DACS IV-2000 (256)
Digital Access and Cross-Connect System IV-2000
Release 3.0
Operations and Maintenance

365-340-401
revision 1
June, 1995

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(AT&T 365-340-401)

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Preface

Purpose

This manual provides procedural information required to support the craft and central maintenance activities involved in the daily operation and maintenance of the DACS IV-2000 Release 3.0.

Audience

This document is intended for individuals who are responsible for the acceptance, provisioning, operations, and maintenance of the DACS IV-2000 Release 3.0.

Contents

Chapter 1 - Introduction

This chapter provides an overview of the DACS IV-2000 and 2000 family of transmission products.

Chapter 2 - Safety Precautions

This chapter contains general safety precautions pertaining to the DACS IV-2000.

Chapter 3 - Routine Maintenance

This chapter contains procedures for performing periodic maintenance of the DACS IV-2000.

Chapter 4 - Logging In and Out

This chapter contains procedures for logging in and out of the DACS IV-2000 and recovering from a system lock.

Chapter 5 - Provisioning and Deprovisioning

This chapter contains procedures for setting up the frame for service (provisioning), and for changing current setups (deprovisioning).

Chapter 6 - Frame Administration

This chapter contains procedures for booting the system, for database management, and for login administration.

Chapter 7 - Link Administration

This chapter contains procedures for changing link parameters and speed, and for adding and removing an interface terminal.

Chapter 8 - Cross-Connections

This chapter contains procedures for making cross-connections.

Chapter 9 - Test Access

This chapter contains procedures for using the test access capabilities.

Chapter 10 - Loopbacks

This chapter contains procedures for creating loopbacks for far-end testing.

Chapter 11 - Performance Monitoring

This chapter 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, and VT1.5 facilities.

Chapter 12 - Alarms

This chapter contains procedures for clearing critical, major, and minor alarms.

Chapter 13 - Diagnostic Messages

This chapter contains procedures for addressing diagnostic messages generated by the system.

Chapter 14 - Replacing Components

This chapter contains procedures for replacing malfunctioning or failed components in the DACS IV-2000 and for changing older versions of system hardware to new versions (for example, MUX1 circuit pack to MUX2 circuit pack).

Chapter 15 - Acceptance Testing

This chapter 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.

Appendix A - Alarm, Status, and Control Points

This appendix provides information on alarm, status, and control (AS&C) points provided with the DACS IV-2000 system.

In addition, a glossary describing terms used in this guide, and a fully cross-referenced index are located at the end of this document.

Conventions

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

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

Related Documents

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

— *DACS IV-2000 Release 3.0 Reference Manual*, document number AT&T 365-340-400
This document provides in-depth DACS IV-2000 information for network planners and maintenance engineers.

— *DACS IV-2000 Release 3.0 Commands and Messages*, document number AT&T 365-340-402
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 Release 3.0 Quick Reference Job Aids*, document number AT&T 365-340-403
These aids are 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 Release 3.0 Applications, Planning, and Ordering*, document number AT&T 365-340-404
This guide is designed for network planners, account representative, account executives, and engineers. It contains the DACS IV-2000 features, applications, and ordering information.

— *DACS IV-2000 Release 3.0 Software Release Description*, document number AT&T 365-340-405
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.

Ordering Documents

To order copies of the *DACS IV-2000 Release 3.0 Software Release Description*, contact your Regional Customer Service center and order using the document number AT&T 365-340-405. To order copies of all other documents, send or call in an order using the associated document number as follows:

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Introduction

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Introduction

1

The DACS IV-2000 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] (and in the future OC-3) 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 system can terminate DS1, DS3, and STS-1 signals and can cross-connect DS1, STS-1 and VT1.5 signals from transmission facilities or from DS1, DS3, and/or STS-1 based network elements. All cross-connections are done at the N-rate signal level. DS3 signals are demultiplexed within the DACS IV-2000 system into 28 DS1 signals to access the switch network. STS-1 signals are either cross-connected as a STS-1 signal or are demultiplexed as 28 VT1.5 tributaries which can be cross-connected as VT1.5 or DS1 signals.

A wide range of termination mixes is supported by the system architecture. 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 (240 STS-1s), DS3 signals (248 DS3s), or for DS1 signals (6944 DS1s).

The DACS IV-2000 system accommodates SONET interfaces (STS-1 signals) to support SONET-to-SONET cross-connections as well as providing 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 system to be deployed economically in any size office.

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

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 synchronous optical network (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 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 signal levels.
- 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*R-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 System Features

New and enhanced features associated with Release 3.0 of the DACS IV-2000 system are:

- SONET Networking Capability
  - — SONET STS-1 Interface
  - — Enhanced Cross-connection
  - — Enhanced Bridging and Rolling
  - — Enhanced Loopback
  - — Enhanced Test Access
  - — SONET Performance Monitoring
  - — SONET Synchronization
- Input Command Routing
- In-Service Upgrade to Release 3.0

Refer to Chapter 2 of the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400) for information on the new and enhanced features.

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

- Main Controller Redundancy
  - — Administrative Links
  - — Dual Disk Capability
  - — Redundant Power
- Nonvolatile Backup Memory
- Alarm Reporting
  - — Office Alarms
  - — Remote Alarms
  - — Circuit Pack Alarms
  - — Multiple Alarm Processing
- Loopbacks
  - — DS1 Loopbacks
  - — DS3 Loopbacks

- Performance Monitoring
  - — DS1 Performance Monitoring
  - — DS3 Performance Monitoring
- Architectural Flexibility
- Support for Operations Systems
  - — Bellcore Operations Systems
  - — AT&T Operations Systems
- Cross-Connections
  - — DS1 Cross-Connections
  - — DS1 Bridging and Rolling
- Test Access
  - — DS1 Test Access
- Craft 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

- 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
  - Autolocking
- BNC Connectors

Refer to Chapter 2 of the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400) for detailed information on system features.

Software Architecture

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

- Main Controller System (with Redundant Main Processor)
  - — Main Processor
  - — Secondary Storage Controller
  - — Enhanced Communications Interface
  - — Synchronizer Module
- Unit Controller System
  - — Unit Controllers
  - — Signal Interface Circuit Packs

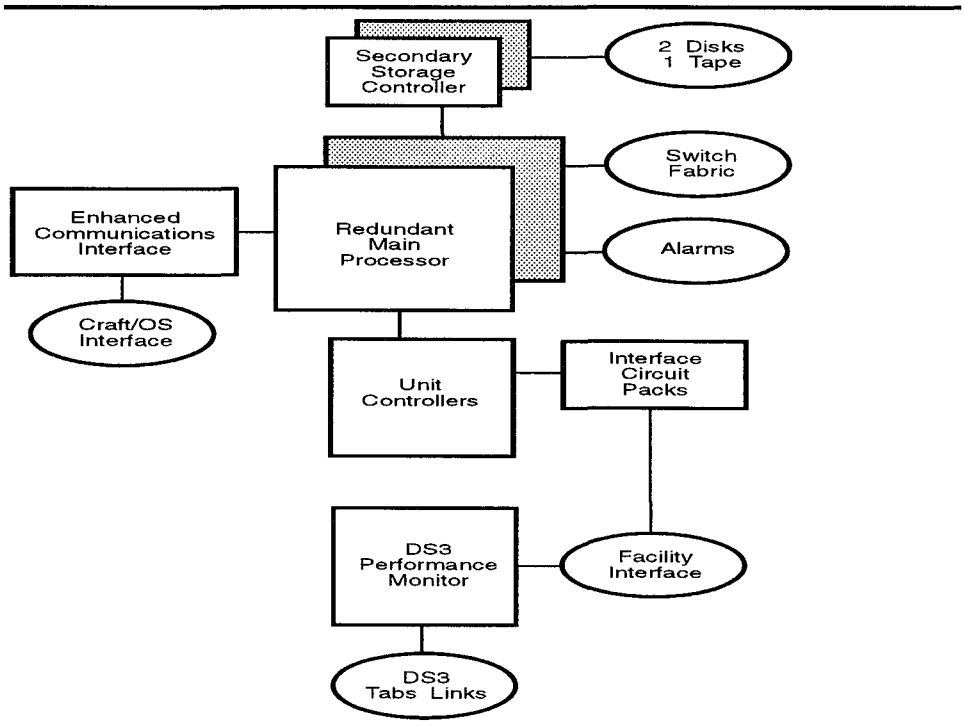


Figure 1-1. System Software Architecture

Main Controller System

The central component of the main controller system is the main processor. To enhance system reliability, a redundant main processor is provided that contains two control complexes. The main processor functions are performed by the active control complex while the standby control complex stays ready to take over these functions in the event the active control complex fails. Any failure of the main controller does not affect the system cross-connects.

The main processor runs application software to perform all system administration functions including cross-connection, provisioning, test access, and providing synchronization for the SONET interfaces. The main processor also serves as the central point of coordination for all system maintenance functions such as diagnostics, fault recovery, and alarm reporting. In addition, the main processor 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 tape drives).

The enhanced communication interface (ECI) supports the user interface to the main processor. It performs the parsing of commands and generates messages with the various synchronous (X.25) and asynchronous (Snider, telemetry) interface protocols. The ECI also allows the use of various system interface languages such as Transaction Language 1 (TL1), Telemetry Asynchronous Block Signal (TABS), and Telemetry Byte-Oriented Serial (TBOS).

The DACS IV-2000 Release 3.0 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 (UC) maintain the DACS IV-2000 system facility interfaces. The UCs support the redundant controller by providing communications with the interface circuit packs and by performing real-time maintenance functions such as hardware fault detection. Separate 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 DS3 performance monitoring controllers (DS3PM) are special purpose stand-alone processors that collect performance monitoring data on DS3 facilities and transmit this information over dedicated DS3PM TABS links to remote telemetry Operations Systems (OSs).

Hardware

The DACS IV-2000 hardware is comprised of two to nine bays containing a number of modules. Each module consists of an equipment shelf and its associated circuit packs.

Bays

There are five DACS IV-2000 system bays for Release 3.0. These bays are:

- Switch (SW) Bay — provides the control, cross-connections, and interbay cabling.
- DS1 Interface (INTFC) Bay — provides the interface for up to 868 DS1 signals (equivalent to 31 DS3 signals).
- DS3 Interface (INTFC) Bay — provides the interface for up to 62 DS3 signals (equivalent to 1736 DS1 signals).
- 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, or up to 30 STS-1 signals and no DS3 signals.
- STS1/DS3 Interface (INTFC) Bay — provides the interface for up to 60 DS3 and/or STS-1 signals (each DS3 is equivalent to 28 DS1 signals). 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
Switch (SW)	Redundant Controller (RC) Redundant Controller Power (RC PWR) Synchronizer (SYNC) Switch (SW) Switch Power (SW PWR) Auxiliary Power (AUX PWR) Fuse and Alarm (FS & ALM) Panel Fan Assembly	1 1 1 1 1 1 1 1
DS1 Interface (INTFC)	DS1 Interface (INTFC) DS1 Interface-Protection (INTFC-P)	3 1
DS3 Interface (INTFC)	DS3 Interface-32 (INFTC)	2
STS1/DS3/DS1 Interface (INTFC)	DS1 Interface (INTFC) DS1 Interface-Protection (INTFC-P) DS3 Interface-32 (INTFC-32) DS3 Interface-16 (INTFC-16) STS1 Interface-16 (INTFC-16)	1 1 o or 1* 0 or 1† 0-2*†
STS1/DS3 Interface (INTFC)	DS3 Interface-16 (INTFC-16) STS1 Interface-16 (INTFC-16) Fan Assembly	0-4‡ 0-4‡ 1

* STS1/DS3/DS1 Interface Bays can be equipped with an STS1 Interface-16 Module in place of the DS3 Interface-32 Module. When doing so, the capacity of the DACS IV-2000 system is decreased by 16 DS3 equivalent signals.

† STS1/DS3/DS1 Interface Bays can be equipped with either a DS3 Interface-16 or STS1 Interface-16 Module in the bottom shelf (STS1/DS3 Interface-16 shelf).

‡ STS1/DS3 Interface Bays can be equipped with any combination of DS3 Interface-16 and STS1 Interface-16 Modules totaling four.

Bay Mounting

The DACS IV-2000 system interface bays are 2 feet 2 inches wide, 7 feet high, 12 inches deep. The Switch Bay is 2 feet 2 inches wide, 7 feet high, and 13 inches deep. Both the Interface and the Switch Bays use the network bay framework. Equipment shelves that mount on these bays are factory installed. The only expansion that occurs is for additional circuit packs or growth bays.

The Switch Bay and STS1/DS3 Interface Bays have forced-air cooling while the DS1, DS3, and STS1/DS3/DS1 Interface Bays are cooled by free convection. The fan assembly at the bottom of the switch and STS1/DS3 Interface Bays takes in air near the floor and exhausts it out the top rear of the bay. Unequipped circuit pack slots are not permitted. Functionally unused slots must either contain a circuit pack or be covered with filler assemblies. Heat baffles are used between the shelves on the interface bays to direct rising heat away from the circuit packs, located above.

The initial or start-up bay configuration consists of the Switch Bay, one interface bay, and two temporary cable end guard assemblies all bolted together as a unit for shipment. This initial configuration is 6 feet 6 inches wide. The Switch Bay is delivered with all its interbay cabling for maximum capacity. Consequently, the cable end guard assemblies are required to store and protect the cables until they are needed. The initial bays are bolted to the floor during installation.

When a growth interface bay is provided, the appropriate cable end guard assembly is moved to allow bay placement adjacent to the existing arrangement. The growth bay is bolted to the floor next to its adjacent bay, and the connections are made between it and the Switch Bay. The cable end guard assembly is discarded if all the stored cable has been used on that side of the Switch Bay. Otherwise, it is reattached to the new growth interface bay on the side away from the Switch Bay. Recommended growth is to the left of the Switch Bay until all the cables are used, then to the right of the Switch Bay.

Interbay Cabling Arrangements

A DACS IV-2000 system can be one of several combinations of DS3, STS1/DS3, STS1/DS3/DS1, and DS1 Interface Bays. Cables transmitting N-rate signals connect the SWIO circuit packs in the Switch Module to MUX circuit packs in DS3 Interface Modules, to SMUX circuit packs in STS1 Interface-16 Modules, and to SWIF circuit packs in DS1 Interface Modules. Cables also connect unit controller (UC) circuit packs in DS3, STS1, and DS1 Interface Modules and DS3PM circuit packs in DS3 Interface Modules to the Switch Bay.

Logical, systematic rules have been developed in naming the many cables involved so that personnel responsible for installing, provisioning, and troubleshooting the frame can perform their tasks with a minimum of confusion. This section contains a summary of the cabling information. The summary is adequate for provisioning the frame.

N-rate Cables

In a fully equipped frame, cables must carry 2048 N-rate signals between interface modules and the Switch Module (512 service signals and 512 protection signals in each direction). A total of 256 cables are used for this purpose. These cables are divided into 16 groups designated by letters running from A through T, leaving out I, O, Q, and S. Each of the 16 groups contains 16 cables. Those in the A group are labelled J1-A, J2-A, ..., J16-A, for example. J1-A through J8-A serve SWIO-1, and J9-A through J16-A serve SWIO-2 (SWIO-1's mate circuit pack). Cables J1-B through J16-B serve SWIO-3 and SWIO-4, and so on to J1-T through J16-T, which serve SWIO-31 and SWIO-32. Table 1-2 contains the N-rate cable group that serves each SWIO circuit pack.

Table 1-2. **SWIO N-Rate Cable Connections**

N-rate Cable Group	SWIO Circuit Packs	
	Cables Jn-1 — Jn-8	Cables Jn-9 — Jn-16
A	1	2
B	3	4
C	5	6
D	7	8
E	9	10
F	11	12
G	13	14
H	15	16
J	17	18
K	19	20
L	21	22
M	23	24
N	25	26
P	27	28
R	29	30
T	31	32

Since 2048 N-rate signals are handled, each of the 256 cables must carry 8 N-rate signals, each requiring a signal wire and a ground return wire. Each cable also contains a wire pair to carry a clock/synchronizing signal and a spare wire pair, so that each cable contains 20 wires. Any given cable serves four MUX, four SMUX, or four SWIF 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 Switch Bay as seen from the front of the frame. A DS3 Interface-32 Module requires two N-rate cable groups; a DS3 Interface-16 or STS1 Interface-16 Module requires two N-rate cable groups; 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 Switch Bay, and the other N-rate cable groups run alphabetically upward and outward from the Switch Bay. N-rate cable groups starting with J serve the interface bays on the right side of the frame in a similar fashion.

Control Cables (J-Cables)

The 32 control cables (J-cables) that connect the unit controllers to the Switch Module are labelled J1 through J32. J1 through J16 serve the interface bays to the left side of the Switch Bay, and J17 through J32 serve the interface bays on the right side. Numbering is similar to the letter assignments of N-rate cables in that numbering starts at the bottom of the interface bay (Bay 4 and 6) nearest the Switch 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 interface 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.

As many as eight DS3PM circuit packs can be used, one for each DS3 Interface-32 or Interface-16 Module. Numbering of the J-cables to DS3PM circuit packs to the left of the Switch Bay starts at J13 and runs upward and outward through J16. DS3PM circuit pack J-cable numbers to the right of the Switch Bay start at J29 and run upward and outward through J32. These DS3PM circuit pack J-cable designations are the same as some of the set used for unit controller J-cables. However, there is no numbering conflict in a given frame because unit controller J-cable designations J13 through J16 and J29 through J32 are used only for Bays 1 and 9, which are not present if there are any DS3 Interface Modules in the frame on both sides of the Switch Bay.

Unit Numbering

To provide a standard numbering convention for the DACS IV-2000 system, the complete bay lineup for the system is considered. Figure 1-2 shows a DACS IV-2000 system nine-bay arrangement with each Interface Bay having four shelf positions (units). The numbering scheme assigns fixed unit numbers to the 32 possible shelf positions in a complete system. The type of module in a shelf position depends on the bay type. For example, an initial two-bay configuration has an STS1/DS3/DS1 Interface Bay and a Switch Bay has four units. From bottom to top, these units are numbered 13 through 16. For DS3 Interface Bays, shelf positions 1 and 4 are empty and are not labeled. For example, if an initial arrangement consists of a DS3 Interface Bay and a Switch Bay, the equipped shelves are units 14 and 15, while the unequipped shelves do not have unit labels.

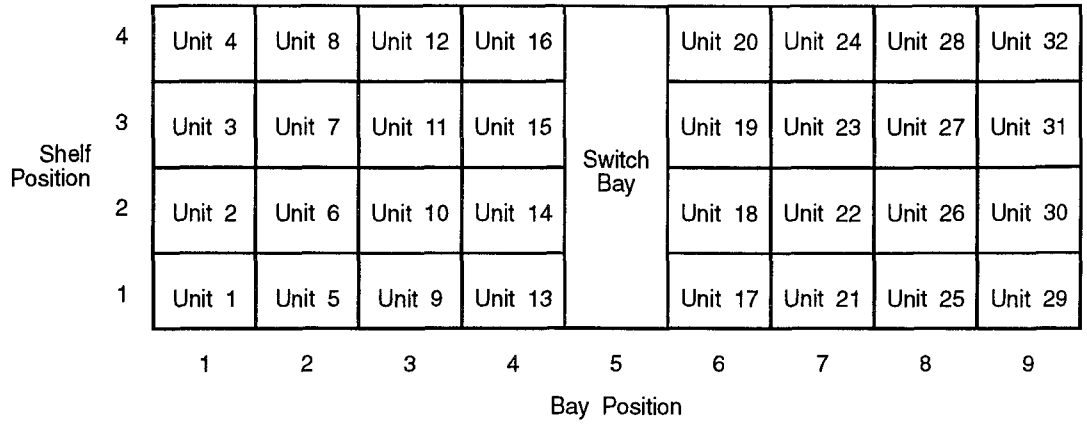


Figure 1-2. **Recommended Unit Numbering**

Facility Numbering Conventions

The numbering convention used in a central office environment generally differs from the numbering convention used for the DACS IV-2000 system. The DACS IV-2000 system facility numbering convention uses DS3 or STS-1 equivalents that correspond to a multiplexer (MUX) circuit pack supporting one DS3, a switch interface (SWIF) circuit pack supporting 28 DS1s, or a SONET multiplexer (SMUX) circuit pack supporting one STS-1 or 28 VT1.5 tributaries. If the other end of a facility connected to the DACS IV-2000 system connects to a DSX-3, a DSX-1, or STSX-1 it is difficult to reconcile the numbering conventions. The numbering convention uses the slot number in the interface module to designate a DS3, a DS1, STS-1. Table 1-3 shows the valid slot numbers in the DACS IV-2000 frame.

Table 1-3. **Valid Slot Numbering Conventions**

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

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

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 DS1IFs is identified with A appended to the slot number (addresses ports 1 through 14 of the equivalent DS3) and the other with 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.

Modules

The major functional segments of the DACS IV-2000 system are the Redundant Controller Module (RC MOD), the cross-connect network provided by the Switch Module (SW MOD), DS1 Interface (INTFC) Modules, DS3 Interface Modules, and STS1 Interface Modules. Figure 1-3 is a functional block diagram showing the main components of the DACS IV-2000 system.

There are eleven different DACS IV-2000 system modules. These modules are:

- Redundant Controller (RC) Module — manages the user interface (administrative links), performs user specified functions, and coordinates database management, maintenance, and fault recovery operations.
- Redundant Controller Power (RC PWR) Module — provides the +5 V, +12 V, and -12 V power and fuse protection for the Redundant Controller Module. This module also provides the -48 V power to the Synchronizer Module.
- Synchronizer (SYNC) Module — generates the timing information for the DACS IV-2000 system.
- Switch (SW) Module — performs the DS1, STS-1, and VT1.5 cross-connection functions.
- Switch Power (SW PWR) Module — provides the +5 V power and fuse protection for the Switch Module and the fuse protection for the -5 V power supplied by the Auxiliary Power Module. This module also provides the +5 V and -5 V power for the Synchronizer Module.
- Auxiliary Power (AUX PWR) Module — provides the -5 V power for the Switch Module.
- DS1 Interface (INTFC) Module — provides eight interfaces for the incoming and outgoing DS1 facilities or network elements. This module accepts DS1 signals (in a format that is compatible with a DSX-1) and switches these signals to and from the Switch Module. Protection for the interfaces of this module is provided by the DS1 Interface-Protection Module contained in the same DS1 Interface Bay.
- DS1 Interface-Protection (INTFC-P) Module — provides seven interfaces for the incoming and outgoing DS1 facilities or network elements. This module accepts DS1 signals (in a format that is compatible with a DSX-1) and switches these signals to and from the Switch Module. This module provides protection for itself in addition to the other DS1 Interface Modules (up to three) within the same DS1 Interface Bay.

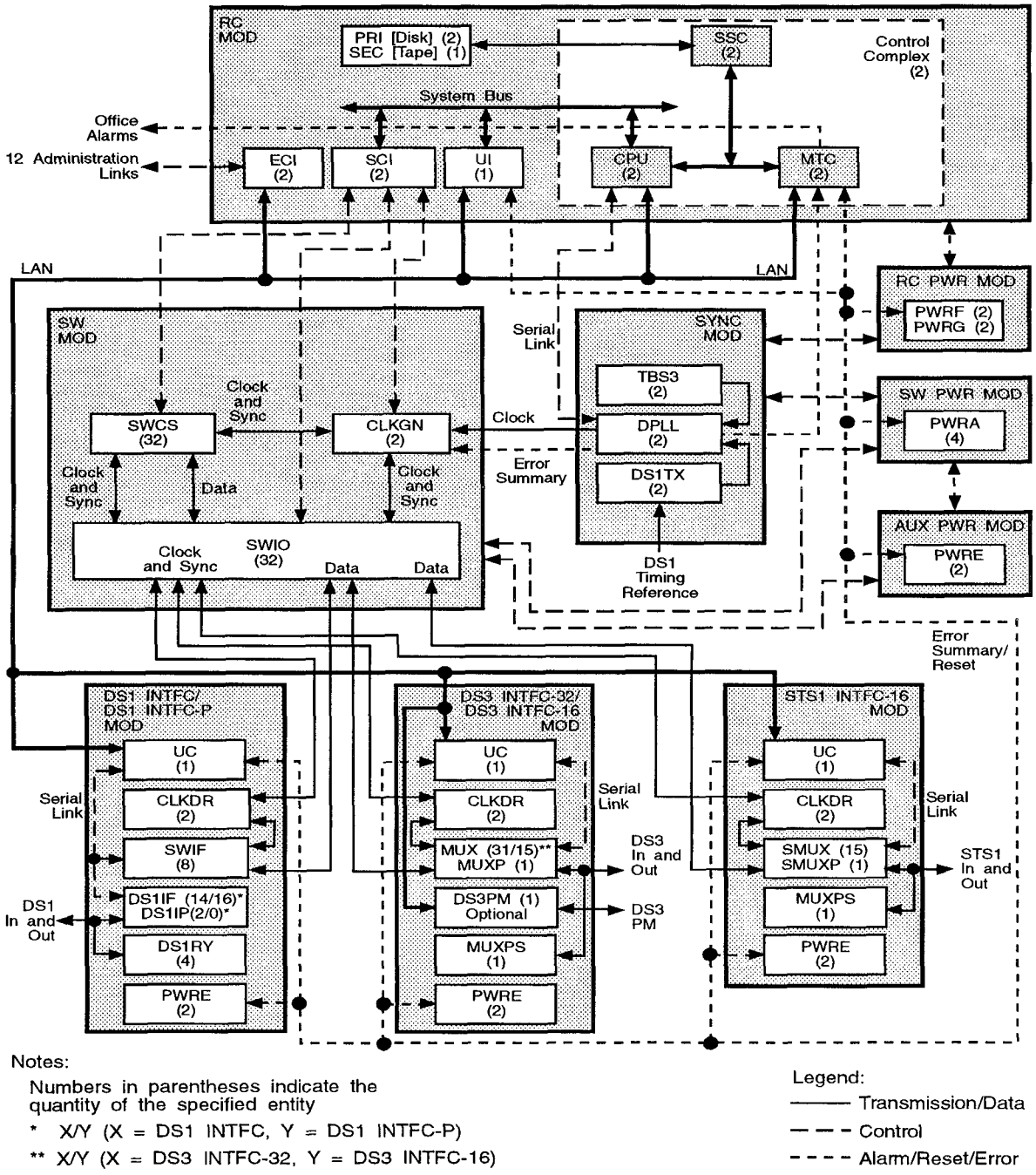


Figure 1-3. DACS IV-2000 Release 3.0 Functional Block Diagram

- DS3 Interface-32 (INTFC-32) Module — provides up to 31 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a format compatible with a DSX-3 and switch the signals to and from the Switch Module.
- DS3 Interface-16 (INTFC-16) Module — provides up to 15 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a format compatible with a DSX-3 and switch the signals to and from the Switch Module.
- 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 switch the signals to and from the Switch Module.

Fan Assembly

Fan assemblies are provided in the Switch Bay and STS1/DS3 Interface Bays. The fan assemblies are used to cool vertically mounted modules. Each fan assembly consists of three horizontally mounted fans with a filter, and control switches and indicators. You must keep the air intake (under the assembly) free of obstructions. In addition, the fan filter needs to be replaced on a routine basis. For fan assemblies ED-2C816-30,G1 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 assemblies ED-9C130-30,G1 and ED-9C130-30,G2 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 BXAs) have LED indicators to aid in fault isolation. A full listing of circuit pack equipment is located in the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

Power

The DACS IV-2000 system operates with a battery plant (48 volts DC nominal) in the central office environment. There are seven power buses connected to the fuse and alarm panel from seven feeders (A, B, C, D, E, F, and G) at the battery distribution feeder board (BDFB). Feeders A, B, C, and D have quad feeder connections to the fuse and alarm panel. The fuse and alarm panel is provided with the initial frame arrangement, and it is not necessary to provide any extra power feeders as the system is grown. Feeders F and G go directly from the battery and supply voltage to the Redundant Controller Power Module.

Fuses

Fuses are required for the Main Fuse Panel, the Switch Bay, and Interface Bays. Complete information on all fuses and their locations can be found in Chapter 12 of this manual as well as in the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403), and in the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

Switches and Indicators

Equipment Control Switches

The status panel (Figure 1-4) in the Redundant Controller Module has four momentary contact switches used for equipment control. They are:

- ACO (alarm cutoff) — silences the audible alarms when pressed.
- LED/Lamp TEST — tests the operation of the LEDs/lamps in the DACS IV-2000 frame. 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 main controller module, switch and auxiliary power modules, SWCS and SWIO circuit packs, and provisioned interface modules are lit on a module by module basis.
- RESET ENABLE and RESET — resets the DACS IV-2000 system. 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.

The status panel also has two TTY connector (TTY1-1 and TTY2-1) that allow the craft interface terminal (CIT) to be used from the front of the frame. Twelve administrative link connectors are located on the back of the redundant controller module.

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

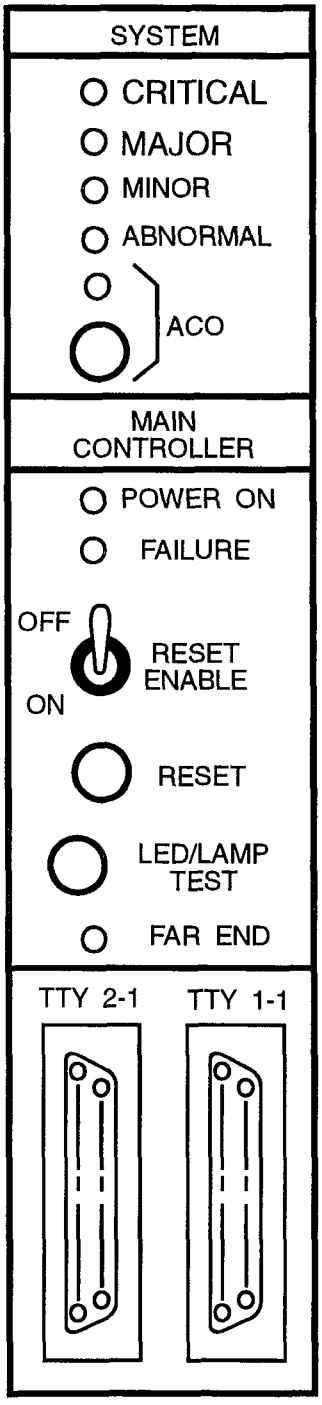


Figure 1-4. **Status Panel**

Equipment Indicators

All circuit packs have a red LED indicator (except for Synchronizer Module circuit packs) for trouble isolation. The LEDs flash on and off at one-second intervals on circuit packs that have input DS1, DS3, or STS-1 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.

The CPU circuit packs have green LEDs to indicate the on-line control complex (CPU/MTC/SSC circuit packs). The disk drives 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 status panel (Figure 1-4) 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.
- ACO — is green and shows that the audible alarms have been silenced (ACO switch activated).
- POWER ON — is green and signals that power is present at the status panel.
- FAILURE — is a red processor major alarm and signals a failure in the RC 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 alarm LEDs on the status panel turn off, and remain off until a system reset is performed.

Office and Telemetry Alarm Terminal Strip

The DACS IV-2000 system provides a terminal strip allowing access to the central office alarm system. This access provides for:

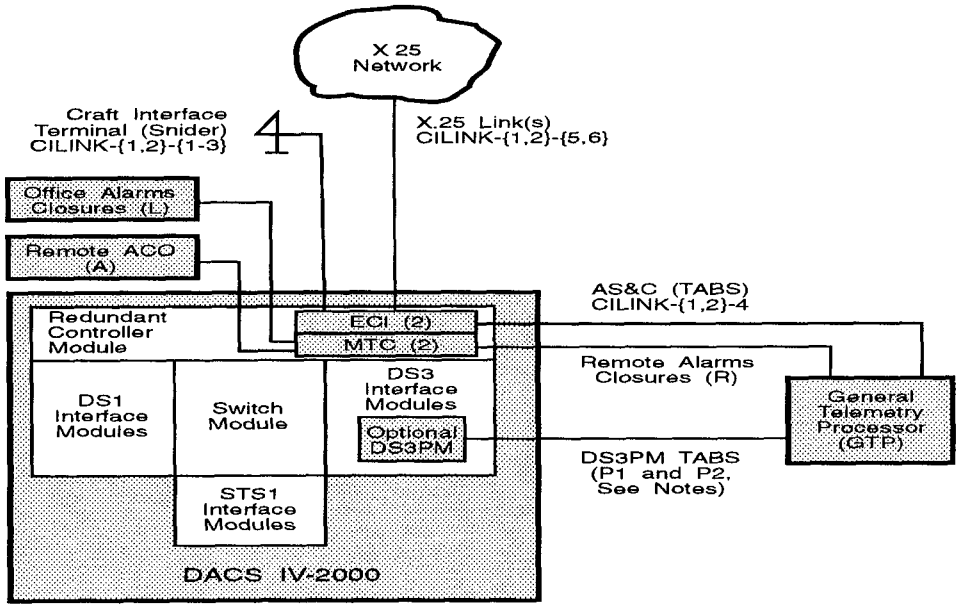
- Central office audible and visual alarms
- Remote monitoring and resetting of the system

The terminal strip is located at the top of the switch bay above the fuse and alarm panel. In order to access the terminal strip the cover plate must be removed. Under normal operations and in procedures contained in this manual, the terminal strip does not need to be accessed. For more details on this equipment, refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

Link Requirements

The DACS IV-2000 system provides twelve administrative links to interface with operations systems (OSs) and craft interface terminals. 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.

Figure 1-5 and Table 1-5 summarize the interfaces provided by the DACS IV-2000 system.



Notes:

1 One or two P links.

2. Up to four DS3PM circuit packs per link.

3. Up to eight DS3PM circuit packs per DACS IV-2000 system.

Figure 1-5. System Interfaces

Table1-5. Interfaces

Interface	Physical	Baud	Electrical	Functional
CILINK 1-1 and 2-1	EIA-232-D	300, 1200, 2400, 4800, and 9600 Default: 9600*	EIA-232-D	Async. Snider
CILINK 1-2 and 2-2	EIA-449	300, 1200, 2400, 4800, and 9600 Default: 2400*	EIA-423	Async. Snider
CILINK 1-3 and 2-3	EIA-449	300, 1200, 2400, 4800, and 9600 Default: 9600*	EIA-423	Async. Snider
CILINK 1-4† and 2-4†	EIA-449	**TABS/TBOS**: 2400 System value: 2400 **Snider**: 300, 1200, 2400, 4800, and 9600 Default: 9600*	EIA-485	TABS/TBOS point-to-point AS&C or Async. Snider
CILINK 1-5, 1-6, 2-5, and 2-6	EIA-449	Based on external timing. System value: 9600	EIA-423	Sync. X.25 or Async. Terminal Interface with external PAD
P1 and P2 (optional)	Connector	2400	RS-485	TABS Async. multipoint DS3PM
L	Wirewrap	-	Closures	Local alarms (Visual and Audible)

See footnotes at end of table.

