
    ```

    If the desired TID (first line of response) is not displayed, redo Step 16 to enter the correct TID.
18. Set date and time by entering the following command:

    ED-DATE:*[a]*::*c*,*d*;

    Where:

    a = Target ID (optional)

    c = Date: `{00-39,86-99}{01-12}{01-31}`

    d = Time: `{00-23}{00-59}{00-59}`
19. Verify the time and date by entering the following command:

    RTRV-HDR:*[a]*;

    Where:

    a = Target ID (optional)

    A sample output response is:

    ```
       TID YY-MM-DD HH:MM:SS
    M  CTAG COMPLD
    ;
    ```

If the information entered is not what you wanted, redo Step 18 to enter the date and time correctly.

20. Determine the software version that is loaded on the system by entering the following command:

    RTRV-NE: *[a]*;

    Where:

    a = Target ID (optional)

    A sample output is (only the pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   c CTAG COMPLD
    /* NETYPE,NESIZE,SFTWR-VRSN:<> */
    "...e:..."
;
```

    Where:

    e = Software version: `5.0.{1-99}.m`

    Match the output against office records to be sure the correct software release is loaded on the frame. If your software version is incorrect, refer the problem to the installation group.

21. Determine the links (other than the link you are using) that are in use (`IS` indicator) or out of service for maintenance (`OOS-MTCE` indicator) by entering the following command:

    RTRV-PRMTR-LINK: *[a]*;

    Where:

    a = Target ID (optional)

    The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:e,..."
    "..."
;
```

    Where:

    d = Link location: `CILINK-{1,2}-{1-8}`

    e = Link state: `{ IS, OOF-FLT, OOS-PRTCL, OOS-MTCE }`

22. Remove from service each link that does not have an `IS` or `OOS-MTCE` indicator by entering the following command:

    `RMV-LINK:`*`[a]`*`:`*`b`*`;`**

    Where:

    a = Target ID (optional)

    b = Administrative link (not in use) location: **`CILINK-{1,2}-{1-8}`**

Operation of Control Complexes

This procedure is used to check the operation of each control complex. This test exercises the interfaces to the secondary storage system, the switch matrix, and the unit controllers (and associated N-rate and other cabling) of each control complex. This procedure assumes that the equipped interface modules have been provisioned.

⚠ CAUTION:
Electrostatic discharge (ESD) can cause damage to the components of a DACS IV-2000. Wear an ESD wrist strap when extracting and installing circuit packs or working near the frame.

⚠ CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

1. Extract the CPU circuit pack with its green on-line LED lit. Refer to Chapter 2 for extracting circuit packs, if necessary.

   The major (MJ) and processor major (MC FAIL) alarm LEDs light on the status panel, and the frame starts a control complex side switch.

2. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

   The system takes up to 20 minutes to reset. Refer to the section titled "Reset and Boot" (page 8-7) for detailed information on system reset. The minor (MN) alarm LED on the status panel remains lit due to the CPU circuit pack extracted in Step 1.

3. Reinstall the CPU circuit pack extracted in Step 1. Refer to Chapter 2 for installing circuit packs, if necessary.

4. Restore the CPU circuit pack extracted in Step 1 to service by entering the following command:

   `RST-EQPT:`*`[a]`*`:`*`b`*`;`**

   Where:

   a = Target ID (optional)

b = CPU circuit pack location: `CPU-{0,1}`

The minor alarm LED on the status panel should extinguish within a few seconds.

If any alarm LEDs remain lit, have the installation group correct the problem before continuing with this procedure.

5. Extract the CPU circuit pack with its green on-line LED lit (the CPU circuit pack tested in Step 2). Refer to Chapter 2 for extracting circuit packs, if necessary.

   The major (MJ) and processor major (MC FAIL) alarm LEDs light on the status panel and the frame starts a control complex side switch.

6. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

   The system takes up to 20 minutes to reset. Refer to the section titled "Reset and Boot" (page 8-7) for detailed information on system reset. The minor (MN) alarm LED on the status panel remains lit due to the CPU circuit pack extracted in Step 5.

7. Reinstall the CPU circuit pack extracted in Step 5. Refer to Chapter 2 for installing circuit packs, if necessary.

8. Restore the CPU circuit pack extracted in Step 5 to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CPU circuit pack location: `CPU-{0,1}`

   The minor alarm LED on the status panel should extinguish within a few seconds.

   If any alarm LEDs remain lit, have the installation group correct the problem before continuing with the next procedure.

Frame Alarm Operation

This procedure is used to check the LED test function and to test the frame alarm operation.

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

1. Make sure there are no alarms present by checking for lit alarm LEDs anywhere on the frame or by entering the following command:

   RTRV-ALM-ALL:*[a]***;**

   Where:

   a = Target ID (optional)

   If there are any alarms, refer the problem to the installation group before continuing.

2. Test the equipment LED indicators by pressing the LED test button on the status panel at the front of the system, or entering the following command:

   EX-EQPT:*[a]***;**

   Where:

   a = Target ID (optional)

CAUTION:
When performing an LED TEST operation (or **EX-EQPT** *command) on the DACS IV-2000, the LED TEST complete message is outputted before the test sequence completes. You must* ***never*** *perform a* **RMV-EQPT::MC;** *operation until the LED TEST has fully completed. This test can take up to 20 minutes on a fully configured system which contains two Remote Complexes configured with all DS1 Interface Bays.*

NOTE:
The ACO LED is tested only when the LED test button on the status panel is depressed. Using the **EX-EQPT** command does not test the ACO LED.

NOTE:
Fan indicators are cycled on and off (on for two seconds, off for two seconds) during the entire LED test sequence. The bay fault indicators on the header strips are turned on at the beginning of the LED test sequence and remain on until the end of the test.

The LEDs light on the circuit packs in the order shown in Tables 20-1 and 20-2. If they do not light in the order given, refer the problem to the installation group.

Table 20-1. **Switch Complex and Collocated Interface Bays — LED Test Sequence**

Order	Module
1	Switch Power 1
2	Memory and Synchronizer *
3	High Capacity Controller †
4	Switch Power 2
5	Switch Power 3
6	Switch Input/Output (SWIO) 1
7	Switch Center Stage (SWCS) 1
8	SWIO 2
9	SWIO 3
10	SWCS 2
11	SWIO 4
12	Interface module (left to right)‡

* Version 1 Synchronizer Module circuit packs do not contain LEDs. Therefore, these circuit packs are not included as part of the LED Test function.

† When the High Capacity Controller Module circuit pack indicators are lit, the status panel (except FE LED) and the header strip indicators (except FE indicator) for the Main Controller Bay are lit at the same time.

‡ Interface modules contained in interface bays are exercised from left to right, bottom to top, assuming they are provisioned consistent with the recommended interface number numbering scheme provided in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

Table 20-2. **Remote Complex — LED Test Sequence**

Order	Module
1	Optical Extension (OPEX) [lower and upper at the same time]
2	Remote Unit Interface (RUI), RUI Power, Auxiliary (AUX) Power, and OPEX Power
3	Interface Bays (Left to Right)†

* The RUI, RUI PWR, AUX PWR, and OPEX PWR Modules are exercised at the same time.

† Interface modules contained in interface bays are exercised from left to right, bottom to top, assuming they are provisioned consistent with the recommended interface number numbering scheme provided in the *DACS IV-2000 (512) Release 5.0 Reference Manual* (AT&T 365-340-900).

3. Determine the states of the SWCS circuit packs by entering the following commands:

   `RTRV-STATE-EQPT:`*[a]*`:SWCS-1-1&&-16;`
   `RTRV-STATE-EQPT:`*[a]*`:SWCS-2-1&&-16;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWCS circuit pack location: `SWCS-{1,2}-{1-16}`

   f = Equipment state: basic states are `ACT` or `OOS`

4. Choose any SWCS circuit pack in the ACT state and extract it from the frame (refer to Chapter 2 for extracting circuit packs, if necessary).

   Wait for the alarm delay interval (up to 30 seconds). Wait for the MN alarm LED and minor alarm aisle lights to light, an alarm to sound, and an autonomous message. The alarm can be silenced by pressing the ACO push-button.

   Default for the alarm delay interval is 10 seconds. This can be changed to any interval between 0 and 30 seconds using the `ED-NE` command.

   If the alarm indication sequence does not occur, refer the problem to the installation group before continuing with this procedure.

5. Extract another SWCS circuit pack in the ACT state (refer to Chapter 2 for extracting circuit packs, if necessary).

   Wait for the alarm delay interval (up to 30 seconds). Wait for the MJ alarm LED and the red aisle lights to light, an alarm to sound, and an autonomous message. The alarm can be silenced by pressing the ACO push-button.

   If the alarm indication sequence does not occur, refer the problem to the installation group before continuing with this procedure.

6. Reinstall both SWCS circuit packs (refer to Chapter 2 for installing circuit packs, if necessary) and wait for the alarm lamps to go off (20 to 30 seconds).

   If the alarm lamps do not go off, refer the problem to the installation group before continuing to the next procedure.

Interbay (N-rate) Cables

N-rate cables in collocated interface bays use two different types of labels. One label type identifies the cable ends that connect to the interface module. This label is marked in the format Jn-ab (where **n** is the number of the connector 1-16 and **ab** is the N-rate cable AA-AS/BA-BS). The other label identifies the cable ends that connect to the SWIO Module. This label is marked in the format JnS-ab (where **n** is the number of the connector 1-12 and **ab** is the N-rate cable AA-AS/ BA-BS). For example, an N-rate cable ID identified in the DACS IV-2000 (512) database as A-C-J12 corresponds to a physical cable labeled J12-AC at the interface module end.

N-rate cables in Remote Complexes also use two different types of labels. One label identifies the cable that connects to the interface module. This label is marked in the format **Jn-a** (where **n** is the number of the connector 1-16 and **a** is the N-rate cable A-T). The other label identifies the cable that connects to the OPEX Module. This label is marked in the format **JnS-a** (where **n** is the number of the connector 1-16 and **a** is the N-rate cable A-T). For example, an N-rate cable ID identified in the DACS IV-2000 (256) database as C-J12 corresponds to a physical cable labeled J12-C at the interface module end and J12S-C at the OPEX Module end.

The following procedure is used to test the cables connecting the switch input/ output (SWIO) circuit packs in the Switch Bays to the SMUX, MUX, or SWIF circuit packs in the Interface Bays. To do this test, the SWIO, CLKDR, and interface circuit packs at each end of the cable must be provisioned and operational.

Specifying a range a-b-J1 through a-b-J16, where a is the letter denoting the side of the switch complex (A for left side cables, B for right side cables) and b is one of the allowed connector letter suffixes (A-S, excluding I, O, and Q), tests all N-rate connectors assigned to two DS1 Interface Modules (which can include one DS1 Interface-Protection Module) or one DS3 Interface-16 Module or a DS3 Interface-32 Module. To evaluate all N-rate cables serving a DS3 Interface-32 Module requires two input commands, one for connectors serving DS3 signals 1 through 15 and one for connectors serving DS3 signals 16 through 31.

To test all interbay cables for the system, begin with the equipped interface module having the lowest logical unit number and progress through all equipped interface modules until all modules have been tested.

⚠ CAUTION:
The 120V AC and the DC meter buzzers must **not** *be used for continuity checking of the ring and tip leads because of the 75 ohms impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-2), for more information, if necessary.*

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

1. Obtain cable numbers from cable diagram or office records, and begin with the equipped interface module with the lowest logical unit number.
2. For two DS1 Interface Modules or a DS1 Interface and a DS1 Interface-Protection Module combination or a DS3, Enhanced DS3, DS3 Clear-Channel, or STS1 Interface-16 Module, test the N-rate cable by entering the following command:

   `TEST-CABLE:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Switch Cable ID:
   `[A,B]-[A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S]-J1&&-J16`

   For a DS3 Interface-32 Module, test the N-rate cables by entering the following command twice, once for the N-rate cables of each module:

   `TEST-CABLE:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Switch Cable ID:
   `[A,B]-[A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S]-J1&&-J16`

NOTE:
The format of the N-rate cable ID corresponds to the physical labels on the cable. The format of this identifier is **a-b-Jn** where:

- **a** = a letter A or B
- **b** = a letter between A and S (excluding I, O, and Q)
- **n** = a number between 1 and 16

3. Check the output response. If the result of any test is `FAIL`, note the interface circuit pack(s) involved in the failed test and refer them to the installation group. (Refer to output message of the command `TEST-CABLE`, in the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual [AT&T 365-340-902].)

   The normal response contains two groups. Each group consists of eight lines of output, one for each N-rate cable connector, each of which indicates `PASS` for all four N-rate signals in each interface module connector.

4. Test each interface module in the frame according to the above procedure until you have completed the testing of all interbay cabling.

External Cables

Do *not* use this procedure to test cables that cannot be looped back at the far-end equipment toward the DACS IV-2000. These cables must be tested as part of the test of the far-end equipment. All of the DS1 ports to be tested must be in the IDLE-REL state. Use the `RTRV-STATE-T1` command to determine the state of the ports.

Perform external cable tests on all cable pairs connected to the DACS IV-2000 that can be looped back at the far-end equipment toward the DACS IV-2000 under test (output cable to input cable).

- To test cables terminating on a DS1 Interface Module, go to the next section titled "DS1 Interface Modules" (page 20-16).
- To test cables terminating on a DS3 Interface Module in a system having at least one DS1IF circuit pack, go to the section titled "DS3 Interface Modules" (page 20-17).
- To test cables terminating on an STS1 Interface-16 Module in a system having at least one DS1IF circuit pack, go to the section titled "STS1 Interface Modules" (page 20-18).
- To test cables in a system having DS3 interfaces (grooming applications) and connected to external multiplexing equipment such as the AT&T DDM-1000, go to the section titled "DS3 Interfaces" (page 20-18).

⚠ CAUTION:
The 120V AC and the DC meter buzzers must ***not*** *be used for continuity checking of the ring and tip leads because of the 75 ohms of impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-2), for more information, if necessary.*

DS1 Interface Modules

This procedure is used to test the cables terminating on DS1 Interface Modules.

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

1. Contact personnel at the far end and request a loopback at the far-end equipment on the cable pair under test. Once the personnel at the far end have looped back the cable pair under test, you can continue this procedure.

2. Test the external cables by entering the following command:

   `TEST-TRMSN-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port (connected to the cable under test) location:
   DS1 Interface Module location: `{1-64}-{1-8}-{1-28}`
   DS1 Interface-P Module location: `{1-64}-{1-7}-{1-28}`

   The test runs for five seconds and generates an autonomous `REPT TRMSN T1` *message reporting the results.*

   Wait for the transmission tests to pass.

3. If transmission test does *not* pass, to isolate problem to the cable or circuit pack, test the signal internally by entering the following command (with a loopback):

   `TEST-TRMSN-T1:`*[a]*`:`*b*`:,LPBKI;`

   Where:

   a = Target ID (optional)

   b = Same DS1 port location used in Step 2

   If it still does not pass, refer the problem to the installation group before continuing with this procedure.

4. After the tests pass, contact personnel at the far end and request that the loopback at the far-end equipment on the cable under test be removed.

5. Repeat this procedure for each remaining cable (terminating on the selected DS1 Interface Module) to be tested.

DS3 Interface Modules

This procedure is used to test the cables terminating on DS3 Interface Modules.

⚠ CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

1. Contact personnel at the far end and request a loopback at the far-end equipment on the cable under test. Once the personnel at the far end have looped back the cable under test, you can continue this procedure.
2. Test the external cables by entering the following command:

   `TEST-TRMSN-T1:`*[a]*`:`*b*`:,,`*e*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port (connected to the cable under test) location:
   DS3 Interface-32 Module location: `[1-64]-[1-31]-[1-28]`
   DS3 Interface-16 Module location: `[1-64]-[1-15]-[1-28]`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `[1-64]-[1-8]-[1-28]`
   DS1 Interface-P Module: `[1-64]-[1-7]-[1-28]`

   Test runs for five seconds and generates an autonomous `REPT TRMSN T1` *message reporting the results.*

   Wait for transmission tests to pass.

   If the transmission tests fail, refer the problem to the installation group before continuing with this procedure.
3. After the transmission tests pass, contact personnel at the far end and request that the loopback at the far-end equipment on the cable under test be removed.
4. Repeat this procedure for each remaining cable (terminating on the selected DS3 Interface Module) to be tested.

STS1 Interface Modules

This procedure is used to test the cables terminating on STS1 Interface Modules.

NOTE:
All EC-1 ports under test must have the EC1MAP set to VTFLOAT and VT1MAP set to ASYN. This condition is the default after provisioning STS1 Interface Modules.

1. Contact personnel at the far end and request a loopback at the far-end equipment on the cable under test. Once the personnel at the far end have looped back the cable under test, you can continue this procedure.
2. Test the external cables by entering the following command:

   `TEST-TRMSN-T1:`*[a]*`:`*b*`:,,`*e*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port (connected to the cable under test) location:
   STS1 Interface-16 Module location:
   DS1 port number: `[1-64]-[1-15]-[1-28]`
   VT1.5 group number: `[1-64]-[1-15]-[1-7]-[1-4]`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `[1-64]-[1-8]-[1-28]`
   DS1 Interface-P Module: `[1-64]-[1-7]-[1-28]`

   Test runs for five seconds and generates an autonomous `REPT TRMSN T1` *message reporting the results.*

   Wait for transmission tests to pass.

   If the transmission tests fail, refer the problem to the installation group before continuing with this procedure.
3. After the transmission tests pass, contact personnel at the far end and request that the loopback at the far-end equipment on the cable under test be removed.
4. Repeat this procedure for each remaining cable (terminating on the selected STS1 Interface Module) to be tested.

DS3 Interfaces

This procedure is used to test DS1 interfaces connected to remote multiplexing equipment (for example, DDM-1000).

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

1. Obtain a DS1 error rate test set.
2. Connect the test set transmitter to the input of the external multiplexer and the receiver to the output of the external multiplexer (see Figure 20-1).

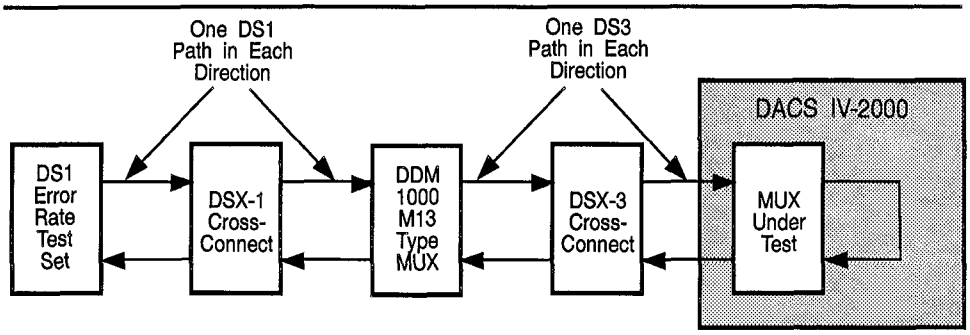


Figure 20-1. **External Cable Test (Only DS3 Interfaces)**

3. Make a one-way cross-connection between the input and output on the switch side by entering the following command:

   `ENT-CRS-T1:`*[a]*`:`*b*`,`*c*`:::1WAY;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports

   DS1 Interface-P Module: `{1-64}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-64}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-64}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-64}-{1-15}-{1-28}`
   STS1 Interface-16 Module:
   DS1 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

NOTE:
The port numbers must be the same, in effect looping back the port internal to the switch.

Optical Fiber Cables

If the system you are accepting contains one or two Remote Complexes, perform the procedures in this section to test the fiber-optic cable connections between the OUI and UIA/UIB circuit packs and OSWIO and OPEX circuit packs.

⚠ WARNING:
Before performing this procedure, you must be familiar with the warnings contained in the section titled "Optical Fiber Cables" (page 2-6).

Control Fiber Test

This procedure is used to test the control fiber cables between the High-Capacity Controller (HCC) Module and the Remote Unit Interface (RUI) Module.

⇒ NOTE:
To test the optical fiber, the both control complex must be in service and the Remote Complex must be provisioned. The Remote Unit Interface circuit packs do not have to be in service.

1. Test the optical fiber cables between the OUI and UIA/UIB circuit packs by entering the following command for each cable path:

   `TEST-FIBER::`*[a]*`:`*b*`:::`*e*`;`

   Where:

   a = Target ID (optional)

   b = OUI circuit pack location: `UI-{0,1}`

   e = UIA/UIB circuit pack location: `{ RUIA-{1,2}, RUIB-{1,2} }`

   This command tests the control fibers between an OUI side(s) and the associated Remote Complex. Free-format text associated with the `TEST-FIBER` command allows you to further isolate cabling and/or circuit pack problems. Refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902) for details. If any problems occur, refer them to the installation group before continuing with the next procedure.