Table continued on next page.

Table1-5. **Interfaces (Continued)**

Interface	Physical	Baud	Electrical	Functional
R	Wirewrap	-	Closures	Remote alarms (GTP)
A	Wirewrap	-	Closures	Remote ACO

Notes:

* For maintenance reasons, it is recommended that default values be used when provisioning CILINKs.

† CILINKs 1-4 and 2-4 have the same characteristics as CILINKs 1-2, 1-3, 2-2, and 2-3 when CILINK 1-4 or 2-4 is provisioned as a Snider link.

1. All EIA-423 links are interoperable with EIA-232-D via the use of the suggested adaptors. 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. Although these links may operate with the EIA-232-D above these data rates, the four 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.

Twelve administrative links on two ECI3 circuit packs support the operations, administration, maintenance, and provisioning functions. They are:

- Links 1-1 through 1-3 and 2-1 through 2-3 are asynchronous links (convertible to RS-232 with an optional passive adapter). Links 1-1 and 2-1 supports the local craft interface, and links 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, or 9600 baud.
- Links 1-4 and 2-4 can be provisioned as asynchronous TABS/TBOS links operating at 2400 baud or Snider links.
- Links 1-5, 1-6, 2-5 and 2-6 can operate as asynchronous links 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.

The DACS IV-2000 Release 3.0 software supports the message set for communication with Bell Communications Research's Operations Systems/ Intelligent Network Elements (OPS/INE) and Network Monitoring and Analysis (NMA) OSs. This message set (formally called Message Set 2) is referred to as TL1, Issue 4.

The optional DS3PM multipoint asynchronous interface (P1 and P2) operates at 2400 baud. A general telemetry processor (GTP) remote unit can be connected to these links and interfaced to a modem over an E2A or compatible data link to the telemetry OS. These links provide DS3 path performance data to telemetry-based OSs.

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 the magnetic tape drive.

Electrical Discharges

The DACS IV-2000 system 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 tape or disk drive, 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 75 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, continuity check by ohms 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

You can damage circuit packs and other hardware by improperly installing or extracting them from the frame.

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

⚠ CAUTION:
Before replacing any fuses, 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.

Extracting Circuit Packs

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

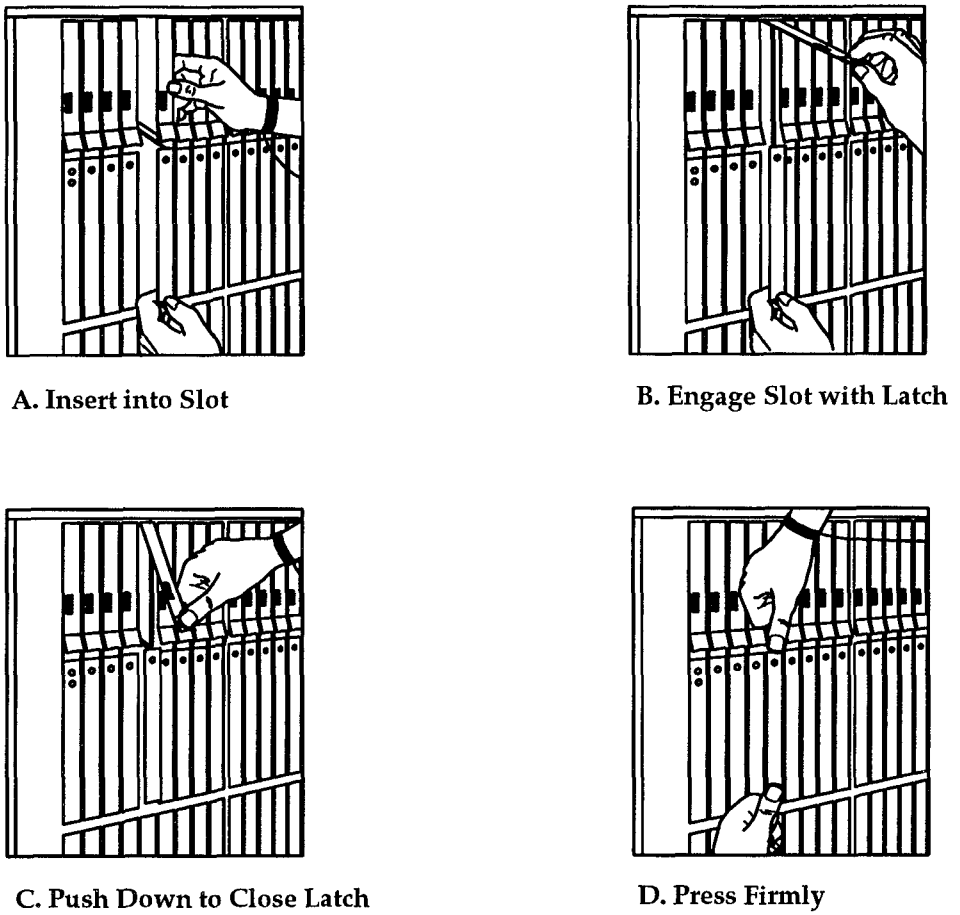
⚠ CAUTION:
Never extract a circuit pack that is carrying service, as it affects traffic. First perform a manual protection switch (`SW-TOPROTN-EQPT` command) on the circuit pack to be extracted.

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

1. Carefully lift the latch.
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 (Figure 2-1B).
4. Push on the bottom part of the circuit pack until the latch engages in the slot. (Do not push with the latch.)
5. After the latch engages in the slot, push down to close the latch (Figure 2-1C).
6. After closing the latch, with one thumb on the latch and the other thumb at the bottom of the circuit pack, press firmly to be sure the circuit pack is properly in place (Figure 2-1D).



A. Insert into Slot

B. Engage Slot with Latch

C. Push Down to Close Latch

D. Press Firmly

Figure 2-1. Installation of Circuit Packs

Disk and Tape Drives

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

- Do not subject either drive to shocks or vibrations. (Even a drop of 2 inches can damage the disk drive.)
- Store the disk and tape drives away from strong magnetic fields, such as those produced by electric motors or large magnets.
- Do not store 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 drive to stabilize at room temperature. This is particularly important for drives that are shipped during cold weather. In this case the drive must be unpacked and left sitting for at least an hour before installing in the frame.

Procedures for using the tape drive are located in Chapter 6, procedures for maintenance of the tape drive are in Chapter 3, and procedures for replacing the disk and tape drives are in Chapter 14.

Tape Cartridges

The tape cartridge for the DACS IV-2000 system was designed to handle the rigors of shipping. This cartridge, when enclosed in its plastic case and wrapped in one layer of bubble wrap, can be reliably mailed or shipped. However, the tape cartridge is sensitive to temperature. Store tape cartridges in a cool place, away from strong magnetic fields. While handling the tape cartridge, avoid touching the tape itself.

The tape cartridge has a write-protect tab. (The write-protect tab is the black insert in the upper left hand corner of the cartridge.) When the arrow on this tab points to SAFE, the cartridge is write-protected and the data on the cartridge can not be overwritten. When the arrow points directly away from SAFE, the cartridge is not write-protected and data can be written to it.

The tape drive for the DACS IV-2000 system uses specially formatted tapes for backing up the operating software and the database. All tape operations must be performed with approved magnetic tape cartridges.

⚠ CAUTION:
Use of unapproved tape cartridges results in a failure of the backup.

The following tape cartridges are the only types approved for use on the redundant controller version of the DACS IV-2000 system:

- J9878650-4, List 1 — For new frame orders, upgrade from
- J9878650-4, List 2 — CN only
- J9878650-4, List 3 — Formatted and initialized tape
- J9878650-4, List 4 — Spare Release 3.0 tape
- J9878650-4, List B — System start-up tape (new frame only)

Tape Life

The expected life of a DACS IV-2000 system tape cartridge is measured in the number of successful database backups that can be made using that cartridge. The number of successful database backups that can be made to a tape cartridge varies, and is dependent on:

- size of the databases
- temperature at which these backups were made
- temperature at which the tape is stored
- air quality in the vicinity of the frame

The expected life of a DACS IV-2000 system tape is 90 database transfers. This expected lifetime is decreased by storing or using the tape at elevated temperatures. Performing back-to-back tape operations without allowing any time between operations for the tape to dissipate its own generated heat is the same as operating it at elevated temperatures, and significantly reduces the tape's life.

Fan Assemblies

Fan assemblies are provided to cool Switch and STS1/DS3 Interface 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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Routine Maintenance

3

This chapter provides routine maintenance procedures for the redundant controller version of 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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					
Tape Replacement	Approximately Every Month (or after 90 back-ups)					
Clean Tape Drive	Once A Month					
Change Fan Filter Only for Switch Bay fan assemblies: ED-2C816-30,G1 ED-2C906-30	Once Every 3 Months (or more often as required)					
Test Remote Alarm Surveillance Capability	Once Every Year					

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 tape. Daily backup of the database is essential. The recommended procedure for performing the backups is to use at least two tapes, and alternate the use of those tapes so that the most recent backup is not overwritten. In addition, the date, time, and tape number (number of tape used in the database backup) of each backup should be recorded in a log.

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

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 system to the tape, be sure that the write-protect tab on the front of the tape is not set in the SAFE position. The backup fails if the tape 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 procedure titled "Isolating Failures" (page 12-10) before performing this procedure.

2. Load the backup tape into the tape drive, if necessary. Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary.

3. Power up the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.

4. Check to see if the backup tape needs to be replaced by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   If the tape cycle count (COUNT) parameter is 90 or greater, replace the backup tape before continuing this procedure. Refer to the section titled "Using the Tape Drive" (page 6-20) for tape replacement, if necessary.

5. Backup the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 20 minutes to complete.

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

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

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

7. Record the date, time, and tape number of the database backup in the frame log.

8. Power down the tape drive by entering the following command:

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

   Where

   a = Target ID (optional)

   This command takes up to 1 minute to complete.

9. Extract the tape from the tape drive and store it in its plastic container.

Scheduled Database Backup

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

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

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 system to the tape, be sure that the write-protect tab on the front of the tape is not set in the SAFE position. The backup fails if the tape is write-protected.

1. Insert the backup tape into the tape drive, if necessary. Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary.
2. Power up the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.
3. Check to see if the backup tape needs to be replaced by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   If the tape cycle count (COUNT) parameter is 90 or greater, replace the backup tape before continuing this procedure. Refer to the section titled "Using the Tape Drive" (page 6-20) for tape replacement, if necessary.
4. Schedule daily database backups by entering the following command:

   ED-NE:*[a]*::::,,,,:ON,*[i]*,Su&&Sa;**

   Where:

   a = Target ID (optional)

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

Checking the Tape Cycle Count

Use this procedure to determine how many times a tape has been used for database backup. If the tape cycle count parameter is 90 or greater, the tape has been used its allotted times and needs to be replaced. If a tape is used for a database backup and the tape cycle count is greater than 90 a minor alarm is raised.

1. Insert the backup tape into the tape drive, if necessary. Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary.
2. Power up the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.
3. Check the tape cycle count of the backup tape by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   If the tape cycle count (COUNT) parameter is 90 or greater, the tape has been used its allotted times and needs replacement.

Cleaning the Tape Drive and Capstan

The following procedures are used for cleaning the tape drive head and drive roller (capstan), using the AT&T Tape Drive Cleaning Kit (Part No. 406646844), 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 tape operations.

⚠ CAUTION:
Use only the cleaning solution contained in the AT&T Tape Drive Cleaning Kit (Part No. 406646844) and Cleaning Kit Refill (Part No. 406646851). Never use alcohol-based solutions for cleaning the DACS IV-2000 tape heads.

Cleaning the Tape Drive

In order to perform this maintenance function, you must use both of the following procedures: "Cleaning the Tape Heads" (page 3-7) and "Cleaning the Tape Drive Roller (Capstan)" (page 3-10).

Cleaning the Tape Heads

1. Remove the tape drive from service and release the tension on the tape by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete.

2. Extract the tape from the tape drive.
3. Extract the cleaning cartridge from the kit, move the slide switch to the ON position, and be sure the drive gear holder (containing no foam pad) is in place. Refer to Figure 3-1.

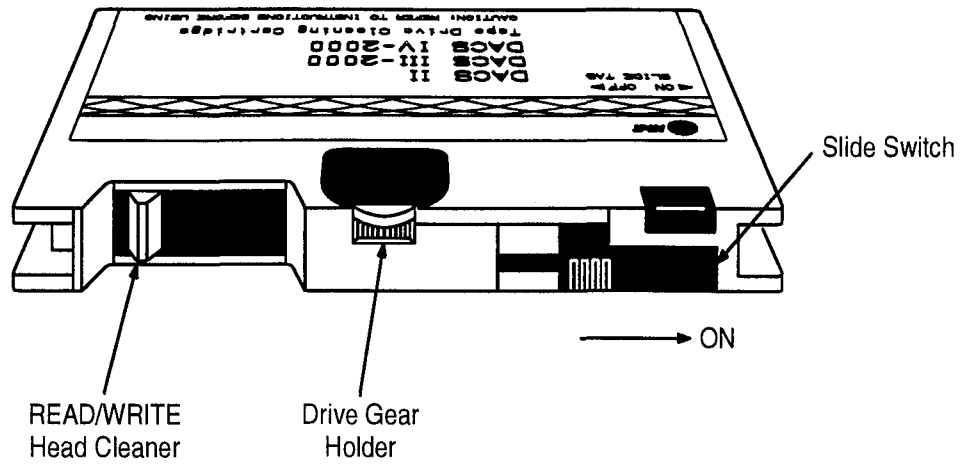


Figure 3-1. **Tape Cleaning Cartridge**

4. Check the READ/WRITE head cleaner to be sure it contains a clean pad (the foam pad must be replaced after every cleaning). Refer to Figure 3-1.

   If the pad (larger of the two provided) needs to be replaced, do the following:

   a. Using tweezers, pull the used pad out of its holder. Refer to Figure 3-2.

   b. Firmly push a new pad (larger of the two types provided) in its place, with the beveled edges facing out.

   c. Dispose of the used pad.

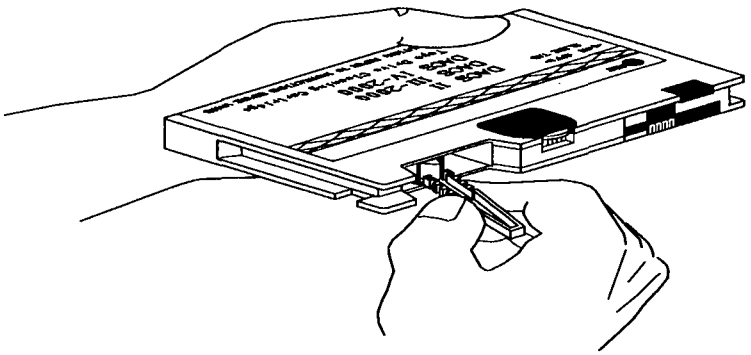


Figure 3-2. **Replacing Tape Head Cleaning Pad**

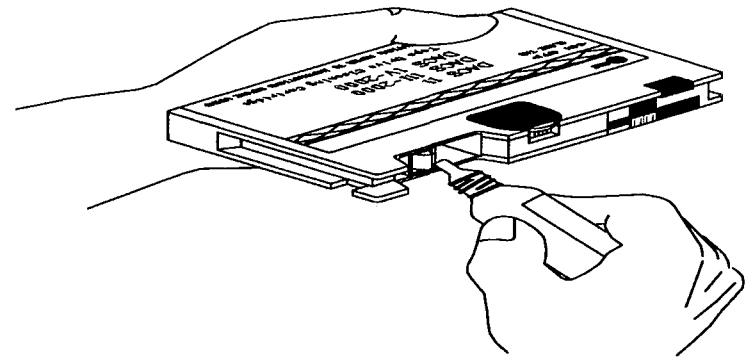


Figure 3-3. **Applying Solution to Pad**

5. Squeeze the solution (provided with the kit) onto the head cleaning pad, thoroughly wetting the pad (refer to Figure 3-3). Quickly install the cleaning cartridge into the tape drive since the solution evaporates rapidly.
6. Begin tape head cleaning by entering the following command:

   RST-EQPT:*[a]*:SEC:::::,CLEAN;**

   Where:

   a = Target ID (optional)

   The cleaning cartridge makes a loud, shifting gear noise during cleaning. *The cleaning process takes 30 seconds to complete.*

Cleaning the Tape Drive Roller (Capstan)

1. Turn the cleaning cartridge upside down and push the removal button forward and down (refer to Figure 3-4) while placing one hand underneath the cartridge to catch the drive gear holder.

   The drive gear holder ejects.

2. Check the capstan pad holder to be sure it contains a clean pad. (The foam pad must be replaced after every cleaning; however, the pad can be used for two cleanings by turning it around.)

   If the pad (smaller of the two provided) needs to be replaced, do the following:

   a. Using tweezers, pull the used pad out of the capstan cleaning pad holder. Refer to Figure 3-5.

   b. To replace the pad, firmly push the new pad into place. To use a pad for the second time, turn the pad around, then firmly push it into place.

   c. If you have replaced the pad, dispose of the used pad.

3. Hold the cleaning cartridge with the label side up and carefully lower the capstan cleaning pad holder into the opening at an angle (refer to Figure 3-6). Firmly push down while at the same time exerting pressure to the rear. Make sure the top of the capstan cleaning pad holder is flush with the top of the tape cleaning cartridge and that the round portion of the capstan cleaning pad holder has entered the keyhole properly and is in its rearmost position.

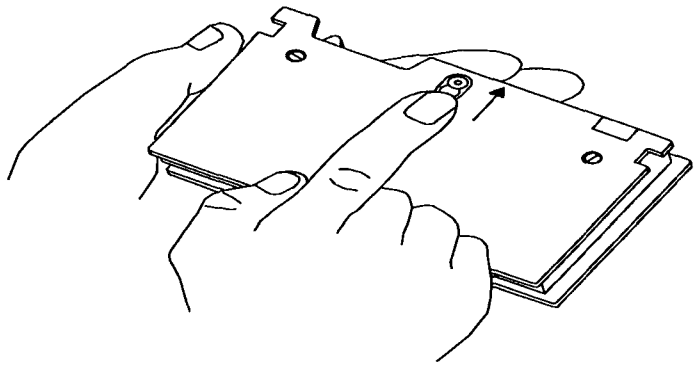


Figure 3-4. **Removing Drive Gear Holder from Cleaning Cartridge**

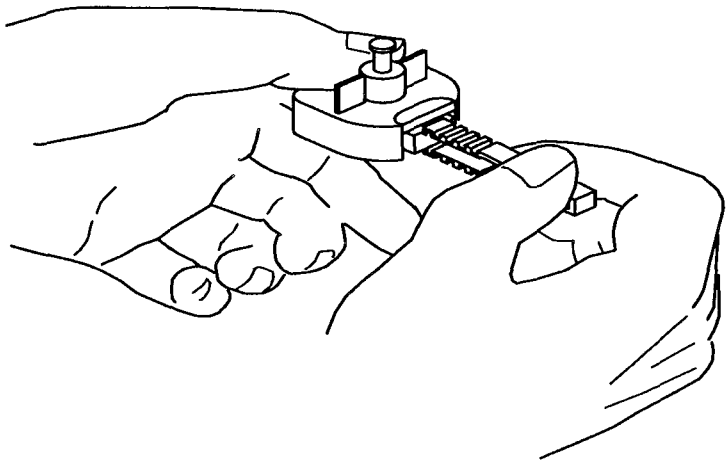


Figure 3-5. **Replacing Capstan Cleaning Pad**

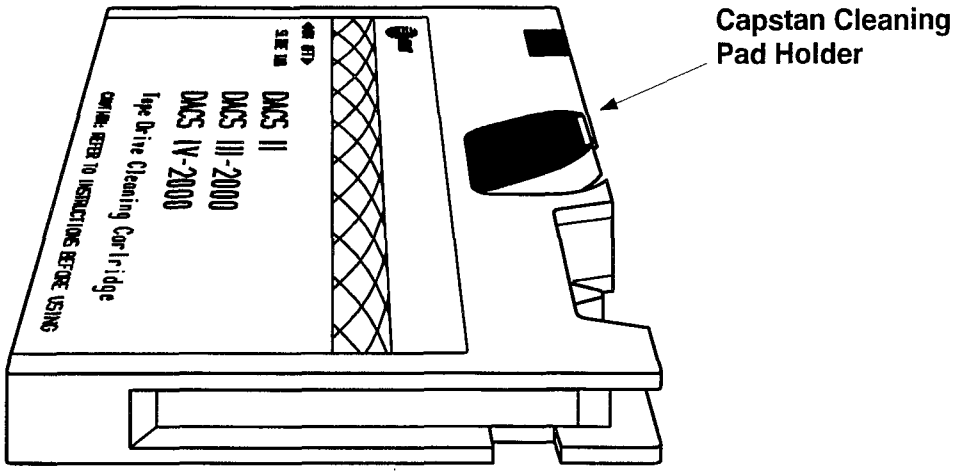


Figure 3-6. **Inserting Capstan Cleaning Pad**

4. Squeeze the solution (provided with the kit) onto the capstan pad, thoroughly wetting the pad and quickly install the cleaning cartridge into the tape drive since the solution evaporates rapidly.

5. Begin tape drive roller cleaning by entering the following command:

   RST-EQPT:*[a]*:SEC:::::,CLEAN;**

   Where:

   a = Target ID (optional)

   The cleaning process takes 30 seconds to complete.

6. Turn the cleaning cartridge upside down and push the removal button forward and down (refer to Figure 3-4) while placing one hand underneath the cartridge to catch the capstan cleaning pad holder.

   The capstan cleaning pad holder ejects.

7. Hold the cleaning cartridge with the label side up and carefully lower the drive gear holder into the opening at an angle (refer to Figure 3-6). Firmly push down while at the same time exerting pressure to the rear. Make sure the top of the drive gear holder is flush with the top of the tape cleaning cartridge and that the round portion of the drive gear holder has entered the keyhole properly and is in its rearmost position.

8. 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 Fan Filter

NOTE:
This procedure is to be used on DACS IV-2000 frames with one of the following fan assemblies: ED-2C816-30,G1 or ED-2C906-30. This procedure must not be used for fan assemblies ED-9C130-30,G1 or ED-9C130-30,G2. The fan filter for fan assemblies ED-9C130-30,G1 and ED-9C130-30,G2 are replaced when the yellow ALM LED on the fan assembly lights (refer to the section titled "Fan Filter Alarm" (page 12-111).

This procedure is used to replace the fan assembly air filter and to test the fan assembly for proper operation. The fan assembly is located at the bottom of the Switch 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 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.

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 15 minutes to maintain proper temperature in the switch bay.

Powering Down the Fan Assembly

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.

1. Pull the main Fan Assembly Fuse on the fuse panel (Fuse E6).
2. Check to see that the Fan Assembly ALM LED lights, indicating that main power has been removed.

   The system immediately generates a `REPT EXCPTN SYS` *message. In about 10 seconds after removing the fuse, the system generates a* `REPT ALM EQPT` *messages are output. The red ALM LED is lit on the fan assembly and the fans start to operate at high speed.*
3. Pull the AUX Fan Assembly fuse on the fuse panel (Fuse B13-2).
4. Check to see that the red ALM LED goes out indicating there is no power to the fan assembly.

5. 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.

Replacing Fan Filter

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

1. Extract the air filter. (If necessary, gently pry on the sides of the filter with a screw driver.)
2. Clean visible dirt from the air filter slot.
3. Make sure the new air filter is flat. If it is warped or bowed, obtain a new one.
4. 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.)
5. Be sure the air inlet below the fan assembly is unobstructed (Figure 3-7).

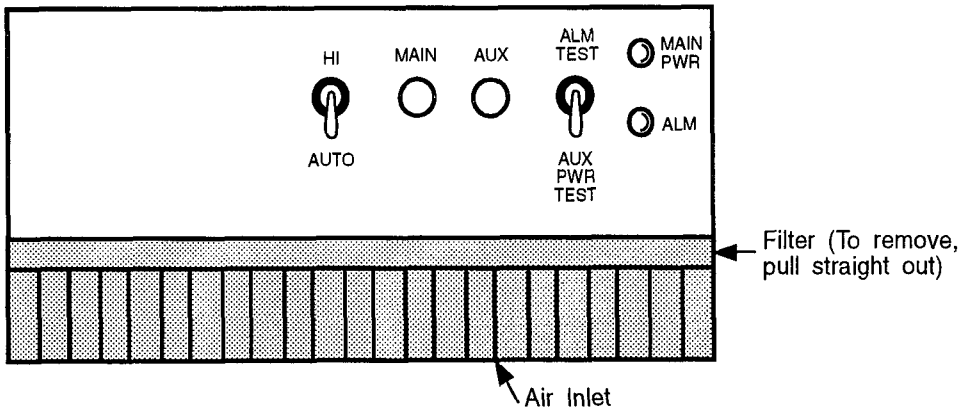


Figure 3-7. Fan Assembly — ED-2C816-30,G1 and ED-2C906-30 Air Filter Location

Powering Up the Fan Assembly

1. Reinsert the AUX Fan Assembly Fuse (Fuse B13-2).
2. Be sure the red ALM LED is on and the fans are operating at *high* speed.
3. Reinsert the Main Fan Assembly Fuse (Fuse E6).
4. 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).
5. Perform the "Checking the Fan Assembly" (page 3-15) procedure in the next section.

Checking the Fan Assembly

1. Be sure the fan assembly operates in both the AUTO and HI speed positions (refer to Figure 3-8, 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.

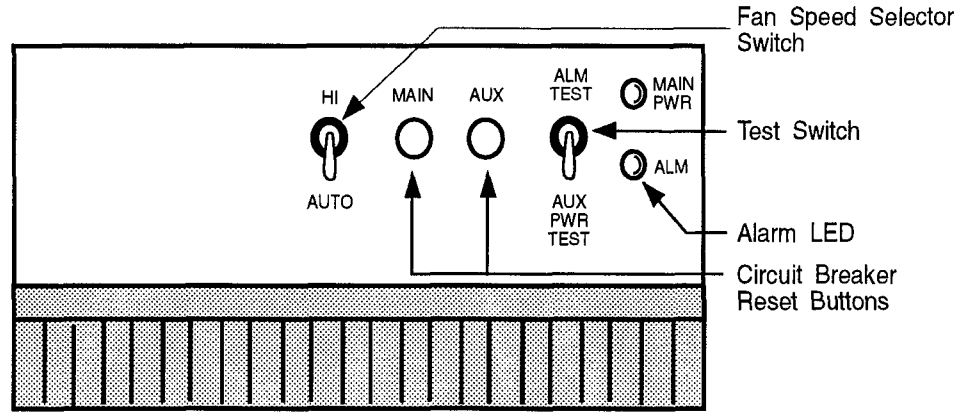


Figure 3-8. **Fan Assembly — ED-2C816-30,G1 and ED-2C916-30 Switch and LED Locations**

2. Perform the alarm failure test by placing the test switch (refer to Figure 3-8) 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 */
    "MP: 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 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 */
    FAN:CL,INT,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: 001-999

3. Perform the auxiliary power test by placing the test switch (refer to Figure 3-8) 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 */
    "MP: 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 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 */
    FAN:CL,INT,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

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

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

   Where:

   a = Target ID (optional)

5. 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 system 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)

   If there are any alarms, refer to Chapter 12 for clearing alarms before continuing 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: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31), UNIT-{1-32} }

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: { {1-32}-{1-31}-{1-28}, SWIF-{1-32}-{1-8}, UNIT-{1-32}, MUX-{1-32}-{1-31} }

   If the notification code (NTFCNCDE parameter) is set to MJ, continue with Step 6. Otherwise, continue with the next step.

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: { {1-32}-{1-31}-{1-28}, SWIF-{1-32}-{1-8}, UNIT-{1-32}, MUX-{1-32}-{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)

   If the DS1 failure type (FAIL-TYPE) parameter is set to BOTH and the DS1 failure threshold (FAIL-THRES) parameter is set to 6, continue with Step 8. Otherwise, continue with the next step.

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

   ED-NE:*[a]*:::,,,,:,,:,,:::BOTH,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: `{1-32}-{1-31}-{1-28}`

   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.
   - MAJOR (first through fifth DS1 alarms) or CRITICAL (sixth DS1 alarm) LED is lit on the status panel in the main controller module.
   - 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 do 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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

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

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

    Where:

    a = Target ID (optional)

    If there are any alarms, refer to Chapter 12 for clearing alarms before continuing 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 system. 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 7 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 system is capable of operating at the following speeds:

300
1200
2400
4800
9600

If the `login:` prompt does not appear after changing your terminal to the above speeds, refer to the section titled "Link Communication Failures" (page 12-29) for further assistance.

1. At the `login:` prompt, enter the system 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 screen.

Using X.25 Links

This procedure is used to login 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 if 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)

2. Check that the X.25 link is in-service (IS). If it is, go to Step 4, otherwise go to Step 3.

3. 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}**

4. 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*;

   Where:

   a = Target ID (optional)

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

   d = Password: <6-8 legal characters>

Logging Out

This procedure is used to log out of the DACS IV-2000 system. It can be used for both Snider (CILINKs 1-1, 1-2, 1-3, 1-4, 2-1, 2-2, 2-3, and 2-4) 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 system by entering the following command:

   CANC-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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) for more information on security link parameters and superusers.

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}-{1-6}** (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}-{1-6}

2. To determine how long the link will be locked out, enter the following command:

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

   Where:

   a = Target ID (optional)

   b = Administrative link location: **CILINK-{1,2}-{1-6}** (optional)

   The value of the time lock-out (TM) parameter 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 due to the link being 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}-{1-6}** (optional)

   If the state of the link is OOS-MTCE, go to Step 2. Otherwise, refer to the next section titled "Fuses Associated with Links" (page 4-7).

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}-{1-6}**

Fuses Associated with Links

There are four 1 amp fuses associated with the links: two on FBF and two on FBH. Each pair of fuses are for ECI-1 and ECI-2, respectively. If any one of these four fuses is blown, you can lose communications with the system.

1. Locate and replace any blown ECI-1 or ECI-2 fuses in fuse boards FBF and FBH.

   If there are no blown fuses, refer to the next section titled "Terminal/Link Parameter Mismatch" (page 4-7).

   After all blown link fuses are replaced, the links that are not in the OOS-MTCE state are autonomously restored.

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}-{1-6}` (optional)

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

   Baud: (same value as the baud rate [BAUD] parameter in Step 1)
   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Answerback: ACK (cntrl-F) (only if the flow control [FLOW] parameter 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 and Deprovisioning

5

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Provisioning and Deprovisioning

5

This chapter contains procedures to provision and deprovision DACS IV-2000 system equipment. If you are changing equipment from earlier versions or changing DS1 Interface Modules to STS1 Interface Modules, refer to Chapter 14.

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

This chapter consists of procedures for the following:

- Provisioning the Network Element:
  - — Target ID
  - — Alarm Delay
  - — Protection Switching Autolock
  - — Automatic Database Backup
  - — Critical Alarm Reporting
  - — Network Element Performance Monitoring Parameters

- Provisioning Equipment:
  - — Interface Modules (Units)
  - — Synchronizer Module circuit packs and timing references
  - — MUX circuit packs
  - — Line Build Out (LBO)
  - — SMUX circuit packs
  - — SWIF and DS1IF circuit packs
  - — EQL and DS1 Code Type (Linecode)
  - — DS3PM circuit packs
  - — PMGR1 circuit packs
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- Configuring EC-1 Ports for Various Terminating Equipment (STS-1, VT1.5, and DS1)

- Deprovisioning Equipment:
  - — DS1 Interface Modules
  - — DS3 Interface Modules
  - — STS1 Interface Modules
  - — DS1IF/SWIF circuit packs
  - — MUX circuit packs
  - — SMUX circuit packs
  - — PMGR1 circuit packs

Provisioning

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

- Setting up the Network Element (NE) — provide information for target ID (TID), alarm delay, protection switching autolock, automatic tape backup, critical alarm reporting, and DS1, DS3, VT1.5, and STS-1 performance monitoring.
- Equipment — provide information of available interface modules, interface circuit packs, and other optional equipment. The recommended provisioning sequence for equipment is listed in Table 5-1. 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.
- DS1, DS3, EC-1 Facilities — provide information associated with DS1, DS3, STS-1 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).

Table 5-1. **Provisioning Sequence**

Entity	Supporting Entities Required To Provision
SWIO* (provisioned in pairs)	None
UNIT	None (DS1 Interface Module requires supporting DS1 Interface-Protection Module)
DS3PM (optional)§	UC
CLKDR† (provisioned in pairs)	UNIT, SWIO
MUXP‡	CLKDR
MUX‡	MUXP
DS1RY**	UNIT
SWIF**	CLKDR
DS1IP**	SWIF, DS1RY
DS1IF**	SWIF, DS1RY, DS1IP (supporting DS1IP circuit pack can be in another UNIT)
TX (provisioned in pairs)	DPLL
TB (provisioned in pairs)	DPLL
CLKGN3	DPLL, TB
SMUXP††	CLKDR
SMUX††	SMUXP
PMGR1 (optional)	UC, CLKDR

* Provisioned as a result of entering the `ENT-EQPT` and `RST-EQPT` commands. SWIO circuit packs are automatically provisioned when the software release is downloaded and/or by initialization via the `INIT-SYS::::9` command.

† Provisioned automatically when a interface module is provisioned with the `RST-EQPT` command.

‡ Provisioned automatically when an DS3 Interface Module is provisioned with the `RST-EQPT` command.

§ DS3PM circuit packs are not supported in STS1 Interface-16 Modules.

** Provisioned automatically when a DS1 Interface or DS1 Interface-Protection Module is provisioned with the `RST-EQPT` command.

†† Provisioned automatically when an STS1 Interface Module is provisioned with the `RST-EQPT` command.

Provisioning Network Element

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

- Target ID (TID) — provides the unique identifier for the DACS IV-2000 frame.
- 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.
- Protection Switching Autolock — sets values for preventing circuit packs from switching to protection. This feature allows you to identify circuit packs indicating intermittent problems by not allowing them to switch to protection after a threshold of switches has been detected. Refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400) 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, equipment failure, or a combination of both has been detected. Critical alarms are indicated by a red LED on the status panel marked CRITICAL, an audible alarm, and a remote critical alarm. Also, a `REPT ALM NE` 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.
  - If the failure type is provisioned as FAC (facility), and the number of active failed conditions fall below the threshold, the system clears the critical alarm indicators. Provisioning the failure type as FAC indicates that the frame counts EC-1/VT1.5/DS1 failures based on facility failures only.
  - If the failure type is provisioned as EQPT (equipment), retiring the last major service-affecting equipment alarm clears the critical alarm indicators. Provisioning the failure type as EQPT indicates that the frame counts failures based on major service affecting equipment failures only.
  - Provisioning the failure type as BOTH indicates that the frame counts failures based on both equipment and facility failures.
  - The initial setting for the critical alarm indicator is NONE, indicating that no critical alarm message or indicator is activated.
  - The initial setting for the facility failure threshold is 6.

- DS1 Performance Monitoring — sets system values for DS1 performance monitoring. Refer to Chapter 11 for detailed information on using the DS1 performance monitoring feature.
- DS3 Performance Monitoring — sets system values for DS3 performance monitoring. Refer to Chapter 11 for detailed information on using the DS3 performance monitoring feature.

1. Retrieve current 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,ALM-DLY,N-SW,SW-INT,HLD-T:
AUTO-BKUP,TIME,DAY:,,:::FAIL-TYPE,FAIL-THRES,CRC-6,SHRT-ACC,
PMTYP,ACC */
    "...f,g,h,i:j,k,l:,,:::r,s,t,u,v,w"
;
```

   Where:

   f = Alarm delay: **{1-30}**

   g = Autolock number of switches: **{1-10}**

   h = Autolock switching interval: **{1-60}**

   i = Autolock release time: **{1-24}**

   j = Automatic tape backup: **{ ON, OFF }**

   k = Time of day: **0000-2359**

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

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

   s = Failure threshold: **{0-500}**

   t = Number of CRC-6 errors: **{0-19200}**

   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 }**

   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]*:::*[c]*,*[d]*:*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,*[j]*,*[k]*,*[l]*,*[m]*,*[n]*,*[o]*,*[p]*;

   Where:

   a = Target ID (optional)

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

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

   e = 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**

   f = 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**

   g = 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**

   h = Automatic tape backup: **{ ON, OFF, CURVAL }**
   Enables (**ON**) or disables (**OFF**) the automatic database backup. When enabled the tape drive must be in-service and have a formatted tape with the current software version installed.
   Initial system value: **OFF**

   i = Time of day: **{ 0000-2359, CURVAL }**
   Specifies the time of day the automatic database backup occurs.
   Initial system value: **0130**

   j = Day of week: **{ Su, Mo, Tu, We, Th, Fr, Sa, CURVAL }**
   Specifies the day of the week the automatic database backup occurs.
   Initial system value: **Su**

   k = 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**

l = Failure threshold: { {0-500}, CURVAL }
Specifies the number of EC-1/VT1.5/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 *k* when parameter *k* is set to **BOTH** or **FAC**.
Initial system value: 6

m = Number of CRC-6 errors: { {0-19200}, CURVAL }
Specifies the number of CRC-6 errors in a minute to count as a degraded minute (DM). Refer to Chapter 11 for more information on DS1 performance monitoring.
Initial system value: 92

n = DS1 Short accumulation period: { 15-MIN, 1-HR, CURVAL }
Specifies the short accumulation period of performance monitoring parameters. Refer to Chapter 11 for more information on DS1 performance monitoring.
Initial system value: 15-MIN

o = DS3 performance monitoring type: { PSET#1, PSET#2, NONE, CURVAL }
Specifies the type of performance monitoring parameters that the frame monitors. Refer to Chapter 11 for more information on DS3 performance monitoring.
Initial system value: NONE

p = DS3 accumulation period: { 15-MIN, 1-HR, CURVAL }
Specifies the accumulation period of performance monitoring parameters. Refer to Chapter 11 for more information on DS3 performance monitoring.
Default value: 15-MIN if PSET#1 or PSET#2 is specified for parameter *p*; CURVAL if CURVAL is specified for parameter *p*.

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

   If any parameters are not set to the desired values, re-enter 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 about 30 minutes to reset. For more information on rebooting, refer to the section titled"Reset and Boot" (page 6-8)

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

Provisioning Interface Modules (Units)

This procedure is used to provision all or some of the interface modules installed in the DACS IV-2000 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, DS3PM, and SMUX circuit pack slots) before performing this procedure.

1. Make a copy of Figure 5-1 (sheets 1 and 2).
2. Retrieve the unit number, interface module type, control cable identification (J1-J32), 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 provide on the top of each worksheet.
   b. Refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) 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.
      - **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.

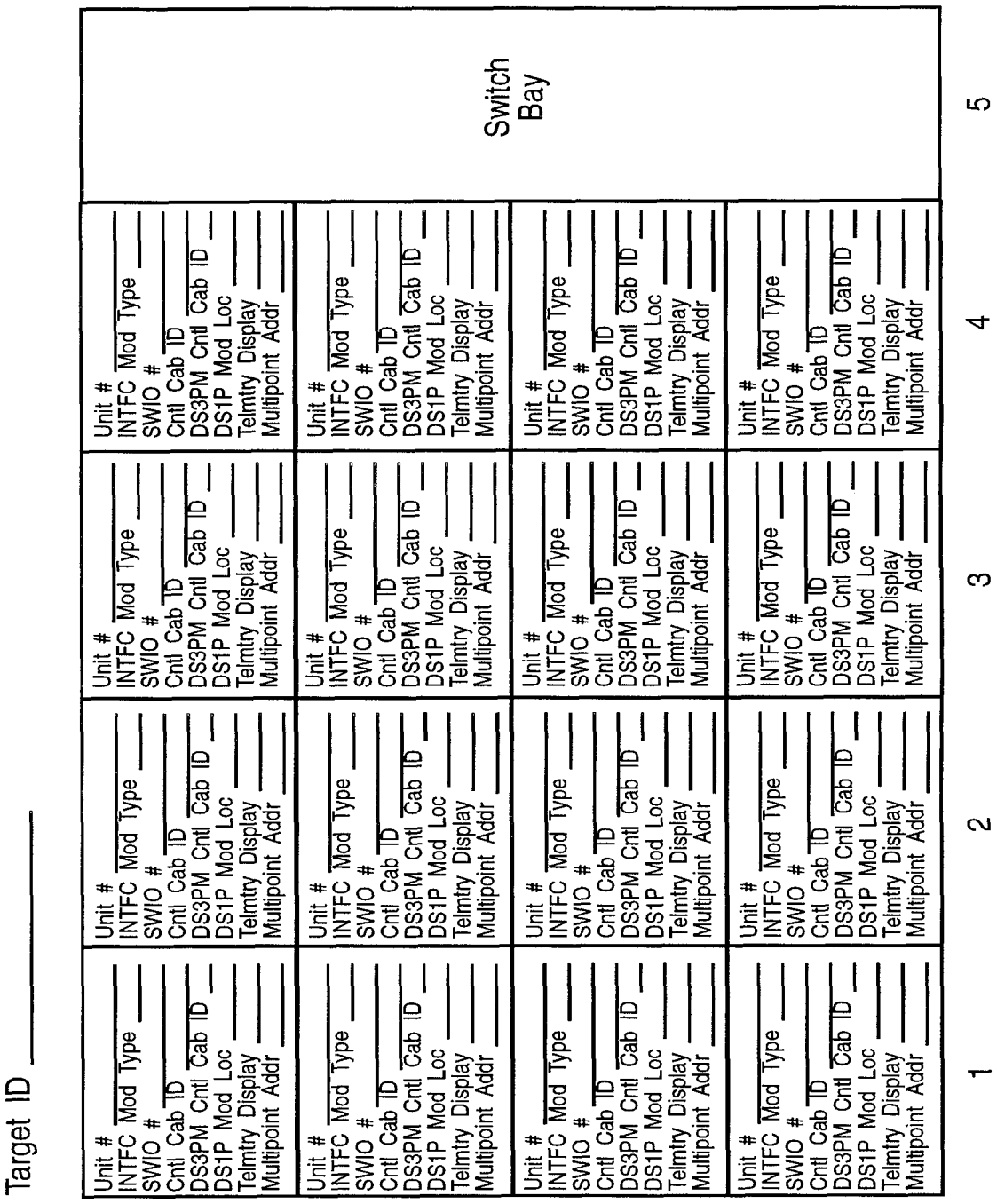


Figure 5-1. **Interface Modules Provisioning Worksheet (Sheet 1 of 2)**

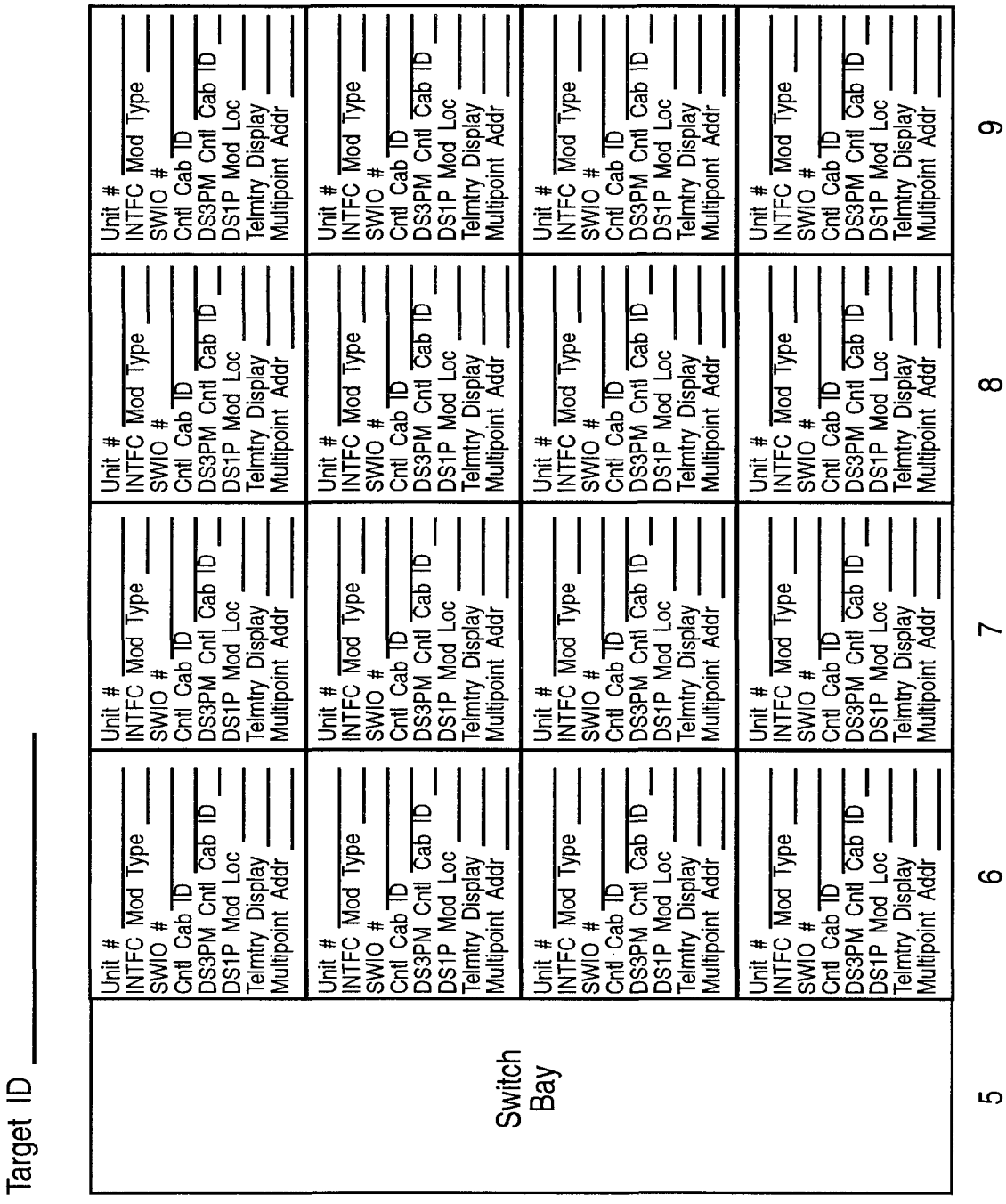


Figure 5-1. **Interface Modules Provisioning Worksheet (Sheet 2 of 2)**

e. Enter the control cable (J-cable) ID (`Cntl Cab ID`) associated with the shelf position of the interface modules identified in Step 2b. J-cables numbered J-1 to J-16 are for interface modules located to the left of the Switch Bay, starting with Unit 13 at the bottom of Bay 4 and proceeding up and out to the left. J-cables numbered J-17 to J-32 are for interface modules located to the right of the Switch Bay, starting with Unit 17 at the bottom of Bay 6 and proceeding up and out to the right. J-cables IDs can also be identified in Figure 2 of the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

f. For any DS3PM circuit pack located in a 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-13 to J-16 (to the left of the Switch Bay) and J-29 to J-32 (to the right of the Switch Bay).

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 31. For DS3 and STS1 Interface Modules, a value between 0 and 15 must be assigned since there are no default values.

i. For each DS3PM circuit pack, enter the multipoint address (`Multipoint Addr`). The multipoint address defaults to the Unit Number minus one (for example, a DS3PM 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 31.

After completing the above procedure, the provisioning worksheet in Figure 5-1 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 DSAB Bays.

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 cable can be left empty.

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-{1-32}**

5. Determine the basic state of the SWIO 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = SWIO circuit pack location: SWIO-{1-32}

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

   If the basic state is EQPD, continue with the next step. If the basic state is AVAIL, go to Step 7. If the basic state is POS, go to Step 8.

6. Install the mate SWIO of the SWIO identified in Step 4. Refer to Chapter 2 for installing circuit packs, if necessary.

7. Create the SWIO slot by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = SWIO circuit pack location: **SWIO-{1-32}**

8. 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]*;

   Where:

   a = Target ID (optional)

   b = Interface module (unit number) location: **UNIT-{1-32}**

   d = Interface module type:
   DS3 Interface-32 Module: **32DS3**
   DS3 Interface-16 Module: **16DS3**
   DS1 Interface Module: **DS1**
   DS1 Interface-Protection Module: **DS1P**
   STS1 Interface-16 Module: **16STS1**

   e = Switch connection equipment location: **SWIO-{1-32}**

   f = Control cable ID (J-cable): **{J1-J32}**

   g = Protection equipment location (DS1 Interface Modules [**DS1**] only): **UNIT-{1-32}**

   h = Telemetry display number: **{0-31}**
   For DS1 Interface and DS1 Interface-Protection Modules, the domain is **0-31** and the default is the Unit Number minus 1. For DS3 Interface-32, DS3 Interface-16, and STS1 Interface-16 Modules, the domain is **0-15** and there is no default.

9. 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-{1-32}**
   (Must be the Unit Number entered in Step 8.)

   As unit controllers are restored, REPT DBCHG *messages for all automatic provisioned equipment are generated indicating that the database is being updated. The* **RST-EQPT** *command takes up to 5 minutes to complete.*

10. Repeat this procedure from Step 8 for each interface module that needs to be provisioned.

11. When all equipment has been provisioned (all `REPT DBCHG` messages have been received), press the LED test button on the status panel at the front of the frame.
12. Check to see that the LEDs light in the order shown below.

Order	Equipment
1	Redundant Controller, Switch Power Module, and Auxiliary Power Module
2	SWCS Circuit Packs
3	SWIO Circuit Packs
4	Interface Modules 1-32 in order*

* Interface module (unit) LEDs light only if provisioned

NOTE:
If the LED test sequence does not begin immediately, the system may be executing another command (for example, autonomous database change). 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 the section titled"Deprovisioning" (page 5-67)] and repeat this procedure with the correct information.

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 Central Office Timing Reference (BITS) source to the timing extractor input ports (TXPT).

NOTE:
In this procedure, provisioning side 0 circuit packs of the Synchronizer Module automatically provisions side 1 circuit packs.

1. Provision the side 0 DPLL circuit pack by entering the following command:

   ENT-EQPT:*[a]*:DPLL-0::::CODE=AWP9;**

   Where:

   a = Target ID (optional)

2. Provision the side 0 TBS3 circuit pack by entering the following command:

   ENT-EQPT:*[a]*:TB-0::::CODE=AWS3;**

   Where:

   a = Target ID (optional)

3. Provision the side 0 DS1TX circuit pack, and provision and assign DS1 reference clocks to TXPTs by entering the following command:

   ENT-EQPT:*[a]*:TX-0::::CODE=AWS5,SYNCPRI=*k*,**
   SYNCSEC=*l*,TLIP1FF=*m*,TLIP2FF=*n*,TLIP1LC=*o*,TLIP2LC=*p*;

   Where:

   a = Target ID (optional)

   k = Primary timing reference location: { 1, 2 }
   Specifies which TXPT the primary synchronization reference is connected to.

   l = Secondary timing reference location: { 1, 2 }
   Specifies which TXPT the 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.

4. 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&CLKGN-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 }

5. 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** }

6. 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 }

7. Restore the TXPTs associated with the synchronizer side restored in Step 5 (active side) by entering the following command for each TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: TXPT-{0,1}-{1,2}

8. Restore the TXPTs associated with the synchronizer side restored in Step 6 (standby side) by entering the following command for each TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: TXPT-{0,1}-{1,2}

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 (AKM68) circuit pack. Refer to the section titled "Changing Multiplexer From MUX1 (AKM52) to MUX2 (AKM68)" (page 14-36) 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 Operation" (page 5-64).

NOTE:
All MUX/SMUX circuit packs that are provisioned but do not carry service must be loopback by either operating a DS3/STS-1 line loopback or creating a loopback at the DS3X/STS-1X connection to avoid transient alarms. To operate line loopbacks refer to the section titled "Operating Near-End DS3 Loopbacks" (page 10-8) for MUX circuit packs or "Operating Near-End STS-1 Loopbacks" (page 10-14) for SMUX circuit packs.

CAUTION:
Before performing this procedure, clear any protection switches involving the DS3/STS1 Interface Module which you are provisioning a MUX/SMUX circuit pack.

1. Retrieve the state of the MUX/SMUX 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-{1-32}-{1-31}, SMUX-{1-32}-{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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: { MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }

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

   If the basic state of the MUX/SMUX slot is ACT, POS, or EQPD, the MUX/SMUX slot must be deprovisioned. Refer to the appropriate procedure in the section titled"Deprovisioning" (page 5-67) 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 next section titled"Setting Line Build Out (LBO)" (page 5-23). After setting the LBO continue with this procedure.

5. Install the MUX/SMUX circuit pack into the MUX/SMUX 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-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }**

7. If the LBO settings match, 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-{1-32}-{1-31}, SMUX-{1-32}-{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-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }**

9. 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: { MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }

   f = Equipment state: basic states are AVAIL or POS

   If the basic state of the MUX/SMXU is POS, the MUX/SMUX circuit pack has been provisioned. If the basic state of the MUX/SMUX circuit pack is AVAIL, continue this procedure to manually provision the MUX/SMUX circuit pack.

10. 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-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }

Setting Line Build Out (LBO)

This procedure is used to set the Line Build Out (LBO) for MUX and 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 5-2), and set saddle switches for MUX2 (AKM68/68B) circuit packs (refer to Figure 5-2) , MUX1 (AKM52/52B) circuit packs (refer to Figure 5-3), or SMUX (AKM84) circuit packs (refer to Figure 5-4). All three saddle switches must be set on the circuit packs.
3. If you are changing the LBO setting on circuit packs that have already been provisioned, update the software to match the hardware by entering the following command:

    ED-EQPT:*[a]*:*b*:::**LBO=INIT**;

    Where:

    a = Target ID (optional)

    b = MUX/SMUX circuit pack location: { **MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }

    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-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }

   If the desired setting does not appear in the output response, repeat this procedure beginning with Step 2.

Table 5-2. DS3/STS-1 Cable Length (ft) 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.

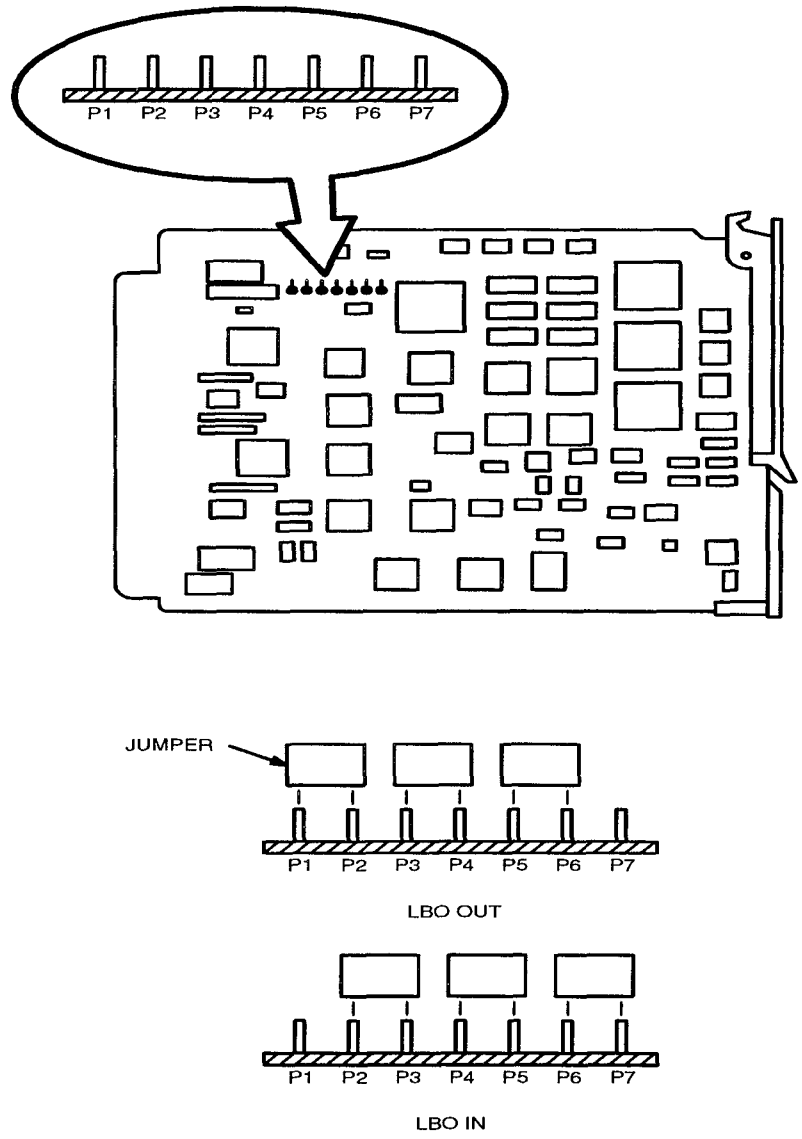


Figure 5-2. LBO Saddle Switches on MUX2 (AKM68B) Circuit Packs

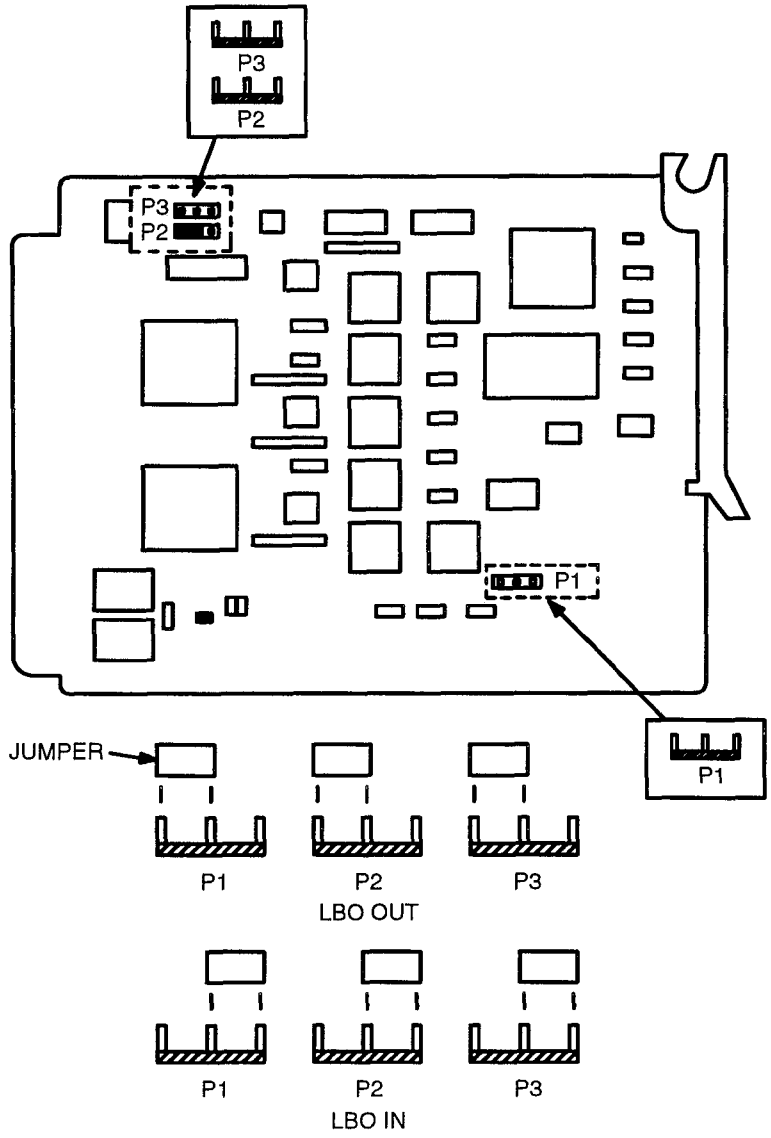


Figure 5-3. LBO Saddle Switches on MUX1 (AKM52/52B) Circuit Packs

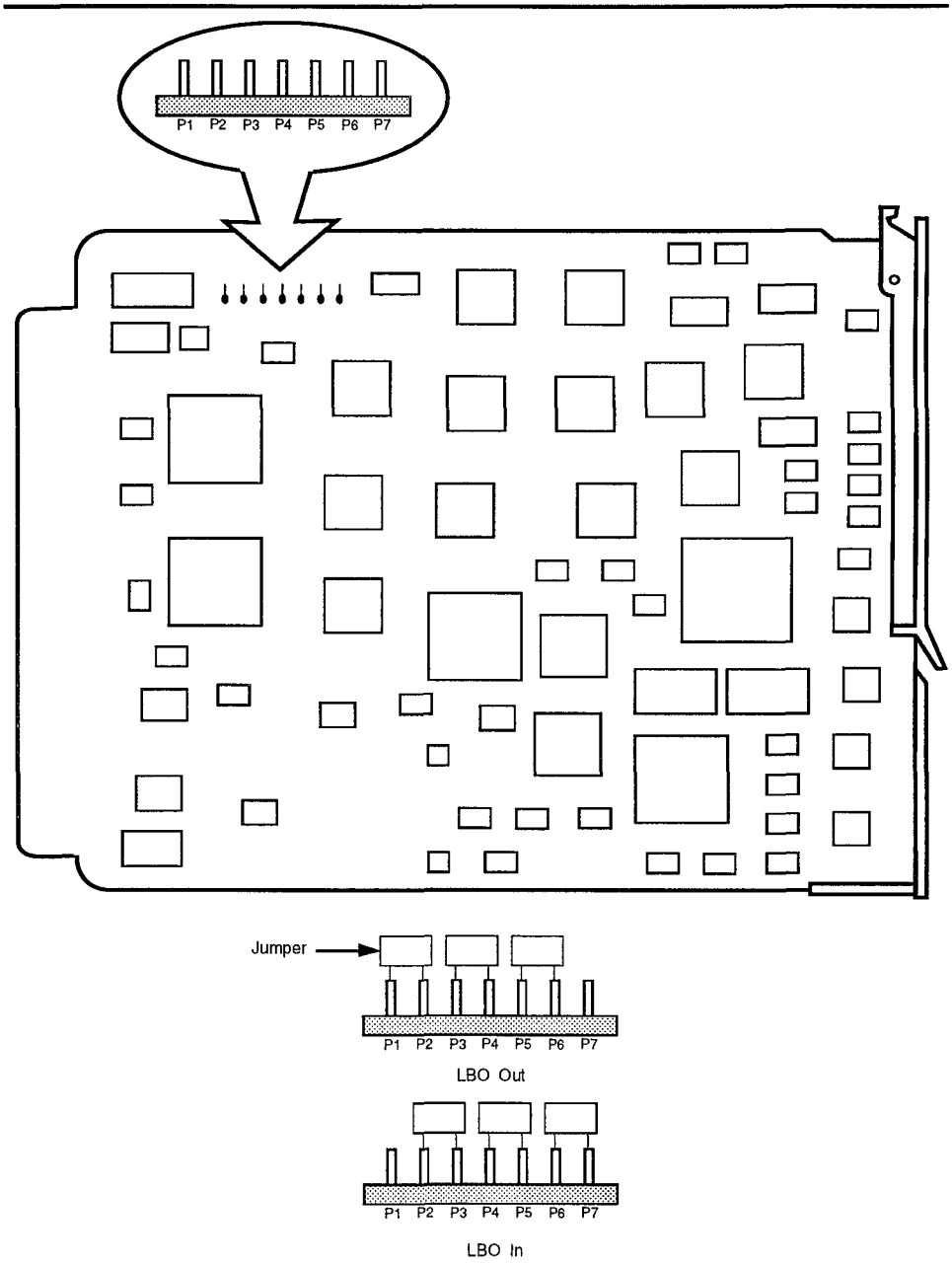


Figure 5-4. LBO Saddle Switches on SMUX1 (AKM84) Circuit Packs

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 14-28) for changing SWIF circuit packs.

⚠ CAUTION:
Before performing this procedure, clear any protection switches involving the DS1 interface protection group which you are provisioning a SWIF and 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-{1-32}-{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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{1A-8B}

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

   If the basic states of the DS1IF slots are ACT, POS, or EQPD, the DS1IF slots must be deprovisioned. Refer to the appropriate procedure in the section titled"Deprovisioning" (page 5-67) 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-{1-32}-{1-8}

4. Determine the basic state of the SWIF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{1-8}

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

   If the basic state of the SWIF slot is ACT, POS, or EQPD, the SWIF slot must be deprovisioned. Refer to the appropriate procedure in the section titled"Deprovisioning" (page 5-67) before continuing this procedure.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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 5-33) [use the software method, where possible]. After setting the equalizer and DS1 code type continue with this procedure.

12. 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-{1-32}-{1-8}**

13. Determine the basic state of the SWIF 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"
   .
   .
   .
   "e:f"
;
```

Where:

e = SWIF circuit pack location: `SWIF-{1-32}-{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, go to Step 15.

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-{1-32}-{1-8}**

15. 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-{1-32}-{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.