Transmission Fiber Test

This procedure is used to test the fiber cables that connect the OSWIO circuit packs in the Switch Bays to the Optical Extension (OPEX) circuit packs in the OPEX Bay of a Remote Complex.

NOTE:
To execute this command, the SWIO and OPEX circuit packs at each end of the fiber cable must be provisioned and in the out-of-service (OOS) state (that is, no traffic is up).

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

NOTE:
The OPEX and OSWIO circuit packs have a one-to-one relationship. For example, OPEX-1-1 is connected to OSWIO-1-1 via the fiber optic cable.

1. Test the optical fiber cables for all OSWIO/OPEX pairs by entering the following command for each pair:

   `TEST-FIBER::`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIO circuit pack location: `SWIO-[1-4]-[1-16]`

   This command tests both directions of fiber between OPEX-1-1 and OSWIO-1-1.

2. If the test run in Step 1 fails, isolate the problem by entering the following command:

   `TEST-FIBER::`*[a]*`:`*b*`:: LPBK;`

   Where:

   a = Target ID (optional)

   b = SWIO circuit pack location: `SWIO-[1-4]-[1-16]`

   This test performs a loopback between the fiber transmitter and receiver. Loopback tests can be performed with a loopback connector on one end of the fiber 1000 feet from the OWIO circuit pack (long loopback test) or with the loopback connector on the OSWIO circuit pack itself (short loopback test). The test is the same in either case. If this test fails, the fiber optic connection or the OSWIO circuit pack is causing the problem. If this test passes, the OPEX circuit pack is causing the problem. In either case, refer the problem to the installation group before continuing.

Fan Assemblies

The default power source for the fan assembly (WP-92310L4 or ED-9C130-30) is the main power source. The fan assembly switches from the main to the auxiliary power source if the main power source shuts down. The fan assembly alarms if either the main or auxiliary power sources shut down.

The LED TEST button on the front panel of the fan assembly provides test capability of the fan assembly's LEDs to ensure they are in working order.

This procedure initializes the fan assembly and tests the main and auxiliary power alarm capabilities, power source switching, and LED functionality. This procedure is for acceptance testing for fan assemblies of new bay orders. Older fan assemblies can still be used in existing Remote Complex OPEX Bays.

NOTE:
The fan assembly provides constant cooling to the system by measuring the system impedance and setting the fan speed accordingly. Initialization of the fan assembly is required so that the fan assembly can learn about the system airflow impedance.

CAUTION:
It is important to perform the first seven steps with the system in its normal running condition to ensure constant cooling capability for the system. If the fan filter is removed or if airflow impedance around the system is changed in any way during initialization (for example, a cover is removed), the initialization will be bad. If this happens, the initialization (first seven steps of this procedure) must be run again. An initialization of the fan assembly cannot be stopped, it must be allowed to run to its completion and run again correctly.

Figure 20-2 shows the location of the fan assembly controls, fan filter, and air inlet.

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

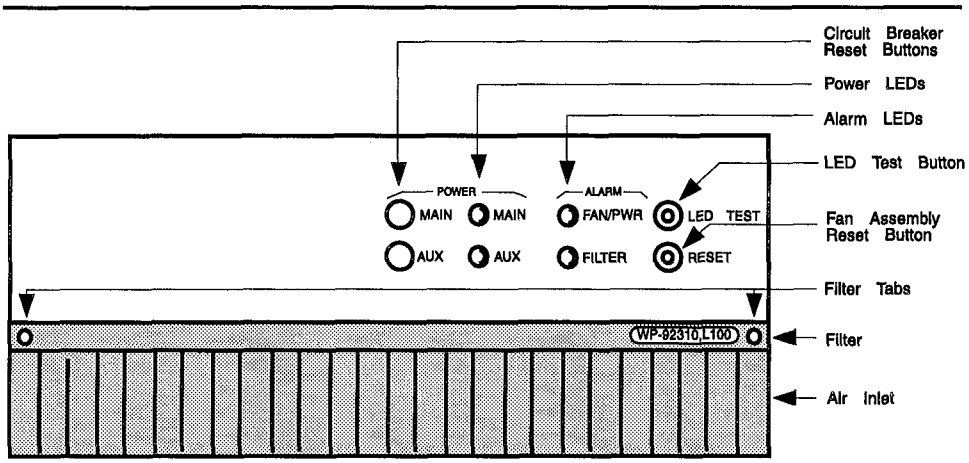


Figure 20-2. **WP-92310L4 or ED-9C130-30 Fan Assembly (Front View)**

1. Make sure there is no constriction of airflow around the system (no boxes or other obstructions around the air inlet of the fan assembly).
2. Make sure that a clean fan filter (WP-92310,L100) is present and installed properly.

   If the fan filter is missing or dirty, refer the problem to the installation group.
3. Make sure all covers are installed on the system.
4. Make sure all doors (if applicable) are closed, except as necessary for access to the RESET button on the fan assembly.
5. Press and hold the RESET button on the fan assembly. Refer to Figure 20-2, if necessary.

   After five seconds, the yellow FILTER LED starts blinking.
6. Continue holding the reset button until the FILTER LED begins blinking faster. Release the RESET button when the FILTER LED blinks faster.

   There is a two-minute delay until the initialization process begins. During this delay, you must perform the next step.

7. Close all doors or covers that were opened for access to the RESET button.

   When the FILTER LED begins blinking slow again (about two minutes), initialization has begun. The initialization process takes between eight and 30 minutes, depending on the system's airflow impedance, to complete. Initialization ends when the FILTER LED stops blinking. After initialization, the green MAIN and the green AUX power LEDs are lit and the FAN/PWR and the FILTER LEDs are not lit.

   The remainder of this procedure tests the main and auxiliary power alarm capabilities, power source switching, and LED functionality.

8. Pull the main fuse from the Fuse and Alarm panel at the top of the switch bay for the fan assembly being tested (refer to Table 20-3).

   The red FAN/PWR LED on the fan assembly turns on and the system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=1m1m FILE= DP=0\",
    c,
    \"409177c0 04010000 20830001 00000000 00000000 0fffffff
     ff000000\""
    /* LOSS OF MAIN POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:MJ,FANMAIN,NSA,,,NEND::,NIMAN
;
```

   Where:

   b = Autonomous sequence number: `001-999`

   c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

   If the alarm LED does not turn on, refer the problem to the installation group.

9. Replace the main fuse pulled in Step 8 in the Fuse and Alarm panel.

Table 20-3. **Fuse Chart for Fan Assemblies in Switch Complex and Collocated Interface Bays**

Power Source	Fuse Panel in Bay 5				Fuse Panel in Bay 10			
	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
Main	AD6	AC6	AB6	AA6	AD6	AC6	AB6	AA6
Auxiliary	BD6	BC6	BB6	BA6	BD6	BC6	BB6	BA6

Power Source	Fuse Panel in Bays 11 and 13		
	Bay 11	Bay 12	Bay 13
Main	AA4	AA6	AA5
Auxiliary	BA4	BA6	BA5

Power Source	Fuse Panel in Bay 14				Fuse Panel in Bay 19			
	Bay 15	Bay 16	Bay 17	Bay 18	Bay 20	Bay 21	Bay 22	Bay 23
Main	AA6	AB6	AC6	AD6	AA6	AB6	AC6	AD6
Auxiliary	BA6	BB6	BC6	BD6	BA6	BB6	BC6	BD6

Note: All load fuses are 10A and all indicator fuses are 0.5A

Table 20-4. **Fuse Chart for Fan Assemblies in Remote Complexes**

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—

Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8 , and 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.

Duplex Power (ED-9C114-30 Fuse Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5

Note: All fuses are 10A with a red alarm lamp to indicate failure.

10. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 20-2, if necessary.

    The system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=coie FILE= DP=0\",
    c,
    \" 40974156 04010000 2083000f 00000000 00000000 0ff0ffff
     ff000000\""
    /* LOSS OF MAIN POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANMAIN,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

    c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

    The FAN/PWR LED turns off.

    If the LED does not turn off, refer the problem to the installation group.

11. Pull the auxiliary fuse for the fan assembly being tested from the Fuse and Alarm panel (refer to Table 20-3).

    The red FAN/PWR LED on the fan assembly turns on and the system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDBAD RC= SEQ= PROC=fafa FILE= DP=0\",
    c,
    \"40974074 04010000 2083000e 00000000 00000000 0ffeffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:MJ,FANAUX,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

    c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

12. Replace the auxiliary fuse pull in Step 11 in the Fuse and Alarm panel.
13. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 20-2, if necessary.

    The system responds with the following messages:

```
    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT EXCPTN SYS
    "CPU-{0,1}:INT,\"ECASE=EBDGOOD RC= SEQ= PROC=mpis FILE= DP=0\",
    c,
    \"407655b6 04010000 2083000a 00000000 00000000 0ff5ffff
     ff000000\""
    /* LOSS OF AUXILIARY POWER TO FAN */
;

<


    TID#0-0 YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    c:CL,FANAUX,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

    c = Fan location: `FAN-{1-4,6-9,11-13,15-18,20-23}`

    The FAN/PWR LED turns off.

    If the LED does not turn off, refer the problem to the installation group.

14. Press and release the LED TEST button on the fan assembly. Refer to Figure 20-2, if necessary.

    All four LEDs on the fan assembly turn off for two seconds, turn on for two seconds and return to normal operating state (that is, the green MAIN and AUX POWER LEDs are on and the FAN/PWR and FILTER alarm LEDs are off).

    If the alarm LEDs do not turn off and/or the power LEDs do not turn on, refer the problem to the installation group.

Protection Switch Function

The following procedure is used to check the protection switch function of the DACS IV-2000 frame. It simulates a failure by extracting a DS1IF, MUX, or SMUX circuit pack. If the protection switch function is working, the protection circuit pack is switched into service for the missing circuit pack.

NOTE:
If you extract and install the same circuit pack more than four times in 10 minutes (default), the protection feature becomes locked. To unlock protection, you must enter the following command:

`ALW-SW-EQPT:`*[a]*`:`*b*`::WKG;`

Where:

a = Target ID (optional)

b = MUX, SMUX, or SWIF circuit pack location:
`{ SWIF-{1-64}-{1-8}, MUX-{1-64}-{1-31}, SMUX-{1-64}-{1-16} }`

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections unless otherwise directed by another procedure or the system administrator.

1. Choose a service DS1IF, MUX, or SMUX port pair. Cross-connect a port in each circuit to each other by entering the following command:

   `ENT-CRS-T1:`*[a]*`:`*b*`,`*c*`:::1WAY;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports
   DS1 Interface-P Module: `{1-64}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-64}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-64}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-64}-{1-15}-{1-28}`
   STS1 Interface-16 Module:
   DS1 port number: `{1-64}-{1-15}-{1-28}`
   VT1.5 group number: `{1-64}-{1-15}-{1-7}-{1-4}`

2. Extract one of the circuit packs selected in Step 1 containing the cross-connected path. Refer to Chapter 2 for extracting circuit packs, if necessary.

NOTE:
Extracting a circuit pack without first switching the circuit pack to protection is not standard practice and leads to switch times greater than 60 ms.

3. Determine if all operations switched to the protection circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX, SMUX, or DS1IF circuit pack location:
   `{ DS1IF-{1-64}-{1A-8B}, MUX-{1-64}-{1-31},`
   `SMUX-{1-64}-{1-16} }`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX, SMUX, or SWIF circuit pack location:
   `{ DS1IF-{1-64}-{1A-8B}, MUX-{1-64}-{1-31},`
   `SMUX-{1-64}-{1-16} }`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, OOS, PNDG,` or `POS`

4. Check to see if all operations switched.

   Operations switched if the output message contains OOS and the green ACT LED on the DS1RY or MUXPS circuit packs are lit. If this does not occur, refer the problem to the installation group.

5. Reinstall the circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

6. Repeat Steps 2 and 3 for the other DS1IF, MUX, and SMUX circuit pack associated with the cross-connection made in Step 1.

7. Disconnect the cross-connection made in Step 1 by entering the following command:

   `DLT-CRS-T1:[a]:b,c:::1WAY;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports

   DS1 Interface-P Module: `{1-64}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-64}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-64}-{1-31}-{1-28}`
   DS3 or STS1 Interface-16 Module: `{1-64}-{1-15}-{1-28}`

8. Repeat this procedure for all other service DS1IF, MUX, and SMUX circuit packs.

Alarm and Telemetry Outputs

If the DACS IV-2000 is not connected to the office alarm and telemetry systems, do not perform this procedure.

The following procedure is used to test alarm and telemetry outputs.

CAUTION:
This procedure must never be performed on a system that is in service with established cross-connections.

1. Extract one SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
2. If the yellow MN LED on the status panel is lit, and the minor office alarm is sounding, press the ACO push-button on the status panel.

   If these conditions do not occur, refer the problem to the installation group before proceeding.
3. Wait for the minor office alarm to stop sounding (up to 30 seconds) and contact the central telemetry observation point to see if the `SWCS Fail NSA` and `SWCS Protection Switch Active` telemetry scan points (point 9 and point 33 of the summary scan points) was detected.

   If the scan point is not activated, there is a problem with the connection or with the telemetry system. Refer the problem to the installation group.

   If the alarm does not stop, refer the problem to the installation group.

4. If the SWCS Fail NSA and SWCS Protection Switch Active telemetry scan points are activated, extract a second SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. If the red MJ LED on the status panel is lit, and the major office alarm is sounding, press the ACO push-button on the status panel.

   If these conditions do not occur, refer the problem to the installation group before proceeding.
6. Wait for the major office alarm to stop sounding (up to 30 seconds) and contact the central telemetry observation point to check the SWCS Fail SA telemetry scan point (point 8 of the summary scan points).

   If the scan point is not activated, there is a problem with the connection or with the telemetry system. Refer the problem to the installation group.

   If the alarm does not stop, refer the problem to the installation group.
7. Reinstall the two SWCS circuit packs that you unplugged earlier in this procedure. Refer to Chapter 2 for installing circuit packs, if necessary.
8. Wait for the major and minor office alarms to clear, and contact the central telemetry observation point to make sure the telemetry scan points (8, 9, 33) are no longer activated.

   The alarms take up to 30 seconds to clear.

   If they do not clear, refer the problem to the installation group.

Emergency Power Removal/Restoral

21

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Contents

Emergency Power Removal/Restoral

21

This chapter consists of procedures required for removing and restoring -48V power from/to the DACS IV-2000. Removing power results in a total loss of all transmission through the system, but may be necessary to conserve office battery supply or to allocate battery supply elsewhere to minimize service loss in the network. Restoring power may be necessary to recover from a planned removal of power, or an unplanned loss of -48V power due to natural disaster, power equipment failure, etc.

CAUTION:
These procedures must only be performed if instructed to due so by the system administrator.

CAUTION:
The person performing the procedures in this chapter must be properly trained and be very familiar with the DACS IV-2000 system architecture and command and message set.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (512) Release 5.0 Commands and Messages* manual (AT&T 365-340-902).

Emergency Power Removal

This procedure is used to remove the -48V power from the DACS IV-2000. Removing power results in a total loss of all transmission through the system, but may be necessary to conserve office battery supply or to allocate battery supply elsewhere to minimize loss in the network.

This procedure takes about 1.5 hours to complete. The first 30 minutes is allowed for visual and operational checks of the power equipment and the DACS IV-2000. The database backup takes up to 30 minutes. The power down procedure takes up to 30 minutes to complete. These time estimates are based on one installer performing the procedure.

NOTE:
If any of the steps specified in this procedure cannot be completed as indicated, contact the system administrator or next level of support for assistance.

CAUTION:
*This procedure has a **high** service risk rating, since there is a service interruption to the end customer. This procedure is intended for use in emergency situations only. This procedure has a **low** implementation risk rating, since there is **no** potential service loss if this procedure is not implemented immediately. This procedure can be implemented at any time as needed.*

CAUTION:
The proper alarm monitoring centers must be notified prior to executing this procedure, since system alarms will occur during the procedure.

CAUTION:
All standard practices concerning electrical-static discharge (ESD) must be followed whenever performing any activity on the DACS IV-2000.

1. If it is not already done, connect a local communications terminal to one of the TTY1-1 or TTY2-1 connectors on the status panel (provided no connections are made to the link on the back of the frame) by referring to the section titled "Adding a Terminal to a Snider Link" (page 9-21).

CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors or both TTY2-1 connectors at the same time.

NOTE:
Any equivalent terminal can be used as long as the options are set accordingly, and the terminal interface is EIA-232-D.

2. If it is not already done, connect a printer to the terminal used in Step 1 by referring to Steps 2 and 3 of the section titled "Adding a Printer in Tandem With a Terminal" (page 9-24).
3. Verify that the printer is ready and properly equipped (power is on, paper and ribbon are installed, etc.). If the printer is not ready or properly equipped, notify the system administrator or next level of support.
4. Retrieve the state of the main controller (MC) by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

   From the output responses, determine the state. A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "MC:f"
;
```

   Where:

   f = State: { IS, OOS-FLT, OOS-MCOND, OOS-MTCE }

   If the state of the MC is OOS-FLT, refer to the section titled "Prioritizing Alarms" (page 15-12) to clear all failures before continuing with this procedure. If the state of the MC is OOS-MCOND or OOS-MTCE, continue with Step 5. Otherwise (MC is in the IS state), continue with Step 7.
5. Restore the MC to service by entering the following command:

   `RST-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)
6. Verify that the MC is in the IS state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:MC;`

   Where:

   a = Target ID (optional)

   If the MC is not in the IS state, contact the system administrator or next level of support for assistance.

7. Verify that there are no alarms on the DACS IV-2000 by entering the following command:

   `RTRV-ALM-COM:` *[a]*`;`

   Where:

   a = Target ID of frame with alarm(s)

   If no alarms are present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If there are alarms present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :NTFCNCDE,CTYPE,SRVEFF */
   " :c,d,e"
;
```

   Where:

   c = Notification code: `{ CR, MJ, MN }`

   d = Condition type: `{ FAC, INT, GP }`
   The value `GP` is specified for major or minor alarms.

   e = Service affecting: `{ NSA, SA }`

   If there are any alarms present, refer to the section titled "Prioritizing Alarms" (page 15-12) to clear all alarms before continuing with this procedure. If there are no alarms, continue with Step 8.