16. Determine the basic state of the DS1IF 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"
   .
   .
   .
   "e:f"
;
```

Where:

e = DS1IF circuit pack location: `DS1IF-{1-32}-{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 17 to manually provision the DS1IF circuit packs. If the basic states of the DS1IF circuit packs are POS, you are done with this procedure.

17. 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-{1-32}-{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.

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 5-36).

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 5-3 for settings when not using a DSAB or Table 5-4 for setting when using DSABs) and set the equalization by entering the following command:

   ED-EQPT:*[a]*:*b*:::**[EQL=***f***]**;

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{1A-8B}**
   (A range of DS1IFs cannot be specified.)

   f = Equalizer setting: **{ 20, 40, 60, 80, 100 }**

Table 5-3. DS1 Cable Length 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 (on-half the total allowable distance between network elements) and for runs between network elements that additional 450/655 feet can be added to the upper limit causing overlapping ranges in the **To Network Element** column.

Table 5-4. DS1 600-Type Cable (22GA) Length 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 (on-half the total allowable distance between network elements using two DSAB Bays) and for runs between network elements that additional 585 feet can be added to the upper limit 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-{1-32}-{1A-8B}**

   If the desired setting does not appear, repeat Step 2 of this procedure.

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=***l]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{1-8}-{1-28}, DS1GRP-{1-32}-{1-8}, UNIT-{1-32} }**

   f = 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: **{ {1-32}-{1-8}-{1-28}, DS1GRP-{1-32}-{1-8}, UNIT-{1-32} }**

   If the desired setting does not appear, repeat this procedure beginning with Step 5.

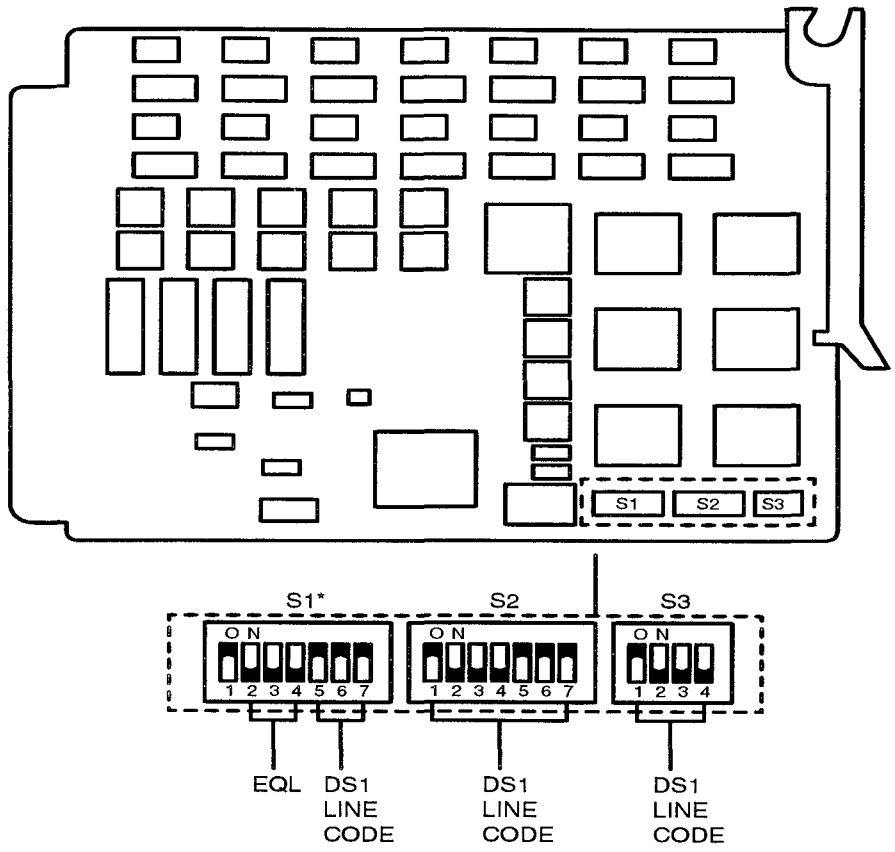
Hardware Method

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 5-3 or 5-4).
3. Extract the DS1IF circuit pack (refer to Chapter 2 if necessary), and set the EQL switches using Tables 5-3 or 5-4 and 5-5, and Figure 5-3.

Table 5-5. EQL Switch Positions

Equalizer	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.



* Switch S1, position 1 must be set to **ON** for proper operation.

Figure 5-5. **EQL Switches and DS1 Code Type (Linecode) Switches on DS1IF Circuit Packs**

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 5-3 and Table 5-6.

Table 5-6. DS1 Code Type (Linecode) Switch Setting

DS1 Channel (14 per DS1IF)	Switch Position	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

6. Reinstall the DS1IF circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
7. 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-{1-32}-{1A-8B}**
8. 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: **{ {1-32}-{1-8}-{1-28}, DS1GRP-{1-32}-{1-8}, UNIT-{1-32} }**

Provisioning DS3PM Circuit Packs

NOTE:
DS3PM circuit packs are not supported in STS1 Interface-16 Modules.

The DS3PM circuit pack reports alarm and control data to the General Telemetry Processor (GTP) Operations System through a TABS link. In order for the TABS link to receive the alarm and control data, the DS3PM circuit pack must be optioned by setting switches P2 and P3 on the DS3PM circuit pack.

There is one TABS link for bays on the left side of the switch bay and a separate TABS link for bays on the right side of the switch bay. The TABS link must be terminated by a resistor on the DS3PM circuit pack. The resistor is optioned IN or OUT with option switches P2 and P3.

On each side of the switch bay only one DS3PM circuit pack can have its terminating resistor set to the IN position, while all others must be set to OUT.

The DS3PM circuit packs are wired serially, so the last one in the series is set to IN. This is generally the DS3PM circuit pack that is the furthest from the switch bay. There are three ways to determine which DS3PM circuit pack must have its terminating resistor set to IN. They are:

- Check with the installation group
- Check office wiring records
- Check the wiring at the back of the frame.

The TABS link connections to the DS3PM circuit pack are made by 2-wire pair cables that are connectorized and connect to pins P51 and P52 on the backplane. The last DS3PM 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 DS3PM circuit pack that must have P2 and P3 optioned to IN. All others on that side of the switch bay must be set to the OUT position.

NOTE:
If you are rearranging the frame or adding DS3PMs circuit pack, you must maintain the wiring arrangement for the DS3PMs circuit pack 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 (J13-J16 for left of switch bay DS3PM circuit packs and J29-J32 for right of switch bay DS3PM circuit packs) from office drawings or the completed provisioning worksheet (Figure 5-1) and determine the DS3PM circuit pack(s) to be optioned for the terminating resistor for the TABS link.
2. To provision the DS3PM circuit pack TABS LINK IN, place a jumper to cover Pins 1 and 2 on both option switches (P2 and P3). To provision the DS3PM circuit pack TABS LINK OUT, place a jumper to cover Pins 2 and 3 on both option switches (P2 and P3). Refer to Figure 5-4 for location of the P2 and P3 switches.

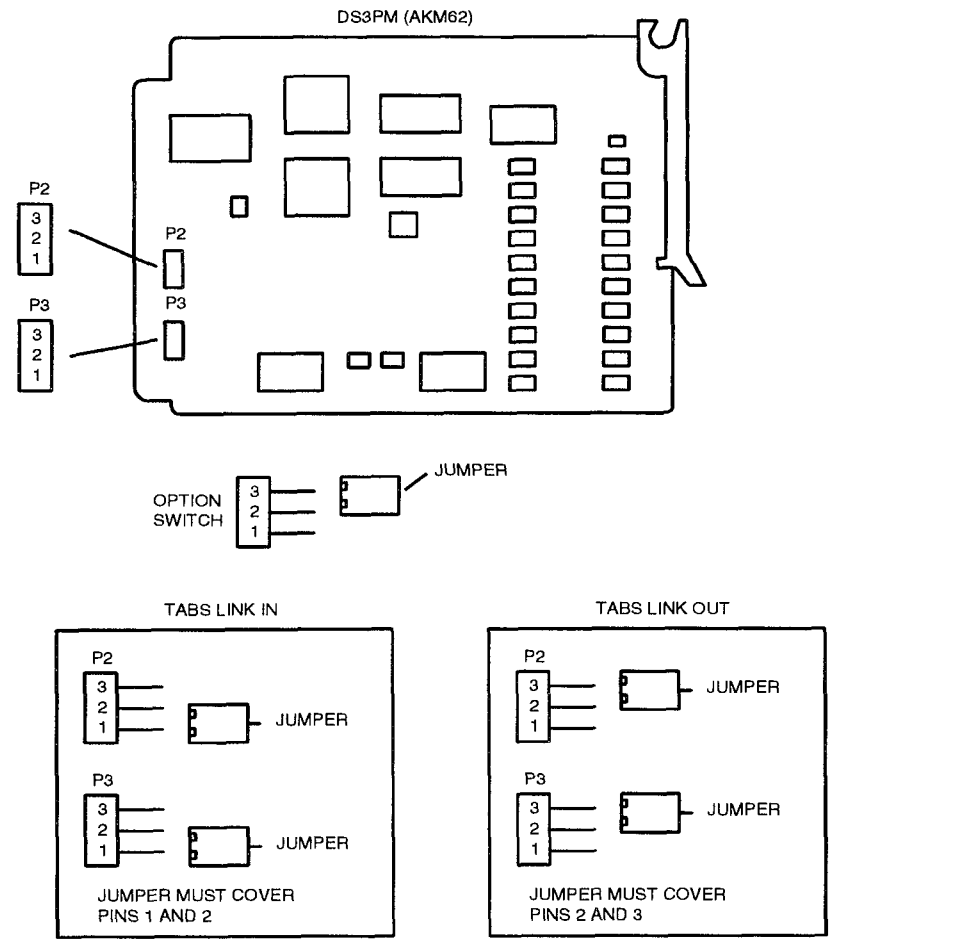


Figure 5-6. Location of Option Switches on DS3PM TABS Link

3. Provision a DS3PM circuit pack by entering the following command:

   ENT-EQPT:*[a]*:*b*::::*[***CABLEID=***f*,**MULPTADD=***i]*;

   Where:

   a = Target ID (optional)

   b = DS3PM circuit pack location: **DS3PM-{1-32}**

   f = Control cable ID (J-cable): **{ {J13-J16}, {J29-J32} }**

   i = DS3PM multipoint address: **{0-31}**
   Default: is the DS3PM circuit pack location minus 1.

4. Restore the DS3PM circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3PM circuit pack location: DS3PM-{1-32}

   The DS3PM circuit pack takes up to 2 minutes to be restored. A REPT RST EQPT *message appears when the DS3PM circuit pack is restored.*

Provisioning PMGR1 Circuit Packs

NOTE:
PMGR circuit packs are not supported in STS1 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.

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 constraints of interface module configurations, UC2 circuit pack memory (scan performance monitoring has a higher demand on memory than full-time/camp-on performance monitoring) and only one PMGR1 circuit pack can be provisioned to perform scan performance monitoring per SWIO circuit pack pair, the number of PMGR1 circuit packs per interface module is limited. Table 5-7 lists the maximum number of PMGR1 circuit packs in each interface module type for given performance monitoring mode combinations.

Table 5-7. **Maximum Allowable PMGR1 Circuit Packs per Interface Module**

Interface Module Type	Performance Monitoring Mode	
	Full-Time/Camp-On	Scan
DS3 Interface-32	16	0
	8	1
	2	2
DS3 Interface-16	15	0
	8	1
DS1 Interface	8	7
	7	1/0*
DS1 Interface-Protection	7	0
	6	1/0†

* 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.

CAUTION:
Before performing this procedure, 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 PMGR1. Otherwise, denial codes appear in entering commands when performing this procedure.

1. 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-{1-32}-{1-31}`

   All DS1 ports associated with the selected DS1 interface group must be in the IDLE-REL state before continuing.

2. Retrieve the state of the MUX or SWIF to be replaced by entering the following command:

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

   Where:

   a = *a* =Target ID (optional)

   b = MUX or SWIF circuit pack location: **{ MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8} }**

3. Determine the basic state of the MUX or SWIF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX or SWIF circuit pack location: `{ MUX-{1-32}-{1-31}, SWIF-{1-32}-{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. Disconnect/delete the interface circuit pack(s) from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = Interface circuit pack location: { **MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8}, DS1IF-{1-32}-{1A-8B}** }

NOTE:
If a DS1 interface group is being removed from service, separate disconnect/delete commands are required for both the DS1IF and SWIF circuit packs. The DS1IF circuit packs must be disconnected/deleted before the SWIF circuit pack.

5. Extract the SWIF or MUX circuit pack deleted in Step 4 from its slot. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A minor (MN) alarm occurs when a SWIF or MUX circuit pack is extracted.

6. Install a PMGR1 circuit pack in the MUX or SWIF slot. Refer to Chapter 2 for installing a circuit pack, if necessary.

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 5-83) for replacing DS1IF circuit packs with BXA circuit packs, if necessary.

7. 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-{1-32}-{1-31}, SWIF-{1-32}-{1-8}** }

   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*::::*[***FNCT=***h]*;

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: { **MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8}** }

   h = Performance monitoring mode: { **PM, PM-SCAN** }

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-{1-32}-{1-31}, SWIF-{1-32}-{1-8}** }

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 5-57),"Provisioning VT1.5 Facilities" (page 5-61), and "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-64) 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

   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: {1-32}-{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 DRVN or NDRVN 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

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, re-enter 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: **{ {1-32}-{1-31}-{1-28}, SWIF-{1-32}-{1-8}, UNIT-{1-32}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{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: {1-32}-{1-31}-{1-28}

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

i = Condition Type: { LOS, T-BER, DS1-AIS, YEL, LOF, INC, MINC }

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: { {1-32}-{1-31}-{1-28}, SWIF-{1-32}-{1-8}, UNIT-{1-32}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{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**
   FEND can only be specified for DS1 signals within DS3s (that is, only if **MUX-{1-32}-{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, re-enter 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 system.

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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**
   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.

Provisioning DS3 Facilities

T3 circuits are provisioned into service using the **ED-T3** and the **SET-ATTR-T3** commands. T3 circuits are configured for the following functions:

- Input Status — specifies the expected signal to a DS3 port.
- Signal Format — specifies if 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) if the DS3 IDLE signal is transmitted if all 28 DS1 tributaries in a DS3 are in the IDLE-REL (idle-released) state.
- Remote Multiplexer — specifies if the selected DS3 signal is to communicate with a remote multiplexer (for example, a DDM-1000 multiplexer). The DACS IV-2000 system 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**.

NOTE:
Remote multiplexer communication is supported by the MUX2 (AKM68) circuit pack 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.

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 to be provisioned.
2. Retrieve current provisioning information by entering the following command:

   RTRV-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{1-31}, UNIT-{1-32} }**

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: `{1-32}-{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.

3. 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**

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 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.

4. Verify the settings using the **RTRV-T3** command as shown in Step 2.

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, re-enter the **ED-T3** command and change the necessary parameters.

5. Retrieve current alarm level information by entering the following command:

   RTRV-ATTR-T3:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{1-31}, UNIT-{1-32} }**

   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: {1-32}-{1-31}

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

   i = Condition Type: { T-BER, LOS, OOF, AIS, AISFRAMED, AISUNFRAMED, IDLE, ALLDS2SOOF, INC, YEL, 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-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-T3:*[a]*:*b*:::*d*:*e*,*[f]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { {1-32}-{1-31}, UNIT-{1-32} }

   d = Notification code: { **MJ**, **MN**, **NA** }
   Initial system value: **MJ** (for the **FAULT** condition group) or **NA** (for the **AIS** and **IDLE** condition groups)
   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 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.

   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.

   f = Location: { **NEND**, **FEND** }
   Default value: **NEND**
   FEND can only be specified for DS3 signals associated with a MUX2 circuit pack.

7. Verify the settings using the **RTRV-ATTR-T3** command as shown in Step 5.

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, re-enter the **SET-ATTR-T3** command and change the necessary parameters.

8. 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: **{ {1-32}-{1-15}, UNIT-{1-32} }**

   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: {1-32}-{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 Operation" (page 5-64) 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: { {1-32}-{1-15}, UNIT-{1-32} }

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, re-enter 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: **{ {1-32}-{1-15}, UNIT-{1-32} }**

   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: {1-32}-{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: { {1-32}-{1-15}, **UNIT**-{1-32} }

   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.

   e = Condition group: { **FAULT**, **AIS-YEL**, **FERF**, **ALL** }
   Default value: None

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, re-enter 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 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 5-57) and "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-64) 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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

   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: {1-32}-{1-15}-{1-28}

   k = 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.

   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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

   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, re-enter 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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

   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: {1-32}-{1-15}-{1-28}

   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: { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }

   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 }
   Default value: None

7. Verify the settings using the RTRV-ATTR-VT1 command as shown in Step 5.

NOTE:
If an alarm condition is currently active on an 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, re-enter 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 Operation

This procedure is used to match STS-1 singals with the type of terminating equipment connected to the DACS IV-2000 system SMUX circuit packs. Since the DACS IV-2000 system 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 and VT1.5 cross-connections are needed, you must perform this procedure to configure EC-1 ports for STS-1 or VT1.5 signals.

Only ports that are in the IDLE state can be change 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 ports only: **{1-32}-{1-15}**
   VT1.5 ports only: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15} }**
   EC-1 ports and associated VT1.5 tributaries: **UNIT-{1-32}**

   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"
      .
      .
      .
   "d:<EC1MAP=e,RCVEC1MAP=f,VTMAP=g,RCVVTMAP=h>:i"
;
```

Where:

d = Port location:
EC-1 port: `{1-32}-{1-15}`
VT1.5 port: `{1-32}-{1-15}-{1-28}`

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. Change the necessary EC-1 port parameters by entering the following command:

ED-PORT:*[a]*:*b*:::*[***EC1MAP=***d*,**VTMAP=***e]*;

Where:

a = Target ID (optional)

b = Port location:
EC-1 port: **`{ {1-32}-{1-15}, UNIT-{1-32} }`**
VT1.5 port: **`{ {1-32}-{1-15}-{1-28},`**
`VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }`

d = EC-1 port format: { **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). For STS-1 signals, one of the modes **UNSPEC**, **ASYN**, **SYNC**, **VTFLOAT**, or **VTLOCK** are selected according to the signal format of the far-end equipment. Normally to configure an EC-1 port for VT1.5 or DS1 cross-connections, this parameter is set to **NOVAL** 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.

d = VT1.5 port format: { **UNSPEC, ASYN, BIT, BYTE, NOVAL** }
Initial system value: **ASYN**
The Active Signal Types becomes **VT1** (indicating an VT1.5 signal) if **UNSPEC**, **BIT**, or **BYTE** is specified or **T1** (indicating an DS1 signal) if **ASYN** is specified. For VT.15 signals, one of the modes **UNSPEC**, **BIT**, or **BYTE** are selected according to the signal format of the far-end equipment. For DS1 signals, **ASYN** is selected. If this parameter is set to NOVAL, the EC-1 port is defined according to the setting of the EC-1 port format (parameter d). 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.

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

   If any parameters are not set to the desired values, re-enter the **ED-PORT** command and change the necessary parameters.

5. Notify the appropriate personnel, according to office procedures, when EC-1 ports are re-configured and update your office records.

Deprovisioning

These procedures are used to deprovision 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 system. 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 other slot 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 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 5-72).

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any DS1 performance monitoring connections involving the DS1IF circuit pack(s) to be deprovisioned.
2. Retrieve the state of the DS1IF circuit pack(s) to be deprovisioned by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: `DS1IF-{1-32}-{1A-8B}`

3. Determine the basic state of the DS1IF 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"
   .
   .
   .
   "e:f"
;
```

Where:

e = DS1IF circuit pack location: `DS1IF-{1-32}-{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 5.

4. Delete the DS1IF circuit pack(s) from the database by entering one of the following commands (depending on the basic state):

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

Where:

a = Target ID (optional)

b = DS1IF circuit pack location: **DS1IF-{1-32}-{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.

5. Retrieve the state of the SWIF circuit pack to be deprovisioned by entering the following command:

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

Where:

a = Target ID (optional)

b = SWIF circuit pack location: **SWIF-{1-32}-{1-8}**

6. Determine the basic state of the SWIF 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"
    .
    .
    .
    "e:f"
;
```

Where:

e = SWIF circuit pack location: SWIF-{1-32}-{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 8.

7. Delete the SWIF circuit pack from the database by entering one of the following commands (depending on the basic state):

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

Where:

a = Target ID (optional)

b = SWIF circuit pack location: **SWIF-{1-32}-{1-8}**

8. Determine 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-{1-32}-1&&-4**

If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 10.

9. 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-{1-32}-{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.

10. Determine 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-{1-32}-1&-2**

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 12.

11. 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-{1-32}-1**

NOTE:
CLKDR circuit packs are provisioned/deprovisioned in pairs. You only need to enter one member of the pair.

12. 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-{1-32}**

    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.

13. 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-{1-32}**

    The major alarm clears (CL) for the UC slot when you remove the DS1 Interface Module from the database.

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 5-67) 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.
2. Retrieve the state of the DS1 interface circuit pack(s) to be deprovisioned by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-1A&&-7B**
3. Determine the basic state of the DS1IF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{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 5.

4. Delete the DS1 interface circuit pack(s) from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{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.

5. Retrieve the state of the SWIF circuit pack to be deprovisioned by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-32}-{1-7}**

6. Determine the basic state of the SWIF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{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 8.

7. Delete the SWIF circuit pack from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-32}-{1-7}**

8. Retrieve the state of the DS1IP circuit pack(s) to be deprovisioned by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IP circuit pack location: **DS1IP-{1-32}-PA&-PB**

9. Determine the basic state of the DS1IP 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = DS1IP circuit pack location: DS1IP-{1-32}-{PA,PB}

   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 11.

10. Delete the DS1IP circuit pack(s) from the database by entering one of the following commands (depending on the basic state):

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

    Where:

    a = Target ID (optional)

    b = DS1IP circuit pack location: **DS1IP-{1-32}-{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.

11. Retrieve the state of the protection SWIF circuit pack to be deprovisioned by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = SWIF circuit pack location: **SWIF-{1-32}-P**

12. Determine the basic state of the protection SWIF 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"
   .
   .
   .
   "e:f"
;
```

    Where:

    e = SWIF circuit pack location: SWIF-{1-32}-{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 14.

13. Delete the protection SWIF circuit pack from the database by entering one of the following commands (depending on the basic state):

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

    Where:

    a = Target ID (optional)

    b = SWIF protection circuit pack location: **SWIF-{1-32}-P**

14. Determine 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-{1-32}-1&&-4**

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 16.

15. 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-{1-32}-{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.

16. Determine 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-{1-32}-1&-2**

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 18.

17. 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-{1-32}-1**

NOTE:
CLKDR circuit packs are provisioned/deprovisioned in pairs. You only need to enter one member of the pair.

18. 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-{1-32}**

    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.

19. 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-{1-32}**

    The major alarm for the UC slot clears (CL) when you remove the DS1 Interface-Protection Module from the database.

Deprovisioning DS3 or STS1 Interface Modules

This procedure is used to deprovision DS3 Interface-16, DS3 Interface-32, 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.
2. Retrieve the states of the MUX/SMUX circuit packs in the DS3/STS1 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location:
   DS3 Interface-32 Modules: **MUX-{1-32}-1&&-31**
   DS3 Interface-16 Modules: **MUX-{1-32}-1&&-15**
   STS1 Interface-16 Modules: **SMUX-{1-32}-1&&-15**

3. 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: `{ MUX-{1-32}-{1-31}, SMUX-{1-32}-{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 5.

4. Disconnect/delete the MUX/SMUX circuit packs from the database by entering one of the following two commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location:
   DS3 Interface-32 Modules: **MUX-{1-32}-1&&-31**
   DS3 Interface-16 Modules: **MUX-{1-32}-1&&-15**
   STS1 Interface-16 Modules: **SMUX-{1-32}-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.

5. Retrieve the state of the MUXP/SMUXP circuit pack in the DS3/STS1 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUXP/SMUXP circuit pack location: **{ MUXP-{1-32}, SMUXP-{1-32} }**

6. Determine the basic state of the MUXP/SMUXP 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUXP/SMUXP circuit pack location: `{ MUXP-{1-32}, SMUXP-{1-32} }`

   f = Equipment state: basic states are `AVAIL`, `STBY`, or `OOS`

   If the basic state is AVAIL, the selected equipment is already deprovisioned, go to Step 8.

7. Delete the MUXP/SMUXP circuit pack from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = MUXP/SMXUP circuit pack location: **{ MUXP-{1-32}, SMUXP-{1-32} }**

8. Determine 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-{1-32}-1&&-4**
   DS3/STS1 Interface-16 Modules: **CLKDR-{1-32}-1&&-2**

   If the basic state is OOS, the selected equipment is already deprovisioned, go to 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:
   DS3 Interface-32 Modules: **CLKDR-{1-32}-1&&-4**
   DS3'STS1 Interface-16 Modules: **CLKDR-{1-32}-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.

10. If you are deprovisioning an STS1 Interface-16 Module or the DS3 Interface Module being deprovisioned does not have a DS3PM circuit pack installed, go to Step 14. Otherwise, continue with this step. Retrieve the state of the DS3PM circuit pack in the DS3 Interface Module by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DS3PM circuit pack location: **DS3PM-{1-32}**

11. Determine the basic state of the DS3PM 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"
    .
    .
    .
    "e:f"
;
```

Where:

e = DS3PM circuit pack location: `DS3PM-{1-32}`

f = Equipment state: basic states are `IS`, `OOS`, or `AVAIL`

If the basic state is IS, continue with Step 12. If the basic state is OOS, continue with Step 13. If the basic state is AVAIL, continue with Step 14.

12. Remove the DS3PM circuit pack from service by entering the following command:

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

Where:

a = Target ID (optional)

b = DS3PM circuit pack location: **DS3PM-{1-32}**

After removing the DS3PM circuit pack from service, continue with the next step.

13. Delete the DS3PM circuit pack (in OOS state) from the database by entering the following command:

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

Where:

a = Target ID (optional)

b = DS3PM circuit pack location: **DS3PM-{1-32}**

After disconnecting the DS3PM circuit pack from the database, continue with the next step.

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-{1-32}**

    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. Disconnect 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-{1-32}**

    The major alarm for the UC slot clears (CL) when you remove the DS3/STS1 Interface Module from the database.

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 5-85).

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, and disconnect any performance monitoring connections involving the DS1IF circuit pack(s) to be deprovisioned.
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-{1-32}-{1A-8B}**

3. Determine the basic state of the DS1IF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{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 5.

4. Delete the DS1IF circuit pack(s) from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{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.

5. If you are replacing DS1IF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 6, 7, and 8 for each DS1IF circuit pack you are replacing.
6. Extract the DS1IF circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

CAUTION:
Do not extract more than one circuit pack at a time.

A minor (MN) alarm occurs for the DS1IF slot when you extract the DS1IF circuit pack.

7. 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.

8. 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-{1-32}-{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 5-83) 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-{1-32}-{1-8}**
3. Determine the basic state of the SWIF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{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 SWIF circuit pack from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-32}-{1-8}**

5. If you are replacing SWIF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 6, 7, and 8 for each SWIF circuit pack you are replacing.

6. Extract the SWIF circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

A minor (MN) alarm occurs for the SWIF slot when you extract the SWIF circuit pack.

7. Install a BXA circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the SWIF slot when you install the BXA circuit pack.

8. 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-{1-32}-{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-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }
3. 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX/SMUX circuit pack location: { MUX-{1-32}-{1-31}, SMUX-{1-32}-{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 5.
4. Delete the MUX/SMUX circuit pack from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: { **MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }

5. If you are replacing MUX/SMUX circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 6, 7, and 8 for each MUX/SMUX circuit pack you are replacing.
6. Extract the MUX/SMUX circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

A minor (MN) alarm occurs for the MUX/SMUX slot when you extract the MUX/SMUX circuit pack.

7. Install a BXA circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the MUX/SMUX slot when you install the BXA circuit pack.

8. 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-{1-32}-{1-31}, SMUX-{1-32}-{1-15}** }

Deprovisioning PMGR1 Circuit Packs

This procedure is used to deprovision PMGR1 circuit packs that occupy SWIF or MUX circuit pack slots.

1. Disconnect any DS1 performance monitoring connections involving the PMGR1 circuit pack being deprovisioned.
2. Retrieve the state of the PMGR1 circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: **{ MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8}**
3. Determine the basic state of the MUX or SWIF 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"
   .
   .
   .
   "e:f"
;
```

   Where:

   e = MUX or SWIF circuit pack location: { MUX-{1-32}-{1-31}, SWIF-{1-32}-{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 connections are disconnected. If the basic state is AVAIL, the selected equipment is already deprovisioned, go to Step 6.

4. 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-{1-32}-{1-31}`

   If the PMGR1 is performing SCAN DS1 performance monitoring, check with your system administrator before stopping the scanning. If scanning is to be stopped, refer to the section title"Stopping DS1 Scan Performance Monitoring" (page 11-15) in Chapter 11 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.

5. Delete the PMGR1 circuit pack from the database by entering one of the following commands (depending on the basic state):

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

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: `{ MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8}`

6. If you are replacing PMGR1 circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 7, 8, and 9 for each PMGR1 circuit pack you are replacing.

7. Extract the PMGR1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

⚠ CAUTION:
Do not extract more than one circuit pack at a time.

A minor (MN) alarm occurs for the MUX slot when you extract a PMGR1 circuit pack from a DS3 Interface Module.

8. Install the BXA circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for MUX slot when you install the BXA circuit pack into the DS3 Interface Module.

9. 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-{1-32}-{1-31}, SWIF-{1-32}-{1-8}** }

Frame Administration

6

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Frame Administration

6

This chapter consists of procedures required for the administration of the DACS IV-2000 system. Included are procedures for creating, changing, and removing logins; using the tape 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

Upgrading with New Software Release

Procedures for upgrading to Release 3.0 of the DACS IV-2000 system are located in the *DACS IV-2000 Release 3.0 Software Release Description* (AT&T 365-340-405) 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 system and login access to the frame (login administration). The memory structure of the DACS IV-2000 system consists of:

- Main Controller RAM (Working Memory or WKG) — stores the DACS IV-2000 system 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.
- Disk (Primary Storage or PRI) — provides primary nonvolatile backup of the DACS IV-2000 system database. There are two copies of the system database stored on each 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 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 disk. Every fifteen minutes, the 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.
- Tape (Secondary Storage or SEC) — provides four functions:
  - — Mechanism for software distribution
  - — Secondary nonvolatile backup of the DACS IV-2000 system database
  - — Out-of-system (off line) backup of the system database
  - — Initialization of database with *System Start-up* tape

  The initial software release and future software release upgrades are distributed on tape cartridges. The tape cartridges offer an economical way to distribute large amounts of data (up to 24 Mbytes) to the field reliably. Backups of the disk (primary storage) can be made to the tape to ensure a backup of the database is available in case of database corruption or failure of the disk drive. It is recommended that one system database backup be made on a tape 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 6-1 illustrates the memory interactions.

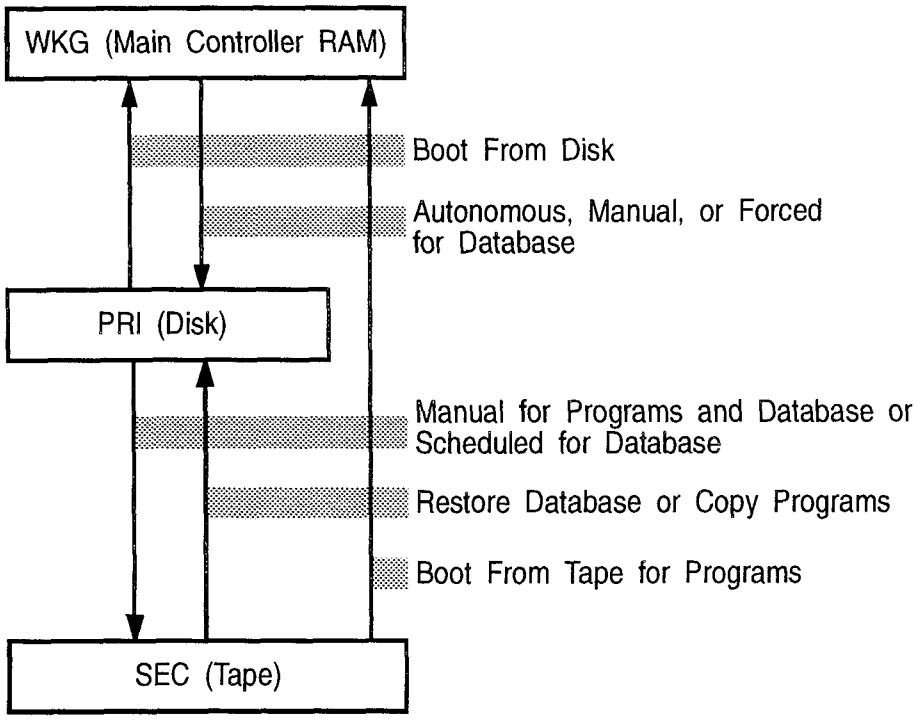


Figure 6-1. **Data Transfers Between Memory Entities**

Memory Integrity Defensiveness Capabilities

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 defensibility measures in place to ensure system integrity:

- System Database Corruption — If during the boot of the DACS IV-2000 system, 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 system 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 system outputs either `CAN'T BOOT DB` or `CAN'T BOOT JOURNALS` messages.

- Backing Up an Initialized Database— It is very dangerous to have an initialized system database on 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 system.

  To prevent generating an initialized system database on disk, the system does not allow OOS working memory to disk (forced) backups if the working memory (WKG) is empty.

- Excessive Use of a Tape Cartridge — The tape cartridges currently used with the tape drive have a limited life-span (measured in number of backups or cycles), after which they are more prone to failure.

  In earlier releases of software there was no method in place to determine how many backups were made to each tape cartridge. Release 3.0 includes a cycle counter for each tape cartridge. This counter is initially set to zero, and is incremented each time the database is saved on the tape cartridge. The cycle counter can be checked by entering the **`RTRV-SYSID`** command. The recommended maximum usage per tape cartridge varies for each software release, but an appropriate number is 90 backups.

NOTE:
To warn you that the backup tape needs replacement a REPT ALM EQPT message is issued for the tape drive (SEC) with the alarm condition BKUPMEMO. Also, if you retrieve alarm conditions associated with the tape drive, the BKUPMEMO condition is indicated.

- Loading a Tape Cartridge from a Different Frame — This is a potentially dangerous situation. If a system database from a different frame is transferred to disk and subsequently booted, the switch matrix hardware is remapped using the wrong system database, causing a loss of service for entire DACS IV-2000 system.

  The tape validation feature was created in part to prevent such an occurrence. When a system database is stored on tape, System Identifiers (for example, the target ID) are saved with the system database. These System Identifiers are compared with the current System Identifiers on the system before the system database is copied back onto disk. If the System Identifiers do not match, the memory transfer is denied with the error code SVTF (tape validation failure) and the following message is output:

```
/* This command was denied because the System Identifiers */
/* (System_Type, System_Release, and TID) stored on the tape (SEC) */
/* and System Identifiers stored in the memory (WKG) of the DACS IV-2000 */
/* are different. Use the RTRV-SYSID command to retrieve the System */
/* Identifiers stored in memory and from the tape for comparison. */
/* Locate the tape for this DACS IV-2000 and try the command again. */
```

CAUTION:
It is imperative that systems in the same office or controlled by the same central maintenance center have different TIDs.

- Booting an Initialized System Database — If the system database to be booted is initialized, the DACS IV-2000 system outputs the following warning message stating that the database on the 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
  ```

- Copying Database to Tape with Protection Switches — the system warns you if you try to backup the database to tape and protection switches are active with the following warning message stating that entities are protected and that the main controller (MC) is being brought to the OOS-MCOND state:

  ```
  DATABASE CONTAINS ENTITIES PROTECTED - BRING MC TO OOS-MCOND
  ```

- Inserting a Disk Drive from a Different Frame — If there are two disks (PRIs) present (meaning even if the second disk is not in-service) in the system, the system compares the Target ID (TID) of the two disks. If the TIDs do not match, the system does not boot in-service remaining in the OOS-MCOND state, allowing you to extract the invalid disk. This prevents the system from modifying the switch and disrupting traffic if a disk from a different system is accidentally inserted.

  To warn you of mismatching TIDs, the system outputs the following message:

```
/* WARNING: TID MISMATCH! */
/* PRI-1 TID: <1-18 Legal Characters> */
/* PRI-2 TID: <1-18 Legal Characters> */
/* BOOTING THE WRONG SYSTEM DATABASE MAY RESULT IN LOSS OF SERVICE */
/* FOR TH4E ENTIRE SYSTEM! AT THIS TIME, VERIFY THAT EACH PRI IS VALID FOR */
/* THIS FRAME. IF A PRI IS VALID BUT HAS THE WRONG TID, INITIALIZE AND */
/* REFORMAT THE PRI AND RESTORE IT TO SERVICE. OTHERWISE, REPLACE OR */
/* EXTRACT THE UNMATCHING EQUIPMENT. AFTER TAKING EITHER ACTION, */
/* REBOOT THE SYSTEM. */
```

  If there is only one disk in the system, there is no comparison and the system boots from that disk. If it is a disk from a different system, there can be a loss of traffic.