8. Back up the system database by referring the section titled "Backing Up Database to SEC Disk" (page 8-34).

9. Verify that there are no alarms on the DACS IV-2000 by entering the following command:

   `RTRV-ALM-COM:` *[a]*`;`

   Where:

   a = Target ID of frame with alarm(s)

   If no alarms are present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

If there are alarms present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :NTFCNCDE,CTYPE,SRVEFF */
   ": c, d, e"
;
```

Where:

c = Notification code: { CR, MJ, MN }

d = Condition type: { FAC, INT, GP }
The value GP is specified for major or minor alarms.

e = Service affecting: { NSA, SA }

If there are any alarm present, refer to the section titled "Prioritizing Alarms" (page 15-12) to clear all alarms before continuing with this procedure. If there are no alarms, continue with Step 10.

10. Remove the MC from service by entering the following command:

    RMV-EQPT:*[a]*:MC;**

    Where:

    a = Target ID (optional)

    This command takes up to one minute to complete. Wait for the COMPLD *response before continuing with this procedure.*

11. Partially extract all 18 PWRJ circuit packs in the three Switch Power Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.

CAUTION:
Transmission on the system is lost after partially extracting the PWRJ circuit packs.

12. For Remote Complexes, perform the following procedure:

    a. Partially extract the two PWRF circuit packs in the RUI Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

    b. Partially extract the four PWRA circuit packs in the OPEX Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

    c. Partially extract the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

13. Partially extract all of the PWRE circuit packs in both the collocated and Remote Complex Interface Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.

14. At this point, power may be removed from the DACS IV-2000 by removing the fuses or switching the circuit breakers to off at the BDFB both in the Switch Complex and associated Remote Complexes.

Emergency Power Restoration

This procedure is used to restore the -48V power to the DACS IV-2000 from the battery distribution feeder board (BDFB). Power restoration I is used to recover from a planned removal of power, or an unplanned loss of -48V power due to natural disaster, power equipment failure, etc.

This procedure takes about one hour to complete. The first 30 minutes is allowed for visual and operational checks of the power equipment and the DACS IV-2000. The power-up sequence takes up to 30 minutes to complete. These time estimates are based on one installer performing the procedure.

NOTE:
If any of the steps specified in this procedure cannot be completed as indicated, contact the system administrator or next level of support for assistance.

CAUTION:
*This procedure has a **high** service risk rating, since there is a service interruption to the end customer. This procedure is intended for use in emergency situations only. This procedure has a **low** implementation risk rating, since there is **no** potential service loss if this procedure is not implemented immediately. This procedure can be implemented at any time as needed.*

CAUTION:
The proper alarm monitoring centers must be notified prior to executing this procedure, since system alarms will occur during the procedure.

CAUTION:
All standard practices concerning electrical-static discharge (ESD) must be followed whenever performing any activity on the DACS IV-2000.

1. If it is not already done, connect a local communications terminal to one of the TTY1-1 or TTY2-1 connectors on the status panel (provided no connections are made to the link on the back of the frame) by referring to the section titled "Adding a Terminal to a Snider Link" (page 9-21). Set the baud rate of the terminal to the initial system value of the DACS IV-2000.

CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors or both TTY2-1 connectors at the same time.

NOTE:
Any equivalent terminal can be used as long as the options are set accordingly, and the terminal interface is EIA-232-D.

2. If it is not already done, connect a printer to the terminal used in Step 1 by referring to Steps 2 and 3 of the section titled "Adding a Printer in Tandem With a Terminal" (page 9-24).
3. Verify that the printer is ready and properly equipped (power is on, paper and ribbon are installed, etc.). If the printer is not ready or properly equipped, notify the system administrator or next level of support.
4. Partially extract all of the circuit packs in the High-Capacity Controller Module (two CPUs, four MTCs, two SSCs, two ECIs, four SCIs, and two UIs). Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Partially extract the 18 PWRJ circuit packs in the three Switch Power Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.
6. For Remote Complexes, perform the following procedures:
    a. Partially extract the two PWRF circuit packs in the RUI Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
    b. Partially extract the four PWRA circuit packs in the OPEX Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
    c. Partially extract the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
7. Partially extract all of the PWRE circuit packs in both collocated and Remote Complex Interface Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.
8. Apply power to the system by installing the fuses or switching the circuit breakers to ON at the BDFB both in the Switch Complex and associated Remote Complexes.
9. Install all of the PWRE circuit packs in both the collocated and Remote Complex Interface Modules. Refer to Chapter 2 for installing circuit packs, if necessary.

10. Install the 18 PWRJ circuit packs in the three Switch Power Modules. Refer to Chapter 2 for installing circuit packs, if necessary.
11. For Remote Complexes, perform the following procedure:
    a. Install the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.
    b. Install the four PWRA circuit packs in the OPEX Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.
    c. Install the two PWRF circuit packs in the RUI Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install all of the circuit packs in the High Capacity Controller Module (two CPUs, four MTCs, two SSCs, two ECIs, four SCIs, and two UIs). Refer to Chapter 2 for installing circuit packs, if necessary.
13. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 20 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 8-7).

Alarm, Scan, and Control Points

A

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Contents

Alarm, Scan, and Control Points

A

This appendix is provided to describe the interface between the DACS IV-2000 and telemetry operations systems (OSs). The AS&C points are used with administrative links (CILINKs 1-4 and 2-4). CILINKs 1-4 and 2-4 support the TABS (telemetry asynchronous block serial) protocol as defined in AT&T Compatibility Bulletin No. 149 entitled *Maintenance Standards for Digital Transmission Standards, Issue 3*. TABS protocol uses a polling format between the telemetry system and the DACS IV-2000 with the telemetry system initiating all communications by sending a request message to the DACS IV-2000 during each poll cycle. The system responds by sending the surveillance (or scan) point to the telemetry remote. The TABS protocol supports both point-to-point and multipoint architectures. CILINKs 1-4 and 2-4 are used as a dedicated links. When using a General Telemetry Processor (GTP), the GTP must be connected to link 4 of the master ECI circuit pack at all times. If both ECI circuit packs are available, ECI-1 is the master ECI on system reset.

Types of AS&C Points

Point is a term which is used to describe a single element of binary information. Physically, an AS&C point can be a single bit position in a serial telemetry message or it can be a discrete relay contact closure. Functionally, three distinct classes of AS&C points exist as follows:

- Alarm Points — provide the telemetry remote with information concerning alarm conditions existing within the DACS IV-2000. This information is available as both dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 to the telemetry remote) and also as a set of discrete relay closures.
- Scan Points — provide the telemetry remote with status information concerning the DACS IV-2000. This information is available as dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 to the telemetry remote).
- Control Points — provide the telemetry remote with operational control of certain aspects of the DACS IV-2000. This information is available as dedicated binary bit positions in the telemetry messages (received by the DACS IV-2000 from the telemetry remote).

Alarm Points via Relay Closures

Alarm points are provided, through relay closures, to telemetry remote equipment accepting discrete inputs (for example, the General Telemetry Processor [GTP]). The relay closures provide the same alarm information to the OS as is available locally through the office alarms. The DACS IV-2000 software supports relay closures for critical, major, and minor alarms. The conditions for activating each type of alarm point are:

- Critical Alarm (CR) — is set on the occurrence of a severe, service-affecting condition which requires immediate corrective action regardless of time-of-day or day-of-the-week.
- Major Alarm (MJ) — is set whenever there are one or more service-affecting failures or whenever failures which can mask service-affecting failures (for example, main controller failures).
- Minor Alarm (MN) — is set whenever there are one or more non-service-affecting failures exist, or when certain manually initiated functions (for example, manual protection switches are in effect).

Scan and Control Displays

The serial telemetry data is broken down into logical groups of 64 points each, called *displays*. This grouping, in general, conforms to the manner in which the data is shown on a terminal, with one display presenting a single terminal screen full of data. There are two types of displays:

- Scan — transmitted by the DACS IV-2000, consists of combinations of alarm and scan points. Scan point indications for momentary conditions (for example, an intermittent failure) are stretched to a minimum duration of

20 seconds to ensure that the conditions are sensed by the telemetry system. The 64th scan point in a display is reserved to indicate to the telemetry remote that serial link errors have occurred.

- Control — received by the DACS IV-2000, consists of control points from a remote site. Through the use of control points, certain aspects of system operation can be controlled by a remote site.

The DACS IV-2000 has the flexibility to support three levels of display sets:

- Summary — providing system level alarms and status identifying:
  - — Type of equipment or facility failure
  - — Presence of a protection switch or of a inhibition of protection switching (that is, lock-out) in a specific type of module

  This set does not indicate the specific facilities, equipment, or modules affected. The primary application for the summary set is as a backup source of alarm data when a message Operations System [OS] (for example, SCCS) is used as the primary source of alarm data.
- Detailed — providing expanded information which identifies the particular module(s) experiencing a problem and usually containing information to isolate a failure to the circuit pack level. This set also allows remote control of manual protection switching and the inhibition or the locking of protection switching. Selecting the detailed set automatically includes the transmission of the summary set.
- Extended Facility — providing additional circuit pack and interface port information, particularly on the DS1 facility level, on the VT1.5 facility level, on out-of-frame (OOF) conditions on DS2s within DS3 facilities, on DS3 input format mismatches, and on EC-1 facility conditions. For STS1 (modules 1-32), DS3 (modules 9-32), and DS1 (modules 33-64) Interface Modules there are control points included in the extended facility set. In addition, for DS3 (modules 9-32) and DS1 (modules 33-64) Interface Modules and Switch Input/Output (modules 3 and 4) Modules, the extended facility set includes detailed set information (scan and control points). Selecting the extended facility set automatically includes the transmission of the summary and detailed sets. The choice of alarm sets is made by you when the telemetry link (CILINK-1-4 and CILINK-2-4) is provisioned. The display sets are described in the following sections.

Summary Display Set

The summary display set provides the OS with data on the severity of the failure and the type of module that indicates the failure. Failures are identified as either non-service affecting (NSA) or service affecting (SA) as specified in Bell Communications Research TA-NWT-000474, Issue 1, or without an indication of the specific facilities affected or the circuit packs responsible for the failure. The main controller failure (MC:FAIL or OOS) point indicates failure(s) in the control complexes (CCs) circuit packs are preventing the execution of system control functions. The point HCC:FAIL or OOS indicates a failure with CC-0 and/or CC-1. Failure of one of the ECI circuit packs is indicated by ECI:FAIL or OOS. Failures of the primary (PRI) and secondary (SEC) backup memories or the secondary storage controller (SSC) are indicated with separate alarm points and are therefore not included in the MC FAIL alarm point. The `SYNC Reference:FAIL NSA` point indicates the presence of a NSA failure of one or both synchronizer timing references.

Scan points indicate if any protection groups are switched to protection or have protection locked (either manually or as a result of an autolock). The type of module is specified, but not the specific protection group affected. If the equipment is in an abnormal state as a result of a manual control (for example, locking or forcing of protection switching), this is indicated by setting a scan point for *manual function initiated.* Failure of any frame audit that results in an autonomous message over the Snider and X.25 links also sets the Frame Audit Failure scan point for one polling cycle.

No control points are associated with the summary set. Table A-1 lists the summary set scan points.

Table A-1. **Summary Display Set Scan Points**

Display †	Point No.	Type *	Description
0	1	A	MC Fail or OOS
	2	A	PRI Fail or OOS
	3	A	SEC Fail or OOS
	4	A	MC/OPEX/RUI Power Fail SA
	5	A	MC/OPEX/RUI Power Fail NSA
	6	A	Clock Hardware Fail SA
	7	A	Clock Hardware Fail NSA
	8	A	SWCS Fail SA
	9	A	SWCS Fail NSA
	10	A	SWIO/OPEX Fail SA
	11	A	SWIO/OPEX Fail NSA
	12	A	DS1 Interface Module UC Fail or OOS
	13	A	DS1 Interface Module Power Fail
	14	A	HCC/RUI Fail or OOS
	15	A	DS1 Interface Module CLKDR Fail SA
	16	A	DS1 Interface Module CLKDR Fail NSA
	17	A	DS1IF/SWIF/DS1RY Fail SA
	18	A	DS1IF/SWIF/PMGR1 Fail NSA
	19	A	Incoming DS3/STS-1 Fail
	20	A	Multiple Incoming DS3/STS-1 Fail
	21	A	DS3/STS1 Interface Module UC Fail or OOS
	22	A	DS3/STS1 Interface Module Power Fail
	23	A	ECI Fail or OOS
	24	A	DS3/STS1 Interface Module CLKDR Fail SA
	25	A	DS3/STS1 Interface Module CLKDR Fail NSA
	26	A	MUX/SMUX Fail SA

* A = Alarm
S = Scan

† There is one display per system.

Table continued on next page.

Table A-1. **Summary Display Set Scan Points (Continued)**

Display †	Point No.	Type *	Description
0	27	A	MUX/PMGR1/SMUX Fail NSA
	28	A	Fan Fail
	29	A	Switch Module Manual Function Initiated
	30	A	DS1 Interface Module Manual Function Initiated
	31	A	DS3/STS1 Interface Module Manual Function Initiated
	32	A	Time of Day Clock Fail
	33	S	SWCS Protection Switch Active
	34	S	SWCS Protection Switch Locked
	35	S	SWCS Protection Switch Auto-Locked
	36	S	SWIO Protection Switch Active
	37	S	SWIO Protection Switch Locked
	38	S	SWIO Protection Switch Auto-Locked
	39	A	SYNC Reference Fail NSA
	40	S	DS1IF Protection Switch Active
	41	S	DS1IF Protection Switch Locked
	42	S	DS1IF Protection Switch Auto-Locked
	43	S	Incoming DS1 Fail
	44	S	Multiple Incoming DS1s Fail
	45	-	Unassigned
	46	S	MUX/SMUX Protection Switch Active
	47	S	MUX/SMUX Protection Switch Locked
	48	S	MUX/SMUX Protection Switch Auto-Locked
	49	S	CILINK-{1,2}-{7,8} OOS or Lock-Out
	50	S	CILINK-1-4 OOS or Lock-Out
	51	S	Transfer to SEC Fail

* A = Alarm
S = Scan

† There is one display per system.

Table continued on next page.

Table A-1. **Summary Display Set Scan Points (Continued)**

Display †	Point No.	Type *	Description
0	52	A	Frame Audit Fail
	53	S	CILINK-1-1 OOS or Lock-Out
	54	S	CILINK-1-2 OOS or Lock-Out
	55	S	CILINK-1-3 OOS or Lock-Out
	56	S	CILINK-1-5 OOS or Lock-Out
	57	S	CILINK-1-6 OOS or Lock-Out
	58	S	CILINK-2-1 OOS or Lock-Out
	59	S	CILINK-2-2 OOS or Lock-Out
	60	S	CILINK-2-3 OOS or Lock-Out
	61	S	CILINK-2-4 OOS or Lock-Out
	62	S	CILINK-2-5 OOS or Lock-Out
	63	S	CILINK-2-6 OOS or Lock-Out
	64	-	Reserved

* A = Alarm
S = Scan

† There is one display per system.

Detailed Display Set

Most applications that use the telemetry AS&C points as the primary source of maintenance data need more detail than is provided by the summary set. The following paragraphs describe the functions provided by the detailed AS&C points and include tables with the specific scan and control points needed for each product.

Most equipment failures are identified by the specific affected circuit pack. The failures are specified as either NSA or SA as specified in Bell Communications Research TA-NWT-000474, Issue 1. An NSA alarm indicates the failure of a circuit pack that does not affect service, such as a controller, or a failure that resulted in a successful protection switch to restore service. In the latter case, a scan point is provided to indicate the state of the protection switch. SA alarms indicate failures that result in service being lost.

The DACS IV-2000 can distinguish between equipment failures and incoming facility failures. Incoming DS3 failures are assigned individual alarm points, while incoming DS1 failures are indicated by a multiple scan point that specifies the affected module but not the individual DS1.

Terminating DS3 facilities have four alarm points[1] per DS3. The first alarm point indicates a loss-of-signal (LOS) or high bit error rate (BER) condition. The BER can be determined through either bipolar violations (BPVs), which is the default, or by monitoring DS3 parity errors. The alarm point is set when the BER exceeds the threshold of 10^{-3} (default) through 10^{-9} as provisioned. The second alarm point indicates an out-of-frame (OOF) condition. Under LOS or when the BER is high enough to cause an OOF, both alarm points are set. The other two alarm points indicate detection of incoming DS3 alarm indication signal (AIS) and detection of incoming DS3 idle signal.