⚠ CAUTION:
Booting a disk drive from a different frame remaps the switch matrix hardware with the wrong system database, causing a loss of service for the entire DACS IV-2000 system.

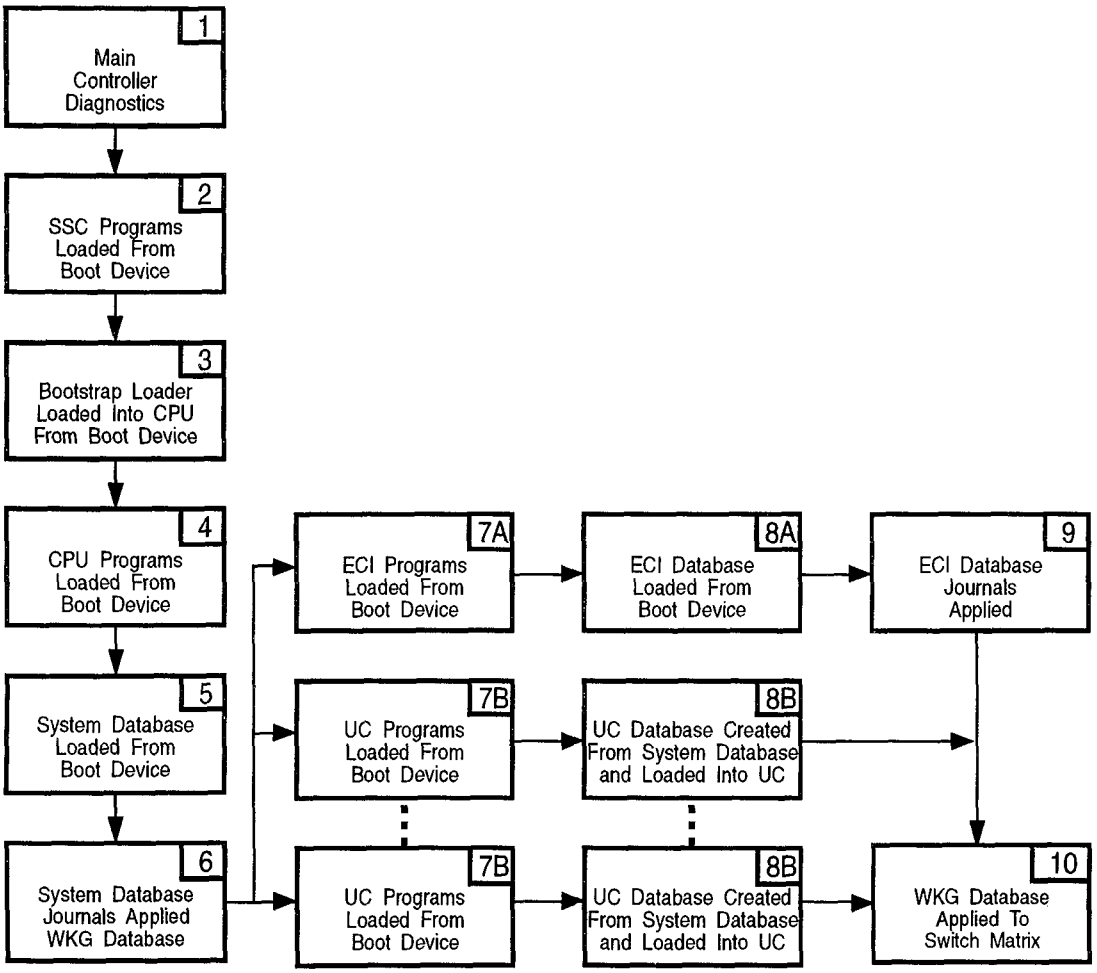
Table 6-1 lists defensibility features of the DACS IV-2000 system and their associated software releases.

Table 6-1. **Defensibility Features**

Defensibility Feature	Software Release Available						
	Simplex				Redundant Controller		
	R1.0	R2.0.3	R2.1.3	R2.2	R2.1	R2.2	R3.0
Two copies of the database stored on PRI and SEC	X	X	X	X	X	X	X
No change to switch matrix if database is corrupted	X	X	X	X	X	X	X
No change to switch matrix if boot from tape	X	X	X	X	X	X	X
Tape validation		X	X	X	X	X	X
Remove command `CPY-MEM:::INIT,PRI,DBASE;`				X		X	X
Prevent saving an initialized database on tape			X	X	X	X	X
Remove command `CPY-MEM:::WKG,SEC,DBASE;`					X	X	X
Add command `CPY-MEM:::WKG,PRI,DBASE,FORCED;`					X	X	X
Tape cycle counter				X	X	X	X
Halt booting an initialized database				X		X	X
Halt database backup with protection switches							X
Prevent booting a PRI from another system (two disk drives present in frame)							X

Reset and Boot

This sections provides information on the actions of the DACS IV-2000 system during full and partial system boots (reset/restore). Figure 6-2 provides a flowchart of the boot process followed for full and partial system boots.



Boot From 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 Tape — 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 *generic query fails*, or if the UC circuit pack(s) are booted from firmware.

Figure 6-2. **System Boot and Reset Process**

Full System Boot (Reset)

This procedure is used to reset the DACS IV-2000 system.

CAUTION:
This procedure must only be performed when instructed to 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.

1. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button at the frame, by using the remote reset function at the central maintenance center, or entering the following command (if possible):

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

   Where:

   a = Target ID (optional)

   The system takes up to 30 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 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*
      - *MAJOR and FAILURE ALM LEDs on the status panel*

      If no equipment alarms existed before the reset the following messages are output:

      ```
      **ECI 1 RESET or **ECI 2 RESET
         (indicating ECI your terminal is connected to)
      ECI 1 STARTUP Pass or ECI 2 STARTUP Pass
         (indicating ECI your terminal is connected to)
      CPU 0 STARTUP Pass or CPU 1 STARTUP Pass
         (indicating active CPU)
      SSC 0 STARTUP Pass or SSC 1 STARTUP Pass
         (indicating active SSC)
      BOOT FROM DISK 1, BOOT FROM DISK 2, or
         BOOT FROM TAPE (indicating boot device)
      ```

If the system is booting from tape and there is a formatted and initialized tape (no programs), a non-redundant controller tape, or a bad tape in the tape drive, the system outputs the above `RESET` *and* `STARTUP` *messages along with the* `SSC 0 Boot Fail` *or* `SSC 1 Boot Fail` *message. The system also continues to attempt to boot alternating control complexes. If you get the* `SSC Boot Fail` *messages, replace the tape with a Release 3.0 programs tape and reset the system using the RESET ENABLE and RESET switches.*

b. After successful completion of the ROM-based diagnostics, the SSC firmware tries to locate a boot device. First, the SSC powers up the disk drive and attempts to read its SSC programs. If successful, the disk drive becomes the boot device and booting continues. Otherwise, the same action is attempted with the tape drive.

   The following red ALM LEDs are turned off:

   - *SSC and CPU circuit pack ALM LEDs*
   - *MAJOR and FAILURE ALM LEDs on the status panel*

c. 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` *messages are output periodically. These messages appear for timing purposes only and do not indicate failure.*

d. The active CPU loads its CPU programs from the boot device and executes them.

e. If the boot device is the disk drive, the boot process in the active CPU reads the system database from the disk drive, and applies any journal files associated with that database.

f. If no valid system database is found on the disk drive, if the boot device is the tape drive, 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.

g. 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).

h. If the boot device is the disk drive, the ECI database is downloaded to the ECIs (any journal files on the disk drive are applied to the ECI database) and the UC databases are constructed from the system database and downloaded to the specific UCs.

i. 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 remain lit, the time-of-day clock needs to be reset (you are directed to do this later in this procedure, if necessary).

j. After the reset is complete, the following messages are output:

- If the boot device is the disk drive:

  `REPT RST EQPT` (MC in the IS state)
  `REPT ALM EQPT` (MC alarm cleared)

- If the boot device is the tape 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 (if necessary, you are directed to set the time-of-day clock later in this procedure):

```
    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`

2. Log into the DACS IV-2000 system (refer to logging in procedures in Chapter 4, if necessary).

3. 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)

   If the state of the MC is in-service (IS), go to Step 5. If the state of the MC is out-of-service maintenance condition (OOS-MCOND), go to the next step. If the state of the MC is out-of-service fault condition (OOS-FLT), refer to the procedure titled "Redundant Controller Failure" (page 12-90).

4. 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 empty database was copied from the disk to WKG memory.

     If your frame is carrying traffic, obtain the most recent tape backup of the system database and refer to the section titled "Restoring Databases from Tape to Disk" (page 6-24) later in this chapter.

⚠ CAUTION:
If the tape backup is old, there can be a loss of service.

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 20 minutes to restore.

- If during the boot process you received the following message:

  `BOOT FROM TAPE`

  both disk drives are either failed or extracted from the redundant controller module.

  If the disk drives (PRI) are extracted from the system, make sure the disk drives associated with the frame are installed properly.

  If or when the disk drives are installed properly, perform the following procedure:

  a. Determine the state of the disk drives by entering the following command:

     RTRV-STATE-EQPT:*[a]*:PRI-1&-2;**

     Where:

     a = Target ID (optional)

     If the state of one disk drive is OOS-FLT, replace the disk drive by referring to the section titled "Replacing One Disk Drive" (page 14-3). If both disk drives are OOS-FLT, replace both disk drives by referring to the section titled "Replacing Both Disk Drives" (page 14-5). Otherwise continue with the next step.

  b. Restore the disk drives to service by entering the following command for each disk drive:

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

     Where:

     a = Target ID (optional)

     b = Disk drive location: **PRI-{1,2}**

     This command takes up to 15 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 tape backup of the system database and go to the section titled "Restoring Databases from Tape to Disk" (page 6-24) .

- If the system booted in the OOS-MCOND state because of TID mismatch, examine the warning message to find out the TIDs of the two disk. Extract the disk that does not belong, and reboot the system. If you need to replace the wrong disk with a new one, refer to the section titled "Replacing One Disk Drive" (page 14-3).

5. 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 ECI3 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)

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. 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)

2. 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 15 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 references 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 12-10).

2. Retrieve the state of the timing extractor input ports (TXPTs) of the standby synchronizer to determine if they are in the IS (in-service) state by entering the following command for both TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: **TXPT-{0,1}-{1-2}**

The following output response appears:

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

Where:

b = Timing extractor input port location: `TXPT-{0,1}-{1-2}`

f = State of timing extractor input port location: `{ IS, OOS, OOS-FLT }`

If either TXPT port is in the `OOS-FLT` state, clear the failure before performing this procedure by referring to the section titled "Prioritizing Alarms" (page 12-10).

3. If either of the TXPT ports of the standby synchronizer side are in the OOS state, restore either or both TXPT ports to service by entering the following command for each TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: **TXPT-{0,1}-{1-2}**

   This command takes less than 1 minute to complete.

4. 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 = 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, 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.

Manual Timing Reference Side Switch

This procedure is used when you need to manually switch the primary and secondary timing references that are received by the DS1TX circuit packs from standby to active and vise versa (for example, during maintenance of one of the external timing references). This procedure must only by performed when instructed to do so by the system administrator.

1. Retrieve the state of the timing references to determine which one is in the standby state (STBY) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SYNCPRI&SYNCSEC;**

   Where:

   a = Target ID (optional)

   The following output response appears:

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

   Where:

   f = State of timing references: { ACT, STBY }

2. Retrieve the state of the synchronizer sides to determine which one is in the active state (ACT) 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 }

3. Retrieve the state of the timing extractor input ports (TXPTs) of the active synchronizer to determine if both are in the IS (in-service) state by entering the following command for both TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: **TXPT-{0,1}-{1-2}**

   The following output response appears:

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

   Where:

   b = Timing extractor input port location: TXPT-{0,1}-{1-2}

   f = State of timing extractor input port location: { IS, OOS, OOS-FLT}

   If either TXPT port is in the OOS-FLT state, clear the failure before performing this procedure by referring to the section titled "Prioritizing Alarms" (page 12-10).

4. If either of the TXPT ports of the active synchronizer side are in the OOS state, restore either or both TXPT ports to service by entering the follwoing command for each TXPT:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor input port location: **TXPT-{0,1}-{1-2}**

   This command takes less than 1 minute to complete.

5. Switch the standby timing reference (SYNCPRI or SYNCSEC) to the active state by entering the following command:

   SW-DX-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Timing reference location: **{ SYNCPRI, SYNCSEC }**
   Specifies the location of the standby timing reference to be switched to the active timing reference.

   This command takes less than 1 minute to complete.

Changing Synchronizer Modes

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:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SMODE "/
   "c"
   ;
```

   Where:

   c = Synchronizer mode: { NORM, HLDOVR }

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 }**
   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.
   - **HLDOVR** (holdover mode) — used to maintain output frequency during external maintenance.

   This command takes less than 1 minute to complete. When changing to holdover mode, a REPT ALM EQPT message appears indicating a minor alarm that the Synchronizer Module is in holdover mode (SYNCHLDOVR alarm condition). When changing to phase-locked mode, a REPT ALM EQPT message appears indicating the SYNCHLDOVR alarm condition has cleared.

Software Release and Databases

Be sure you have a tape that has been formatted for the current software release. You cannot format tapes on the DACS IV-2000; they must be formatted during the manufacturing process. Chapter 2 contains information on the approved tape cartridges supported by the DACS IV-2000 system.

Using the Tape Drive

1. Power down the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete.

2. If there is currently a tape in the tape drive, push in on this tape until the tape holder *clicks*. Release the tape, extract it from the tape drive, and store it in its plastic container.

3. Take the new tape from its plastic container and insert it in the tape drive with the aluminum baseplate to the right, and the tape door down. Push the cartridge all the way in until the tape holder *clicks*.

   The tape drive grabs the tape when you release it. If there is no click, check the orientation of the tape.

4. Power up the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.

NOTE:
This tape drive produces a tapping noise for the first few seconds as the tape heads calibrate and a humming noise as the tape is retentioned. This is normal operation.

Backing Up Software Release to Tape

The following procedure is used to make backup copies of the software release on tape. There is no reason to use this procedure with the List 20, 21, or 23 tapes. (A copy of the software is already on these tapes.) The state of the main controller must be in-service (IS) to perform this procedure.

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 system to the tape, be sure that the write-protect tab on the front of the tape is not set to the SAFE position. The backup fails if the tape is write-protected.

1. Load a tape in the tape drive. If necessary, refer to the previous section titled "Using the Tape Drive" (page 6-20).
2. Copy the software release from the disk to the tape by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 25 minutes to complete.
3. Power down the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete.
4. Extract the tape from the tape drive and store it in its plastic container.

Backing Up Database to Tape

The following procedure is used to make backup copies of the database onto tape. Daily backup of the database is essential. The recommended procedure for performing the backups is to use at least two tapes (preferably one tape for each day of the week you perform backups), and alternate the use of those tapes so that the most recent backup is not overwritten. In addition, the date, time, and tape 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 3-5) for more information.

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

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 system to the tape, be sure that the write-protect tab on the front of the tape is not set in the SAFE position. The backup fails with an error code of ENRI *if the tape 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 12-10) before performing this procedure.

2. Load the backup tape into the tape drive, if necessary. Refer to the section titled "Using the Tape Drive" (page 6-20) earlier in this chapter if necessary.

3. Check to see if the backup tape needs to be replaced by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   If the tape cycle count (COUNT) parameter is 90 or greater, replace the backup tape before continuing this procedure. Refer to the section titled "Using the Tape Drive" (page 6-20) earlier in this chapter for tape replacement, if necessary.

4. Backup the database by entering the following command:

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

   Where.

   a = Target ID (optional)

   This command takes up to 20 minutes to complete.

   If during the database transfer a protection switch occurs (alarm becomes present), the following message appears:

   DATABASE CONTAINS ENTITIES PROTECTED - BRING MC TO OOS-MCOND

   If the above message appears, go to the section titled "Isolating Failures" (page 12-10), clear any alarm, and restart this procedure.

5. Enter the following command to retrieve the date and time of the backup:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

6. Record the date, time, and tape number of the database backup in a log.

7. Power down the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete.

8. Extract the tape from the tape drive and store it in its plastic container.

Restoring Databases from Tape to Disk

This procedure is used to restore the database from a backup tape to the disk if the 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 disk if the disk drive is in-service (IS). This is **not** a daily operation, and should only be performed after consulting your system administrator or next level of support.*

The write-protect tab on the front of the tape can be set to the SAFE position 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 MAJOR and FAILURE alarm LEDs on the status panel turn on.

2. Load the tape with the latest database backup in the tape drive. If necessary, refer to the section titled "Using the Tape Drive" (page 6-20) earlier in this chapter.

3. Power up the tape drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.

4. Check the date and time of the database backup, the software release of the tape database, and the TID associated with the stored database information by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete.

   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 tape matches the TID of the frame. If any of the information is not correct, get the correct tape and go back to Step 2.

5. Copy the database from the tape to the disk by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete.

6. Restore the MC to the IS state by entering the following command:

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

   Where:

   a = Target ID (optional)

   The system takes about 30 minutes to reset. For more information on booting the DACS IV-2000 system, see the section titled "Reset and Boot" (page 6-8).

   If during the system reset you receive the following message:

   DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO COS-MCOND

   see your system administrator or next level of support 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 system, 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 system, the system administrator creates valid UIDs (logins) and their associated passwords. These UID/password pairs allow users to access the DACS IV-2000 system to perform administrative, operational, provisioning, and maintenance functions.

Valid UIDs consist of one to ten characters in length. Allowable characters are letters (A-Z, a-z), decimal digits (0-9), and *special legal characters* (- . # % +). The first character of an UID must be a letter. Valid passwords consist of six to eight characters in length. At least two of the characters must be nonalphabetic characters with at least one character being a *special legal characters.* 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 system 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.

Creating Logins

1. To create a user login, enter the command:

   ENT-SECU-USER:*[a]*:*b*:::*d*,,*e*:*[*UCPL=*f*,SCREEN=*g*,DMODE=*h*,
   UTYPE=*i*, ECHO=*j]*;

   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" (page 7-22).

2. Repeat this procedure for each user login you need to create.

Changing Logins

1. To change a user login enter the 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*`];`

   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" (page 7-22).

   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 Release 3.0 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 6-2 lists the events that are entered into the security audit log.

Table 6-2. **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

Table continued on next page.

Table 6-2. Security Audit Log Events (Continued)

Security-Related Event	Command Format (Output Response	Status
ED-SECU-PID	ED SECU PID::*b*:*c*::, **Where:** *b* = UID, *c* = CTAG	COMPLD
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*> **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 system security audit database. This procedure is restricted to system administrators with an 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"
   .
   .
   .
   "e,f,g,h,i,j"
;
```

Where:

e = Status of 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 system 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 Table 6-2 for 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 system security audit database. This procedure is restricted to system administrators with an 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"
   .
   .
   .
   "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 system 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 6-2 for list of commands and autonomous events.

   After execution of this command, the security audit database stored on the DACS IV-2000 system only contains the **DLT-SECU-AUD** command.

Link Administration

7

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Link Administration

7

This chapter contains procedures for the DACS IV-2000 system administrative links. TTY1-1, TTY1-2, TTY1-3, TTY2-1, TTY2-2 and TTY2-3 are provisioned for Snider protocol. TTY1-4 and TTY2-4 can be provisioned for either Snider, TBOS, or TABS protocol. TTY1-5, TTY1-6, TTY2-5 and TTY2-6 are provisioned for X.25 protocol. The TTY1-1 and TTY2-1 connectors on the back of the main controller and the TTY1-1 and TTY2-1 connectors on the main controller status panel are the same, respectively.

⚠ CAUTION:
Never connect two different terminal jacks into both TTY1-1 connectors or TTY2-1 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 7-2). If another terminal is not available, determine if there is an unterminated Snider link (an unconnected TTY1-1, TTY1-2, TTY1-3, TTY2-1, TTY2-2, and TTY2-3). If so, use the section titled "Using One Terminal to Change Snider Link Parameters" (page 7-5).

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

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.

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}-{1-4}**

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}-{1-4}**

   e = Baud rate: { **300, 1200, 2400, 4800, 9600, CURVAL** } (optional)
   Default: **CURVAL**
   Initial system value: **9600** (CILINK-{1,2}-{1-3}) and **2400** (CILINK-{1,2}-4)

   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}-{1-4}**

7. Log off the link by entering one of the following commands:

   CANC-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.

Using One Terminal to Change Snider Link Parameters

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}-{1-4}** (optional)
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}-{1-4}**

⚠ **CAUTION:**
Restored and unterminated links may degrade system performance. Complete this procedure as quickly as possible.

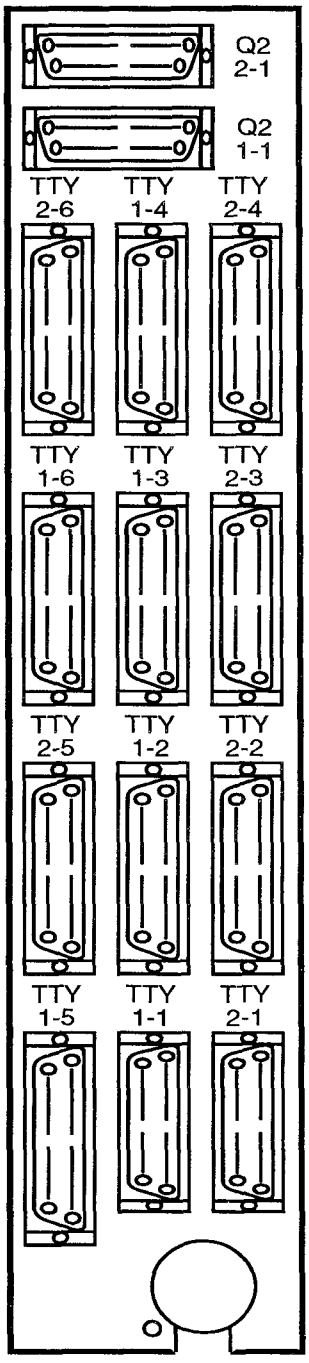
4. Log off the link you are using by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 legal characters> (optional)
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. You may have to remove the stile strip to access the TTY connectors at the back of the Switch Bay. Figure 7-1 shows the location of the CILINK TTY connectors. CILINK 1-1 and 2-1 use RS-232C connectors, all other CILINKs use RS-449 connectors.



Note: TTY connectors Q2 1-1 and Q2 2-1 are reserved for future use.

Figure 7-1. **CILINK TTY Connector Locations at the Back of the Switch Bay.**

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.

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}-{1-4}**

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}-{1-4}**

    e = Baud rate: **{ 300, 1200, 2400, 4800, 9600, CURVAL }** (optional)
    Default: **CURVAL**
    Initial system value: **9600** (CILINK-{1,2}-{1-3}) and **2400** (CILINK-{1,2}-4)

    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}-{1-4}**

12. 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)

13. Move the connector cable of your terminal to the TTY connector of the link you changed. If necessary, replace the stile strip that covers the TTY connectors at the back of the Switch Bay.

NOTE:
If the Snider link's baud and/or flow control parameters were changed in Step 10 or if the terminals 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.

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}-{1-4}**

Changing TABS/TBOS Link Parameters

1. Determine the state of the TABS/TBOS link by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: **CILINK-{1,2}-4** (optional)

2. If the state of the TABS/TBOS link is OOS-MTCE, go to Step 3. Otherwise, remove the TABS/TBOS link from service by entering the following command:

   RMV-LINK:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: **CILINK-{1,2}-4**

3. Edit the desired TABS/TBOS link parameter(s) by entering the following command:

   ED-PRMTR-LINK:*[a]*:*b*::*[d]*,,,*[g]*,*[h]*;

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: **CILINK-{1,2}-4**

   d = Protocol type: **{ TABS, TBOS }**
   Initial system value: **TABS**

   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. Restore the TABS/TBOS link by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: **CILINK-{1,2}-4**

Changing CILINK-1-4/CILINK-2-4 Protocol Type

NOTE:
The following commands must be entered on a link other than the one you are changing.

1. Determine the state and protocol type of the link by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: `CILINK-{1,2}-4` (optional)

   If the state of the link is `OOS-MTCE`, go to Step 3. Otherwise, go to Step 2.

2. Remove the link from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: `CILINK-{1,2}-4`

3. Change the link's protocol type by entering one of the following commands:

   - **Changing to Snider protocol**:

     `ED-PRMTR-LINK:`*[a]*`:`*b*`::Snider,`*[e]*`,`*[f]*`,`*[g]*`,,`*[i]*`;`

     Where:

     a = Target ID (optional)

     b = TABS/TBOS link location: `CILINK-{1,2}-4`

     e = Baud rate: `{ 300, 1200, 2400, 4800, 9600, CURVAL, NOVAL }` (optional)
     Default: `CURVAL`
     Initial system value: `2400`

     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

- **Changing to TABS or TBOS protocol**:

  ED-PRMTR-LINK:*[a]*:*b*::*d*,,,*[g]*,*[h]*;

  Where:

  a = Target ID (optional)

  b = TABS/TBOS link location: CILINK-{1,2}-4

  d = Link protocol: { TABS, TBOS }
  Initial system value: TABS

  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 the link's protocol type was changed to Snider in Step 3, connect a terminal to that link. Refer to the procedure "Adding a Terminal to a Snider Link" (page 7-18).
5. Restore the link by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TABS/TBOS link location: CILINK-{1,2}-4

CAUTION:
Restored and unterminated links may degrade system performance. Complete this procedure as quickly as possible.

Changing X.25 Link Parameters

NOTE:
The following commands must be entered on a link other than the one you are changing.

1. Determine if 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)

2. If necessary, notify users to log out.

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)

   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: **{ 300, 1200, 2400, 4800, 9600, CURVAL, NOVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **9600**

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}`

7. If necessary, notify the users logged out during Step 2 that the link has been restored.

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 7-2.

This procedure provides information for preparing CILINK-1-5, CILINK-1-6, CILINK-2-5, and CILINK-2-6 for connecting a Micombox 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:

- Micombox Type 2 asynchronous PAD
- Terminal(s) to connect to the PAD
- Modem eliminator or X.25 Packet Network and its required equipment

1. 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)

   If the state of the link is OOS-MTCE, go to Step 3. Otherwise, go to Step 2.

2. 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}**

3. 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. PAD = Packet Assembler and Disassembler

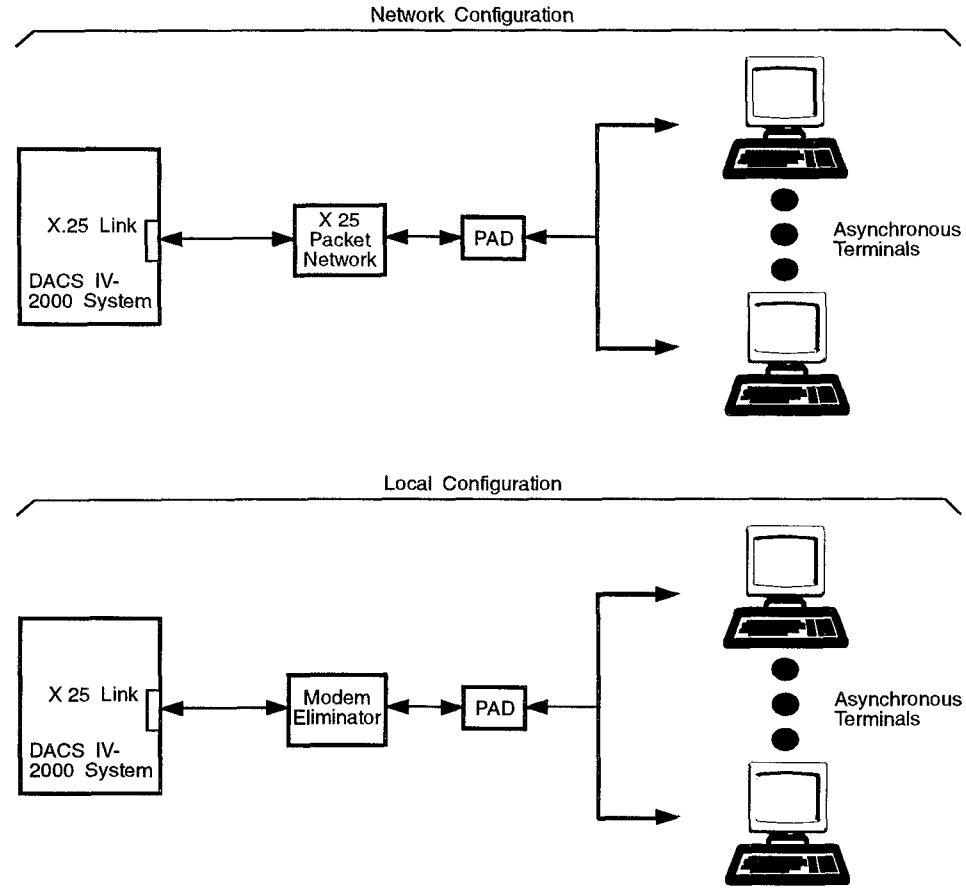


Figure 7-2. **CILINK-1-5, CILINK-1-6, CILINK-2-5, or CILINK-2-6 Configured for Micombox PAD**

4. 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)

NOTE:
The link parameters and the X.25 PAD parameters must agree. Refer to the previous section "Changing X.25 Link Parameters" (page 7-12) to edit X.25 link parameters.

5. 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}**

   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 3).

6. 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)

   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.

7. 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, TTY1-4, TTY2-1, TTY2-2, TTY2-3, or TTY2-4).

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}-{1-4}` (optional)

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}-{1-4}`

   e = Baud rate: `{ 300, 1200, 2400, 4800, 9600, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `9600` (CILINK-{1,2}-{1-3}) and `2400` (CILINK-{1,2}-4)
   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. You may have to remove the stile strip to access the TTY connectors at the back of the Switch Bay. Figure 7-1 (earlier in this chapter) shows the location of the CILINK TTY connectors. If you remove the stile strip, replace it after connecting the terminal.

NOTE:
CILINK 1-1 and 2-1 use RS-232C connectors, all other CILINKs use RS-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}-{1-4}

   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 7-18) 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 7-18)
   - An X.25 PAD network set up as described in the section titled "Connecting an X.25 Packet Assembler and Disassembler (PAD)" (page 7-15).

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 the following command:

   CANC-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}-{1-4}**

3. Disconnect the terminal connector from the Snider TTY port of the link removed in Step 2.

CAUTION:
Restored and unterminated links may degrade system performance. Complete this procedure as quickly as possible.

Using the Input Command Routing Feature

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 system's input command routing capability.

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.

NOTE:
Only one link or virtual circuit can be provisioned to echo input commands and acknowledgment codes at a time.

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}-{1-6}**
   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}**
   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}-{1-6}**
   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}**
   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}-{1-6}** (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"

    .
    .
    "d, e:f"
;
```

   Where:

   d = CILINK location: CILINK-{1,2}-{1-6}
   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) to `ON`. For additional information on the `REPT LOCL IN` message, refer to the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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*`:<`*g 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 par): `{ P{1-5}, M{1-5}, T{1-5}, S{1-5}, PM{1-5} }`

   g = Message screening: `{ AUTO, ALL, DBAUTO, DBALL }`
   Default value: `DBALL`

   j = Message echo: `{ ON, OFF }`
   Default value: `OFF`
   To turn on the input command routing capability, you must set this parameter to `ON`.

Existing user login/password: `ED-SECU-USER:`*[a]*`:`*b*`::::,,,:<`*h k*`>;`

Where:

a = Target ID (optional)

b = Old user ID: < 1 to 10 UID legal characters >

h = Message screening: **{ AUTO, ALL, DBAUTO, DBALL, CURVAL}**
Default value: **CURVAL**

k = Message echo: **{ ON, OFF }**
Default value: **OFF**
To turn on the input command routing capability, you must set this parameter to **ON**.

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)

Cross-Connections

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Cross-Connections

8

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

For detailed information on Cross-Connection Types, refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

Establishing Cross-Connections

These procedures are used to establish a one-way, two-way, or broadcast 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 singals, Table Table 8-1 shows the mappings used to identify the singals within the DACS IV-2000. For more information on mapping DS1 to VT1.5 and VT1.5 to VT1.5 singals, refer to the section titled "Cross-Connections" in Chapter 2 of the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

Table 8-1. **DS1 and VT1.5 Mappings**

DS3 Convention		VT Mapping per TR-NWT-000253	
DS2,DS1	DS1 Within DS3 (DACS IV-2000)	VT Group, VT	VT1.5 Within STS-1 (DACS IV-2000)
1,1	1	1,1	1
1,2	2	1,2	8
1,3	3	1,3	15
1,4	4	1,4	22
2.1	5	2,1	2
2,2	6	2,2	9
2,3	7	2,3	16
2,4	8	2,4	23
3,1	9	3,1	3
3,2	10	3,2	10
3,3	11	3,3	17
3,4	12	3.4	24
4,1	13	4,1	4
4,2	14	4,2	11
4,3	15	4,3	18
4,4	16	4,4	25
5.1	17	5.1	5
5,2	18	5,2	12
5,3	19	5,3	19
5,4	20	5,4	26
6,1	21	6,1	6
6,2	22	6,2	13
6,3	23	6,3	20
6,4	24	6,4	27
7,1	25	7,1	7
7,2	26	7,2	14
7,3	27	7,3	21
7,4	28	7,4	28

Establishing One-Way and Two-Way Cross-Connections

Use one of the following procedures [Establishing DS1 One-Way and Two-Way Cross-Connections on page 8-3, Establishing STS-1 One-Way and Two-Way Cross-Connections on page 8-5, or Establishing VT1.5 One-Way and Two-Way Cross-Connections on page 8-8] 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). 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 are within EC-1 ports, the Active Signal Type must be T1 (DS1 signal) or the **ENT-CRS-T1** command is denied.

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 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: **{1-32}-{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:<ISTATE=o,OSTATE=p>"
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   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 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

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 are 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 if the EC-1 port can be reconfigured using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-64) or if another DS1 port(s) is to be selected.

3. Establish a one-way or two-way cross-connection (circuit) 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 or STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

   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 an 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 an 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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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 8-2 shows the allowable STS-1 cross-connections for the differenct STS-1 signal formats.