The DS1 facilities associated with the DS1 Interface Module have two scan points indicating that one or more of the incoming DS1 signals to the module have either an LOS condition or a BER that exceeds the threshold of 10^{-3} (default) through 10^{-9} as determined by monitoring BPVs.

Control points allow manual protection switching of individual circuit packs and permit inhibiting (lockout) protection switching. Three controls are provided:

- Make protection switch — transfers service to the protection circuit pack if it is available and good and locks it in that state. This control has no effect if service on the indicated circuit pack is already on protection, if protection is unavailable, or if protection is inhibited (locked).
- Lock protection — inhibits service from being transferred to the protection circuit pack. In this state, no automatic switch to protection occurs if the service circuit pack is diagnosed as bad.
- Unlock protection — allows manual or automatic protection switching on the indicated circuit pack. If a manual protection switch has been made on a *good* circuit pack, the unlock control allows the DACS IV-2000 to release the switch. No control point is provided to force a circuit pack into the unprotected state if it is in the protected state and diagnosed as bad.

For each control, a corresponding scan point is provided to allow verification that the action specified by the control was completed.

Tables A-2 through A-14 define the scan and control points required for each module or assembly of the DACS IV-2000. Scan points are divided by type into alarm and scan points, and alarm points are further designated as either NSA or SA.

HCC, SYNC, SWIO, SWCS, RUI, and OPEX Modules

Tables A-2 and A-3 list the detailed High Capacity Controller, Synchronizer, Switch Input/Output, Switch Center Stage, Remote Unit Interface, and Optical Extension Module scan and control points, respectively.

1. An additional alarm point is provided in the extended display set for DS3 format mismatches. Refer to the section titled "Extended Facility Display Sets" (page A-29) for more information on the extended display sets.

Table A-2. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points**

Display †	Point No.	Type *	Description
1	1	A	MC Fail
	2	A	PRI-1 Fail
	3	A	SEC Fail
	4	A	OPEX-1 Power Fail SA
	5	A	OPEX-1 Power Fail NSA
	6	A	RUI-1 Power Fail NSA
	7	A	CLKGN Fail SA
	8-9	A	CLKGN-{0,1} Fail NSA
	10	A	Frame Audit Fail
	11	A	Fan-1 Fail
	12-27	A	SWIO-1-{1-16} Fail NSA
	28-43	A	SWIO-2-{1-16} Fail NSA
	44	A	Switch Module Manual Function Initiated
	45	A	Time of Day Clock 1 Fail
	46	A	CC-1 Fail or OOS
	47	A	Time of Day Clock 2 Fail
	48	A	CC-0 Fail or OOS
	49	S	CILINK-1-7 OOS-MTCE
	50-51	S	CLKGN-{0,1} Active
	52	S	CILINK-1-7 OOS-FLT, Protocol, or Lock-Out
	53	S	Transfer to SEC Fail
	54	S	CILINK-1-1 OOS-MTCE
	55	S	CILINK-1-2 OOS-MTCE
	56	S	CILINK-1-3 OOS-MTCE
	57	S	CILINK-1-5 OOS-MTCE

* A = Alarm
S = Scan

† There are six displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-2. Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points (Continued)

Display †	Point No.	Type *	Description
1	58	S	CILINK-1-6 OOS-MTCE
	59	S	CILINK-1-4 OOS-MTCE
	60-61	A	ECI-{1,2} Fail or OOS
	62-63	S	SYNC-{0,1} Active
	64	-	Reserved
2	1-16	A	SWIO--1-{1-16} Fail SA
	17-32	A	SWIO--2-{1-16} Fail SA
	33	A	SWCS-1-16 Fail SA
	34-39	S	CILINK-1-{1-6} OOS-FLT, Protocol, or Lock-Out
	40-45	S	CILINK-2-{1-6} OOS-MTCE
	46-51	S	CILINK-2-{1-6} OOS-FLT, Protocol, or Lock-Out
	52	A	TBS3 Fail SA
	53-54	A	TBS3-{0,1} Fail NSA
	55	A	DPLL Fail SA
	56-57	A	DPLL-{0,1} Fail NSA
	58-59	-	Unassigned
	60	S	CILINK-1-8 OOS-MTCE
	61	S	CILINK-1-8 OOS-FLT, Protocol, or Lock-Out
	62	-	Unassigned
	63	A	PRI-2 Fail or OOS
	64	-	Reserved
3	1-16	S	SWIO-1-{1-16} Protection Switch Active
	17-32	S	SWIO-2-{1-16} Protection Switch Active
	33-35	A	Fan-{2-4} Fail

* A = Alarm
S = Scan

† There are six displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-2. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points (Continued)**

Display †	Point No.	Type *	Description
3	36	A	Fan-6 Fail
	37-38	A	DS1TX-{0,1} Fail NSA
	39	S	CILINK-2-7 OOS-MTCE
	40	S	CILINK-2-7 OOS-FLT, Protocol, or Lock-Out
	41	A	SYNCPRI-0 (DS1TX-0) Primary Reference Fail NSA
	42	A	SYNCSEC-0 (DS1TX-0) Secondary Reference Fail NSA
	43	A	SYNCPRI-1 (DS1TX-1) Primary Reference Fail NSA
	44	A	SYNCSEC-1 (DS1TX-1) Secondary Reference Fail NSA
	45	S	CILINK-2-8 OOS-MTCE
	46	S	CILINK-2-8 OOS-FLT, Protocol, or Lock-Out
	47	A	SYNC Mode Fail NSA
	48-50	A	Fan-{7-9} Fail
	51-53	A	Fan-{11-13} Fail
	54-57	A	Fan-{15-18} Fail
	58-61	A	Fan-{20-23} Fail
	62-63	S	Reserved
	64	-	Reserved
4	1-16	S	SWIO Pair {1-16} Protection Switch Auto-Locked
	17-48	S	SWIO-{1-32} Protection Switch Locked
	49	A	MC OOS-MCOND
	50-51	A	CC-{0,1} OOS-MTCE

* A = Alarm
S = Scan

† There are six displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-2. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points (Continued)**

Display †	Point No.	Type *	Description
4	52	A	PRI-1 OOS-MTCE
	53	-	Reserved
	54	A	PRI-2 OOS-MTCE
	55-56	-	Reserved
	57-58	A	RUI-{1,2} OOS-FLT
	59-60	A	RUI-{1,2} OOS-MTCE
	61-62	A	RUI-{1,2} OOS-FEF
	63	-	Unassigned
	64	-	Reserved
5	1-15	A	SWCS-1-{1-15} Fail SA
	16-31	A	SWCS-2-{1-16} Fail SA
	32-47	A	SWCS-1-{1-16} Fail NSA
	48-63	A	SWCS-2-{1-16} Fail NSA
	64	-	Reserved
6	1	S	SWCS Protection Auto-Locked
	2-17	S	SWCS-1-{1-16} Protection Switch Active
	18-32	S	SWCS-2-{1-15} Protection Switch Active
	33-48	S	SWCS-1-{1-16} Protection Switch Locked
	49-63	S	SWCS-2-{1-15} Protection Switch Locked
	64	-	Reserved

* A = Alarm
S = Scan

† There are six displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table A-3. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points**

Display †	Point No.	Description
1	1-2	CLKGN-{0,1} Make CLKGN Active
	3-4	SYNC-{0,1} Make SYNC Active
	5	SYNCPRI-0 Make Timing Reference Active
	6	SYNCSEC-0 Make Timing Reference Active
	7-22	SWIO-4-{1-16} Make Protection Switch
	23	SYNCPRI-1 Make Timing Reference Active
	24	SYNCSEC-1 Make Timing Reference Active
	25-63	Unassigned
	64	Reserved
2	1-16	SWIO-1-{1-16} Make Protection Switch
	17-32	SWIO-2-{1-16} Make Protection Switch
	33-48	SWIO-3-{1-16} Make Protection Switch
	49-63	Unassigned
	64	Reserved
3	1	SWIO-1-1 Lock Protection
	2	SWIO-1-1 Unlock Protection
	3	SWIO-1-2 Lock Protection
	4	SWIO-1-2 Unlock Protection
	5	SWIO-1-3 Lock Protection
	6	SWIO-1-3 Unlock Protection
	7	SWIO-1-4 Lock Protection
	8	SWIO-1-4 Unlock Protection
	9	SWIO-1-5 Lock Protection
	10	SWIO-1-5 Unlock Protection
	11	SWIO-1-6 Lock Protection
	12	SWIO-1-6 Unlock Protection
	13	SWIO-1-7 Lock Protection

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-3. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points (Continued)**

Display †	Point No.	Description
	14	SWIO-1-7 Unlock Protection
	15	SWIO-1-8 Lock Protection
	16	SWIO-1-8 Unlock Protection
	17	SWIO-1-9 Lock Protection
	18	SWIO-1-9 Unlock Protection
	19	SWIO-1-10 Lock Protection
	20	SWIO-1-10 Unlock Protection
	21	SWIO-1-11 Lock Protection
	22	SWIO-1-11 Unlock Protection
	23	SWIO-1-12 Lock Protection
	24	SWIO-1-12 Unlock Protection
	25	SWIO-1-13 Lock Protection
	26	SWIO-1-13 Unlock Protection
3	27	SWIO-1-14 Lock Protection
	28	SWIO-1-14 Unlock Protection
	29	SWIO-1-15 Lock Protection
	30	SWIO-1-15 Unlock Protection
	31	SWIO-1-16 Lock Protection
	32	SWIO-1-16 Unlock Protection
	33	SWIO-2-1 Lock Protection
	34	SWIO-2-1 Unlock Protection
	35	SWIO-2-2 Lock Protection
	36	SWIO-2-2 Unlock Protection
	37	SWIO-2-3 Lock Protection
	38	SWIO-2-3 Unlock Protection
	39	SWIO-2-4 Lock Protection
	40	SWIO-2-4 Unlock Protection

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-3. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points (Continued)**

Display †	Point No.	Description
3	41	SWIO-2-5 Lock Protection
	42	SWIO-2-5 Unlock Protection
	43	SWIO-2-6 Lock Protection
	44	SWIO-2-6 Unlock Protection
	45	SWIO-2-7 Lock Protection
	46	SWIO-2-7 Unlock Protection
	47	SWIO-2-8 Lock Protection
	48	SWIO-2-8 Unlock Protection
	49	SWIO-2-9 Lock Protection
	50	SWIO-2-9 Unlock Protection
	51	SWIO-2-10 Lock Protection
	52	SWIO-2-10 Unlock Protection
	53	SWIO-2-11 Lock Protection
	54	SWIO-2-11 Unlock Protection
	55	SWIO-2-12 Lock Protection
	56	SWIO-2-12 Unlock Protection
	57	SWIO-2-13 Lock Protection
	58	SWIO-2-13 Unlock Protection
	59	SWIO-2-14 Lock Protection
	60	SWIO-2-14 Unlock Protection
	61	SWIO-2-15 Lock Protection
	62	SWIO-2-15 Unlock Protection
	63	SWIO-2-16 Lock Protection
	64	Reserved
4	1-16	SWCS-1-{1-16} Switch to Protection
	17-32	SWCS-2-{1-16} Switch to Protection
	33-63	Unassigned

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-3. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points (Continued)**

Display †	Point No.	Description
4	64	Reserved
5	1	SWCS-1-1 Lock Protection
	2	SWCS-1-1 Unlock Protection
	3	SWCS-1-2 Lock Protection
	4	SWCS-1-2 Unlock Protection
	5	SWCS-1-3 Lock Protection
	6	SWCS-1-3 Unlock Protection
	7	SWCS-1-4 Lock Protection
	8	SWCS-1-4 Unlock Protection
	9	SWCS-1-5 Lock Protection
	10	SWCS-1-5 Unlock Protection
	11	SWCS-1-6 Lock Protection
	12	SWCS-1-6 Unlock Protection
	13	SWCS-1-7 Lock Protection
	14	SWCS-1-7 Unlock Protection
	15	SWCS-1-8 Lock Protection
	16	SWCS-1-8 Unlock Protection
	17	SWCS-1-9 Lock Protection
	18	SWCS-1-9 Unlock Protection
	19	SWCS-1-10 Lock Protection
	20	SWCS-1-10 Unlock Protection
	21	SWCS-1-11 Lock Protection
	22	SWCS-1-11 Unlock Protection
	23	SWCS-1-12 Lock Protection
	24	SWCS-1-12 Unlock Protection
	25	SWCS-1-13 Lock Protection
	26	SWCS-1-13 Unlock Protection

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-3. Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points (Continued)

Display †	Point No.	Description
	27	SWCS-1-14 Lock Protection
	28	SWCS-1-14 Unlock Protection
	29	SWCS-1-15 Lock Protection
	30	SWCS-1-15 Unlock Protection
	31	SWCS-1-16 Lock Protection
	32	SWCS-1-16 Unlock Protection
	33	SWCS-2-1 Lock Protection
	34	SWCS-2-1 Unlock Protection
	35	SWCS-2-2 Lock Protection
	36	SWCS-2-2 Unlock Protection
	37	SWCS-2-3 Lock Protection
	38	SWCS-2-3 Unlock Protection
	39	SWCS-2-4 Lock Protection
5	40	SWCS-2-4 Unlock Protection
	41	SWCS-2-5 Lock Protection
	42	SWCS-2-5 Unlock Protection
	43	SWCS-2-6 Lock Protection
	44	SWCS-2-6 Unlock Protection
	45	SWCS-2-7 Lock Protection
	46	SWCS-2-7 Unlock Protection
	47	SWCS-2-8 Lock Protection
	48	SWCS-2-8 Unlock Protection
	49	SWCS-2-9 Lock Protection
	50	SWCS-2-9 Unlock Protection
	51	SWCS-2-10 Lock Protection
	52	SWCS-2-10 Unlock Protection
	53	SWCS-2-11 Lock Protection

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-3. **Detailed Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points (Continued)**

Display †	Point No.	Description
5	54	SWCS-2-11 Unlock Protection
	55	SWCS-2-12 Lock Protection
	56	SWCS-2-12 Unlock Protection
	57	SWCS-2-13 Lock Protection
	58	SWCS-2-13 Unlock Protection
	59	SWCS-2-14 Lock Protection
	60	SWCS-2-14 Unlock Protection
	61	SWCS-2-15 Lock Protection
	62	SWCS-2-15 Unlock Protection
	63	SWCS-2-16 Lock Protection
	64	Reserved

† There are five displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

DS1 Interface Modules

Tables A-4 and A-5 list the detailed scan and control points, respectively, for each DS1 Interface and DS1 Interface-Protection Module. The same points are used for both the DS1 Interface and DS1 Interface-Protection Modules. Detailed display sets for modules 33-64 are part of the extended displays sets.

Table A-4. **Detailed Display Set (DS1 INTFC Module) — Scan Points**

Display †	Point No.	Type *	Description
1	1	A	Power Circuit Pack(s) Fail
	2	-	Unassigned
	3	A	UC Fail or OOS
	4	A	CLKDR Fail SA
	5-6	A	CLKDR-{1,2} Fail NSA
	7-22	A	DS1IF-{1-16} Fail SA
	23-38	A	DS1IF-{1-16} Fail NSA
	39-46	A	SWIF-{1-8} Fail SA
	47-54	A	SWIF/PMGR-{1-8} Fail NSA
	55-58	A	DS1RY-{1-4} Fail SA
	59	A	SWIO/SWCS Module Manual Function Initiated
	60-63	-	Unassigned
	64	-	Reserved
2	1	S	DS1 Incoming Fail
	2	S	Multiple DS1s Incoming Fail
	3	-	Unassigned
	4-19	S	DS1IF-{1-16} Protection Switch Active
	20-35	S	DS1IF-{1-16} Protection Switch Locked
	36	S	DS1IF Protection Switch Auto-Locked
	37-63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are two displays per DS1 Interface Module

Table A-5. **Detailed Display Set (DS1 INTFC Module) — Control Points**

Display †	Point No.	Description
	1	Unassigned
	2	DS1IF-{1A,1B} Switch to Protection
	3	Unassigned
	4	DS1IF-{2A,2B} Switch to Protection
	5	Unassigned
	6	DS1IF-{3A,3B} Switch to Protection
	7	Unassigned
	8	DS1IF-{4A,4B} Switch to Protection
	9	Unassigned
	10	DS1IF-{5A,5B} Switch to Protection
	11	Unassigned
	12	DS1IF-{6A,6B} Switch to Protection
	13	Unassigned
1	14	DS1IF-{7A,7B} Switch to Protection
	15	Unassigned
	16	DS1IF-{8A,8B} Switch to Protection
	17-19	Unassigned
	20	DS1IF-{1A,1B} Lock Protection
	21	DS1IF-{1A,1B} Unlock Protection
	22-23	Unassigned
	24	DS1IF-{2A,2B} Lock Protection
	25	DS1IF-{2A,2B} Unlock Protection
	26-27	Unassigned
	28	DS1IF-{3A,3B} Lock Protection
	29	DS1IF-{3A,3B} Unlock Protection
	30-31	Unassigned
	32	DS1IF-{4A,4B} Lock Protection

† There is one display per DS1 Interface Module

Table continued on next page.

Table A-5. Detailed Display Set (DS1 INTFC Module) — Control Points (Continued)

Display †	Point No.	Description
1	33	DS1IF-{4A,4B} Unlock Protection
	34-35	Unassigned
	36	DS1IF-{5A,5B} Lock Protection
	37	DS1IF-{5A,5B} Unlock Protection
	38-39	Unassigned
	40	DS1IF-{6A,6B} Lock Protection
	41	DS1IF-{6A,6B} Unlock Protection
	42-43	Unassigned
	44	DS1IF-{7A,7B} Lock Protection
	45	DS1IF-{7A,7B} Unlock Protection
	46-47	Unassigned
	48	DS1IF-{8A,8B} Lock Protection
	49	DS1IF-{8A,8B} Unlock Protection
	50-64	Unassigned

† There is one display per DS1 Interface Module

DS3 Interface Modules

The same points are assigned to the DS3 Interface-16 or DS3 Interface-32 Modules, except that the points referring to MUX number 17-32 or CLKDR number 3-4 are not needed for the DS3 Interface-16 Modules. MUX-16 (DS3 Interface-16 Modules) and MUX-32 (DS3 Interface-32 Modules) refer to the MUXP circuit packs. These points are always set to 0 in the DS3 Interface-16 Module displays. Tables A-6 and A-7 list the required scan and control points, respectively. In addition to equipment failures, alarm points are required to indicate incoming DS3 facility alarms. These points specify whether the DS3 is OOF or if there is a LOS or BER exceeding the selected threshold (either 10^{-3} or 10^{-6}). Detailed display sets for modules 9-32 are part of the extended display sets.

Table A-6. **Detailed Display Set (DS3 INTFC Module) — Scan Points**

Display †	Point No.	Type *	Description
1	1	A	Power Circuit Pack(s) Fail
	2	-	Unassigned
	3	A	UC Fail SA
	4-7	A	CLKDR-{1-4} Fail SA
	8-11	A	CLKDR-{1-4} Fail NSA
	12	A	MUXPS Fail SA
	13	-	Reserved
	14	A	DS3 Interface Manual Function Initiated
	15-18	-	Unassigned
	19-49	S	MUX-{1-31} Protection Switch Active
	50-63	-	Unassigned
	64	-	Reserved
2	1	S	MUX Protection Switch Auto-Locked
	2-32	S	MUX-{1-31} Protection Switch Locked
	33-63	A	DS3 Signal-{1-31} ID Error
	64	-	Reserved
3	1-31	A	MUX-{1-31} Fail SA
	32-62	A	MUX/PMGR-{1-32} Fail NSA
	63	A	MUX-32 (MUXP) Fail NSA
	64	-	Reserved
4	1-31	A	Incoming DS3 Signal-{1-31} LOS/BER
	32-62	A	Incoming DS3 Signal-{1-31} OOF
	63	A	MUX-32 (MUXP) Fail SA
	64	-	Reserved

* A = Alarm
S = Scan

† There are five displays per DS3 Interface Module

Table continued on next page.

Table A-6. Detailed Display Set (DS3 INTFC Module) — Scan Points (Continued)

Display †	Point No.	Type *	Description
5	1-31	A	Incoming DS3 Signal-{1-31} AIS Detected
	32-62	A	Incoming DS3 Signal-{1-31} Idle Detected
	63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are five displays per DS3 Interface Module

Table A-7. Detailed Display Set (DS3 INTFC Module) — Control Points

Display †	Point No.	Description
1	1	Unassigned
	2-32	MUX-{1-31} Switch to Protection
	33-64	Unassigned
2	1	MUX-1 Lock Protection
	2	MUX-1 Unlock Protection
	3	MUX-2 Lock Protection
	4	MUX-2 Unlock Protection
	5	MUX-3 Lock Protection
	6	MUX-3 Unlock Protection
	7	MUX-4 Lock Protection
	8	MUX-4 Unlock Protection
	9	MUX-5 Lock Protection
	10	MUX-5 Unlock Protection
	11	MUX-6 Lock Protection
	12	MUX-6 Unlock Protection
	13	MUX-7 Lock Protection
	14	MUX-7 Unlock Protection
	15	MUX-8 Lock Protection

† There are two displays per DS3 Interface Module

Table continued on next page.

Table A-7. **Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)**

Display †	Point No.	Description
	16	MUX-8 UnLock Protection
	17	MUX-9 Lock Protection
	18	MUX-9 Unlock Protection
	19	MUX-10 Lock Protection
	20	MUX-10 Unlock Protection
	21	MUX-11 Lock Protection
	22	MUX-11 Unlock Protection
	23	MUX-12 Lock Protection
	24	MUX-12 Unlock Protection
	25	MUX-13 Lock Protection
	26	MUX-13 Unlock Protection
	27	MUX-14 Lock Protection
	28	MUX-14 Unlock Protection
2	29	MUX-15 Lock Protection
	30	MUX-15 Unlock Protection
	31	MUX-16 Lock Protection
	32	MUX-16 Unlock Protection
	33	MUX-17 Lock Protection
	34	MUX-17 Unlock Protection
	35	MUX-18 Lock Protection
	36	MUX-18 Unlock Protection
	37	MUX-19 Lock Protection
	38	MUX-19 Unlock Protection
	39	MUX-20 Lock Protection
	40	MUX-20 Unlock Protection
	41	MUX-21 Lock Protection
	42	MUX-21 Unlock Protection

† There are two displays per DS3 Interface Module

Table continued on next page.

Table A-7. Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)

Display †	Point No.	Description
	43	MUX-22 Lock Protection
	44	MUX-22 Unlock Protection
	45	MUX-23 Lock Protection
	46	MUX-23 Unlock Protection
	47	MUX-24 Lock Protection
	48	MUX-24 Unlock Protection
	49	MUX-25 Lock Protection
	50	MUX-25 Unlock Protection
	51	MUX-26 Lock Protection
	52	MUX-26 Unlock Protection
2	53	MUX-27 Lock Protection
	54	MUX-27 Unlock Protection
	55	MUX-28 Lock Protection
	56	MUX-28 Unlock Protection
	57	MUX-29 Lock Protection
	58	MUX-29 Unlock Protection
	59	MUX-30 Lock Protection
	60	MUX-30 Unlock Protection
	61	MUX-31 Lock Protection
	62	MUX-31 Unlock Protection
	63-64	Unassigned

† There are two displays per DS3 Interface Module

Extended Display Sets

HCC, SYNC, SWIO, SWCS, RUI and OPEX Modules

For the DACS IV-2000 (512), additional detailed scan and control display sets are provided in the extended display sets. These additional scan and control points are provided for the additional SWIO circuit packs. Tables A-8 and A-9 list the additional detailed High Capacity Controller, Synchronizer, Switch Input/Output, Switch Center Stage, Remote Unit Interface, and Optical Extension Module scan and control points, respectively.

Table A-8. **Extended Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points**

Display †	Point No.	Type *	Description
1	1-16	A	SWIO-3-{1-16} Fail NSA
	17-32	A	SWIO-4-{1-16} Fail NSA
	33-48	A	SWIO-3-{1-16} Fail SA
	49-63	-	Unassigned
	64	-	Reserved
2	1-16	A	SWIO-4-{1-16} Fail SA
	17-32	S	SWIO-3-{1-16} Protection Switch Active
	33-48	S	SWIO-4-{1-16} Protection Switch Active
	49-63	-	Unassigned
	64	-	Reserved
3	1-16	S	SWIO-3-{1-16} Protection Switch Locked
	17-32	S	SWIO-4-{1-16} Protection Switch Locked
	33-48	S	SWIO-2-{1-16} Protection Switch Auto-Locked
	49-63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are seven displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-8. Extended Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points (Continued)

Display †	Point No.	Type *	Description
	1-16	S	SWIO-3-{1-16} Protection Switch Auto-Locked
	17-32	S	SWIO-4-{1-16} Protection Switch Auto-Locked
	33	S	SWCS-2-16 Protection Switch Active
	34	S	SWCS-2-16 Protection Switch Locked
	35	A	PWRJ-1-{1,2} Fail NSA
	36	A	PWRJ-1-{1,2} Fail SA
	37	A	PWRJ-1-{3,4} Fail NSA
	38	A	PWRJ-1-{3,4} Fail SA
	39	A	PWRJ-1-{5,6} Fail NSA
	40	A	PWRJ-1-{5,6} Fail SA
	41	A	PWRJ-2-{1,2} Fail NSA
4	42	A	PWRJ-2-{1,2} Fail SA
	43	A	PWRJ-2-{3,4} Fail NSA
	44	A	PWRJ-2-{3,4} Fail SA
	45	A	PWRJ-2-{5,6} Fail NSA
	46	A	PWRJ-2-{5,6} Fail SA
	47	A	PWRJ-3-{1,2} Fail NSA
	48	A	PWRJ-3-{1,2} Fail SA
	49	A	PWRJ-3-{3,4} Fail NSA
	50	A	PWRJ-3-{3,4} Fail SA
	51	A	PWRJ-3-{5,6} Fail NSA
	52	A	PWRJ-3-{5,6} Fail SA
	53	A	PWRG Fail NSA
	54	A	PWRG Fail SA

* A = Alarm
S = Scan

† There are seven displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table continued on next page.

Table A-8. Extended Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Scan Points (Continued)

Display †	Point No.	Type *	Description
4	55	A	OPEX-2 Power Fail SA
	56	A	OPEX-2 Power Fail NSA
	57	A	RUI-2 Power Fail NSA
	58-59	A	RX-{1,2} Fan Fail
	60-63	-	Unassigned
	64	-	Reserved
5	1-16	A	OPEX-1-{1-16} Fail SA
	17-32	A	OPEX-2-{1-16} Fail SA
	33-48	A	OPEX-3-{1-16} Fail SA
	49-63	-	Unassigned
	64	-	Reserved
6	1-16	A	OPEX-4-{1-16} Fail SA
	17-32	A	OPEX-1-{1-16} Fail NSA
	33-48	A	OPEX-2-{1-16} Fail NSA
	49-63	-	Unassigned
	64	-	Reserved
7	1-16	A	OPEX-3-{1-16} Fail NSA
	17-32	A	OPEX-4-{1-16} Fail NSA
	33-63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are seven displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Table A-9. Extended Display Set (HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules) — Control Points

Display †	Point No.	Description
1	1-16	SWIO-3-{1-16} Lock Protection
	17-32	SWIO-4-{1-16} Lock Protection
	33-64	Unassigned
	64	Reserved
2	1-16	SWIO-3-{1-16} Unlock Protection
	17-32	SWIO-4-{1-16} Unlock Protection
	33	SWIO-2-16 Unlock Protection
	34	SWCS-2-16 Unlock Protection
	35-63	Unassigned
	64	Reserved

† There are two displays for the HCC/SYNC/SWIO/SWCS/RUI/OPEX Modules.

Extended Facility Display Sets

The detailed scan points described previously are not always sufficient to identify the specific facility affected by a failure. In particular, incoming DS1 failures are specified by a single scan point for a DS1 Interface Module that can interface with up to 224 DS1 signals. The extended set provides the telemetry remote with increased information concerning incoming DS1 failures, and incoming DS3 OOF and format mismatches.

The extended facility scan and control points listed in Tables A-10, A-11, A-12, A-13, and A-14 overcome the limitations of the detailed AS&C set previously described. Even with the addition of the scan points, failures relating to outgoing DS1 and DS3 facilities are not identified to the specific affected facility.

DS1 Facilities

A single scan point is provided for each incoming DS1 signal. This point indicates whenever the specified DS1 signal exceeds the BPV error threshold of 10^{-3} through 10^{-9} or is in an LOS condition. Table A-10 lists these scan points. These scan points require four additional displays for each DS1 Interface Module.

Table A-10. **Extended Display Set (DS1 INTFC Module) — Scan Points**

Display †	Point No.	Type *	Description
1	1-56	S	Incoming DS1 Signal-{1-56} Fail
	57-63	-	Unassigned
	64	-	Reserved
2	1-56	S	Incoming DS1 Signal-{57-112} Fail
	57-63	-	Unassigned
	64	-	Reserved
3	1-56	S	Incoming DS1 Signal-{113-168} Fail
	57-63	-	Unassigned
	64	-	Reserved
4	1-56	S	Incoming DS1 Signal-{169-224} Fail
	57-63	-	Unassigned
	64	-	Reserved

* S = Scan

† There are four displays per DS1 Interface Module.

DS3 Facilities

For each service MUX circuit pack in a DS3 Interface Module, one alarm point is provided to indicate signal format mismatches (M13 or CBIT) and seven alarm points are provided to indicate DS2 signals within the incoming DS3 facility that are OOF. Table A-11 lists these points. These scan points require four additional displays for each DS3 Interface Module.

In addition to the above points, MUX3 circuit packs also have one alarm point is provided to indicate signal label match failures (SLMF) and one alarm point each for DS1 tributaries within a DS3 signal for OOF, BER, AIS, YEL, DLI, and DLN conditions. Table A-12 lists these points. These scan points require four additional displays for each DS3 Interface Module.

Table A-11. **Extended Display Set (DS3 INTFC Module, All MUX Circuit Packs) — Scan Points**

Display†	Point No.	Type *	Description
1	1-7	A	DS3 1, DS2-{1-7} OOF
	8-14	A	DS3 2, DS2-{1-7} OOF
	15-21	A	DS3 3, DS2-{1-7} OOF
	22-28	A	DS3 4, DS2-{1-7} OOF
	29-35	A	DS3 5, DS2-{1-7} OOF
	36-42	A	DS3 6, DS2-{1-7} OOF
	43-49	A	DS3 7, DS2-{1-7} OOF
	50-56	A	DS3 8, DS2-{1-7} OOF
	57-63	A	DS3 9, DS2-{1-7} OOF
	64	-	Reserved
2	1-7	A	DS3 10, DS2-{1-7} OOF
	8-14	A	DS3 11, DS2-{1-7} OOF
	15-21	A	DS3 12, DS2-{1-7} OOF
	22-28	A	DS3 13, DS2-{1-7} OOF
	29-35	A	DS3 14, DS2-{1-7} OOF
	36-42	A	DS3 15, DS2-{1-7} OOF
	43-49	A	DS3 16, DS2-{1-7} OOF
	50-56	A	DS3 17, DS2-{1-7} OOF
	57-63	A	DS3 18, DS2-{1-7} OOF
	64	-	Reserved
3	1-7	A	DS3 19, DS2-{1-7} OOF
	8-14	A	DS3 20, DS2-{1-7} OOF
	15-21	A	DS3 21, DS2-{1-7} OOF
	22-28	A	DS3 22, DS2-{1-7} OOF
	29-35	A	DS3 23, DS2-{1-7} OOF
	36-42	A	DS3 24, DS2-{1-7} OOF

* A = Alarm

† There are four displays per DS3 Interface Module.

Table continued on next page.

Table A-11. **Extended Display Set (DS3 INTFC Module, All MUX Circuit Packs) — Scan Points (Continued)**

Display†	Point No.	Type *	Description
3	43-49	A	DS3 25, DS2-{1-7} OOF
	50-56	A	DS3 26, DS2-{1-7} OOF
	57-63	A	DS3 27, DS2-{1-7} OOF
	64	-	Reserved
4	1-7	A	DS3 28, DS2-{1-7} OOF
	8-14	A	DS3 29, DS2-{1-7} OOF
	15-21	A	DS3 30, DS2-{1-7} OOF
	22-28	A	DS3 31, DS2-{1-7} OOF
	29-59	A	DS3 Signal-{1-31} Format Mismatch
	60-63	-	Unassigned
	64	-	Reserved

* A = Alarm

† There are four displays per DS3 Interface Module.

Table A-12. **Extended Display Set (DS3 INTFC Module, MUX3 Additional Points) — Scan Points**

Display†	Point No.	Type *	Description
1	1-31	A	DS3 Signal-{1-31} SLMF
	32-62	A	DS3 Signal-{1-31} DS1-{1-28} OOF
	63	-	Unassigned
	64	-	Reserved
2	1-31	A	DS3 Signal-{1-31} DS1-{1-28} BER
	32-62	A	DS3 Signal-{1-31} DS1-{1-28} AIS
	63	-	Unassigned
	64	-	Reserved
3	1-31	A	DS3 Signal-{1-31} DS1-{1-28} YEL
	32-62	A	DS3 Signal-{1-31} DS1-{1-28} DLI

* A = Alarm

† There are four displays per DS3 Interface Module.

Table continued on next page.

Table A-12. **Extended Display Set (DS3 INTFC Module, MUX3 Additional Points) — Scan Points (Continued)**

Display†	Point No.	Type *	Description
3	63	-	Unassigned
	64	-	Reserved
4	1-31	A	DS3 Signal-{1-31} DS1-{1-28} DLN
	32-63	-	Unassigned
	64	-	Reserved

* A = Alarm

† There are four displays per DS3 Interface Module.

STS1 Interface Module AS&C Points

All AS&C points for STS1 Interface Modules are provided as extended alarm sets. Alarm, scan, and control points are provided for equipment associated with STS1 Interface Modules. In addition, for each incoming STS-1 facility to a SMUX circuit pack, eight alarm points (120 alarm points for each SMUX circuit pack) are provided to indicate:

- Loss of signal or high bit error rate (LOS/T-BERL)
- Loss of frame (LOF)
- Loss of pointer (LOP)
- Line alarm indication signal (AISL)
- Path alarm indication signal (AISP)
- Path yellow (YEL)
- Far-end remote failure (FERF)
- Signal label match failure (SLMF)

For a VT1.5 tributary signal within an EC-1 facility, the following points are provided:

- Fifteen alarm points to identify one or more VT LOP condition(s)
- Fifteen status points to identify one or more VT path yellow condition(s) has been detected on an upstream tributary failure

Tables A-13 and A-14 list the extended set scan and control points, respectively.

Table A-13. **Extended Display Set (STS1 INTFC Module) — Scan Points**

Display†	Point No.	Type *	Description
1	1	A	Power Circuit Pack Fail
	2	-	Unassigned
	3	A	UC Fail SA
	4-5	A	CLKDR-{1,2} Fail SA
	6-7	A	CLKDR-{1,2} Fail NSA
	8	A	MUXPS Fail SA
	9	A	STS1 Interface Manual Function Initiated
	10-14	-	Unassigned
	15-29	S	SMUX-{1-15} Protection Switch Active
	30	S	SMUX Protection Switch Auto-Locked
	31-45	S	SMUX-{1-15} Protection Switch Locked
	46-60	-	Reserved
	61-63		Unassigned
	64	-	Reserved
2	1-15	A	SMUX-{1-15} Fail SA
	16	A	SMUX-16 (SMUXP) Fail SA
	17-31	A	SMUX-{1-15} Fail NSA
	32	A	SMUX-16 (SMUXP) Fail NSA
	33-47	A	Incoming STS-1 Signal-{1-15} LOF/T-BERL
	48-62	A	Incoming STS-1 Signal-{1-15} LOF
	63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are five displays per STS1 Interface-16 Module.

Table continued on next page.

Table A-13. Extended Display Set (STS1 INTFC Module) — Scan Points (Continued)

Display†	Point No.	Type *	Description
3	1-15	A	Incoming STS-1 Signal-{1-15} LOP
	16-30	A	Incoming STS-1 Signal-{1-15} AISL
	31-45	S	Incoming STS-1 Signal-{1-15} AISP
	46-60	S	Incoming STS-1 Signal-{1-15} YEL
	61-63	-	Unassigned
	64	-	Reserved
4	1-15	S	Incoming STS-1 Signal-{1-15} FERF
	16-30	A	Incoming STS-1 Signal-{1-15} SLMF
	31-63	-	Unassigned
	64	-	Reserved
5	1-15	A	STS1-{1-15}, VT1.5-{1-28} VT LOP
	16-30	S	STS1-{1-15}, VT1.5-{1-28} VT AISP
	31-45	S	STS1-{1-15}, VT1.5-{1-28} VT YEL
	46-63	-	Unassigned
	64	-	Reserved

A = Alarm
S = Scan

† There are five displays per STS1 Interface-16 Module.

Table A-14. Extended Display Set (STS1 INTFC Module) — Control Points

Display†	Point No.	Description
1	1	Unassigned
	2-16	SMUX-{1-15} Make Protection Switch
	17	SMUX-1 Lock Protection
	18	SMUX-1 Unlock Protection
	19	SMUX-2 Lock Protection
	20	SMUX-2 Unlock Protection

† There is one display per STS1 Interface-16 Module.

Table continued on next page.

Table A-14. Extended Display Set (STS1 INTFC Module) — Control Points (Continued)

Display†	Point No.	Description
1	21	SMUX-3 Lock Protection
	22	SMUX-3 Unlock Protection
	23	SMUX-4 Lock Protection
	24	SMUX-4 Unlock Protection
	25	SMUX-5 Lock Protection
	26	SMUX-5 Unlock Protection
	27	SMUX-6 Lock Protection
	28	SMUX-6 Unlock Protection
	29	SMUX-7 Lock Protection
	30	SMUX-7 Unlock Protection
	31	SMUX-8 Lock Protection
	32	SMUX-8 Unlock Protection
	33	SMUX-9 Lock Protection
	34	SMUX-9 Unlock Protection
	35	SMUX-10 Lock Protection
	36	SMUX-10 Unlock Protection
	37	SMUX-11 Lock Protection
	38	SMUX-11 Unlock Protection
	39	SMUX-12 Lock Protection
	40	SMUX-12 Unlock Protection
	41	SMUX-13 Lock Protection
	42	SMUX-13 Unlock Protection
	43	SMUX-14 Lock Protection
	44	SMUX-14 Unlock Protection
	45	SMUX-15 Lock Protection
	46	SMUX-15 Unlock Protection
	47-63	Unassigned
	64	Reserved

† There is one display per STS1 Interface-16 Module.

Display Requirements

The number of displays required depends on the choice of AS&C set and on the configuration of the system. The following paragraphs discuss the total number of displays required for each of the three AS&C sets previously described.

Summary AS&C Points

The summary set consists of a single scan display.

Detailed and Extended AS&C Points

Tables A-15 (scan points) and A-16 (control points) list the number of displays required for each module and, for each module type, how many modules can be equipped in a single system. Although the maximum number of DS3 Interface Modules is 32 and the maximum number of DS1 Interface Modules is 64, the switch is limited to a capacity of 512/496 DS3/STS-1 equivalents and, therefore, the number of DS1 Interface Modules must be reduced by 4 for each DS3 Interface-32 Module and by 2 for each DS3 Interface-16 or STS1 Interface-16 Module in the system.

The maximum number of displays (detailed and extended) is 360. For example, a DACS IV-2000 configuration of 8 STS1 Interface-16 Modules, 8 DS3 Interface-32 Modules, and 16 DS1 Interface Modules uses 13 displays for the High Capacity Controller, Synchronizer, Switch Input/Output, Switch Center Stage, Switch Power, Remote Unit Interface, and Optical Extension Modules, 40 displays for the 8 STS1 Interface-16 Modules, 104 displays for the 8 DS3 Interface-32 Modules, and 96 displays for the 16 DS1 Interface Modules for a total of 253 displays. In normal practice, only changed displays are transmitted, and this greatly reduces the number of displays sent in any given polling interval. Displays for modules that are not equipped are not sent in response to a *Scan All* or *Scan Changed Displays*, but are indicated by a gap in the response.

The DACS IV-2000 can be equipped in a variety of configurations with different combinations of DS1, DS3, and STS1 interfaces. The configuration with the most displays has 64 DS1 Interface Modules and no DS3 Interface or STS1 Interface Modules and requires 70 detailed displays (6 for the High Capacity Controller, Switch Input/Output, Switch Center Stage, Synchronizer, Switch Power, Remote Unit Interface, and Optical Extension Modules and 64 for the first 32 DS1 Interface Modules).

Table A-15. **Number of Scan Point Displays**

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
HCC, SYNC, SWIO, SWCS, RUI, and OPEX Modules	1	6	7
DS1 Interface Module (1-32)	32	2	4
DS1 Interface Module (33-64)	32	0	6
DS3 Interface Module [MUX1/ MUX2/MUX3] (1-8)	8	5	4
DS3 Interface Module [MUX1/ MUX2/MUX3] (9-32)	24	0	9
DS3 Interface Module [MUX3 additional points] (1-32)	32	0	4
STS1 Interface Module (1-32)	32	0	5

Table A-16. **Number of Control Point Displays**

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
HCC, SYNC, SWIO, SWCS, RUI, and OPEX Modules	1	5	2
DS1 Interface Module (1-32)	32	1	0
DS1 Interface Module (33-64)	32	0	1
DS3 Interface Module (1-8)	8	2	0
DS3 Interface Module (9-32)	24	0	2
STS1 Interface Module (1-32)	32	0	1

Display Numbering

Table A-17 lists the AS&C display numbering assignments.

Table A-17. **Scan Point Display Numbering**

Scan Display	Control Display	Module
0	-	Summary (entire system)
1-6	1-5	High Capacity Controller Module, Synchronizer Module, Switch Input/Output Module, Switch Center Stage, Switch Power Module, Remote Unit Interface Module, and Optical Extension Module
7-11	7-8	DS3 Interface 1
12-16	12-13	DS3 Interface 2
17-21	17-18	DS3 Interface 3
22-26	22-23	DS3 Interface 4
27-31	27-28	DS3 Interface 5
32-36	32-33	DS3 Interface 6
37-41	37-38	DS3 Interface 7
42-46	42-43	DS3 Interface 8
47-48	48	DS1 Interface 1
49-50	50	DS1 Interface 2
51-52	52	DS1 Interface 3
53-54	54	DS1 Interface 4
55-56	56	DS1 Interface 5
57-58	58	DS1 Interface 6
59-60	60	DS1 Interface 7
61-62	62	DS1 Interface 8
63-64	64	DS1 Interface 9
65-66	66	DS1 Interface 10
67-68	68	DS1 Interface 11
69-70	70	DS1 Interface 12

Table continued on next page.

Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
71-72	72	DS1 Interface 13
73-74	74	DS1 Interface 14
75-76	76	DS1 Interface 15
77-78	78	DS1 Interface 16
79-80	80	DS1 Interface 17
81-82	82	DS1 Interface 18
83-84	84	DS1 Interface 19
85-86	86	DS1 Interface 20
87-88	88	DS1 Interface 21
89-90	90	DS1 Interface 22
91-92	92	DS1 Interface 23
93-94	94	DS1 Interface 24
95-96	96	DS1 Interface 25
97-98	98	DS1 Interface 26
99-100	100	DS1 Interface 27
101-102	102	DS1 Interface 28
103-104	104	DS1 Interface 29
105-106	106	DS1 Interface 30
107-108	108	DS1 Interface 31
109-110	110	DS1 Interface 32
111-119	-	Unused
120-123	-	DS3 Interface 1 Extended Facilities
124-127	-	DS3 Interface 2 Extended Facilities
128-131	-	DS3 Interface 3 Extended Facilities
132-135	-	DS3 Interface 4 Extended Facilities
136-139	-	DS3 Interface 5 Extended Facilities
140-143	-	DS3 Interface 6 Extended Facilities
144-147	-	DS3 Interface 7 Extended Facilities
148-151	-	DS3 Interface 8 Extended Facilities

Table continued on next page.

Table A-17. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
152-155	-	DS1 Interface 1 Extended Facilities
156-159	-	DS1 Interface 2 Extended Facilities
160-163	-	DS1 Interface 3 Extended Facilities
164-167	-	DS1 Interface 4 Extended Facilities
168-171	-	DS1 Interface 5 Extended Facilities
172-175	-	DS1 Interface 6 Extended Facilities
176-179	-	DS1 Interface 7 Extended Facilities
180-183	-	DS1 Interface 8 Extended Facilities
184-187	-	DS1 Interface 9 Extended Facilities
188-191	-	DS1 Interface 10 Extended Facilities
192-195	-	DS1 Interface 11 Extended Facilities
196-199	-	DS1 Interface 12 Extended Facilities
200-203	-	DS1 Interface 13 Extended Facilities
204-207	-	DS1 Interface 14 Extended Facilities
208-211	-	DS1 Interface 15 Extended Facilities
212-215	-	DS1 Interface 16 Extended Facilities
216-219	-	DS1 Interface 17 Extended Facilities
220-223	-	DS1 Interface 18 Extended Facilities
224-227	-	DS1 Interface 19 Extended Facilities
228-231	-	DS1 Interface 20 Extended Facilities
232-235	-	DS1 Interface 21 Extended Facilities
236-239	-	DS1 Interface 22 Extended Facilities
240-243	-	DS1 Interface 23 Extended Facilities
244-247	-	DS1 Interface 24 Extended Facilities
248-251	-	DS1 Interface 25 Extended Facilities
252-255	-	DS1 Interface 26 Extended Facilities
256-259	-	DS1 Interface 27 Extended Facilities
260-263	-	DS1 Interface 28 Extended Facilities
264-267	-	DS1 Interface 29 Extended Facilities

Table continued on next page.

Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
268-271	-	DS1 Interface 30 Extended Facilities
272-275	-	DS1 Interface 31 Extended Facilities
276-279	-	DS1 Interface 32 Extended Facilities
280-284	280-281	DS3 Interface 9
285-289	285-286	DS3 Interface 10
290-294	290-291	DS3 Interface 11
295-299	295-296	DS3 Interface 12
300-304	300-301	DS3 Interface 13
305-309	305-306	DS3 Interface 14
310-314	310-311	DS3 Interface 15
315-319	315-316	DS3 Interface 16
320-323	-	DS3 Interface 9 Extended Facilities
324-327	-	DS3 Interface 10 Extended Facilities
328-331	-	DS3 Interface 11 Extended Facilities
332-335	-	DS3 Interface 12 Extended Facilities
336-339	-	DS3 Interface 13 Extended Facilities
340-343	-	DS3 Interface 14 Extended Facilities
344-347	-	DS3 Interface 15 Extended Facilities
348-351	-	DS3 Interface 16 Extended Facilities
352-355	355	STS1 Interface 1
356-359	359	STS1 Interface 2
360-363	363	STS1 Interface 3
364-367	367	STS1 Interface 4
368-371	371	STS1 Interface 5
372-375	375	STS1 Interface 6