Table 8-2. 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
	ASYNC	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

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: **{1-32}-{1-15}**

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 = EC-1 port location: {1-32}-{1-15}

f = Active signal type: { EC1, T1, VT1 }

If the Active Signal Type for either port is not EC1, an STS-1 cross-connection can not be made. 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 Operation" (page 5-64) or if 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: **{1-32}-{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: {1-32}-{1-15}

f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

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:
   STS1 Interface-16 Module: {1-32}-{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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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 8-3 shows the allowable VT1.5 cross-connections for the different VT1.5 signal formats.

Table 8-3. Allowable VT1.5 Cross-Connections

VT1.5 Signal Formats		TO VT1.5 Port			
		UNSPEC	BIT	BYTE	ASYNC
FROM VT1.5 Port	UNSPEC	Allowed	Allowed	Allowed	Not Allowed
	BIT	Allowed	Allowed	Allowed w/Warning	Not Allowed
	BYTE	Allowed	Allowed w/Warning	Allowed	Not Allowed
	ASYNC	Not Allowed	Not Allowed	Not Allowed	Not Allowed

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: `{1-32}-{1-15}-{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 = VT1.5 port location: `{1-32}-{1-15}`

f = Active signal type: `{ EC1, T1, VT1 }`

If the Active Signal Type for either port is not VT1, a VT1.5 cross-connection can not be made. 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 Operation" (page 5-64) or if 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: **{1-32}-{1-15}-{1-28}**

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: `{1-32}-{1-15}-{1-28}`

f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

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 (circuit) 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: `{1-32}-{1-15}-{1-28}`

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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 cross-connections have been established and update your office records.

Establishing Broadcast Cross-Connections

Use one of the following procedures [Establishing DS1 Broadcast Cross-Connections on page 8-11, Establishing STS-1 Broadcast Cross-Connections on page 8-13, or Establishing VT1.5 Broadcast Cross-Connections on page 8-16] to form a broadcast 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 Broadcast Cross-Connections

This procedure is used to form a broadcast DS1 cross-connect from a selected DS1 input port to another DS1 output port that is in the IDLE-REL state. If the 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 can not cross-connect more than two DS1 output ports to one DS1 input port. A broadcast 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 broadcast cross-connect command.

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 two DS1 ports to be used in the broadcast cross-connection by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{1-32}-{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:<ISTATE=o,OSTATE=p>"
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   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 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

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 are 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 if the EC-1 port can be reconfigured using the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-64) or if another DS1 port(s) is to be selected.

3. Establish a broadcast 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 or STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

   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 associated with STS1 Interface-16 Modules.

f = Special service type: { **RDLD, NOVAL** }
Default: **NOVAL** (not red-lined)
Specifies whether or not the broadcast connection is red-lined. If the circuit you are broadcasting from is red-lined, the broadcast 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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 cross-connections have been established and update your office records.

Establishing STS-1 Broadcast Cross-Connections

This procedure is used to form a broadcast 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 more than two EC-1 output ports to one EC-1 input port. A broadcast 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 broadcast 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 broadcast cross-connection by entering the following command:

RTRV-EC1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = EC-1 port location: **{1-32}-{1-15}**

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 = EC-1 port location: {1-32}-{1-15}

f = Active signal type: { EC1, T1, VT1 }

If the Active Signal Type for either port is not EC1, an STS-1 broadcast cross-connection can not be made. 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 Operation" (page 5-64) or if 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 broadcast cross-connection by entering the following command:

   RTRV-STATE-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{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: {1-32}-{1-15}

   f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   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 broadcast 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: {1-32}-{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 broadcast connection is red-lined. If the circuit you are broadcasting from is red-lined, the broadcast 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 Broadcast Cross-Connections

This procedure is used to form a broadcast 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 can not cross-connect more than two VT1.5 output ports to one VT1.5 input port. A broadcast 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 broadcast 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 broadcast cross-connection by entering the following command:

   RTRV-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{1-32}-{1-15}-{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 = VT1.5 port location: {1-32}-{1-15}

   f = Active signal type: { EC1, T1, VT1 }

   If the Active Signal Type for either port is not VT1, a VT1.5 broadcast cross-connection can not be made. 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 Operation" (page 5-64) or if 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 broadcast cross-connection by entering the following command:

   RTRV-STATE-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{1-32}-{1-15}-{1-28}**

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: `{1-32}-{1-15}-{1-28}`

f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 broadcast 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: `{1-32}-{1-15}-{1-28}`

   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 broadcast connection is red-lined. If the circuit you are broadcasting from is red-lined, the broadcast 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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 cross-connections have been established and update your office records.

Rolling Over Cross-Connections

The cross-connection rollover feature provides a flexible capability to move connections from one port to another with a minimum of signal interruption time, typically less than 2 msec [less than 3 msec for STS-1(cc-SPE)]. 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 on page 8-19
- STS-1 Cross-Connection Rollover on page 8-22
- VT1.5 Cross-Connection Rollover on page 8-25

DS1 Cross-Connection Rollover

This procedure is used to roll a DS1 cross-connect from a selected DS1 input port to another DS1 input port. If either of the selected DS1 ports is within an EC-1 port, the Active Signal Type must be T1 (DS1 signal) 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-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: **{1-32}-{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:<ISTATE=o,OSTATE=p>"
;
```

Where:

e = DS1 port location: `{1-32}-{1-31}-{1-28}`

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

For a two-way rollover, 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 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 Operation" (page 5-70)] or whether another DS1 port(s) is to be selected.

4. Roll over a one-way or two-way cross-connection by entering the following command:

ENT-ROLL-T1:*[a]*:*b*,*c*,*d*::*[f]*:*[g]*:*[h]*;

Where:

a = Target ID (optional)

b = FROM DS1 port location:

c = TO DS1 port location:

d = NEWFROM DS1 port location:

FROM/TO/NEWFROM DS1 Ports:
DS1 Interface-P Module: `{1-32}-{1-7}-{1-28}`
DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
DS3 or STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

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, 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 can not** 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 8-1 show 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**.

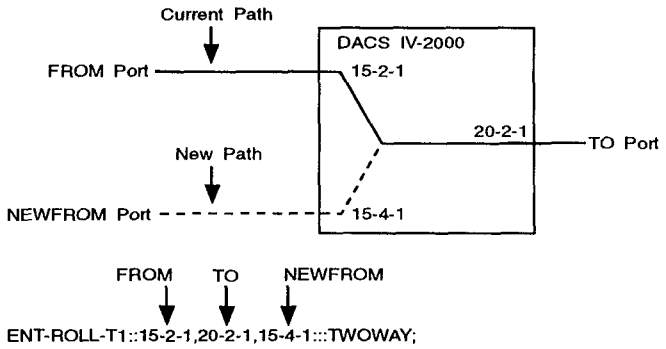


Figure 8-1. **Example of Using the ENT-ROLL-T1 Command**

NOTE:

The **ENT-ROLL-T1** command does not automatically take down broadcast connections. Broadcast connections must be taken down using the **DLT-CONF-T1** command. See the section titled "Disconnecting Cross-Connections" for information on disconnecting broadcast connections.

For two-way rollovers, 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 re-enter the command. If the completed message is still not received, refer to the document titled

DACS IV-2000 Release 3.0 Commands and Messages manual (AT&T 365-340-402) 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 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: **{1-32}-{1-15}**

   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 = EC-1 port location: {1-32}-{1-15}

   f = 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 Operation" (page 5-70)] 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: {1-32}-{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: {1-32}-{1-15}

   f = EC-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   For two-way rollovers, 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: {1-32}-{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, 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 8-2 show 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**.

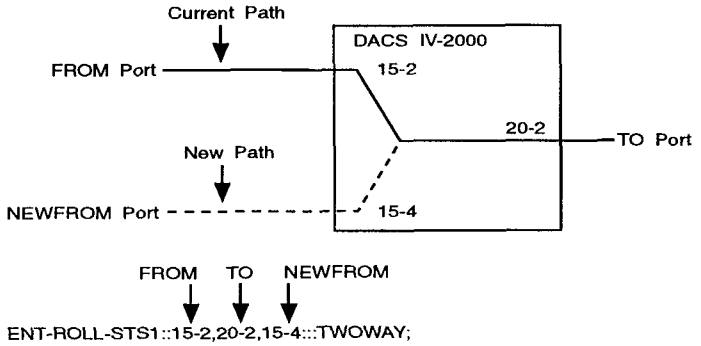


Figure 8-2. **Example of Using the ENT-ROLL-STS1 Command**

NOTE:
The **ENT-ROLL-STS1** command does not automatically take down broadcast connections. Broadcast connections must be taken down using the **DLT-CONF-STS1** command. See the section titled "Disconnecting Cross-Connections" for information on disconnecting broadcast connections.

For two-way rollovers, 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 2 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 re-enter the command. If the completed message is still not received, refer to the docu-

ment titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: **{1-32}-{1-15}-{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 = VT1.5 port location: {1-32}-{1-15}-{1-28}

   f = 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 Operation" (page 5-70)] 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: **{1-32}-{1-15}-{1-28}**

   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: {1-32}-{1-15}-{1-28}

   f = VT1.5 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   For two-way rollovers, 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:
   DSTS1 Interface-16 Module: **{1-32}-{1-15}-{1-28}**

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, 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 8-3 show 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**.

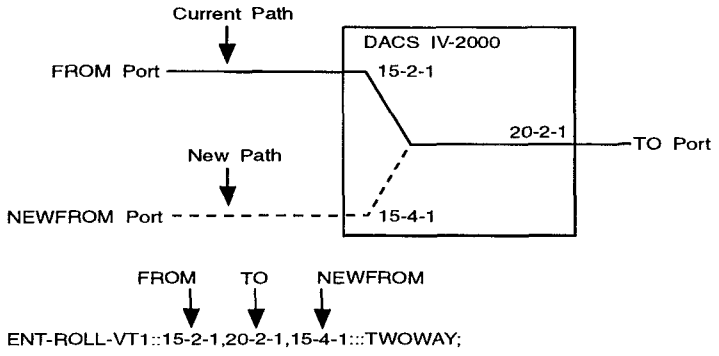


Figure 8-3. Example of Using the **ENT-ROLL-VT1** Command

NOTE:

The **ENT-ROLL-VT1** command does not automatically take down broadcast connections. Broadcast connections must be taken down using the **DLT-CONF-VT1** command. See the section titled "Disconnecting Cross-Connections" for information on disconnecting broadcast connections.

For two-way rollovers, 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 2 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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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 broadcast cross-connection.

Disconnecting One-Way and Two-Way Cross-Connections

Use one of the following procedures [Disconnecting DS1 One-Way and Two-Way Cross-Connections on page 8-29, Disconnecting STS-1 One-Way and Two-Way Cross-Connections on page 8-30, or Disconnecting VT1.5 One-Way and Two-Way Cross-Connections on page 8-31] 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

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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 or STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

   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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: {1-32}-{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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: {1-32}-{1-15}-{1-28}

   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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 Broadcast Cross-Connections

Use one of the following procedures [Disconnecting DS1 Broadcast Cross-Connections on page 8-32, Disconnecting STS-1 Broadcast Cross-Connections on page 8-33, or Disconnecting VT1.5 Broadcast Cross-Connections on page 8-34] to disconnect a broadcast cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and a DS1, STS-1, VT1.5 output port (ADDTO).

Disconnecting DS1 Broadcast Cross-Connections

This procedure is used to disconnect a broadcast 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 broadcast 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 or STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 STS-1 Broadcast Cross-Connections

This procedure is used to disconnect a broadcast 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 broadcast 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: {1-32}-{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 re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 VT1.5 Broadcast Cross-Connections

This procedure is used to disconnect a broadcast 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 broadcast 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: {1-32}-{1-15}-{1-28}

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

Test Access

9

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Test Access

9

This chapter contains procedures used for provisioning and releasing testports (TPPV-REL [testport-provisioned-released] state), setting up, changing, or removing a test connection in the DACS IV-2000 system. Test access in the DACS IV-2000 is provided through a testport which is also referred to as a facility access digroup (FAD). Any unused port (that is, a port that is in the IDLE-REL [idle-released] or TPPV-REL state can be designated as a testport.

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

For more information on test access, refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400) or the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

1. Arbitrarily designate which port to be tested is to be the near-end (E-END) and which port to be tested is to be the far-end (F-END). This designation is to be carried throughout this procedures. Figure 9-1 shows the configuration of the E-END and F-END designations and the direction of signal flows used during a test access session.

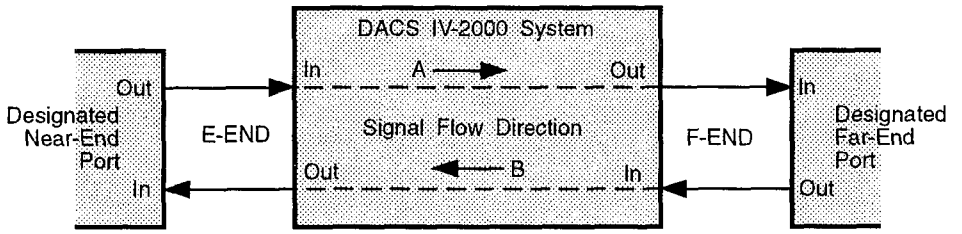


Figure 9-1. Test Access Conventions

2. Check the parameters of the ports (near- and far-end) to be tested for loopbacks (also for DS1 ports, check the line coding [AMI or B8ZS]) by entering the following command:

   T1 ports: `RTRV-T1:`*[a]*`:`*b*`;`
   STS-1 ports: `RTRV-STATE-EC1:`*[a]*`:`*b*`;`
   VT1.5 ports: `RTRV-STATE-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Near- and far-end ports to be tested location:
   DS1: `{1-32}-{1-31}-{1-28}`
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.
   EC1: `{1-32}-{1-15}`
   VT1: `{1-32}-{1-15}-{1-28}`

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 10-4) or "Releasing Far-End DS1 Loopbacks" (page 10-7). If any of the other parameters need to be set, use the **ED-T1** command to set the necessary parameters.

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 10-16) for STS-1 loopbacks or "Releasing Near-End VT1.5 Loopbacks" (page 10-19) 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:

   c = Target ID (optional)

   d = DS1 testport location: {1-32}-{1-31}-{1-28}
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

   Make sure the line coding parameter is set to the same option (AMI or B8ZS) as the DS1 ports to be tested. 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, STS-1, or VT1.5) to be used for this procedure using one of the following procedures; "Provisioning DS1 Testports" (page 9-9) for DS1 test sessions, "Provisioning STS-1 Testports" (page 9-10) for STS-1 test sessions, or "Provisioning VT1.5 Testports" (page 9-11) for VT1.5 test sessions.

5. Connect your test set (according to office procedures) to the port designated for the testport (FAD).
6. To test if the signal from the near-end is received by the DACS IV-2000 system, establish a MONE test access connection by using one of the following procedures; "Establishing DS1 Test Access Connections" (page 9-16) for DS1 test sessions, "Establishing STS-1 Test Access Connections" (page 9-19) for STS-1 test sessions, or "Establishing VT1.5 Test Access Connections" (page 9-21) 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 9-2 shows the test access configuration after establishing the MONE test access connection.

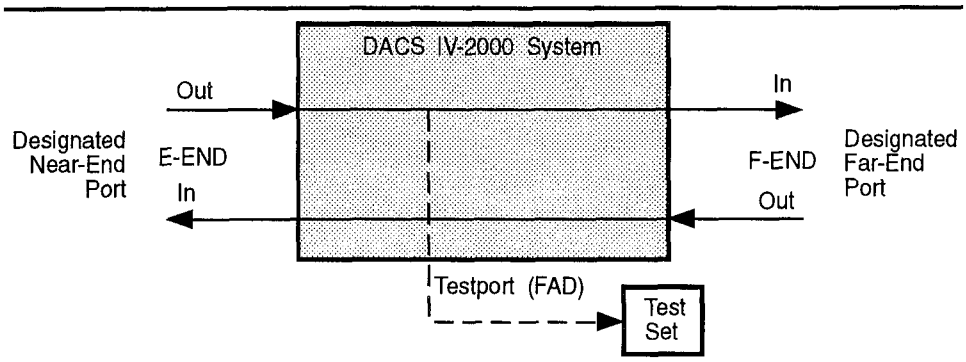


Figure 9-2. **Test Access Configuration After Establishing MONE Connection**

7. Perform the required test (specified by your system administrator) for transmission of the signal from the near-end to the DACS IV-2000 system.
8. To test both ends of the transmission paths for the near-end, change the MONE test connection to a SPLTE test connection using one of the following procedures; "Changing DS1 Test Access Mode" (page 9-24) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-26) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-27) for VT1.5 test sessions.

   Figure 9-3 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 near-end from/to the DACS IV-2000 system.

   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 9-35) (after releasing the test connection you are done with this procedure). Otherwise, continue with the next step.

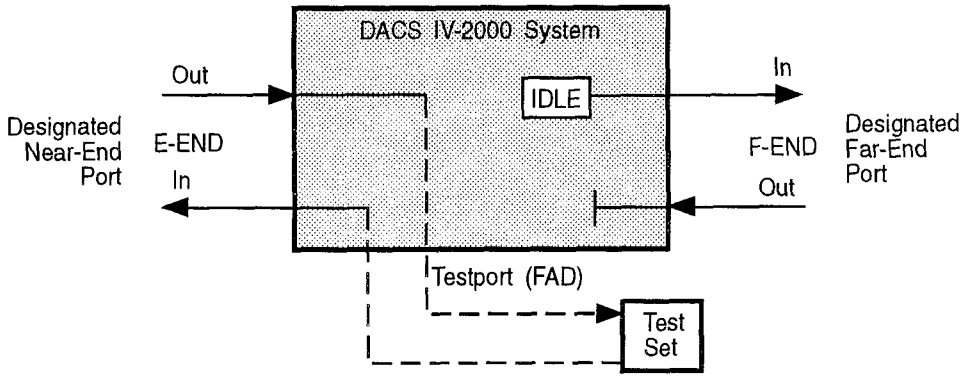


Figure 9-3. **Test Access Configuration After Changing to SPLTE Connection**

10. To test both ends of the transmission paths for the far-end, change the SPLTE test connection to a SPLTF test connection using one of the following procedures; "Changing DS1 Test Access Mode" (page 9-24) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-26) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-27) for VT1.5 test sessions.

    Changing the test access connection to a SPLTF allows you to test the transmission between the far-end and the DACS IV-2000 system. Figure 9-4 shows the test access configuration after changing to the SPLTF test access connection.

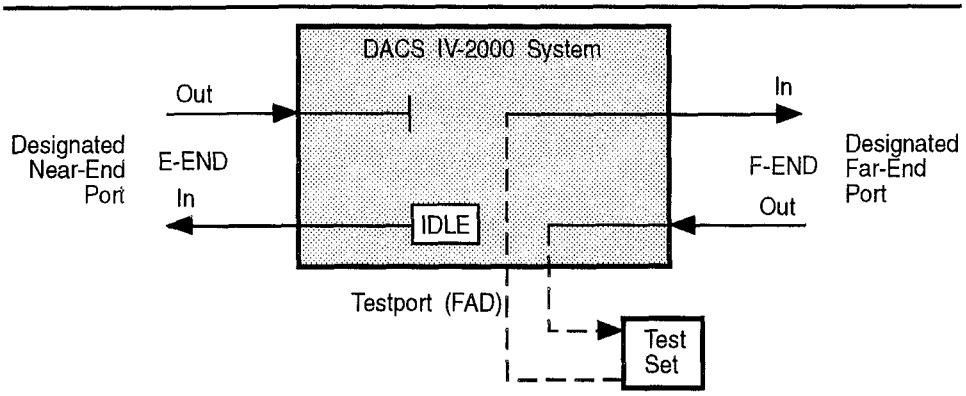


Figure 9-4. **Test Access Configuration After Changing to SPLTF Connection**

11. Perform the required test (specified by your system administrator) for transmission of the signal to/from the far-end from/to the DACS IV-2000 system.

    If this is 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 9-35). After releasing the test connection you are done with this procedure. Otherwise, continue with the next step.

12. If a round-robin test is required, loop up both ends (near- and far-ends) of the network interface as shown in Figure 9-5.

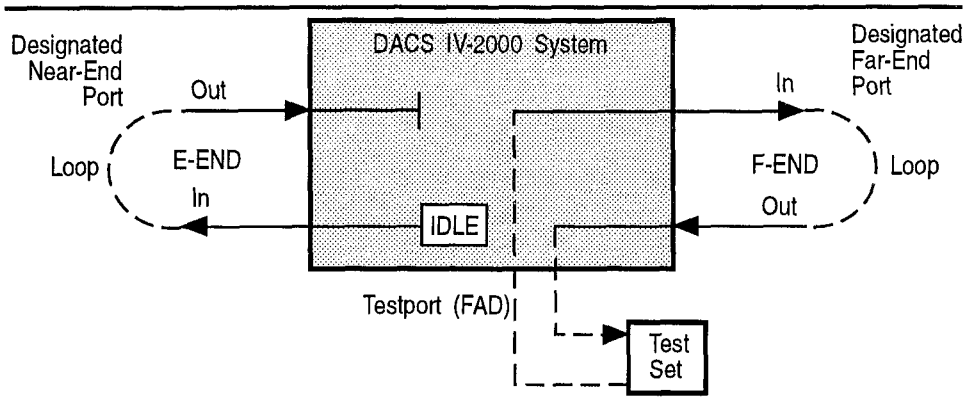


Figure 9-5. **Test Access Configuration After Looping Both Ends of the DACS IV-2000 System**

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 9-24)for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-26) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-27) for VT1.5 test sessions.

    Changing the test access connection to a SPLTA allows you to test the transmission from the near-end to the far-end through the DACS IV-2000 system. Figure 9-6 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 near-end to the far-end through the DACS IV-2000 system.

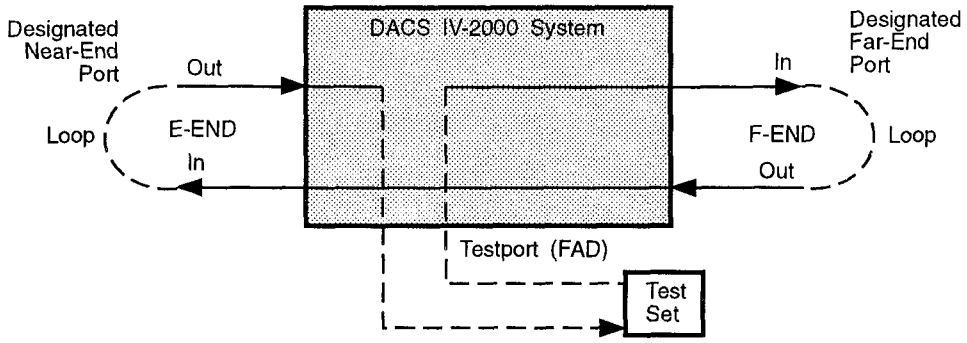


Figure 9-6. **Test Access Configuration After Changing to SPLTA Connection**

15. Change the SPLTA test connection to a SPLTB test connection using one of the following procedures; "Changing DS1 Test Access Mode" (page 9-24) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-26) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-27) for VT1.5 test sessions.

    Changing the test access connection to a SPLTB allows you to test the transmission from the far-end to the near-end through the DACS IV-2000 system. Figure 9-7 shows the test access configuration after changing to the SPLTB test access connection.

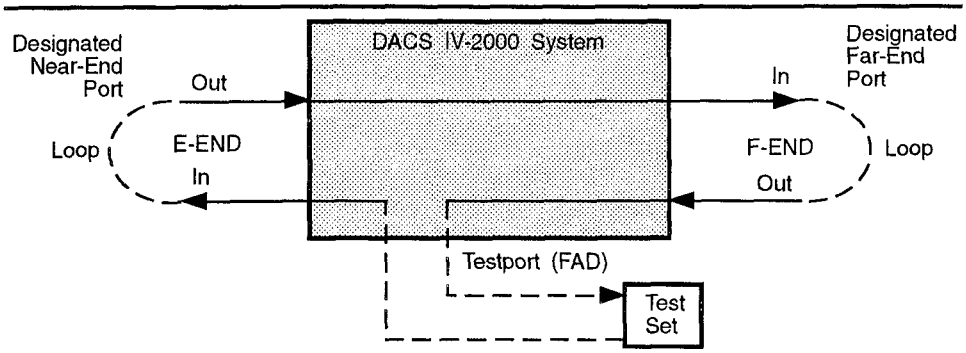


Figure 9-7. **Test Access Configuration After Changing to SPLTB Connection**

16. Perform the required test (specified by your system administrator) for transmission of the signal from the far-end to the near-end through the DACS IV-2000 system.
17. Disconnect the test access connection using the section titled "Removing Test Access Connections" (page 9-35).
18. To complete the test access session, remove the loops made in Step 12.

Provisioning Testports

Use one of the following procedures ["Provisioning DS1 Testports" (page 9-9), "Provisioning STS-1 Testports" (page 9-10), or "Provisioning VT1.5 Testports" (page 9-11)] to manually provision DS1, STS-1, or VT1.5 ports as testports.

Provisioning DS1 Testports

The **ENT-TSTPT-T1** command moves DS1 ports form 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:

   e = Target ID (optional)

   f = DS1 port(s) to be provisioned as the testport(s) location:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   DS1 ports can be associated with DS1, DS3, or STS1 Interface Modules.

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:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   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 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:

   c = Target ID (optional)

   d = STS-1 port(s) to be provisioned as the testport(s) location:
   { {1-32}-{1-15}, UNIT-{1-32} }
   STS-1 ports are associated with STS1 Interface Modules.

   If the desired STS-1 port is not in the IDLE-REL state and not provisioned, you can provision the STS-1 port by referring to the section titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 5-57) 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 = DS1 port(s) to be provisioned as the testport(s) location:
   { {1-32}-{1-15}, UNIT-{1-32} }
   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:

   c = Target ID (optional)

   d = VT1.5 port(s) to be provisioned as the testport(s) location:
   { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }
   VT1.5 ports are associated with STS1 Interface Modules.

   If the desired VT1.5 port is not in the IDLE-REL state and not provisioned, you can provision the VT1.5 port by referring to the section titled "Provisioning VT1.5 Facilities" (page 5-61) 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:
   { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }
   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 9-12), "Releasing STS-1 Testports" (page 9-13), or "Releasing VT1.5 Testports" (page 9-14)] to manually deprovision DS1, 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:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   DS1 testports can be associated with DS1, DS3, or STS1 Interface Modules.

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:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   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 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:
   { {1-32}-{1-15}, UNIT-{1-32} }
   STS-1 testports are associated with STS1 Interface Modules.

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:
   { {1-32}-{1-15}, UNIT-{1-32} }
   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:
   { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }
   VT1.5 testports are associated with STS1 Interface Modules.

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:
   { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }
   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" (page 9-16), "Establishing STS-1 Test Access Connections" (page 9-19), or "Establishing VT1.5 Test Access Connections" (page 9-21)] to establish a DS1, STS-1, or VT1.5 test access connection. The ten types of test access connections are:

- MONE — establishes a monitor connection between a FAD and the E-END (input port).
- MONF — establishes a monitor connection between a FAD and the F-END (output port).
- MONEF — establishes a monitor connection between a pair of FADs and both the E-END and the F-END of the two-way connection. This test access requires a pair of FADs. 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 for DS1 and VT1.5 or 11-3 and 11-4 for STS-1).
- 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 equipment (E) end.
- SPLTF — splits the F-END to E-END connection of a two-way cross-connection to provide test access at the facility (F) end.
- SPLTEF — splits both directions of a two-way cross-connection to provide test access at both the equipment (E) end and the facility (F) end. The SPLTEF mode requires a pair of FADs. 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:
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

This procedure is used to establish 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 9-2).

1. Determine type of test access connection to make, FAD 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-TACC command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 9-2) for more information].

2. 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 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:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   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 linecode (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.

3. 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 DS1 One-Way and Two-Way Cross-Connections" (page 8-2), if necessary.
4. Establish a of test access connection by entering the following command:

   CONN-TACC-T1:*[a]*:*b*,*c*,:::*[f]*:*[g]*;

   Where:

   a = Target ID (optional)

   b = DS1 port (FAD) location: {1-32}-{1-31}-{1-28}
   Specifies the FAD, 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 FADs 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): {1-32}-{1-31}-{1-28}
   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, DS3, or STS1 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 or not 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: {1-32}-{1-31}-{1-28}

n = E-END port location: {1-32}-{1-31}-{1-28}

o = F-END port location: {1-32}-{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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 DS1 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 9-2).

1. Determine type of test access connection to make, FAD 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-TACC** command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 9-2) 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:
   { {1-32}-{1-15}, UNIT-{1-32} }
   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 9-10).

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 STS-1 One-Way and Two-Way Cross-Connections" (page 8-4), 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 (FAD) location: **{1-32}-{1-15}**
   Specifies the FAD, 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 FADs 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): `{1-32}-{1-31}-{1-28}`
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.

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 output 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 or not the test session is to be associated with the link on which the **CONN-TACC-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-STS1** 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}-{1-31}-{1-28}`

n = E-END port location: `{1-32}-{1-31}-{1-28}`

o = F-END port location: `{1-32}-{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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 9-2).

1. Determine type of test access connection to make, FAD 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-TACC** command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 9-2) 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:
   { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }
   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 9-11).

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 VT1.5 One-Way and Two-Way Cross-Connections" (page 8-7), 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 (FAD) location: `{1-32}-{1-15}-{1-28}`
   Specifies the FAD, 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 FADs 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): `{1-32}-{1-31}-{1-28}`
   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:
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 or not 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: {1-32}-{1-31}-{1-28}

n = E-END port location: {1-32}-{1-31}-{1-28}

o = F-END port location: {1-32}-{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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 previous was not associated)

Changing Test Access Mode

Use one of the following procedures ["Changing DS1 Test Access Mode" (page 9-24), "Changing STS-1 Test Access Mode" (page 9-26), or "Changing VT1.5 Test Access Mode" (page 9-27)] 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 9-2).

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)

NOTE:
The test modes are divided into two groups: one-way test modes that use one FAD (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two FADs (MONEF and SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode cannot be changed from a one-way mode to a two-way mode or vice-versa. 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: `{1-32}-{1-31}-{1-28}`
   Specifies the test access path (TAP), which is represented by the DS1 port being used as the FAD (facility access digroup) 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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 9-2).

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)

NOTE:
The test modes are divided into two groups: one-way test modes that use one FAD (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two FADs (MONEF and SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode cannot be changed from a one-way mode to a two-way mode or vice-versa. 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: **{1-32}-{1-15}**
   Specifies the test access path (TAP), which is represented by the STS-1 port being used as the FAD (facility access digroup) 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 9-2).

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)

NOTE:
The test modes are divided into two groups: one-way test modes that use one FAD (MONE, MONF, SPLTA, SPLTB, SPLTE, SPLTF, LOOPE, AND LOOPF) and two-way test modes that use two FADs (MONEF and SPLTEF). The Test Mode can be changed within any one-way mode or two-way mode, but the Test Mode cannot be changed from a one-way mode to a two-way mode or vice-versa. 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: `{1-32}-{1-15}-{1-28}`
   Specifies the test access path (TAP), which is represented by the VT1.5 port being used as the FAD (facility access digroup) 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 9-29), "Changing STS-1 Test Access Parameters" (page 9-31), or "Changing VT1.5 Test Access Parameters" (page 9-33)] 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)

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: `{1-32}-{1-31}-{1-28}`
   Specifies the test access path (TAP), which is represented by the DS1 port being used as the FAD (facility access digroup) for this test session. The DS1 port can be associated with a DS1, DS3, or STS1 Interface Module.

   c = DS1 port (E-END): `{1-32}-{1-31}-{1-28}`
   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 FAD 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): `{1-32}-{1-31}-{1-28}`
   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 or the E-END is associated with an STS1 Interface Module, **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 E-END DS1 output port is idle, the value TERM cannot be given. If there is no QRSS (quasi-random signal source) provisioned or the F-END is associated with an STS1 Interface Module, **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 or not 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. 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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)

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: `{1-32}-{1-15}`
   Specifies the test access path (TAP), which is represented by the STS-1 port being used as the FAD (facility access digroup) for this test session. The STS-1 port can only be associated with an STS1 Interface Module.

   c = STS-1 port (E-END): `{1-32}-{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 FAD 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): `{1-32}-{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 or not 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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)

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: `{1-32}-{1-15}-{1-28}`
   Specifies the test access path (TAP), which is represented by the VT1.5 port being used as the FAD (facility access digroup) for this test session. The VT1.5 port can only be associated with an STS1 Interface Module.

   c = VT1.5 port (E-END): `{1-32}-{1-15}-{1-28}`
   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 FAD 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): `{1-32}-{1-15}-{1-28}`
   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 or not 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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, STS-1, and/or VT1.5 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]*`;`
   STS-1 Testports: `RTRV-TACC-EC1:`*[a]*`;`
   VT1.5 Testports: `RTRV-TACC-VT1:`*[a]*`;`

   Where:

   a = Target ID (optional)

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, STS-1, and VT1.5 ports: `ALL`
   DS1 ports only: `{1-32}-{1-31}-{1-28}`
   (DS1, DS3, or STS1 Interface Modules)
   STS-1 ports only: `{1-32}-{1-15}`
   (STS1 Interface Modules only)
   VT1.5 ports only: `{1-32}-{1-15}-{1-28}`
   (STS1 Interface Modules only)

   Specifies the test access path, which is represented by the port that is being used as the FAD (facility access digroup) for this test session. If this port is not an active FAD, 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-EC1**, and/or **RTRV-TACC-VT1** commands 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

Loopbacks

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Loopbacks

10

This chapter consists of procedures required for establishing and disconnecting 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

For more information on loopbacks, refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400) or the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

DS1 Loopback Operations

The procedures in this section are used for creating and releasing 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 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: **{1-32}-{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: {1-32}-{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 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   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 Operation" (page 5-64) or if another DS1 port is to be selected.

3. 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**
   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

   f = Link association: **{ Y, N }**
   Default: **Y** (yes, the DS1 loopback is associated with the link).
   Specifies whether or not the DS1 loopback is associated with the link on which the **OPR-LPBK-T1** command is given. 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.

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 loopback has been established and update your office records.

Releasing Near-End DS1 Loopbacks

This procedure is used to release near-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: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

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: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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) circuit packs provisioned to communicate with far-end remote multiplexers. The only type of loopback allowed are DS1 tributary loopbacks (LPBKM). Far-end DS1 loopbacks are allowed for either of the remote multiplexer communication protocols (FEAC, TR9, and SBIT). Both MUX2 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**

   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: {1-32}-{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 "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-64) 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. 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

   c = Link association: **{ Y, N }** (for FEAC and TR9 remote multiplexers)
   Default: **Y** (yes, the DS1 loopback is associated with the link)
   Specifies whether or not the DS1 loopback is associated with the link on which the **OPR-LPBK-T1** command is given. 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.

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 system 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

NOTE:
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 system 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.

4. 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: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

2. Release the desired far-end DS1 loopback by entering the following command:

   RLS-LPBK-T1:*[a]*:*b*:::**FEND**;

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

DS3 Loopback Operations

The procedures in this section are used for creating and releasing 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) 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**

   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: {1-32}-{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. Loopback a DS3 signal by entering the following command:

   OPR-LPBK-T3:*[a]*:*b*:::**NEND**:*[e]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{1-31}, UNIT-{1-32} }**
   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 or not the DS3 loopback is associated with the link on which the **OPR-LPBK-T3** command is given. 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.

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

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: **{ {1-32}-{1-31}, UNIT-{1-32} }**
   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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) 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**

   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: {1-32}-{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 5-51) 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. 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: **{ {1-32}-{1-31}, UNIT-{1-32} }**

   e = Link association: **{ Y, N }**
   Default: **Y** (yes, the DS3 loopback is associated with the link)
   Specifies whether or not the DS3 loopback is associated with the link on which the **OPR-LPBK-T3** command is given. 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.

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

4. 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: { {1-32}-{1-31}, UNIT-{1-32} }
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

2. Disconnect the desired far-end DS3 loopback by entering the following command:

   RLS-LPBK-T3:*[a]*:*b*:::**FEND**;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { {1-32}-{1-31}, UNIT-{1-32} }
   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

STS-1 Loopback Operations

The procedures in this section are used for creating and releasing 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: **{1-32}-{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: {1-32}-{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 Operation" (page 5-64) 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: {1-32}-{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: {1-32}-{1-15}

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   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. 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: { {1-32}-{1-15}, UNIT-{1-32} }

   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

   f = Link association: { Y, N }
   Default: **Y** (yes, the STS-1 loopback is associated with the link)
   Specifies whether or not the STS-1 loopback is associated with the link on which the **OPR-LPBK-EC1** command is given. 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.

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: **{ {1-32}-{1-15}, UNIT-{1-32} }**

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: **{ {1-32}-{1-15}, UNIT-{1-32} }**

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

VT1.5 Loopback Operations

The procedures in this section are used for creating and releasing 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: **{1-32}-{1-15}-{1-28}**

   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: {1-32}-{1-15}

   i = Active signal type: { EC1, T1, VT1 }

   If the Active Signal Type (parameter *i*) for the port is not VT1, an 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 Operation" (page 5-64) 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: **{1-32}-{1-15}-{1-28}**

   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 = VT1.5 port location: {1-32}-{1-15}-{1-28}

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   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. 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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

   e = Loopback state: **LPBKT**
   Specifies the loopback state. Refer to the VT1.5 loopback state description in the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403).

   f = Link association: **{ Y, N }**
   Default: **Y** (yes, the VT1.5 loopback is associated with the link)
   Specifies whether or not the VT1.5 loopback is associated with the link on which the **OPR-LPBK-VT1** command is given. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autono-

mous 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.

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

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: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

Performance Monitoring

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Performance Monitoring

11

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

For detailed information on performance monitoring, refer to the *DACS IV-2000 Release 3.0 Reference Manual* (AT&T 365-340-400).

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 11-1 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, these procedures assume that the PMGR1 circuit packs have been

provisioned using the section titled "Provisioning PMGR1 Circuit Packs" (page 5-42).

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 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 protection 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 UC2 circuit pack in a DS1 Interface Module and/or a module equipped with PMGR1 circuit packs causes loss of all short interval and the current daily total DS1 performance monitoring data associated with the DS1 interfaces or DS1 interfaces monitored by the PMGR1 circuit packs in the module.

Failure of the hard disk (PRI) causes loss of the 7-day history of daily total DS1 performance monitoring data for all monitored DS1 facilities on the DACS IV-2000 system.

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 craft interface terminal can be inundated with `REPT EVT T1` messages.

Table 11-1. **DS1 Performance Monitoring Procedures**

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Dedicated full-time — using SWIF2 (AKM50) circuit pack	"Verifying DS1 Equipment Parameters" (page 11-6) "Setting DS1 Performance Monitoring Threshold Values" (page 11-9) "Setting DS1 Facility Parameters" (page 11-11)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-5) [Short Accumulation Time and CRC-6 Errors] **"Initializing Accumulated DS1 Performance Monitoring Data" (page 11-16)**
Bridged-access full-time or manual camp-on — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-6) "Setting DS1 Performance Monitoring Threshold Values" (page 11-9) "Setting DS1 Facility Parameters" (page 11-11) "Establishing DS1 Manual Camp-on Performance Monitoring" (page 11-12)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-5) [Short Accumulation Time and CRC-6 Errors] **"Initializing Accumulated DS1 Performance Monitoring Data" (page 11-16)** **"Scheduling DS1 Performance Monitoring Reports" (page 11-17)** **"Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 11-19)** **"Allowing Scheduled DS1 Performance Monitoring Reports" (page 11-19)** **"Retrieving DS1 Performance Monitoring Reports" (page 11-20)** **"Retrieving DS1 Performance Monitoring Data" (page 11-21)** **"Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-22)**

Table continue on next page.

Table 11-1. DS1 Performance Monitoring Procedures (Continued)

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Scan — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-6) "Setting DS1 Facility Parameters" (page 11-11) "Setting DS1 Scan Monitoring Threshold Values" (page 11-13) "Starting DS1 Scan Performance Monitoring" (page 11-15)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-5) [Short Accumulation Time and CRC-6 Errors] **"Initializing Accumulated DS1 Performance Monitoring Data" (page 11-16)** **"Scheduling DS1 Performance Monitoring Reports" (page 11-17)** **"Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 11-19)** **"Allowing Scheduled DS3 Performance Monitoring Reports" (page 11-33)** **"Retrieving DS1 Performance Monitoring Reports" (page 11-20)** **"Retrieving DS1 Performance Monitoring Data" (page 11-21)** **"Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-22)**
Automatic Camp-on — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-6) "Provisioning Automatic Camp-on Performance Monitoring DS1 Ports" (page 11-13)	"Retrieving DS1 Performance Monitoring Data" (page 11-21) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-22)

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 Chapter 5 for provisioning).

1. Determine if the values of the *number of cyclic redundancy code 6 errors (CRC-6)* and *short accumulation period (SHRT-ACC)* 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,ALM-DLY,N-SW,SW-INT,HLD-T:
AUTO-BKUP,TIME,DAY:,,:::FAIL-TYPE,FAIL-THRES,CRC-6,SHRT-ACC,
PMTYP,ACC */
    "... t,u, ... "
;
```