376-379	379	STS1 Interface 7
380-383	383	STS1 Interface 8
384-387	387	STS1 Interface 9
388-391	391	STS1 Interface 10

Table continued on next page.

Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
392-395	395	STS1 Interface 11
396-399	399	STS1 Interface 12
400-403	403	STS1 Interface 13
404-407	407	STS1 Interface 14
408-411	411	STS1 Interface 15
412-415	415	STS1 Interface 16
416	-	STS1 Interface 1 Extended Facilities
417	-	STS1 Interface 2 Extended Facilities
418	-	STS1 Interface 3 Extended Facilities
49	-	STS1 Interface 4 Extended Facilities
420	-	STS1 Interface 5 Extended Facilities
421	-	STS1 Interface 6 Extended Facilities
422	-	STS1 Interface 7 Extended Facilities
423	-	STS1 Interface 8 Extended Facilities
424	-	STS1 Interface 9 Extended Facilities
425	-	STS1 Interface 10 Extended Facilities
426	-	STS1 Interface 11 Extended Facilities
427	-	STS1 Interface 12 Extended Facilities
428	-	STS1 Interface 13 Extended Facilities
429	-	STS1 Interface 14 Extended Facilities
430	-	STS1 Interface 15 Extended Facilities
431	-	STS1 Interface 16 Extended Facilities
432-433	433	DS1 Interface 33
434-435	435	DS1 Interface 34
436-437	437	DS1 Interface 35
438-439	439	DS1 Interface 36
440-441	441	DS1 Interface 37
442-443	443	DS1 Interface 38
444-445	445	DS1 Interface 39

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
446-447	447	DS1 Interface 40
448-449	449	DS1 Interface 41
450-451	451	DS1 Interface 42
452-453	453	DS1 Interface 43
454-455	455	DS1 Interface 44
456-457	457	DS1 Interface 45
458-459	459	DS1 Interface 46
460-461	461	DS1 Interface 47
462-463	463	DS1 Interface 48
464-465	465	DS1 Interface 49
466-467	467	DS1 Interface 50
468-469	469	DS1 Interface 51
470-471	471	DS1 Interface 52
472-473	473	DS1 Interface 53
474-475	475	DS1 Interface 54
476-477	477	DS1 Interface 55
478-479	479	DS1 Interface 56
480-481	481	DS1 Interface 57
482-483	483	DS1 Interface 58
484-485	485	DS1 Interface 59
486-487	487	DS1 Interface 60
488-489	489	DS1 Interface 61
490-491	491	DS1 Interface 62
492-493	493	DS1 Interface 63
494-495	495	DS1 Interface 64
496-499	-	DS1 Interface 33 Extended Facilities
500-503	-	DS1 Interface 34 Extended Facilities
504-507	-	DS1 Interface 35 Extended Facilities
508-511	-	DS1 Interface 36 Extended Facilities

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
512-515	-	DS1 Interface 37 Extended Facilities
516-519	-	DS1 Interface 38 Extended Facilities
520-523	-	DS1 Interface 39 Extended Facilities
524-527	-	DS1 Interface 40 Extended Facilities
528-531	-	DS1 Interface 41 Extended Facilities
532-535	-	DS1 Interface 42 Extended Facilities
536-539	-	DS1 Interface 43 Extended Facilities
540-543	-	DS1 Interface 44 Extended Facilities
544-547	-	DS1 Interface 45 Extended Facilities
548-551	-	DS1 Interface 46 Extended Facilities
552-555	-	DS1 Interface 47 Extended Facilities
556-559	-	DS1 Interface 48 Extended Facilities
560-563	-	DS1 Interface 49 Extended Facilities
564-567	-	DS1 Interface 50 Extended Facilities
568-571	-	DS1 Interface 51 Extended Facilities
572-575	-	DS1 Interface 52 Extended Facilities
576-579	-	DS1 Interface 53 Extended Facilities
580-583	-	DS1 Interface 54 Extended Facilities
584-587	-	DS1 Interface 55 Extended Facilities
588-591	-	DS1 Interface 56 Extended Facilities
592-595	-	DS1 Interface 57 Extended Facilities
596-599	-	DS1 Interface 58 Extended Facilities
600-603	-	DS1 Interface 59 Extended Facilities
604-607	-	DS1 Interface 60 Extended Facilities
608-611	-	DS1 Interface 61 Extended Facilities
612-615	-	DS1 Interface 62 Extended Facilities
616-619	-	DS1 Interface 63 Extended Facilities
620-623	-	DS1 Interface 64 Extended Facilities
624-628	624-625	DS3 Interface 17

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
629-633	629-630	DS3 Interface 18
634-638	634-635	DS3 Interface 19
639-643	639-640	DS3 Interface 20
644-648	644-645	DS3 Interface 21
649-653	649-650	DS3 Interface 22
654-658	654-655	DS3 Interface 23
659-663	659-660	DS3 Interface 24
664-668	664-665	DS3 Interface 25
669-673	669-670	DS3 Interface 26
674-678	674-675	DS3 Interface 27
679-683	679-680	DS3 Interface 28
684-688	684-685	DS3 Interface 29
689-693	689-690	DS3 Interface 30
694-698	694-695	DS3 Interface 31
699-703	699-700	DS3 Interface 32
704-707	-	DS3 Interface 17 Extended Facilities
708-711	-	DS3 Interface 18 Extended Facilities
712-715	-	DS3 Interface 19 Extended Facilities
716-719	-	DS3 Interface 20 Extended Facilities
720-723	-	DS3 Interface 21 Extended Facilities
724-727	-	DS3 Interface 22 Extended Facilities
728-731	-	DS3 Interface 23 Extended Facilities
732-735	-	DS3 Interface 24 Extended Facilities
736-739	-	DS3 Interface 25 Extended Facilities
740-743	-	DS3 Interface 26 Extended Facilities
744-747	-	DS3 Interface 27 Extended Facilities
748-751	-	DS3 Interface 28 Extended Facilities
752-755	-	DS3 Interface 29 Extended Facilities
756-759	-	DS3 Interface 30 Extended Facilities

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
760-763	-	DS3 Interface 31 Extended Facilities
764-767	-	DS3 Interface 32 Extended Facilities
768-771	771	STS1 Interface 17
772-775	775	STS1 Interface 18
776-779	779	STS1 Interface 19
780-783	783	STS1 Interface 20
784-787	787	STS1 Interface 21
788-791	791	STS1 Interface 22
792-795	795	STS1 Interface 23
796-799	799	STS1 Interface 24
800-803	803	STS1 Interface 25
804-807	807	STS1 Interface 26
808-811	811	STS1 Interface 27
812-815	815	STS1 Interface 28
816-819	819	STS1 Interface 29
820-823	823	STS1 Interface 30
824-827	827	STS1 Interface 31
828-831	831	STS1 Interface 32
832	-	STS1 Interface 17 Extended Facilities
833	-	STS1 Interface 18 Extended Facilities
834	-	STS1 Interface 19 Extended Facilities
835	-	STS1 Interface 20 Extended Facilities
836	-	STS1 Interface 21 Extended Facilities
837	-	STS1 Interface 22 Extended Facilities
838	-	STS1 Interface 23 Extended Facilities
839	-	STS1 Interface 24 Extended Facilities
840	-	STS1 Interface 25 Extended Facilities
841	-	STS1 Interface 26 Extended Facilities
842	-	STS1 Interface 27 Extended Facilities

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
843	-	STS1 Interface 28 Extended Facilities
844	-	STS1 Interface 29 Extended Facilities
845	-	STS1 Interface 30 Extended Facilities
846	-	STS1 Interface 31 Extended Facilities
847	-	STS1 Interface 32 Extended Facilities
848-854	848-849	High Capacity Controller Module, Synchronizer Module, Switch Input/Output Module, Switch Center Stage Module, Switch Power Module, Remote Unit Interface Module, and Optical Extension Module
855-858	-	DS3 Interface 1 Extended Facilities (Additional MUX3 Points)
859-862	-	DS3 Interface 2 Extended Facilities (Additional MUX3 Points)
863-866	-	DS3 Interface 3 Extended Facilities (Additional MUX3 Points)
867-870	-	DS3 Interface 4 Extended Facilities (Additional MUX3 Points)
871-874	-	DS3 Interface 5 Extended Facilities (Additional MUX3 Points)
875-878	-	DS3 Interface 6 Extended Facilities (Additional MUX3 Points)
879-882	-	DS3 Interface 7 Extended Facilities (Additional MUX3 Points)
883-886	-	DS3 Interface 8 Extended Facilities (Additional MUX3 Points)
887-890	-	DS3 Interface 9 Extended Facilities (Additional MUX3 Points)
891-894	-	DS3 Interface 10 Extended Facilities (Additional MUX3 Points)
895-898	-	DS3 Interface 11 Extended Facilities (Additional MUX3 Points)

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Table A-17. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
899-902	-	DS3 Interface 12 Extended Facilities (Additional MUX3 Points)
903-906	-	DS3 Interface 13 Extended Facilities (Additional MUX3 Points)
907-910	-	DS3 Interface 14 Extended Facilities (Additional MUX3 Points)
911-914	-	DS3 Interface 15 Extended Facilities (Additional MUX3 Points)
915-918	-	DS3 Interface 16 Extended Facilities (Additional MUX3 Points)
919-922	-	DS3 Interface 17 Extended Facilities (Additional MUX3 Points)
923-926	-	DS3 Interface 18 Extended Facilities (Additional MUX3 Points)
927-930	-	DS3 Interface 19 Extended Facilities (Additional MUX3 Points)
931-934	-	DS3 Interface 20 Extended Facilities (Additional MUX3 Points)
935-938	-	DS3 Interface 21 Extended Facilities (Additional MUX3 Points)
939-942	-	DS3 Interface 22 Extended Facilities (Additional MUX3 Points)
943-946	-	DS3 Interface 23 Extended Facilities (Additional MUX3 Points)
947-950	-	DS3 Interface 24 Extended Facilities (Additional MUX3 Points)
951-954	-	DS3 Interface 25 Extended Facilities (Additional MUX3 Points)
955-958	-	DS3 Interface 26 Extended Facilities (Additional MUX3 Points)
959-962	-	DS3 Interface 27 Extended Facilities (Additional MUX3 Points)
963-966	-	DS3 Interface 28 Extended Facilities (Additional MUX3 Points)

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Table A-17. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
967-970	-	DS3 Interface 29 Extended Facilities (Additional MUX3 Points)
971-974	-	DS3 Interface 30 Extended Facilities (Additional MUX3 Points)
975-978	-	DS3 Interface 31 Extended Facilities (Additional MUX3 Points)
979-982	-	DS3 Interface 32 Extended Facilities (Additional MUX3 Points)

Glossary

A

Absent (ABS)
The circuit pack or a blank circuit pack is not in the associated slot.

Active (ACT)
The circuit pack or module is in service, not protected. If it is a traffic-carrying circuit pack or module, it is carrying traffic.

Alarm
An indication that a failure has occurred within a piece of equipment and/or a transmission facility.

Alarm Cutoff (ACO)
A button on the Status Panel used to silence audible alarms. Audible alarms can also be silenced using the `OPR-ACO-ALL` command.

Alarm Delay
Specifies the alarm delay (in seconds) for software-detected alarm conditions. Initial value is 10 seconds.

Alarm Indication Signal (AIS)
A signal transmitted downstream if the incoming signal is defective.

Alarm, Scan, and Control (AS&C)) Points
Interface between the DACS IV-2000 and telemetry operations systems (OSs).

All-Ones Signal
Signal that is defined to contain all ones. AIS is an example of an all-ones signal.

Alphanumeric Characters
Letters and digits.

Alternate Mark Inversion (AMI)
A DS1 line code in which alternate one bits are positive and negative, but zero substitution is not used.

ASCII Characters
Letters, digits, and symbols used in the American Standard Code for Information Interchange.

Attribute
Alarm indication level: critical, major, minor, or no alarm.

Autolock
When the system autolocks a circuit pack, it switches to protection and forbids return to the working circuit pack even if the trouble clears. This is caused by multiple protection switches on that circuit pack in a short time period.

Autolock Numbers of Switches
This parameter is the number of times that the system restores a circuit pack to service (after intermittent failures) in a given autolock switching interval before the circuit pack is autolocked.

Autolock Release Time
The number of hours between times when the system automatically releases autolock.

Autonomous
An action performed by the system without direction by you.

Auto-provisioning
Put into the provisioned state automatically by the system.

Available (AVAIL)
Circuit pack or interface module is not provisioned and not assigned in the database. The circuit pack or interface module is not monitored by the system

B

B3ZS
Bipolar with 3-zero substitution; a DS3 or STS-1 line code.

B8ZS
Bipolar with 8-zero substitution; a DS1 line code.

Battery Distribution Feeder Board (BDFB)
Lineage 2000 (or equivalent) battery plant (-48 Vdc nominal) used to supply power to the DACS IV-2000. New Release 4.0 frame orders use two BDFBs (red and blue power feeds), while existing frames software upgraded to Release 4.0 use one BDFB

Baud Rate
Transmission rate (bits per second) on a link.

BER Metric
Specifies the metric for calculating bit error rate at a DS3 interface port. Options are bipolar variation (BPV) or parity (PTY). The initial value is BPV.

Bipolar Variation
A variation of the alternating +1, -1 pattern in a 3-level code.

Bit Error Rate (BER) Threshold
Point at which an alarm is issued for bit errors.

Blank (BLK)
Circuit pack slot containing a bus extender (blank) circuit pack.

Blue Code
Same as alarm indication signal (AIS).

Boot
To transfer contents of backup memory into the system's working memory.

Broadcast
To take a signal from a single input port and connect it to multiple output ports.

Byte
Usually refers to a group of eight consecutive binary digits, but sometimes used for bit groups of other sizes.

C

Call Redirect
Autonomous action taken when the ECI circuit pack that an X.25 network is connected to fails. A call redirect takes up to 2 minutes to complete and switches the X.25 network to the working ECI circuit pack.

Capacity Expansion
Feature that allows customers to minimize the number of DACS IV-2000 frames needed in larger offices by absorbing up to two DACS IV-2000 (256) systems into the Switch Complex of a DACS IV-2000 (512) system.

C-bit Parity
Parity checks on blocks of data are used to detect bits in error. C-bit parity is a DS3 format specified by ANSI T1.107 that supports near-end and far-end path performance monitoring, contains far-end alarm/control, and three end-to-end overhead communications channels.

Clear (CL)
The state where an alarm condition no longer exists.

Clear-Channel
A channel in which all bandwidth is used, with no overhead bits.

Collocated
A standalone system in which the interface bays are electrically connected to the Switch Complex.

Command Mode
One of two modes used to communicate with the DACS IV-2000. This mode involves entering commands directly into the system without any prompts.

Communication Interface Link (CILINK)
Access port that allows users or operations systems (OSs) to communicate with the DACS IV-2000.

Condition
The type of alarm failure, such as internal and loss of signal.

Control Cable ID
Specifies the controller cable (J cable) identification associated with an interface module or a DS3 performance monitor (DS3PM) circuit pack.

Control Complex (CC)
A set of circuit packs (CPU/MTC/SSC) that provide all control functions for the DACS IV-2000. For the redundant controller, two control complexes are provided for increased reliability of the main controller.

Critical (CR)
Alarm that indicates a severe, service-affecting condition.

Cross-Connect
Hardware used to interconnect line-terminating equipment, multiplexers, and other equipment, allowing access to these facilities and having the ability to change these facilities as required.

Crosstalk
An unwanted signal induced into one transmission line from another transmission line.

Current Value
In the dialog mode, indicates that the current value of a parameter is used by the system unless you direct otherwise.

D

Database
A record of cross-connections, status of circuit packs and facilities, and other data.

Default
A value the system automatically uses for a parameter if the you do not specify a value.

Delimiter
A punctuation mark (colon or comma) used to separate two parameters in an input message.

Demultiplexer
An electronic device used with a multiplexed signal for recovering signals combined within it and restoring the distinct individual channels of these signals.

Diagnose
To test a circuit pack.

Display Number
Specifies a TABS display number.

Double Ampersand (&&)
Specifies multiple addressed ranges of equipment, links, or ports. For example, 1&&-6 means equipment/link/port locations 1 through 6.

Driven
A condition in which an interface with a connection is being monitored.

DS1GRP
A group of 28 DS1 ports in an SWIF, MUX, or SMUX [VT1.5(DS1) signals] circuit pack.

DS1 Port
Terminates a DS1 signal on a DS1IF (one of fourteen ports), as part of a DS3 signal on a MUX, or as part of an STS-1(VT1.5) signal on an SMUX circuit pack.

DS1 Signal
A logical signal with a data rate of 1.544 Mbps (ANSI T1.107). A DS1 signal is produced by combining 192 payload bits and one framing bit; for example, 24 DS0 signals (eight bits per DS0) can be combined with one framing bit, thereby transmitting 193 bits per frame.

DS2 Signal
A logical signal with a data rate of 6.312 Mbps (ANSI T1.107). A DS2 signal is produced by combining seven DS1 signals.

DS3 Clear-Channel Interface-16 Module
A DS3 Interface-16 Module that contains one to fifteen MUX3 circuit packs, one MUXP3 circuit pack, and no MUX2 circuit packs.

DS3 Equivalent
The second item in the address of a port. It refers either to a MUX circuit pack or to an SWIF circuit pack, either of which handles 28 DS1 signals.

DS3 Format
Specifies the line format of a DS3 interface port. The initial value is M13, the common multiplexer format.

DS3 Idle Signal
A signal that can be optionally applied to any DACS IV-2000 output port that is not cross-connected to any input port. This signal lets downstream network elements know that the facility is operating normally even though the DACS IV-2000 is not sending a normal DS3 signal.

DS3 Interface Port
Specifies a DS3 port on a MUX circuit pack. If the value UNIT is given, it indicates all the DS3 interface ports in that DS3 Interface Module.

DS3 Signal
A logical or electrical B3ZS signal with a data rate of 44.736 Mbps (ANSI T1.107). For the DACS IV-2000, a traffic-carrying DS3 signal is either framed or unframed (MUX3 only). A framed signal is made up of 28 DS1 signals and control bits used for synchronization and other purposes. The DS3 signal consists of a succession of masterframes approximately 106 μs long. Each masterframe contains seven subframes, each of which consists of eight data blocks. A data block contains one control bit and 84 data bits, with three data bits coming from each of the 28 DS1 signals that make up the DS3 signal. An unframed DS3 is any DS3 conformant to electrical specifications in ANSI T1.102-1994.

DSX-1, 2, 3y DS3
Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the DS1, DS2, or DS3 level.

Duplex Entity
A pair of circuit packs in which one is active and the other is in hot standby (clock generators).

Duplicate Control Complex
A set of circuit packs (CPU/MTC/SSC/SCI/UI) that provides all control functions for the DACS IV-2000. For the high capacity-controller, the main controller functions are duplicated by the two Control Complexes.

E

Echo
To display an input at a terminal. (A user ID is echoed, but a password is not.)

Electrical Carrier 1 (EC-1)
The industry standard nomenclature for an electrical STS-1 signal.

Electromagnetic Compatibility (EMC)
A measure of equipment tolerance to external electromagnetic fields.

Electromagnetic Interference (EMI)
Interference generated in a circuit by electromagnetic radiation energy coupling.

Electrostatic Discharge (ESD)
Static electrical energy potentially harmful to circuit packs and humans.

Enhanced Bay
An interface bay containing seismic bay framework.

Enhanced DS3 Interface-16 Module