   Where:

   t = Number of CRC-6 errors: `0-19200`

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

   If the values set for CRC-6 errors (parameter *t*) and 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]*:::,:,,,,,,,,*[m]*,*[n]*;

   Where:

   a = Target ID (optional)

   m = Number of CRC-6 errors: **`{0-19200}`** (optional)

   n = Short accumulation period: **`{ 15-MIN, 1-HR }`** (optional)

3. If the value of SHRT-ACC 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 30 minutes to reset. Refer to the section titled "Reset and Boot" (page 6-8) for detailed information on system reset

Verifying DS1 Equipment Parameters

Any signal associated with a SWIF2 (AKM50) or a PMGR1 (AKM66) circuit pack can be monitored. Dedicated full-time performance monitoring can be performed on DS1 signals associated with SWIF2 circuit packs. Camp-on or scan performance monitoring can be performed on DS1 signals associated with PMGR1 circuit packs.

Verifying SWIF2 Equipment Parameters

This procedure is used to set the DS1 performance monitoring parameters that are associated with SWIF2 circuit packs (that is, parameters associated with dedicated full-time monitoring through the specified SWIF2 circuit pack).

1. Verify the circuit pack code name is set to AKM50 and the basic state is ACT or POS of the SWIF2 circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-32}-{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>::x"
;
```

Where:

d = SWIF circuit pack location: `SWIF-{1-32}-{1-8}`

f = Provisioned circuit pack code name: `{ AKM50, AKM49, AKM66, INVALID }`

g = Circuit pack code name: `{ AKM50, AKM49, AKM66, INVALID }`

x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

If either the provisioned circuit pack code (parameters *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 5-28) to provision a SWIF2 (AKM50) circuit pack.

If the basic state (parameter *x*) is EQPD, PNDG, or AVAIL, refer to the "Switch Interface (SWIF)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) to determine the appropriate actions to provision the SWIF2 to the POS state.

Verifying PMGR1 Equipment Parameters

This procedure is used to set the DS1 performance monitoring parameters are 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 or MUX circuit pack slots and **cannot** reside in SMUX circuit pack slots

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-{1-32}-{1-8}, MUX-{1-32}-{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>::x"
;
```

Where:

d = SWIF or MUX circuit pack location: `{ SWIF-{1-32}-{1-8}, MUX-{1-32}-{1-31} }`

f = Provisioned circuit pack code name: `{ AKM66, AKM49, AKM50, AKM52, AKM68, INVALID }`

g = Circuit pack code name: `{ AKM66, AKM49, AKM50, AKM52, AKM68, INVALID }`

q = Performance monitoring function: `{ PM, PM-SCAN }`

x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

If either the provisioned circuit pack code (parameters *f*) or the circuit pack code (parameter *g*) is AKM49, AKM50, AKM52, AKM68, or INVALID, refer to the section titled "Provisioning PMGR1 Circuit Packs" (page 5-42) to provision a PMGR1 (AKM66) circuit pack.

The performance monitoring function (parameter *q*) must be set to PM to be used for auto camp-on performance monitoring or PM-SCAN for scan performance monitoring.

If the basic state (parameter *x*) 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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, bridged-access full-time, and camp-on performance monitoring. DS1 signals within DS3 or STS-1 signals can only be monitored using bridged-access full-time or camp-on monitoring. For scan monitoring, refer to the section titled "Setting DS1 Scan Monitoring Threshold Values" (page 11-13).

1. Determine the threshold values for the desired parameters for dedicated full-time, bridged-access 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

d = Monitored parameter: refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) 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: {1-32}-{1-31}-{1-28}

h = Monitored parameter

i = Location: { NEND, FEND }

j = Threshold value: 0-134217728

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 Release 3.0 Quick Reference Job Aids* [AT&T 365-340-403] or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual [AT&T 365-340-402] 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 3.

3. 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: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**
   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 Operation" (page 5-64) for configuring EC-1/VT1.5 ports).

   d = Monitored parameter: **{ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, SLS }**

   e = Threshold Level: **{0-134217728}**
   Refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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.

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: **{ (1-32)-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:f:<BER=h, FMT=l, FENDNTE=w>"
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = Active signal type: { T1, EC1, VT1 }

   h = BER threshold value: 3-9

   l = Signal format: { ESF, SF, UNFR }

   w = Far-end notification: { ANSI, NOT-ANSI }

   From the above response, determine if the values for bit error rate (parameter *h*), signal format (parameter *l*), and far-end network equipment type (parameter *w*) 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 *f*) 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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`
   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 Operation" (page 5-64) in Chapter 5 for configuring EC-1/VT1.5 ports).

   d = Bit error rate threshold: `{3-9}`

   h = DS1 signal format: `{ ESF, SF }`

   l = Far-end notification: `{ ANSI, 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. 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: `{1-32}-{1-31}-{1-28}`

   c = Performance monitoring DS1 port (PMGR1 circuit pack in SWIF or MUX circuit pack slot): `{1-32}-{1-31}-{1-28}`

   e = Red lined: `{ Y, N }`

Provisioning Automatic Camp-on Performance Monitoring DS1 Ports

This procedure establishes a 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: **{1-32}-{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 facilities cannot be scan monitored. For full-time and camp-on monitoring, refer to the section titled "Setting DS1 Performance Monitoring Threshold Values" (page 11-9).

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,SIG-FMT,THLEV,TMPER */
   ":f,g,h,j,j"
;
```

Where:

f = Monitored parameter

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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 SWIF or MUX circuit pack slot occupied with a PMGR1 circuit pack.

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 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-{1-32}-{1-8}, MUX-{1-32}-{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-{1-32}-{1-8}, MUX-{1-32}-{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): `{1-32}-{1-31}-{1-28}`

   c = Performance monitoring DS1 port (PMGR1): `{1-32}-{1-31}-{1-28}`

   e = Red lined: `{ RDLD, Y, N }`
   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. 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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`
   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 5 for provisioning STS-1 and VT1.5 signals).

   d = Monitored parameters: `{ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, SLS, ALL }`

e = Monitored Value: `{0-134217728}`
Refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on **Monitored Parameters** in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 reports can be scheduled. Scheduling 64 reports can generate a large amount of output.

1. 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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

   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, SLS, 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`.

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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

   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. Once the reports have been inhibited, the accumulated data can 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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

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: `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

Retrieving DS1 Performance Monitoring Reports

This procedure is used to retrieve scheduled DS1 performance monitoring report information.

1. Retrieve the scheduled performance monitoring reports by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }** (optional)
   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(s): { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   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.

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: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }
   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 5 for provisioning STS-1 and VT1.5 signals).

   d = Monitored parameters: { CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, SLS, 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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on **Monitored Parameters** in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: {1-32}-{1-31}-{1-28}

k = Monitored parameters

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 = Performance monitored or monitoring DS1 port location:
   { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

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: `{1-32}-{1-31}-{1-28}`

e = Performance Monitored DS1 port location: `{1-32}-{1-31}-{1-28}`

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: **`{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`**

   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 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: {1-32}-{1-31}-{1-28}

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 you 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 and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

NOTE:
Removing a MUX2 circuit pack or failure of a MUX2 circuit pack causes the loss of all stored DS3 performance monitoring data for the associated DS3 facility.

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 (PMTYP) and DS3 accumulation period (ACC) 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,ALM-DLY,N-SW,SW-INT,HLD-T:
AUTO-BKUP,TIME,DAY:,,:::FAIL-TYPE,FAIL-THRES,CRC-6,SHRT-ACC,
PMTYP,ACC */
    "... v, w, . "
;
```

Where:

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

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]*:::,,:,,,,,,,,,,*[o]*,*[p]*;

   Where:

   a = Target ID (optional)

   o = DS3 performance monitoring type: { **PSET#1, PSET#2, NONE** }
   Specifying **NONE** turns off DS3 performance monitoring. However, any bit error rate (BER) values are still active.

   p = 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 30 minutes to reset. Refer to the section titled "Reset and Boot" (page 6-8) in Chapter 6 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 circuit packs. Any DS3 signal associated with a MUX2 (AKM68 or AMK68B) circuit pack can be monitored.

1. Verify the circuit pack code name is set to AKM68 and the basic state is ACT or POS of the MUX2 circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: **MUX-{1-32}-{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-{1-32}-{1-31}

   f = Provisioned circuit pack code name: { AKM52, AKM68, INVALID }

   g = Circuit pack code name: { AKM52, AKM68, INVALID }

   x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   If either the provisioned circuit pack code (parameters *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-20) to provision a MUX2 (AKM68 or AKM68B) circuit pack.

   If either the provisioned circuit pack code (parameters *f*) or the circuit pack code (parameter *g*) is AKM52, a MUX1 circuit pack occupies the circuit pack slot and DS3 performance monitoring parameters can not 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 (AKM68)" (page 14-36).

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: **`{ {1-32}-{1-31}, UNIT-{1-32} }`**

   d = Monitored Parameter: **`{`** <valid monitored parameter>, **`ALL }`** (optional)

   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: `{1-32}-{1-31}`

   h = Monitored parameter

   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 Release 3.0 Quick Reference Job Aids* [AT&T 365-340-403] or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual [AT&T 365-340-402] for PSET#1 and PSET#2 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: { {1-32}-{1-31}, UNIT-{1-32} }

   d = Monitored parameter: { **BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES** }

   e = Threshold Level: {0-811987200}
   Refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: { {1-32}-{1-31}, UNIT-{1-32} }

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e::<BER=h,BERM=j,FMT=l>"
;
```

   Where:

   e = DS3 port location: {1-32}-{1-31}

   h = BER threshold value: 3-9

j = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }

l = Signal format: { ASYNC, CBIT }

From the above response, determine if the values for bit error rate (parameter *h*), bit error rate metric (parameter *i*), and DS3 signal format (parameter *l*) 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*:::::*[***BER**=*d*,**BERM**=*f*,**DS3FORMAT**=*h]*;

Where:

a = Target ID (optional)

b = DS3 port location: { (1-32)-(1-31), UNIT-(1-32) }

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: { (1-32)-(1-31), UNIT-(1-32) }

d = Monitored parameter: { **BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL** }

e = Monitored Value: `{0-811987200}`
Refer to the *DACS IV-2000 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 reports can be scheduled. Scheduling 64 reports can generate a large amount of output.

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: `{ {1-32}-{1-31}, UNIT-{1-32} }`

   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 }`

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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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`.

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: `{ {1-32}-{1-31}, UNIT-{1-32} }`

   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 is used to inhibit 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. Once the reports have been inhibited, the accumulated data can 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: { {1-32}-{1-31}, UNIT-{1-32} }

Allowing Scheduled DS3 Performance Monitoring Reports

This procedure is used to allow 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: { {1-32}-{1-31}, UNIT-{1-32} }

Retrieving DS3 Performance Monitoring Reports

This procedure is used to retrieve scheduled DS3 performance monitoring report information.

1. Retrieve the scheduled performance monitoring reports by entering the following command:

   RTRV-PMSCHED-T3:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{1-31}, UNIT-{1-32} }** (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): { {1-32}-{1-31}, UNIT-{1-32} }

   e = DS3 port location: {1-32}-{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 or MUXP2 circuit pack. If a manual switch to protection is executed the data on the MUX2 circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the MUX2 circuit pack is not bad or has not been removed. After switching back to working the performance monitoring data on the MUXP2 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: `{ {1-32}-{1-31}, UNIT-{1-32} }`

   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: {1-32}-{1-31}

k = Monitored parameters

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 you 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 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

NOTE:
Removing a SMUX circuit pack or failure of a 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 is used to set 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.

Verifying STS1 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-{1-32}-{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>:...:x"
;
```

   Where:

   d = SMUX circuit pack location: SMUX-{1-32}-{1-15}

   f = Provisioned circuit pack code name: { AKM84, INVALID }

   g = Circuit pack code name: { AKM84, INVALID }

   x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   If either the provisioned circuit pack code (parameters *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-20) to provision an SMUX (AKM84) circuit pack.

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

   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: `{1-32}-{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 Release 3.0 Quick Reference Job Aids* [AT&T 365-340-403] or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual [AT&T 365-340-402] 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: { {1-32}-{1-15}, **UNIT**-{1-32} }

   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 are monitored and far-end path error 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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: { {1-32}-{1-15}, **UNIT**-{1-32} }

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e: ..:<BERL=i,SOAKON=ae,SOAKCLR=af>"
;
```

Where:

e = EC-1 port location: `{1-32}-{1-15}`

i = STS-1 line BER threshold value: `{ 3, 5-9 }`

ae = SONET condition onset soak time: `1-30`

af = SONET condition clear soak time: `1-30`

From the above response, determine if the values for line bit error rate (parameter *i*), SONET condition onset soak time (parameter *ae*), and SONET condition clear soak time (parameter *af*) 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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

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: { {1-32}-{1-15}, UNIT-{1-32} }

   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 reports can be scheduled. Scheduling 64 reports can generate a large amount of output.

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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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`.

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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

   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. Once the reports have been inhibited, the accumulated data can 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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

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: **{ {1-32}-{1-15}, UNIT-{1-32} }**

Retrieving STS-1 Performance Monitoring Reports

This procedure is used to retrieve scheduled STS-1 performance monitoring report information.

1. Retrieve the scheduled performance monitoring reports by entering the following command:

   RTRV-PMSCHED-EC1:*[a]*:*[b]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{ {1-32}-{1-15}, UNIT-{1-32} }**
   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): `{ {1-32}-{1-15}, UNIT-{1-32} }`

e = EC-1 port location: `{1-32}-{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 a 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 SMUX 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: `{ {1-32}-{1-15}, UNIT-{1-32} }`

   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: {1-32}-{1-15}

k = Monitored parameters

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 you 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

NOTE:
Removing a SMUX circuit pack or failure of a 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, FEND, ALL** }
   Specifying **ALL** sets the threshold values for the near-end and far-end to the same level.

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-{1-32}-{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>:...:x"
;
```

   Where:

   d = SMUX circuit pack location: SMUX-{1-32}-{1-15}

   f = Provisioned circuit pack code name: { AKM84, INVALID }

   g = Circuit pack code name: { AKM84, INVALID }

   x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

   If either the provisioned circuit pack code (parameters *f*) or the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-20) to provision an SMUX (AKM84) circuit pack.

   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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) to determine the appropriate actions to provision the MUX2 to the POS state.

SettingVT1.5 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: **`{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }`**
   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: `{1-32}-{1-15}-{1-28}`

   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 Release 3.0 Quick Reference Job Aids* [AT&T 365-340-403] or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual [AT&T 365-340-402] 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: **{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }**
   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: **{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }**
   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 reports can be scheduled. Scheduling 64 reports can generate a large amount of output.

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: **{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }**
   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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**.

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: { {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }
   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. Once the reports have been inhibited, the accumulated data can 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: { {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }
   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: **{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }**
   VT1.5 ports are located on SMUX circuit packs only.

Retrieving VT1.5 Performance Monitoring Report Schedule

This procedure is used to retrieve scheduled VT1.5 performance monitoring report information.

1. Retrieve the scheduled performance monitoring reports by entering the following command:

   RTRV-PMSCHED-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{ {1-32}-{1-15}-{1-28}, UNIT-{1-32}, VT1GRP-{1-32}-{1-15} }**
   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(s): `{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-25}, UNIT-{1-32} }`

e = VT1.5 port location: `{1-32}-{1-15}-{1-28}`

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 a 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 SMUX 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: { {1-32}-{1-15}-{1-28}, **UNIT**-{1-32}, **VT1GRP**-{1-32}-{1-15} }
   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 Release 3.0 Quick Reference Job Aids* (AT&T 365-340-403) or the appendix on "Monitored Parameters" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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: {1-32}-{1-15}-{1-28}

k = Monitored parameters

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

12

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Alarms

12

This chapter consists of procedures required to clear critical, major, and minor alarms that occur in the DACS IV-2000 system.

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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

⚠ 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 office 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 system) 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 system provides six office alarm outputs. They are: critical audible, critical visual, major audible; major visual; minor audible; and minor visual. The major alarms are *fail-safe* in that all failure conditions associated with the alarm circuitry, including power failures, result in an alarm state. An alarm cutoff (ACO) is provided for the audible alarms. Contact closures for visual alarms remain on until the condition causing the alarm is corrected.

The DACS IV-2000 system provides four remote alarms (critical, major, minor, and main controller failure), as well as local status indicators on the status panel. Table 12-1 summarizes the alarm indications. 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 code and the alarm notification code. Table 12-2 lists the parameters for the various alarm levels.

Table 12-1. **DACS IV-2000 System Alarm Indications**

Indicators	Status Panel	Office		
		Audible	Visual	Remote
Critical	X	X	X	X
Major	X	X	X	X
Minor	X	X	X	X
FAILURE (Main Controller Failure)	X			X
ACO	X			

Table 12-2. **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 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.
- ACO — is green and shows that the audible alarms have been silenced (ACO switch activated).
- POWER ON — is green and signals that power is present at the status panel.
- FAILURE — 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.
- FAR END — reserved for future use.

All circuit packs (except Synchronizer Module 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 the DS1, DS3, and STS1 interface circuit packs, the LED indicators flash continuously at 1-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 2 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 system 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 system. 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 12-10) 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 how they are 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 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 associated with transmission equipment failure reported as a major alarm (MJ), service effecting (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 system 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 packs (DS1IFs, MUXs, SMUXs), switch interface packs (SWIFs), switch input/output packs (SWIOs), switch center stage packs (SWCSs), Synchronizer Module circuit packs (DPLLs, TBS3s, and DS1TXs and clock generator circuit packs (CLKGNs).

If both synchronizer sides fail at the same time, a critical alarm is raised due to loss of system timing and synchronization.

Facility (FAC)

The failure type setting of FAC (facility) in the **ED-NE** command, activates and clears critical alarms by:

- 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 clears
  - The DS1 port is changed to the NDRVN (not-driven) or INIT (initialized) state
- DS3 interface ports — 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 clears
  - The DS3 port is changed to the NDRVN or INIT state
- 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 clears
  - The VT1.5 port is changed to the NDRVN (not-driven) or INIT (initialized) state
- STS1 interface ports — all major facility alarms result in the critical alarm counter being incremented by 30. The critical alarm counter is decremented by 30 when the following events occur:
  - The EC-1 facility clears
  - The STS1 port is changed to the NDRVN (not-driven) or INIT (initialized) state

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`, `REPT ALM T3`, `REPT ALM EC1`, or `REPT ALM VT1` messages. The system generates a critical alarm message `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: 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 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 activates the critical alarm LED, audible alarm, and remote critical alarm indicators.
- If the system is currently in the critical alarm state 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 activates the critical alarm LED, audible alarm, and remote critical alarm indicators.
- 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, audible alarm, and remote critical alarm indicators until the transmission equipment failures are eliminated. 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).

Main Controller Failure Alarm (FAILURE) Active

When the main controller failure alarm becomes active (the FAILURE LED is lit or the remote main controller failure alarm is active), one of the following has occurred:

- The main controller failed and cannot recover autonomously. (Link communications is lost.)
- A single ECI circuit pack failed and a ECI circuit pack *restart* is in progress. (Link communications is temporarily lost [approximately 2 minutes] during the *restart*.)
- The active control complex (CPU/SSC/MTC) fails. (Link communications is temporarily lost for approximately 5 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
  - — Both controller complexes (CPU/SSC/MTC) fail
  - — Either SCI circuit pack fails
  - — The UI circuit pack fails
  - — A combination of the above failures

  For MC failures, the main controller failure alarm indicators (FAILURE LED and remote indicator) become active and remain active until the problem is cleared on the frame.
- Single ECI Circuit Pack Failure:
  - — When the ECI circuit pack your terminal or X.25 network is connected to fails, communications with the frame is lost, the main controller failure 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 2 minutes to complete.

    When the restart is completed, the main controller failure alarm indicators clear, the X.25 network (if connected) is switched to the working ECI circuit pack, 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 X.25 network is **not** connected to fails, the main controller failure alarm indicators become active and the ECI circuit pack you are connected to is restarted. During the restart (up to 2 minutes) any command that you entered is acknowledge 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 and the main controller failure alarm indicators clear. That is, you must login again to access the system.

- Active Control Complex (CPU/SSC/MTC) Failure — causes the MC to enter the OOS-FLT state, the main controller failure alarm indicators become active, and a *side switch* (restart) to the standby control complex is started. During the side switch (up to 5 minutes) only commands that can be executed while the MC is in the OOS-FLT state are accepted (**DGN-DET-EQPT** [MC and MC circuit packs], **INIT-SYS** [level 9], **RTRV-CMD-STAT**, **RTRV-STATE-EQPT** [MC], and **RST-EQPT** [MC]).

  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.

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 (Switch Power Module)
- Power circuit pack failures
- Blown fuse(s) in the Redundant Controller Module
- Main Controller (MC) failures or manual removal
- Both synchronizer sides fail
- Both disk drives failure
- Unit controller (UC) failures
- Interface circuit pack failures in an interface module (when active and not protected)
- Protection switch failures

- Internal clock and signal failures associated with interface (MUX, SMUX, DS1IF, or SWIF), switch (SWIO or SWCS), and clock generator (CLKGN) circuit packs
- Fan assembly failure
- Fan filter replacement indicator (fan assemblies ED-9C130-30-30,G1 or ED-9C130-30-30,G2)
- Incoming DS1, DS3, STS-1, or VT1.5 signal failures (when attributes are set to MJ)

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
- Blown secondary fuses in Switch Power Module (Switch Power Module)
- Interface circuit pack failures in an interface module
- Blown fuse(s) in the Redundant Controller Module
- Main Controller (MC) failures
- Synchronizer Module equipment (DPLL, DS1TX, TBS3, and TXPT) associated with a single synchronizer side
- BITS timing reference failure
- Single disk drive failure
- CILINK failure (including OOS-PRTCL state)
- PMGR1 circuit pack failures
- Time of day clock failure
- Autonomous switch to protection is in progress
- Manual switch to protection is active
- Attempt to exceed 90 tape backups of the database
- Fan filter replacement alarm for fan assemblies ED-2C816-30-30,G1 or ED-2C906-30-30 (every 91 days)
- Incoming DS1, DS3, STS-1, or VT1.5 signal failures (when attributes are set to MN)

Isolating Failures

The DACS IV-2000 system provides a feature that allows you to communicate with Bell Communications Research's (Bellcore) Operations Systems/Intelligent Network Elements (OPS/INE), and Network Monitoring and Analysis (NMA) operating systems. With this feature, isolating failures can be done at a remote maintenance center by communicating with the DACS IV-2000 system, normally through a 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 craft interface terminal) at the frame. In the case of most equipment failures, maintenance must be performed at the frame.

Prioritizing Alarms

This procedure is used to isolate and prioritize 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 7-20), if necessary.)

1. Check to see if the main controller failure alarm indicator (FAILURE LED on the frame or remote main controller alarm indicator) is active.

   If the main controller failure alarm indicator is active and remains active for ten minutes, service at the frame to clear the equipment failures is necessary. 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 fuses in the redundant controller power module. Use the section titled "Fuses in Redundant Controller Power Module" (page 12-79). Replacement fuses may be necessary (see fuse chart in the referenced procedure information).

   b. Check for and/or replace failed redundant controller power circuit pack(s) (PWRF and PWRG). Use the section titled "Multiple Power Circuit Pack Failures in Redundant Controller Power Module" (page 12-77). Replacement PWRF and PWRG circuit packs may be necessary (two of each).

   c. Check for and/or replace failed redundant controller circuit packs. Use the section titled "Redundant Controller Failure" (page 12-90). Replacement redundant controller circuit packs may be necessary (2 CPU2, 2 SSC2, 2 MTC3, 2 ECI3 or ECI4, 2 SCI2, and 1 UI circuit packs).

2. If you are logged in already, continue with the next step; otherwise, log into the DACS IV-2000 system. Refer to the logging in procedures in Chapter 4, if necessary.

   If you can not log into the DACS IV-2000 system, refer to the section titled "Link Communication Failures" (page 12-29).

3. Verify that the alarm is on the DACS IV-2000 system by entering the following command:

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

   Where:

   a = Target ID of frame with alarm(s)

   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 or facility 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 the next step.

   If the message does not contain a notification code (CR, MJ, or MN), there are no pending alarms for the specified DACS IV-2000 system. If this is the case, do not continue with this procedure for the specified system (Target ID).

4. Restore the main controller to service 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 30 minutes to complete. For more information on booting the system refer to the section titled "Reset and Boot" (page 6-8).

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)

   - To determine all far-end alarms associated with remote multiplexers connected to MUX2 circuit packs:

     Far-end alarms:

     `RTRV-ALM-EQPT:`*[a]*`:`*b*`:::,,,FEND;`
     `RTRV-ALM-T1:`*[a]*`:`*b*`:::,,,FEND;`
     `RTRV-ALM-T2:`*[a]*`:UNIT-1&&-32;`
     `RTRV-ALM-T3:`*[a]*`:UNIT-1&&-32:::,,,FEND;`

     Where:

     a = Target ID (optional)

     b = MUX2 circuit pack location: `MUX-{1-32}-{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;`

   Where:

   a = Target ID (optional)

   b = T1 with FEND specified location: `MUX-{1-32}-{1-31}`
   T1 with NEND (default) specified location: `{ UNIT-{1-32}, SWIF-{1-32}-{1-8} }`
   T2 and T3 location: `{ UNIT-{1-32}, {1-32}-{1-31} }`
   EC1 location: `{ UNIT-{1-32}, {1-32}-{1-15} }`
   VT1 location: `{ UNIT-{1-32}, {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15} }`

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 12-3 to determine which alarm must be cleared first. Table 12-3 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 and 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 are more than one major, service-affecting alarms associated with ports, pick any one of them to clear first.

Table 12-3. 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	SA	port	4th
MN	SA	port	5th
MJ	NSA	equipment	6th
MN	NSA	equipment	7th
MJ	NSA	port	8th
MN	NSA	port	9th

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 12-4 for near-end equipment failures (**RTRV-ALM-ALL** command), Table 12-5 for far-end equipment failures (**RTRV-ALM-EQPT** command), Table 12-6 for near- and far-end T1 facility failures (**RTRV-ALM-ALL** [near-end] and **RTRV-ALM-T1** [far-end] commands), Table 12-7 for near- and far-end T2 facility failure (**RTRV-ALM-ALL** [near-end] and **RTRV-ALM-T2** [far-end] commands), Table 12-8 for near- and far-end T3 facility failure (**RTRV-ALM-ALL** [near-end] and **RTRV-ALM-T3** [far-end] commands), Table 12-9 for near-end EC1 facility failure (**RTRV-ALM-ALL** or **RTRV-ALM-EC1** command), or Table 12-10 for near-end VT1 facility failure (**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 the previous step.
10. If there are multiple alarms return to Step 8 to determine the next alarm to clear.

Table 12-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
BKUPMEMO (Tape exceeds 90 backup cycles)	SEC	"Synchronizer Module Failure" (page 12-35)	X	
CONTBUS (control bus failure)	SWCS SWIO	"Clearing CONTBUS Conditions" (page 12-105)	X	
DTLCH (data latch error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
EOR (end-of-range error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
EXJIT (excessive jitter)	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
EXPHR (excessive phase error)	DPLL	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
EXTERR (error detected external to system)	ECI-1/ECI-2	"Link Communication Protocol Failures (OOS-PRTCL)" (page 12-31)	X	X
FRQOF (frequency offset error)	SYNCPRI SYNCSEC TB (TBS31) TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
FSNLN (frequency synthesizer loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
FSTO (phase lock loop fast start time-out)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)		

Table continued on next page.