A DS3 Interface-16 Module that contains at least one MUX3 circuit pack and one MUXP3 circuit pack in addition to one or more MUX2 circuit packs.

Enter
To provision a circuit pack or interface module by a command, not automatically by the system.

Entity
A specific piece of hardware (such as a circuit pack, memory device, or communications link) that has been assigned a name recognized by the system.

Entity Identifier
The name used by the system to refer to a circuit pack, memory device, or communications link.

Equalizer
A circuit adjustment used to maintain signal strength within desired limits.

Equipped (EQPT)
The circuit pack or interface module is in the system database and physically in the frame, but is not yet provisioned.

F

Facility
A one-way or two-way circuit connected to the DACS IV-2000 that carries a transmission signal (such as a DS1 or STS-1 signal).

Far-end
Equipment not associated with the DACS IV-2000 frame currently being communicated with over the CILINKs.

Fault
The circuit pack has a hard (not temporary) fault and can not provide its normal function.

Forced
A traffic-carrying circuit pack (either service or protection) has been deliberately locked into a service-providing state by a manual command despite being bad.

Frame
The smallest repetitive block of digital data being transmitted (for example, 193 bits in a DS1 signal, which contains twenty-four 8-bit bytes and a synchronizing frame bit). Also refers to an assembly of equipment units, such as a DACS IV-2000 frame.

G

Grooming
Rearrangement of DS1/VT1.5 signals in DS3/STS-1 signals.

Group Numbering Method
The numbering method using the combination of the VT1.5 group and the VT1.5 port for DS1 signals within VT1.5 signals.

H

Hardware ID
Specifies the hardware identification (type and version) of a circuit pack.

Header
The first line of a message.

Header Date
Specifies the current date as YYMMDD, where YY is the last two digits of the year, MM is the month, and DD is the day of the month.

Header Time
Specifies the current time of day as HHMMSS, where HH is the hour (00 to 23), MM is the minute, and SS is the second.

Hierarchy
An orderly ranking or sequence of elements, such as that of menus presented at a terminal.

Hit
A momentary disruption of service.

Hot Standby
A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack.

I

Idle
An output port is idle if it is not cross-connected to an input port.

Idle Code
A signal that is transmitted downstream automatically from an idle output port; it can also be transmitted downstream by a manual command from a cross-connected output port. The DS1 idle code (the same as DS1 alarm indication signal) consists of all ones.

Input Status
The input signal status of a DS1, DS3, VT1.5, or STS1 interface port, which can be:

- DRVN (driven) — indicates that a valid signal is expected at the Port, the Port is being monitored for incoming failures, and no incoming failures are currently detected.
- NDRVN (not driven) — indicates that no valid signal is expected at the Port, and the port is not monitored for failures. If the port is formatted, Performance Monitoring data is accumulated.
- INIT (initialized) — is used for an initialized (unset) value (in this case, the port is considered not driven until a valid signal is detected, at which time it becomes DRVN).
- QRSS (quasi-random signal source) — is used to indicate that the DS1 signal is provisioned as the QRSS source for the system. Only one Input Port can be designated as the QRSS Port at any given time. Attempting to specify QRSS for more than one port is denied.

Initial values are INIT for a DS1 interface port; DRVN for a DS3, VT1.5, and STS-1 interface port; and DRVN for DS1 ports of an DS3 interface port.

In-Service
A state in which the circuit pack is performing normal service functions, in either active or standby mode.

J

Jitter
Short-term variations in timing properties of a digital signal.

L

Line
A transmission medium, together with the associated equipment, required to provide the means of transporting information between two consecutive network elements; one network element originates the line signal and the other terminates the line signal.

Line Buildout (LBO)
An attenuating (signal-reducing) element used to keep DS3 or STS-1 output signal strength within desired limits. The line buildout setting for MUX or SMUX circuit packs includes:

- IN — the line buildout is in use, reducing the output signal strength
- OUT — the line buildout is not in use
- INIT — initialized (unset)

Line Code Type
Specifies the code type for a DS1 port terminating in a DS1 circuit pack, B8ZS or AMI.

Line Layer
The third layer of the standard SONET signal, used for reliable transport of the path layer payload and its overhead across the physical medium. The added overhead is accessed at points where STS signals are formed or terminated. Both lower layers (the photonic and section layers) exist to provide transport for this layer.

Link ID
The location and type of a user interface link.

Literal Character
A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

Location
An identifier for a specific circuit pack, interface module, interface port, or communications link.

Loopback (LPBK)
A circuit arrangement that causes a received signal to be returned to its source.

Loopback State
Specifies the state of a DS1, VT1.5, or STS1 port loopback:

- LPBKL (line loopback) — loops the signal from an input port to the corresponding output port in the same circuit pack by a connection in the circuit pack
- LPBKT (terminal loopback) — loops the signal from an input port to the corresponding output port in the same circuit pack by a cross-connection in the Switch Module
- LPBKI (internal loopback) — loops the signal from an output port to the corresponding input port of the same circuit pack.

M

M13
A standard format used for DS3 signals, produced by a DS1-to-DS3 multiplexer.

Major (MJ)
Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

Maintenance Condition (MCOND)
A circuit pack state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that can not be performed while normal service is being provided.

Mapped
Cross-connected.

Memory Class
One of two types of memory in the DACS IV-2000: PROG (software release) or DBASE (database).

Memory Data
Specifies the data (eight hexadecimal digits) associated with a memory type.

Memory Location
Specifies the equipment, DS1 interface port, DS3 MUX port, or STS1 SMUX port location associated with a memory type.

Memory Type
Specifies the memory device, which may be:

- WKG — working (system) random access memory
- PRI — primary backup (disk)
- SEC — secondary backup (optical disk).

Menu/Prompt Mode
One of two modes used to communicate with the DACS IV-2000. When operating in this mode, the system lets you choose commands from menus and then prompts you for information to complete the command.

Minor (MN)
Indicates a non-service-affecting equipment or facility failure.

Multiplexer
An electronic device that allows two or more signals to pass over one communications circuit.

Multipoint Address
Specifies the Layer 2 (multipoint) address used on a TABS link.

N

Near-end
Equipment associated with the DACS IV-2000 frame that is currently being communicated with over the CILINKs.

Network Element
A DACS IV-2000 frame is an example of a network element.

Notification Code
The notification code for alarm and status conditions, which includes:

- MJ — major alarm
- MN — minor alarm
- NA — indicates no alarm (status only)
- CL — cleared alarm.

NOVAL (no value)
In dialog mode, it indicates that no value is used for this parameter unless you enter one.

N-Rate Cable
A cable that carries an N-rate signal (27.648 Mbps), which includes 14 DS1 signals, half of an STS-1(cc-SPE) signal, or 14 STS-1(VT1.5) signals and timing information. There are four N-rate cable groups:

- R1 — from SWIF, MUX, or SMUX to SWIO
- X1 — from SWIO to SWCS
- Y1 — from SWCS to SWIO

- T1 — from SWIO to SWIF, MUX, or SMUX.

O

Optical Extension (OPEX)
Circuit pack that allows one or two DACS IV-2000 (256) systems to be optically connected to a DACS IV-2000 (512) Switch Complex, thereby increasing the capacity of the (512) system.

Optical Remoting
The optional feature in which optical fibers and circuit packs connect interface bays. Optical Remoting is used to accomplish capacity expansion.

Optical Unit Interface (OUI)
A circuit pack in the High-Capacity Controller that provides the LAN distribution and error summary functions for the Unit Controller and power circuit packs in the interface modules of a Remote Complex.

Outage
A disruption of service that lasts for more than 1 second.

Out-Of-Service (OOS)
The circuit pack is not providing its normal service function (removed from service or protected) either because of a system problem or because it has been removed from service manually.

Output Mode
Specifies what is being transmitted from a DS1, VT1.5, or STS1 output port. The modes are:

- NORM — normal cross-connected data
- TERM (terminated) — idle code
- AIS — alarm indication signal
- QRSS (quasi-random signal source) — an externally generated DS1 test signal, assumed to be quasi-random.

The initial value is NORM.

P

Parity Check
A check that tests whether the number of ones (or zeros) in an array of binary bits is odd or even; used to determine that the received signal is the same as the transmitted signal.

Path
A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Layer
The highest of the four layers of a standard SONET signal, used to transport services between path-terminating network elements. Examples of such services include DS1s, DS3s (synchronous and asynchronous), and video signals.

Path Overhead (POH)
Informational bytes assigned to, and transported with, the payload until the payload is demultiplexed.

Payload Pointer
The pointer that shows the location of the beginning of the synchronous payload envelope (SPE).

Photonic Layer
The lowest of the four layers in a standard SONET signal, used to convert STS signals and OC (optical carrier) signals.

Poll Timing
Specifies (in seconds) how often the system expects a poll request from a remote telemetry on a TABS link.

Port
The point of access on an interface circuit pack that connects the DACS IV-2000 to a DS1, DS3, or STS-1 signal.

Port Numbering Method
The numbering method using the sequence of 1 to 28 VT1.5 signals within an STS-1 signal.

Primary Line
The second line in an output message.

Program
The software that directs the operation of the main controller and other frame elements.

Protocol
Detailed format and procedures used for transmitting digital data.

Protocol Type
Indicates the protocol supported on an interface link.

Provision
To set parameters to establish the environment required for correct interaction of hardware, software, and peripherals.

Provisioned (PROV)
The circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

Pulse Code Modulation (PCM)
The process by which analog signals are sampled, quantized, and coded into a digital bit stream.

Q

Quasi-random Signal Source (QRSS)
Equipment that generates a specific, reproducible but complicated digital test signal that resembles a normal traffic-carrying DS1 signal.

R

Red-lined
A circuit that is given special protection against unintentional disconnection.

Released
If an input port, it is not under test access; if an output port, it is not cross-connected to an input port under test access.

Remote Complex
A DACS IV-2000 (256) frame (containing at least one Interface Bay and a Switch Bay) whose Switch Module is replaced with an OPEX Module and connected with optical fiber to the Optical Switch Input/Output (OSWIO) Module in the Switch Bay of a (512) system with at least 256 DS3 equivalents available. By using such a configuration, the OAM&P of the two systems is combined, effectively increasing the capacity of the (256) system.

Remote Unit Interface (RUI)
The Remote Unit Interface Module is located in a shelf in the OPEX bay. This module replaces the 256 Redundant Controller Module in capacity-expansion applications. The RUI supports the Remote Complex fiber interface to the Optical Unit Interface in the Switch Complex Main Controller.

Return to Zero
A code form having two information states termed zero and one and having a third state or an at-rest condition to which the signal returns during each period.

Rollover
Operation used when the transmission facility between the system and an upstream system is to be replaced.

S

Section
The portion of a transmission facility, including terminating points, between:

- a terminal network element and a line-terminating network element, or
- two line-terminating network elements.

A terminating point is the point, after single regeneration, at which performance monitoring is done.

Section Layer
The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

Sequential Numbering Method
The process of numbering the DS1/VT1.5 signal (DS1 signals within VT1.5 signals) from 1 through 28.

Side Switch
The autonomous action taken when the active Control Complex (CC) fails. A side switch takes up to 5 minutes to complete and switches the standby CC to the active state.

Single Ampersand (&)
Specifies multiple addressed equipment, links, or ports. For example, 1&-5 means equipment/link/port locations 1 and 5.

Snider
Protocol (message format) used on administrative links.

Software ID
Number that provides the software version information for the system. The software ID contains:

- a 1-digit number that indicates the software release
- a 2-digit number that indicates the point release
- a 3-digit number that indicates the issue of the point release
- one letter that indicates the load of the software release.

Split
Test access state in which an incoming signal is cross-connected to the receiver of a test set rather than to a previously connected output port, and a signal from the transmitter of the test set is cross-connected to the previously connected output port.

Standby (STBY)
The circuit pack is in service but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

State
The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

STSX-1
Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the STS-1 level.

STS1 Interface Port
Specifies an STS1 port on an SMUX circuit pack.

STS Envelope Capacity
Bandwidth within, and aligned to, the STS frame that carries the STS SPE.

STS Path Overhead
Nine evenly distributed path overhead bytes per 125 μs starting at the first byte of the STS SPE. STS path overhead provides for communications between the point of assembly of an STS SPE and its point of disassembly.

STS Payload Capacity
The maximum bandwidth within the STS SPE that is available for payload.

STS Synchronous Payload Envelope (STS SPE)
A 125-µs frame structure composed of STS path overhead and bandwidth for payload.

STS Transport Overhead
The overhead (informational bytes that contain the line and section overhead) added to the STS SPE for transmission.

STS-1 Signal
The basic building block signal in the SONET standard. An STS-1 signal has a data rate of 51.84 Mbps. An STS-1 signal frame consists of 90 columns and 9 rows of 8-bit bytes, for a total of 810 bytes (6480 bits) for a frame length of 125 µs. The first three columns of an STS-1 signal are the transport overhead, which contains overhead bytes of section (nine bytes) and line (eighteen bytes) layers. The remaining 87 columns of 9 rows of bytes (783 bytes) make up the STS-1 envelope capacity.

Subpart
In the Digital Data System, a data bit rate that is 2.4, 4.8, or 9.6 kbps.

Subrate
In the Digital Data System, a data bit rate that is either 2.4, 4.8, or 9.6 kbps.

Synchronous
The essential characteristic of time scales or signals such that their corresponding significant instances occur at precisely the same average rate.

Synchronous Network
The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Payload
Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame; that is, no variable bit-stuffing-rate adjustments are required to fit the payload in the transmission signal.

T

T1
Transmission carrier system at the rate of 1.544 Mbps (same as DS1 signal).

T2
Transmission carrier system at the rate of 6.312 Mbps (same as DS2 signal).

T3
Transmission carrier system at the rate of 44.736 Mbps (same as DS3 signal).

Terminated
Output mode in which idle code is transmitted downstream.

Test Access
Allows the DACS IV-2000 the ability to apply and monitor test signals in accordance with Bellcore TA-TSY-000203.

Test Mode
Specifies the test access mode.

Test Signal Identification (TSID)
Unique name given to a DS1 test signal

Tributary
One of the 28 DS1 (1.544 Mbps) channels in a DS3 (44.736 Mbps) signal or one of 28 VT1.5 (1.728 Mbps) channels in an STS-1 (51.84 Mbps) signal.

U

User Community Authorization Level (UCAL)
Specifies the user authorization level: 5 identifies a super user (system administrator); 1 identifies an ordinary user.

Unit
An interface module; the term is sometimes used instead of entity or subassembly.

Unit Type
Specifies the type of interface module:

- 32DS3 — for DS3 Interface-32 Module
- 16DS3 — for DS3 Interface-16 Module
- 16EDS3 — for Enhanced DS3 Interface-16 Module
- 16DS3CC — for DS3 Clear-Channel (DS3CC) Interface-16 Module
- 16STS1 — for STS1 Interface-16 Module
- DS1 — for DS1 Interface Module
- DS1P — for DS1 Interface-Protection Module.

V

Virtual Tributary (VT)
A structure designed for transporting and switching some STS-1 payloads.

Volatile Memory
Type of memory that is lost if electrical power to it is interrupted.

VT1.5 Port
Terminates a VT1.5 signal that is part of an STS-1 signal on an SMUX circuit pack.

VT1.5 Tributary
A SONET logical signal with a data rate of 1.728 Mbps. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies twelve columns of the 9-row structure and, for VT1.5s, contains four VTs per group.

VT Envelope Capacity
Bandwidth within, and aligned to, the VT Superframe that is available for the VT SPE.

VT Group
A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte-interleaved within the VT-organized SPE.

VT Path Overhead
One path overhead byte per 500 µs located at the first byte of the VT SPE. VT path overhead provides for communication between the point of assembly of the VT SPE and the point of its disassembly.

VT Payload Capacity
The maximum bandwidth within the VT SPE that is available for payload.

VT Superframe
The VT is organized into a 500-µs superframe structure overlaid on, and aligned to, a 125-µs STS1 SPE. Contained within this structure is the VT payload pointer and the VT SPE.

VT Synchronous Payload Envelope (VT SPE)
A 500-µs frame structure carried by the VT, composed of VT path overhead and bandwidth for payload. The envelope is contained within the VT envelope capacity and can have any alignment with respect to it.

W

Wideband Digital Cross-Connect System (WDCS)
A digital cross-connect system that interfaces any one or combinations of SONET, DS3, and DS1 signals and has the basic functionality of cross-connecting at the floating SONET Virtual Tributary 1.5 (VT1.5) or the DS1 level. A SONET WDCS is a DCS that cross-connects at the VT1.5 level and provides SONET signal multiplexing and termination. A DCS 3/1 is a DCS that cross-connects at the DS1 level and provides DS3 multiplexing and termination.

Wideband Loopback
The connection of a VT1.5 [VT1.5(cc-SPE) or VT1.5(DS1)] tributary from an incoming STS-1 facility to the outgoing direction of the same facility. This type of loopback differs from a line loopback in that the signal being looped back is not at the line rate, and it is necessary to modify the VT pointer bits to perform the loopback. The DACS IV-2000 implements the wideband loopback as a terminal loopback (the loopback point is in the cross-connect network).

Acronyms

Symbols

°C	Degrees Celsius
°F	Degrees Fahrenheit

Numerics

16DS3	DS3 Interface-16 Module
16DS3CC	DS3 Clear-Channel Interface-16 Module
16EDS3	Enhanced DS3 Interface-16 Module
16STS1	STS1Interface-16 Module
1WAY	One Way
2ASCCS	2A Switching Control Center System
2BSCCS	2B Switching Control Center System
2WAY	Two Way
32DS3	DS3 Interface-32 Module

A

A	Ampere
ABN	Abnormal
ABT	Abort
AC	Alternating Current
ACCMD	Access Mode
ACCUM	DS3 Accumulation Period
ACFAIL	AC Power Failure
ACK	Acknowledge
ACO	Alarm Cutoff
ACPWR	AC Power
ACT	Activate
	Active
ACTIVE_REF	
	Active Timing Reference
ACTSIG	Active Signal
ADDR	Address
ADJ	Adjusted
AI	Asynchronous Interface
AIS	Alarm Indication Signal
AISFRAMED	
	Alarm Indication Signal, Framed
AISL	Alarm Indication Signal, Line
AISP	Alarm Indication Signal, Path
AISSL	AIS Seconds, Line
AISUNFRAMED	
	Alarm Indication Signal, Unframed
ALL1SIGNAL	
	All Ones Signal
ALLDS2SOOF	
	All DS2 Tributaries Out-of-Frame
ALLREFFAIL	
	All Timing References Failed
ALM	Alarm
ALMDLY	Alarm Delay
ALSP	AIS/Loss-of-Pointer Seconds, Path
ALW	Allow
AMI	alternate Mark Inversion
ANSI	American National Standards Institute
APPL	Application
AS&C	Alarm, Scan, and Control
ASYN	Asynchronous
Async	Asynchronous
ATTR	Attribute
AUD	Audit
AUTO	Automatic
AUTOCMPN	
	Automatic Camp-on
AUTOREL	Automatic Release
AUTORET	Automatic Carriage Return
AUX	Auxiliary
AVAIL	Available

B

B8ZS	Bipolar with 8-Zero Substitution
BDCST	Broadcast
BDFB	Battery Distribution Feeder Board
BEC	Block Error Counts
Bellcore	Bell Communications Research
BER	Bit Error Rate
BERL	Bit Error Rate, Line
BERM	Bit Error Rate Metric
BESP	Bursty Errored Seconds, Path
BITS	Building Integrated Timing Source
BKUP	Backup
BKUPALM	Backup Alarm

BKUPMEMS	Backup Memory Secondary Failure
BOC	Bell Operating Company
BOOTMSG	Boot Message
BPV	Bipolar Violation
BRT	Business Remote Terminal
BUSA	Fuse Bus A
BUSB	Fuse Bus B
BUSC	Fuse Bus C
BUSD	Fuse Bus D
BUSE	Fuse Bus E
BXA	Bus Extender A

C

CABLEID	Control Cable Identification
CALCK	Calculated Checksum
CANC	Cancel
CB	Compatibility Bulletin
CBIT	C Bit Protocol
CC	Clear-Channel (Hardware) Control Complex
cc	Clear Channel (Signal)
CCITT	International Telegraph and Telephone Consultative Committee
CCODE	Circuit Pack (Hardware) Code
CD	Compact Disk
CE	Capacity Expansion
CEQL	Circuit Pack Equalization
CHG	Change
CILINK	Communications Interface Link
CIT	Communications Interface Terminal
CKTLED	Circuit Pack LED
CL	Clear
CLEI	Common Language Equipment Identification
CLFI	Common Language Facility Identification
CLKDR	Clock Distributor
CLKGN	Clock Generator
CLKMODE	Clock Mode
CLLI	Common Language Location Identification
CLRDLY	Clear Delay
CMD	Command
CMDCTAG	Command CTAG
CMDSTAT	Command Status
CMPN	Camp-On
CMPR	Compare
COM	Common
COMCODE	Component Code
COMPLD	Completed
COND	Condition
CONDDESCR	Condition Descriptor
CONF	Conference
CONN	Connect
CONT	Continue
CONTBUS	Control Bus
CP-BITS	Copy of the Parity Bits
CPE	Customer Premises Equipment
CPLINECDE	Circuit Pack Linecode
CPU	Central Processing Unit
CPY	Copy
CR	Carrier/Response Critical
CRS	Cross-Connection
CRT	Circuit
CRTE	Create
CSS	Controlled Slipped Seconds
CTAG	Correlation Tag
CTYPE	Condition Type
CURR-F-END	Current F-End
CURVAL	Current Value
CV	Coding Violations
CVL	Coding Violations, Line
CVP	Coding Violations, Path

D

DACS	Digital Access and Cross-Connect System
DAYWK	Day-of-Week
DB	Database
DBALL	Database All
DBASE	Database
DBAUTO	Database Automatic

DBCHG	Database Change
DC	Direct Current
dc	Direct Current
DD	Day
DET	Detailed
DGN	Diagnose
DGNDET	Diagnose Detailed
DISC	Disconnect
DLI	Data Link Inaccessible
DLN	Data Link Not Responding
DLT	Delete
DLTCRS	Deleted Cross-Connection
DM	Degraded Minutes
DMODE	Dialog Mode
DN	Down
DP	Decision Point
DPLL	Digital Phase Lock Loop
DPLX	Duplex
DRAM	Dynamic Random Access Memory
DROPCRS	Dropped Cross-Connection
DRVN	Driven
DS1	Digital Signal, Level 1
	DS1 Interface Module
DS1-AIS	DS1 Alarm Indication Signal
DS1GRP	DS1 Interface Group
DS1IF	DS1 Interface
DS1IP	DS1 Interface Protection
DS1P	DS1 Interface-Protection Module
DS1RY	DS1 Relay
DS1TX	DS1 Timing Extractor
DS2	Digital Signal, Level 2
DS2XRCV	DS2 X-Bits Receive
DS2XTR	DS2 X-Bits Transmit
DS3	Digital Signal, Level 3
DS3CC	DS3 Clear-Channel (Hardware)
DS3cc	DS3 Clear-Channel (Signal)
DS3FORMAT	
	DS3 Signal Format
DS3FRMTMISMATCH	
	DS3 Format Mismatch
DS3MODE	DS3 Mode
DS3PM	DS3 Performance Monitor
	DS3 Performance Monitoring
DSAB	Digital System Access Bay
DSX	Digital Signal Cross-Connect
DSX-1	Digital Signal Cross-Connect, Level 1
DSX-3	Digital Signal Cross-Connect, Level 3
DTLCH	Data Latch
DTYPE	Data Type
DX	Duplex

E

EC-1	Electrical Carrier, Level 1
EC1MAP	EC-1 Map
ECASE	Type of Event
ECHO_STAT	
	Echo Status
ECI	Enhanced Communications Interface
ED	Edit
	Equipment Drawing
EEPROM	Electrically Erasable Programmed Read-Only Memory
EF-STAT	E to F Special Connection Status
EIA	Electronic Industries Association
EIDDET	Detailed Equipment Location
EMI	Electromagnetic Interference
ENH	Enhanced
ENT	Enter
E-OMODE	E-End Output Mode
EOR	End-of-Range
E-PORT	E-End Port
EPROM	Electrical Programmable Read-Only Memory
EQL	Equalization
EQPD	Equipped
EQPT	Equipment
EQPWR	Equipment Power
EQTYPE	Equipment Type
ES	Errored Seconds
ESAL	Errored Seconds Type A, Line
ESAP	Errored Seconds Type A, Path
ESBL	Errored Seconds Type B, Line
ESBP	Errored Seconds Type B, Path
ESD	Electrostatic Discharge
ESF	Extended Super Frame
ESFPATH	Extended Super Frame Path
E-SIG	E-End Input Health
ESL	Errored Seconds, Line
ESP	Errored Seconds, Path
EST	Eastern Standard Time
EVT	Event

EX	Exercise
EXCPTN	Exception
EXEC	Executive
EXJIT	Excessive Jitter
EXP	Expected
EXPCLFI	Expected Common Language Facility Identification
EXPCLLI	Expected Common Language Location Identification
EXPHR	Excessive Phase
EXTERR	External Error

F

FAC	Facility
FAILTHRES	Failure Threshold
FAILTYPE	Failure Type
FANAUX	Fan Auxiliary
FANFILTER	Fan Filter
FANMAIN	Fan Main
FANUNIT	Fan Assembly
FAX	Facsimile
FBA	Fuse Board A
FBB	Fuse Board B
FBC	Fuse Board C
FBD	Fuse Board D
FBF	Fuse Board F
FBG	Fuse Board G
FBH	Fuse Board H
FBI	Fuse Board I
FBJ	Fuse Board J
FBK	Fuse Board K
FBL	Fuse Board L
FBM	Fuse Board M
FE	Far-End
FEAC	Far-End Alarm and Control
FEF	Family of Equipment Failure
FEND	Far-End
FENDADD	Far-End Address
FENDNTE	Far-End Notification
FERF	Far-End Receive Failure
FE-STAT	F to E Special Connection Status
FIC	Frame Identification Code
FIFO	First In First Out
FLOW	Flow Control
FLPBKL	Far-End Loopback, Line
FLPBKM	Far-End Loopback, DS1 Tributary
FLT	Fault
FMA-BITS	F&M Bits Adjusted
FMN-BITS	F&M Bits Non-Adjusted
FMT	Format
FNCT	Function
F-OMODE	F-End Output Mode
FOMODE	FROM Output Mode
FPD	Floor Plan Data
FPGA	Field Programmed Gate Array
F-PORT	F-End Port
Fr	Friday
FRCD	Forced
FRD	Security Violation
FRNG	Free-Running Mode
FRQOF	Frequency Offset
FS & ALM	Fuse and Alarm
F-SIG	F-End Input Health
FSNLN	Frequency Synthesizer Loss-of-Energy
FST	Fast Start
FSTO	Fast Start Time-Out
FW	Firmware
FWID	Firmware Identification

G

GEN	Generator Number
GP	General Purpose
GTP	General Telemetry Processor

H

HCC	High Capacity Controller
HDA	Header Designation Assembly
HDR	Header
HEADCK	Header Checksum
HH	Hour
HI	High
HLDOVR	Holdover Mode
HR	Hour

I

ICTLR	Interrupt Controller
ID	Identification
IDBLK	Identification Block
IDMISMATCH	Identification Mismatch
IDUNREADABLE	Identification Unreadable
IHRER	Interrupt Holding Register Error
IMPROPBLK	Improper Blank
IMPROPRMVL	Improper Removal
IN	Input
INACTV	Inactivity
INC	Incoming Signal
INCL	Inclusive (Special Service Type)
INE	Intelligent Network Elements
INH	Inhibit
INHDS1FLPBK	Inhibit DS1 Far-End Loopback
INHDS1LPBK	Inhibit DS1 Loopback
INHDS3FLPBK	Inhibit DS3 Far-End Loopback
INHDS3LPBK	Inhibit DS3 Loopback
INHEC1LPBK	Inhibit EC-1 Loopback
INH-STATE	Inhibit State
INHSWPR	Inhibit Switch to Protection
INHSWWKG	Inhibit Switch to Working
INHVT1LPBK	Inhibit VT1.5 Loopback
INIT	Initialize Initialized
INPUT_CMD	Input Command
IN-STATE	Input State
INT	Internal
INTEGCK	Integrity Check
INTFC	Interface
INTFC-16	Interface-16
INTFC-32	Interface-32
INTFC-P	Interface-Protection
INTRVL	Interval
INVL	Report Interval
IP	In Progress
IS	In-Service
ISID	Idle Signal Identification
ISTAT	Input Status
ISTATE	Input State

K

K	Link Window Size K

L

L	Line
LAN	Local Area Network
LAPD	Link Access Protocol D
LBO	Line Build Out
LCKD-OUT	Locked-Out
LED	Light Emitting Diode
LERDF	Line Error Detector Failure
LGN	Login
LGT	Logout
LINECDE	Linecode
LINKID	Link Identification
LINKNUM	Link Number
LOC	Location
LOCL	Local
LOCN	Location (Near- or Far-End)
LOF	Loss-of-Frame
LOOPE	Loop E
LOOPF	Loop F
LOP	Loss-of-Pointer
LOS	Loss-of-Signal
LOSSS	Loss-of-Signal Seconds, Section
LPBK	Loopback
LPBKF	Loopback, Far-End
LPBKI	Loopback, Internal
LPBKL	Loopback, Line
LPBKM	Loopback, DS1 Tributary

LPBK-STATE	Loopback State
LPBKT	Loopback, Terminal
LSTATE	Loopback State

M

MAN	Manual
MANPROT	Manual Protection
MAP	Mapped
Mbits/s	Million (Mega) Bits per Second
MC	Main Controller
MCOND	Maintenance Condition
MEM	Memory
	Memory Storage
MEMTYPE	Memory Type
MESSAGE	Message Screening
MIN	Minute
MINC	Multiple Incoming Signals
MISRSP	Mismatch Response
MJ	Major
MM	Minute
	Month
MML	Human-Machine Language
MN	Minor
Mo	Monday
MOD	Module
MONE	Monitor E
MONEF	Monitor EF
MONF	Monitor F
MONLEV	Monitored Level
MONPARM	Monitored Parameter
MONPORT	Monitored Port
MONVAL	Monitored Value
ms	Milli Second
MTC	Maintenance
	Maintenance Controller
MTCE	Maintenance
MTCH	Match
MTYPE	STS-1 Performance Monitoring Mode
MULPTADD	Multipoint Address
MUX	Multiplexer
MUXP	Multiplexer Protection
MUXPS	Multiplexer Protection Switch

N

N	No
N2	Counter N2
NA	No Alarm
	Not Applicable
	Not Available
NDRVN	Non-Driven
NE	Network Element
NEND	Near-End
NENDADD	Near-End Address
NESIZE	Network Element Size
NETYPE	Network Element Type
NIMAN	Manual Isolation Must be Performed
NMA	Network Monitoring and Analysis
NORM	Normal
NOVAL	No Value
NSA	Non-Service Effecting
NTE	Network Terminating Equipment
NTFCNCDE	Notification Code
NUMBR	Number Lock-Out
NUMINVL	Number of Intervals
NUMSW	Number Switches

O

OC-12	Optical Carrier, Level 12
OC-3	Optical Carrier, Level 3
OC-48	Optical Carrier, Level 48
OMODE	Output Mode
ONEWAY	One-Way
OOF	Out-of-Frame
OOFS	Out-of-Frame Seconds
OOS	Out-of-Service
OPEX	Optical Extension
OPR	Operate
OPS	Operations Systems
OR	Optical Remoting
OS	Operations System
OSTATE	Output State

OSWIO	Optical Switch Input/Output
OUI	Optical Unit Interface
OUT-STATE	Output State

P

P	Packet Size P
	Path
PAD	Packet Assembler/Disassembler
PATCH#	Patch Number
PC	Personal Computer
	Program Counter
PCODE	Provisioned Circuit Pack Code
PEQL	Provisioned Equalization
PFLCH	Phase/Frequency Latch
PHSTP	Phase Step Error
PID	Path Identification
PLBO	Provisioned Line Build-Out
PM	Performance Monitoring
PMCNFGRN	Performance Monitoring Configuration
PMGR	Performance Monitoring Generator/Receiver
PMREPT	Performance Monitoring Report
PMSCHED	Performance Monitoring Schedule
PMTYPE	DS3 Performance Monitoring Type
POLL	Poll Timing
POS	Provisioned Out-of-Service
POWERE	Power E
PRI	Primary Storage
PRMTR	Parameter
PROC	Process
PROG	Program
PROTLOC	Protection Location
PRTCL	Protocol
PRTL	Partial
PRVG	Privilege
PSET	Performance Monitoring Set
PSHLN	Phase Shifter Loss-of-Energy
PSWD	Password
PTY	Parity
PTYPE	Protocol Type
PWR	Power
PWRA	Power A
PWRE	Power E
PWRF	Power F
PWRG	Power E
PWRJ	Power J

Q

QRSS	Quasi Random Source Signal
QUART	Quasi Universal Asynchronous Receiver/Transmitter

R

R20	Counter R20
R22	Counter R22
R23	Counter R23
R25	Counter R25
RAM	Random Access Memory
RAMER	Random Access Memory Error
RBOC	Regional Bell Operating Company
RC	Return Code
RCI	Remote Communications Interface
RCLEI	Received Common Language Equipment Identification
RCLFI	Received Common Language Facility Identification
RCLKGN	Remote Clock Generator
RCLLI	Received Common Language Location Identification
RCV	Receive
RCV_ERR	Receiver Error
RCVEC1MAP	Received EC-1 Format
RCVVTMAP	Receive VT1.5 Format
RDLD	Redlined
REG	Register
REL	Release
	Released
REPT	Report
REPTDAT	Report Date
REPTTM	Report Time
RFAN	Remote Fan
RFIC	Received Frame Identification Code

RLS	Release
RLSTM	Release Time
RMTMUXC	Remote Multiplexer
RMV	Remove
ROLL	Rollover
ROM	Read-Only Memory
ROMER	Read-Only Memory Error
RPOWERE	Remote Power E
RPWRA	Remote Power A
RPWRF	Remote Power F
RSCI	Remote Switch Controller Interface
RST	Restore
RSTCRS	Restored Cross-Connection
RTRV	Retrieve
RTRVSEL	Retrieve DS3 ID Selector
RTV	Real-Time Violation
RTYPE	Received DS3 Identification Type
RUI	Remote Unit Interface
RUIA	Remote Unit Interface A
RUIB	Remote Unit Interface B
RUNIT	Received Unit String
RX	Remote Complex

S

S	Section
SA	Service Affecting
Sa	Saturday
SBIT	DS3 Stuff Bit Protocol
SBITFAIL	DS3 Stuff Bit Failure
SCANPM	Scan Performance Monitoring
SCANTH	Scan Threshold
SCCS	Switching Control Center System
SCHED	Schedule
SCI	Switch Controller Interface
SEC	Secondary Storage
SECU	Security
SEFS	Severely Errored Frame Seconds
SEFSS	Severely Errored Frame Seconds, Section
SEQ	Sequence
SES	Severely Errored Seconds
SESL	Severely Errored Seconds, Line
SESP	Severely Errored Seconds, Path
SF	Super Frame
SFPATH	Super Frame Path
SFTWR	Software
SFTWR-VRSN	Software Version
SHACCUM	DS1 Short Accumulation Period
SID	Source Identification
SLMF	Signal Label Match Failure
SMODE	Synchronizer Mode
SMUX	SONET Multiplexer
SMUXP	SONET Multiplexer Protection
SOAKCLR	SONET Condition Clear Soak Time
SOAKON	SONET Condition Onset Soak Time
SONET	Synchronous Optical Network
SPE	Synchronous Payload Envelope
SPLTA	Split A
SPLTB	Split B
SPLTE	Split E
SPLTEF	Split EF
SPLTF	Split F
SPLX	Standard
SPR	Spare
SRAM	Static Random Access Memory
SRV	Service
SRVEFF	Service Effecting
SS	Second
SSC	Secondary Storage Controller
SST	Special Service Type
STA	Start
STAT	Status
STP	Stop
STS-1	Synchronous Transport Signal, Level 1
Su	Sunday
SW	Switch
SWCS	Switch Center Stage
SWID	Software Release Identification
SWIF	Switch Interface
SWINTVL	Switch Interval
SWIO	Switch Input/Output
SWLOC	Switch Location
SWSLMF	Switch Signal Label Match Failure
SYNC	Synchronizer
	Synchronous
Sync	Synchronous
SYNCCLK	Synchronizer Clock

SYNCFRNG	Synchronizer Free Running
SYNCFST	Synchronizer Fast Start
SYNCHLDOVR	Synchronizer Holdover
SYNCN	Synchronizer
SYNCPRI	Primary Timing Reference
SYNCSEC	Secondary Timing Reference
SYPLN	Synchronizer Pulse Loss-of-Energy
SYS	System
SYSID	System Identification
SYSTYPE	System Type

T

T1	Timer T1 Transmission Facility, Level 1
T1ID	T1 Identification
T2	Transmission Facility, Level 2
T20	Timer T20
T22	Timer T22
T23	Timer T23
T25	Timer T25
T3	Timer T3 Transmission Facility, Level 3
TA	Technical Advisory
TABS	Telemetry Asynchronous Block Serial
TACC	Test Access
TAP	Test Access Port
TB	Time Base Time Base (TBS3)
T-BER	Bit Error Rate Threshold
T-BERL	Bit Error Rate Threshold, Line
TBIOER	Time Base Input/Output Error
TBLEN	Time Base Loss-of-Energy
TBNDF	Time Base Energy Detector Failure
TBS3	Time Base Stratum 3
TELDISP	Telemetry Display
TERM	Terminated
TH	Threshold
Th	Thursday
THLEV	Threshold Level
TID	Target Identification
TL1	Transaction Language 1
TLIP1FF	Timing Link Interface Port 1 Framing Format
TLIP1LC	Timing Link Interface Port 1 Linecode
TLIP2FF	Timing Link Interface Port 2 Framing Format
TLIP2LC	Timing Link Interface Port 2 Linecode
TLMTRY	Telemetry
TM	Time
TMDAY	Time-of-Day
TMOFST	Time Offset
TMPER	Time Period
TNR	Test Not Run
TODC	Time-of-Day Clock
TOMODE	TO Output Mode
TOPROTN	To Protection
TOWKG	To Working
TP	Testport
TPA	Type A
TPB	Type B
TPC	Type C
TPPV	Testport Provisioned
TR	Technical Report
TR9	TR-TSY-000009 Remote Multiplexer
TRANSID	Transport Self-Identification
TRBER	High Bit Error Rate
TRC	Transmit Path Trace
TRMNBER	Minor High Bit Error Rate
TRMSN	Transmission
TRNCLEI	Transmitted Common Language Equipment Identification
TRNCLFI	Transmitted Common Language Facility Identification
TRNCLLI	Transmitted Common Language Location Identification
TRNDS3ID	Transmitted DS3 Identification Type
TRNFIC	Transmitted Frame Identification Code
TRNUNIT	Transmitted Unit String
TSGR	Test Signal Generator/Receiver
TSID	Test Signal Identification
TSR	Test Signal Receiver
TSR_LOC	Test Signal Receiver Location
TSTPT	Testport
TTY	Terminal Typewriter
Tu	Tuesday
TWOWAY	Two-Way
TX	Timing Extractor

U

UART	Universal Asynchronous Receiver/ Transmitter
UAS	Unavailable Seconds
UASL	Unavailable Seconds, Line
UASP	Unavailable Seconds, Path
UC	Unit Controller
UCAL	User Community Authorization Level
UCFC	User Community Functional Category
UCPL	User Community Priority Level
UI	Unit Interface
UIA	Unit Interface A
UIB	Unit Interface B
UID	User Identification
UNF	Unframed
UNFR	Unframed
UNKN	Unknown
UNSPEC	Unspecified
UPC	User Privilege Code
URTER	UART Error
UTYPE	Unit Type User Type

V

V	Volt
Vdc	Volts, Direct Current
VIRT_CIRC	Virtual Circuit
VLDTY	Validity
VRSN	Version
VT	Virtual Tributary
VT1.5	Virtual Tributary, Level 1.5
VT1.5NUM	VT1.5 Number
VT1GRP	VT1.5 Interface Group
VTFLOAT	Virtual Tributary Float
VTGROUP	VT Group
VTLOCK	Virtual Tributary Lock
VTMAP	Provisioned VT1.5 Format
VTNUM	VT1.5 Numbering

W

W	Network Window Size W
We	Wednesday
WKG	Working
WRNGPWR	Wrong Power
WTRSCE	Waiting for Resources

X

X1LEN	Cross-Couple 1 ms Loss-of-Energy
X3LEN	Cross-Couple 30 ms Loss-of-Energy
XBITRCV	DS3 X-Bits Receive
XCOOL	Cross-Couple Out-of-Lock
XCRTV	Cross-Couple Real-Time Violation
XCSUM	Cross-Couple Summary
XFLRG	Cross-Couple Fast Lock Range
XFQOF	Cross-Couple Frequency Offset
XLKDN	Cross-Couple Link Down
XMIT	Transmit
XPOL	DS3 X-Bits Transmit

Y

Y	Yes
YEL	Yellow Signal
YY	Year

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