Table 12-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
ICTLR (interrupt controller error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
IHRER (interrupt holding register error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
IMPROPBLK (blank BXA circuit pack in wrong slot)	DS1IF DS1IP SWIF SWIF-P (protection) MUX MUXP SMUX SMUXP	"Clearing IMPROPBLK Conditions" (page 12-52)	X	X
IMPROPRMVL (circuit pack improperly extracted)	CLKDR CLKGN DS1IF DS1IP DS1RY MUX MUXP MUXPS MC circuit packs PWRA PWRE SMUX SMUXP SWCS SWIF SWIF-P (protection) SWIO	"Clearing IMPROPRMVL Conditions" (page 12-53)	X	
INHSWPR (switch to protection equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWPR Conditions" (page 12-55)	X	X

Table continued on next page.

Table 12-4. **Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)**

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
INHSWWKG (switch to working equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWWKG Conditions" (page 12-55)	X	X
INT (internal hardware failure)	PWRA PWRE	"Primary Fuses" (page 12-67) for blown primary fuses and/or "Power Circuit Pack Failure" (page 12-73) for failed circuit packs	X	
	PWRF PWRG	"Redundant Controller Power Circuit Pack Fuses" (page 12-81) for circuit pack fuses and/or "Power Circuit Pack Failure" (page 12-73) for failed circuit packs	X	
	MC CC-0/CC-1 CPU-0/CPU-1 ECI-1/ECI-2 MTC-0/MTC-1 PRI-1/PRI-2 SCI-1/SCI-2 SSC-0/SSC-1 UI	Critical or Major alarms: "Fuses in Redundant Controller Power Module" (page 12-79) for blown circuit pack fuses, "Power Circuit Pack Failure" (page 12-73) for failed redundant controller power circuit packs and/or "Redundant Controller Failure" (page 12-90) for circuit pack failure	X	
		Minor Alarms: "Minor Alarms Due to Redundant Controller Failure" (page 12-114)	X	

Table continued on next page.

Table 12-4. 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 Redundant Controller Failure" (page 12-114) for blown fuses and/or "CPY-MEM Command Failure" (page 13-8) in Chapter 13 for other alarm conditions	X	
	DPLL TB (TBS31) TXPT (DS1TX)	Critical alarm: "Critical Alarm Caused by Synchronizer Module Failure" (page 12-36) Major or Minor alarms: "Synchronizer Module Failure" (page 12-35)	X	
	UC	"Primary Fuses" (page 12-67) for interface bay power circuit packs, "Power Circuit Pack Failure" (page 12-73) for interface bay power circuit packs, and/or "Unit Controller Failure" (page 12-96) for unit controller circuit pack failure	X	X
	CLKDR DS1IF MUX SMUX SWIF	"Primary Fuses" (page 12-67) for blown interface bay power circuit pack fuses, "Power Circuit Pack Failure" (page 12-73) for failed interface bay power circuit packs, and/or "Interface and Switch Module Circuit Pack Failures" (page 12-97) for failed interface module circuit packs	X	

Table continued on next page.

Table 12-4. **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]	CLKGN SWCS SWIO	"Primary Fuses" (page 12-67) for blown power circuit pack fuses in the switch bay, "Power Circuit Pack Failure" (page 12-73) for failed switch module power circuit packs, Secondary Fuses in Switch Power Module for blown switch module circuit pack fuses, and/or "Interface and Switch Module Circuit Pack Failures" (page 12-97) for failed switch module circuit packs	X	
	DS1IP DS1RY MUXP MUXPS SMUXP SWIF-P (protection)	"Primary Fuses" (page 12-67) for blown interface bay power circuit pack fuses, "Power Circuit Pack Failure" (page 12-73) for failed interface bay power circuit packs, and/or "Protection Circuit Pack Failures" (page 12-108) for failed protection switch circuit packs	X	
	DS3PM MUX (PMGR) SWIF (PMGR)	"PMGR1 and DS3PM Circuit Pack Failures" (page 12-118)	X	
	FAN	"Fan Assembly Failure" (page 12-110)	X	
LERDF (line error detector failure)	TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X

Table continued on next page.

Table 12-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
LOS (loss of signal)	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
MAN (manual removal of equipment)	CC-0/CC-1 DPLL DS3PM MC PRI SEC TB (TBS31) TXPT (DS1TX) UC	"Clearing MAN Conditions" (page 12-52)	X	X
OOF (out of frame)	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
PFLCH (phase/frequency readable output latch error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
PHSTP (phase step error)	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
PSHLN (phase shifter output loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
RAMER (RAM error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
ROMER (ROM error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
RTV (real-time violation)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	

Table continued on next page.

Table 12-4. 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)	SWCS SWIO	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 12-106)	X	
SYNCCLK1 (Clock side 1 hardware failure)	SWCS SWIO	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 12-106)	X	
SYNCFRNG (synchronizer has made a transition into free-running mode)	SYNCN	"Synchronizer Mode Alarm Conditions" (page 12-50)	X	X
SYNCFST (synchronizer has made a transition into fast-start mode)	SYNCN	"Synchronizer Mode Alarm Conditions" (page 12-50)	X	X
SYNCHLDOVR (synchronizer has made a transition into holdover mode)	SYNCN	"Synchronizer Mode Alarm Conditions" (page 12-50)	X	X
SYNCPRI (synchronizer has detected failure and isolated it to the primary timing reference)	SYNCN	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
SYNCPRI (synchronizer has detected failure and isolated it to the secondary timing reference)	SYNCN	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
SYPLN (sync pulse generator loss of energy	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	

Table continued on next page.

Table 12-4. Procedures for Near-End Equipment Condition (RTRV-ALM-ALL) (Continued)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
TBCOLD (time base oven cold)	TB (TBS31)	"TBS31 Circuit Pack Failure" (page 12-44)	X	X
TBIOER (time base communication error)	TB (TBS31)	"TBS31 Circuit Pack Failure" (page 12-44)	X	
TBLEN (time base strobe loss of energy)	DPLL TB (TBS31) TXPT (DS1TX)	"Synchronizer Module Failure" (page 12-35)	X	
TBNDF (time base strobe energy detector failure)	TXPT (DS1TX)	"Synchronizer Mode Alarm Conditions" (page 12-50)	X	
TODC (time-of-day clock failure)	ECI-1/ECI-2	"Time of Day Clock Failure" (page 12-121)	X	X
TRBER (high bit error rate > 10^{-3})	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
TRMNBER (minor bit error rate > 10^{-6})	SYNCPRI SYNCSEC TXPT (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-113)	X	X
URTER (UART error)	DPLL	"DPLL Circuit Pack Failure" (page 12-38)	X	
X1LEN (loss of energy on 1 ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	
X3LEN (loss of energy on 30 ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	

Table continued on next page.

Table 12-4. 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 12-40)	X	
XCRTV (synchronizer cross-couple real-time violation error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	
XCSUM (synchronizer cross-couple summary error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	
XFLRG (synchronizer cross-couple fast lock range error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	
XFQOF (synchronizer cross-couple frequency offset error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	
XLKDN (synchronizer cross-couple communication link error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-40)	X	

Table 12-5. Procedures for Far-End Equipment Condition (RTRV-ALM-EQPT)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
ACPWR (AC power failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-66)	X	X
COM (common equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-66)	X	X
DS1IF (DS1 interface equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-66)	X	X
MUX (multiplex equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-66)	X	X

Table 12-6. 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) LSSIG (loss of signal)	NEND	"Clearing LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-57)	X	X
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 12-57)	X	X

Table continued on next page.

Table 12-6. 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
INC (incoming DS1 failure) MINC (multiple incoming DS1 failures)	FEND	"Remote Multiplexer Signal Failure" (page 12-66)	X	X
T+BER (bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-56)	X	X

Table 12-7. 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 12-66)	X	X
OOF (out of frame)	NEND	"Clearing LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-57)	X	X

Table 12-8. 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
LSSIG (loss of signal) OOF (out of frame)	NEND	"Clearing LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-57)	X	X

Table continued on next page.

Table 12-8. 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) AISFRAMED (framed alarm indication signal detected) AISUNFRAMED (unframed alarm indication signal detected) 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 12-57)	X	X
T+BER (bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-56)	X	X
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 12-66)	X	X

Table 12-9. **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 12-57)	X	X
LOF (loss of frame) LOP (loss of pointer LOS (loss of signal) SLMF (signal label match failure)	NEND	"Clearing LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-57)	X	X
T+BERL (line bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-56)	X	X

Table 12-10. 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 12-57)	X	X
LOP (loss of pointer)	NEND	"Clearing LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-57)	X	X

Alarm Clearing Procedures

This section contains alarm clearing procedures reference in the previous section titled "Prioritizing Alarms" (page 12-10). 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 system can be lost due to equipment failure (fuses [including those associated with CILINKs], power supplies, and redundant controller circuit packs), X.25 PAD network failures, terminal/CILINK parameter mismatch, or communication protocol errors. 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 **LGN-USER** command is not accepted) and the main controller failure alarm indicator is inactive (no indication on the remote main controller alarm for remote locations or the red FAILURE LED on the status panel is not lit at the frame), use the procedures in this section to clear the trouble.

NOTE:
Links can appear 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 lockout interval has elapsed. Information regarding security link parameters can be retrieved using the **RTRV-SECU-LINK** command on a link that is not locked-out. Security link parameters can only be change by superusers with the **ED-SECU-LINK** command. Refer to the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) for more information on security link parameters and superusers.

If the main controller failure alarm is active (an indication on the remote main controller alarm for remote locations or the red FAILURE LED on the status panel is lit at the frame) refer to the section titled "Prioritizing Alarms" (page 12-10). If after performing all the procedures in this section you still can not log in, consult with your system administrator or next level of support for assistance.

Fuses Associated with CILINKs

There are four 1 amp fuses associated with the CILINKs: two on FBF and two on FBG. Each pair of fuses is for ECI-1 and ECI-2, respectively. Failure of these fuses can cause loss of communications with the CILINKs. Perform the following procedure to replace blown fuses associated with CILINKs.

If there are alarms associated with ECI circuit packs (for example, blown 5 amp ECI fuses), clear those alarms first before using this procedure [refer to the section titled "Prioritizing Alarms" (page 12-10)].

1. Check for and replace all blown CILINK fuses (1 amp ECI 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.

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 system as described in the section titled "Adding a Printer" (page 7-20). 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 7-20), 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 system 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.
2. If you are using a 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 12-34).
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)

      From the message that is returned, note the values of the first two parameters (LOC and STATE) 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}-{1-6}`

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}-{1-6}`

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:

   `LGT-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}-{1-6}`

   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}-{1-6}`

   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}-{1-6}**

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}-{1-6}**

If the link state 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 by your system administrator or a previous procedure. This procedure is performed only if communications has been lost to all CILINKs and can not 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 a X.25 PAD network, contact personnel responsible for the X.25 PAD network to verify it is working properly.
3. Make sure the 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 7-18), 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 6-8).

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, OOF, PHSTP,SYNCPRI, SYNCSEC, TRBER, and TRMNBER), go to the section titled "External Timing Reference (BITS) Failure" (page 12-113).

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 12-36).
2. Check for blown SYNCF and SYNCG fuses in fuse board FBI. If either fuse is blown, replace it (if both are blown replace one at a time).
3. If you replaces 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 1 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 12-38) — 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 12-40) — for alarm conditions, X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, and XLKDN.
   - "TBS31 Circuit Pack Failure" (page 12-44) — for alarm conditions, INT (with equipment location of TB), TBCOLD, and TBIOER
   - "Synchronizer Mode Alarm Conditions" (page 12-50) — for alarm conditions (associated with the equipment location TXPT), INT and TBNDF.
   - "Synchronizer Mode Alarm Conditions" (page 12-50) — for alarm conditions, SYNCFRNG, SYNCFST, and SYNCHLDOVR.
   - "Prioritizing Alarms" (page 12-10) — 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 12-35).

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 causes loss of system timing and synchronization that impacts all cross-connections on the frame.

2. Check for blown SYNCF and SYNCG fuses in fuse board FBI. If either fuse is blown, replace it (if both are blown replace one at a time).
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, TXPT-0-1&-2, TXPT-1&-2** }

   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}, TXPT-{0,1}-{1,2} }

   f = State: { OOS-FLT, OOS-FEF, IS }

4. Remove both synchronizer sides from service by entering the following command for each side:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: **SYNC-{0,1}**

5. Obtain necessary Synchronizer Module circuit packs for all circuit packs indicating an OOS-FLT state in Step 3.

6. Replace one at a time the failed circuit packs with new ones. Refer to Chapter to for replacing circuit packs if necessary.

   After extracting a circuit pack attach alarm report.

7. If both TBS31 circuit packs were replaced in Step 6, wait 30 minutes for both TBS31 circuit packs to temperature stabilize before continuing this procedure. If only one TBS31 circuit pack was replaced in Step 6, continue with the next step after noting the time so that 30 minutes can pass before restoring the failed TBS31 circuit pack. If no TBS31 circuit packs were replaced in Step 6, continue with the next step.

8. Restore the synchronizer side associated with the TBS31 circuit pack that has temperature stabilized (side 0 if both have stabilized) 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 1 minute to complete.

   After completion the CLKGN circuit packs exit the OOS-FEF state and enter the ACT/STBY state and timing is restored to the DACS IV-2000 system.

9. Restore the other synchronizer side (waiting a 30 minute period for the TBS31 circuit pack to temperature stabilized, if necessary) 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 1 minute to complete.

DPLL Circuit Pack Failure

This procedure is used to clear major and minor alarms associated with DPLL circuit packs that are caused by the alarm conditions: DTLCH, EOR, 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 12-36). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-35).

1. Determine which DPLL circuit packs is in the 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 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, ACT }

2. 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}**

3. Obtain a new DPLL circuit pack.
4. Extract the failed DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
5. Install the new DPLL circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

6. Restore the synchronizer side removed in Step 2 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 1 minute to complete.

7. Retrieve the state of the DPLL circuit pack associated with the synchronizer side restored in Step 6 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 packs 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 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 12-36). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-35).

1. Determine which DPLL circuit packs 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. Remove the standby synchronizer side (STBY or 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}

3. Obtain a new DPLL circuit pack.
4. Extract the standby DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and mark for later reference.
5. Install the new DPLL circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

6. Restore the synchronizer side removed in Step 2 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 1 minute to complete.

7. Retrieve the alarm state of the DPLL circuit pack installed in Step 5 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 following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   the cross-couple alarm has cleared. Attach the alarm report to the DPLL circuit pack extracted in Step 4 and you are done with this procedure.

   If 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*/
   "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, continue with the next step. Otherwise, attach the original alarm report to the DPLL circuit pack extracted in Step 4 and go to the section titled "Prioritizing Alarms" (page 12-10) to clear the remaining alarms.

8. Force the synchronizer side associated with the DPLL circuit pack installed in Step 5 into service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: **SYNC-{0,1}**

   This command takes up to 1 minute to complete.

9. Remove the synchronizer side **not** specified in Step 8 from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: **SYNC-{0,1}**

10. Obtain the DPLL circuit pack extracted in Step 4.

11. Extract the DPLL circuit pack associated with the synchronizer side removed in Step 9 (referring to Chapter 2 for extracting circuit packs, if necessary).

12. Install the DPLL circuit pack obtained in Step 10 (referring to Chapter 2 for installing circuit packs, if necessary).

13. Restore the synchronizer side removed in Step 9 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 1 minute to complete.

14. Retrieve the alarm state of the DPLL circuit pack installed in Step 12 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 following output response appears:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
;
```

    the cross-couple alarm has cleared. Attach the original alarm report to the DPLL circuit pack extracted in Step 11 and you are done with this procedure.

    If 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*/
    "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 trouble. Otherwise, attach the original alarm report to the DPLL circuit pack extracted in Step 11 and go to the section titled "Prioritizing Alarms" (page 12-10) to clear the remaining alarms.

TBS31 Circuit Pack Failure

This procedure is used to clear major and minor alarms associated with TBS31 circuit packs that are caused by the alarm conditions: INT, TBCOLD, 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 12-36). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-35).

1. If the condition that caused the alarm is not TBCOLD, go to Step 2. Otherwise, remove the synchronizer side associated with the TBS31 circuit pack that is indicating the TBCOLD condition from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b =

   c = Synchronizer side location: **SYNC-{0,1}**

   After this command completes go to Step 7.

2. Determine which TBS31 circuit packs is in the OOS-FLT 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 TBS31 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, ACT }

3. Remove the synchronizer side associated with the failed TBS31 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}**

4. Obtain a new TBS31 circuit pack.
5. Extract the failed TBS31 circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
6. Install the new TBS31 circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).
7. Let the TBS31 circuit pack temperature stabilize for 30 minutes before continuing with this procedure.
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 1 minute to complete.

9. Retrieve the state of the TBS31 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 = TBS31 circuit pack location: **TB-{0,1}**

   From the following output response, determine the state of the new TBS31 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 TBS31 circuit pack is STBY, you are done with this procedure. If the state of the new TBS31 circuit packs is OOS-FLT, continue with the next step.

10. Remove the synchronizer side associated with the failed TBS31 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}**

11. Let the TBS31 circuit pack temperature stabilize for an additional 15 minutes before continuing this procedure.

12. Restore the synchronizer side removed in Step 10 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 1 minute to complete.

13. Retrieve the state of the TBS31 circuit pack of the synchronizer side restored in Step 12 by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = TBS31 circuit pack location: **TB-{0,1}**

    From the following output response, determine the state of the new TBS31 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 TBS31 circuit pack is STBY, you are done with this procedure. If the state of the new TBS31 circuit packs is OOS-FLT, contact your system administrator or next level of support for assistance in clearing the trouble.

DS1TX Circuit Pack Failure

This procedure is used to clear minor alarms associated with DS1TX circuit packs (indicated by TXPT as the equipment location) that are caused by the alarm conditions: INT and 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 12-36) earlier in this chapter. If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-35).

1. Determine which TXPT ports are in the OOS-FLT state by entering the following command for each port:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: **TXPT-{0,1}-{1,2}**

   From the following output response, determine which TXPT 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: TXPT-{0,1}-{1,2}

   f = State: { OOS-FLT, ACT }

2. 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, 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 }

3. If only TXPT ports that are in the OOS-FLT state are associated with the active synchronizer side, go to Step 8. Otherwise, If both DS1TX circuit packs indicate an OOS-FLT state associated with a TXPT port or If only TXPT ports that are in the OOS-FLT state are associated with the standby synchronizer side, remove the TXPT ports associated with the standby synchronizer side from service by entering the following command for each port:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port locations: **TXPT-{0,1}-{1,2}**

4. Obtain a new DS1TX circuit pack.

5. Extract the DS1TX circuit pack removed in Step 3 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

6. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

7. Restore the TXPT ports removed in Step 3 by entering the following command for each port:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: **TXPT-{0,1}-{1,2}**

   This command takes up to 1 minute to complete.

   If alarm remains that is associated with the DS1TX circuit packs installed in Step 6, contact your system administrator or next level of support for assistance in clearing the trouble.

   If only TXPT ports associated with the standby synchronizer side were in the OOS-FLT state, you are done with this procedure. Otherwise continue with the next step.

8. Perform a manual synchronizer side switch by referring to the section titled "Manual Synchronizer Side Switch" (page 6-15).

9. Remove the TXPT ports 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 locations: **TXPT-{0,1}-{1,2}**

10. Obtain a new DS1TX circuit pack.
11. Extract the DS1TX circuit pack removed in Step 9 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
12. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).
13. Restore the TXPT ports removed in Step 9 by entering the following command for each port:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TXPT-{0,1}-{1,2}`

    This command takes up to 1 minute to complete.

    If alarm remains that is associated with the DS1TX circuit packs installed in Step 12, 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 6-15) 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 12-10).

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]*:*b*;

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: **SYNC-{0,1}**

   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*/
      "h:...,j,..."
   ;
   ```

   Where:

   h = Synchronizer side location: SYNC-{0,1}

   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 exist 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 5-17)], wait for the Synchronizer Module to phase-lock onto the BITS timing source, or clear BITS failures ["External Timing Reference (BITS) Failure" (page 12-113)].

Clearing BKUPMEMO Conditions

The condition type BKUPMEMO occurs when a database backup (manual or automatic) is requested and the tape in the tape drive has been used for 90 backups. To clear this condition, use the following procedure.

1. Obtain a Release 3.0 formatted and initialized tape (tape cartridge J9878650-4, List 3).
2. Replace the tape in the tape drive (power down tape drive, replace tape, and power up tape drive). Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary.
3. Check the tape cycle count of the new tape by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

   This command takes up to 2 minutes to complete and responses with the following:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMORY_TYPE,ID_BLOCK,SYSTEM_TYPE,SYSTEM_RELEASE,TID,DATE, TIME,COUNT */
   "c,d,e,f,g,h,i,j"
;
```

   If the tape cycle count (COUNT) parameter (j) is 90 or greater, the tape has been used its allotted times and needs replacement (redo this procedure from Step 1).

4. Reenter the command that caused the BKUPMEMO condition. If an automatic database backup caused the BKUPMEMO condition, perform a manual backup by referring to the section titled "Backing Up Database to Tape" (page 6-22).

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)

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-{1-32}, DPLL-{0,1}, TB-{0,1}, TXPT-{0,1}-{1,2}, DS3PM-{1-32} }**

   This command takes up to 5 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 fails that is associated with a BXA in a protection slot.

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 appropriated DS1IF, SWIF, SWIF2, MUX1, MUX2, 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 5-83) for DS1IF, "Deprovisioning SWIF Circuit Packs" (page 5-85) for SWIF, or "Deprovisioning MUX or SMUX Circuit Packs" (page 5-87) 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)

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. 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-{1-32}, SWIO-{1-32}, CLKDR-{1-32}-{1-4}, MUX-{1-32}-{1-31}, MUXP-{1-32}, SMUX-{1-32}-{1-15}, SMUXP-{1-32}, MUXPS-{1-32}, SWIF-{1-32}-{1-8,P}, DS1IF-{1-32}-{1A-8B}, DS1IP-{1-32}-{PA,PB}, DS1RY-{1-32}-{1-4} }**

The output response of the **RTRV-EQPT** command is as follows (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-{1-32}, SWIO-{1-32}, CLKDR-{1-32}-{1-4}, MUX-{1-32}-{1-31}, MUXP-{1-32}, SMUX-{1-32}-{1-15}, SMUXP-{1-32}, MUXPS-{1-32}, SWIF-{1-32}-{1-8,P}, DS1IF-{1-32}-{1A-8B}, DS1IP-{1-32}-{PA,PB}, DS1RY-{1-32}-{1-4} }

f = Provisioned code name (circuit pack code): { AWR2C, AWR4, AWR5, AWR6, AWR7, AWR10, AWS1, AWS1B, AKM46, AKM47, AKM49, AKM50, AKM52, AKM55, AKM59, AKM59B, AKM66, AKM68, AKM70, AMK84, AKM85, AWR11, AWP9, AWS3, AWS5 }

h = Provisioned line build-out (MUX or SMUX circuit packs only): { OUT, IN }

j = Provisioned equalizer (DS1IF circuit packs only): { 20, 40, 60, 80, 100 }

4. 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 5-33) to set the EQL to the value identified by parameter *j* in Step 3.
6. If the circuit pack to be installed is a MUX or SMUX circuit packs, refer to the section titled "Setting Line Build Out (LBO)" (page 5-23) to set the LBO to the value identified by parameter *h* in Step 3.
7. Install the new circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

Clearing INHSWPR Conditions

The condition type INHSWPR occurs when a 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 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-{1-32}-{1-8}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, SWCS-{1-31}, SWIO-{1-32} }**

Clearing INHSWWKG Conditions

The condition type INHSWWKG occurs when a interface (SWIF, MUX, or SMUX) or switch (SWCS or SWIO) circuit pack is inhibited from switching to working because:

- The interface or switch circuit pack is autonomously switched to protection and locked (exceeding the auto-lock 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 working by the **INH-SW-EQPT** command. To clear this condition, perform the following procedure.

1. Determine 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-{1-32}-{1-8}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, SWCS-{1-31}, SWIO-{1-32} }**

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 and Switch Module Circuit Pack Failures" (page 12-97) 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 system 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 system 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 system. 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 system from other equipment to indicate an error condition that occurred downstream (that is, the incoming signal is good but, somewhere upstream a failure occurred). When the DACS IV-2000 system 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 LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions

Depending on the type of facility indicating the alarm condition, the typical causes are:

- T1 facilities — the condition types LOF and LSSIG occur when there is a problem with line coding and/or framing type provisioning, the incoming signal, or with the cable connected to the frame.
- T2 and T3 facilities — the condition types LSSIG and OOF occur when there is a problem with the signal format provisioning, the incoming signal, or with the cable connected to the frame.
- EC-1 facilities — the condition types LOF, LOP, and LOS occur when there is a problem with the port provisioning, 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 (for example, the port is provisioned as an STS-1 signal when a DS1 signal is needed).
- VT1.5 facilities — the condition type LOP occurs when there is a problem with the port provisioning, 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 system 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 75 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 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: `{1-32}-{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:T1:<BER=h, ISTAT=k, FMT=l, OMODE=s,
      LINECDE=u, FENDNTE=w>"
;
```

   Where:

   e = DS1 port location: `{1-32}-{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 `DRVN` or `NDRVN` 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 }`

T3 Facilities:

`RTRV-T3:[a]:b;`

Where:

a = Target ID (optional)

b = DS3 port location: `{1-32}-{1-31}`

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: `{1-32}-{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 }`

EC-1 Facilities:

RTRV-EC1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = EC-1 port location: **{1-32}-{1-15}**

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: {1-32}-{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

VT1.5 Facilities:

RTRV-VT1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = VT1.5 port location: **{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }**

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: {1-32}-{1-15}-{1-28}

k = 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.

s = 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 port: **{1-32}-{1-15}**
VT1.5 port: **{1-32}-{1-15}-{1-28}**

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: {1-32}-{1-15}
VT1.5 port: {1-32}-{1-15}-{1-28}

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.

4. For ports associated with SMUX circuit packs, if the retrieve port configuration information does not match the configuration of the equipment connected to the SMUX circuit pack, change the configuration by entering the following command:

ED-PORT:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Port location:
EC-1 port: {1-32}-{1-15}
VT1.5 port: {1-32}-{1-15}-{1-28}

d = EC-1 port format: { **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).

d = VT1.5 port format: { **UNSPEC, ASYN, BIT, BYTE, NOVAL** }
Initial system value: **ASYN**
The Active Signal Types becomes **VT1** (indicating an VT1.5 signal) if **UNSPEC**, **BIT**, or **BYTE** is specified or **T1** (indicating an DS1 signal) if **ASYN** is specified.

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: {1-32}-{1-31}-{1-28}

   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: {1-32}-{1-31}

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: {1-32}-{1-15}

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 location: { {1-32}-{1-15}-{1-28},
VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }

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.

Remote Multiplexer Signal Failure

Conditions associated with far end remote multiplexers (**RTRV-ALM-T1**, **RTRV-ALM-T2**, and **RTRV-ALM-T3** 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 system 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 port indicating the alarm condition by entering the following command:
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:

   If the alarm condition clears, you are done with this procedure. Otherwise, continue with the next step.
4. Contact the system administrator of the remote multiplexer of the condition encountered, so that trouble can be resolved.

Primary Fuses

Primary fuses are located at the top of switch bay. These fuses are arranged as shown in Figure 12-1. Use this procedure only if a red bus alarm LED on the alarm and fuse panel is lit. There are nine bus alarm LEDs in the alarm and fuse panel (these alarms are shaded in Figure 12-1).

1. Check to see if there are any bus alarm LEDs lit.

   If there are any bus alarm LEDs lit, continue with this procedure.

   If there are no bus alarm LEDs lit and you are clearing a switch module alarm, go to the section titled "Secondary Fuses in Switch Power Module" (page 12-69); otherwise, go to the section titled "Power Circuit Pack Failure" (page 12-73).

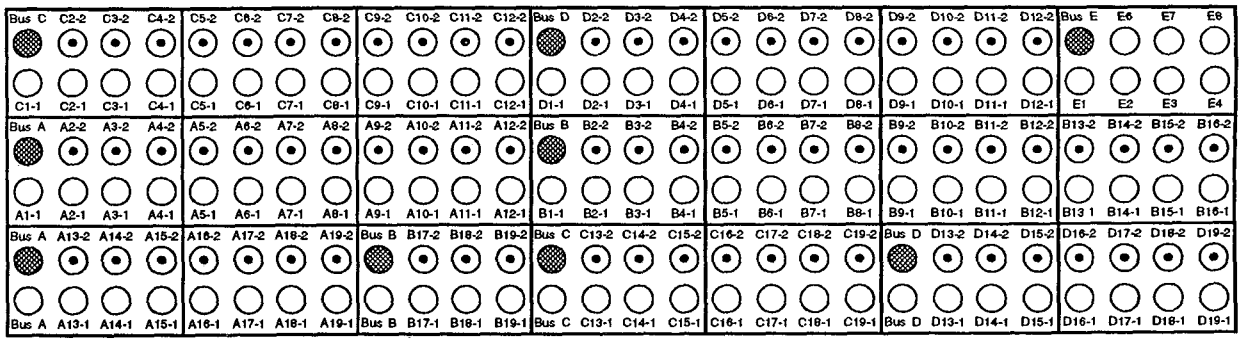
2. Locate the blown primary fuses (stem of indicator fuse is extended from its base), if more than one, select one at a time.

3. For the primary fuse selected in Step 2, replace the load fuse (identified by the *-1* after the location number) first, then the indicator fuse identified by the *-2*).

4. If the replaced fuse:

   - Blows again, continue with the next step.
   - Does not blow again and there are other blown fuse indicators lit, go to Step 2; otherwise go to Step 8.

5. Obtain a new power circuit pack associated with the blown fuse in Step 4, and replace the failed one (refer to Chapter 2 for extracting and installing circuit packs, if necessary). Refer to Figure 12-1 and Tables 12-11 and 12-12 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 12-1. **Main Fuse Panel (on Alarm and Fuse Panel)**

Table 12-11. Fuse Chart for Switch Bay (Bay 5 Excluding Fan Assembly)

Auxiliary Power PWRA		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.

Table 12-12. Fuse Chart for Interface Bays

Shelf	PWR Circuit Pack	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
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 (labeled with *-1*) are 10 A and all indicator fuses (labeled with *-2*) are 0.5 A.

6. Replace blown fuses (load fuse first, then indicator fuse).
7. 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 blown fuse indicators lit, go to Step 2; otherwise do not continue with this procedure.
   - Do not blow, attach the alarm report to the failed circuit pack.

     If there are other blown fuse indicators lit, go to Step 2. Otherwise continue with the next step.
8. After all blown 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)

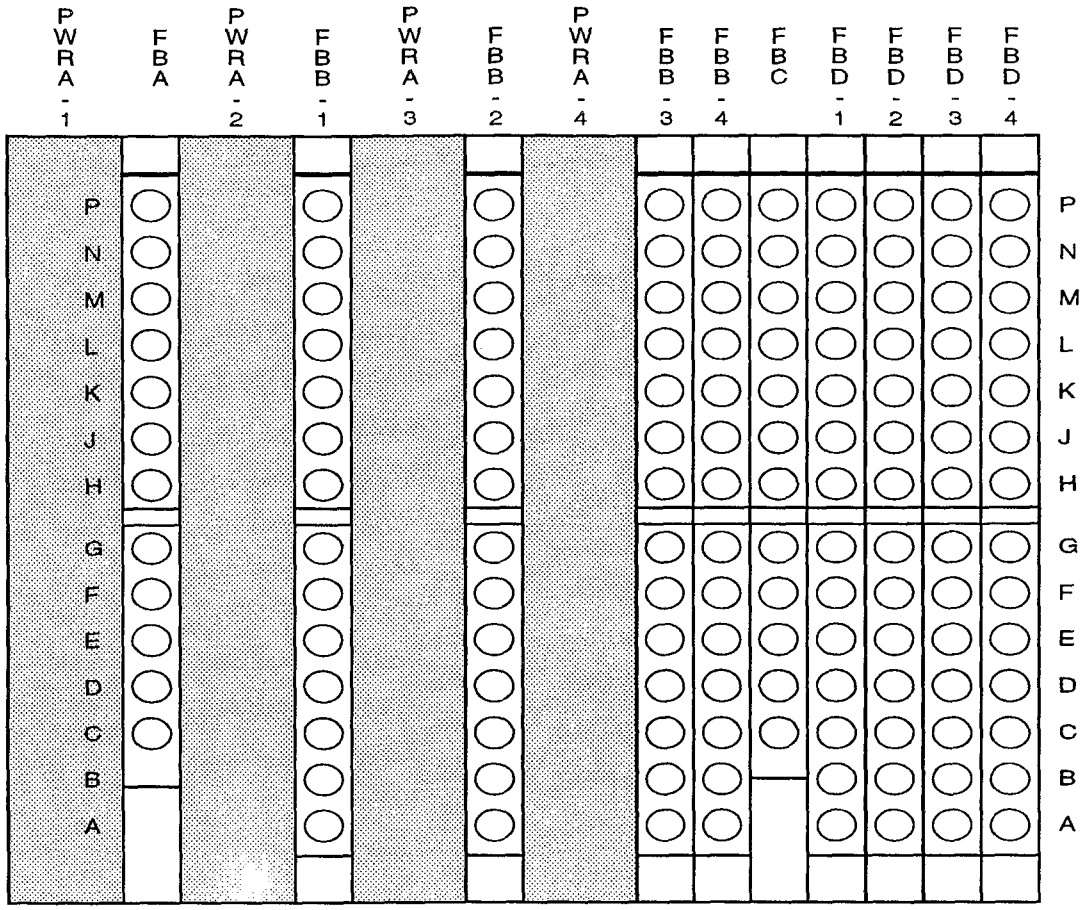
   b = Power circuit pack location: `{ PWRA-{1-4}, PWRE-{1-32}-{1,2}, PWRE2-SW-{1,2} }`

Secondary Fuses in Switch Power Module

This procedure is applicable for major and minor alarms associated with secondary fuses in the switch power 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.

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 module (FBA, FBB, FBC, and FBD).

   If there are no blown fuse indicators active, go to the section titled "Interface and Switch Module Circuit Pack Failures" (page 12-97). If there are indicators active, continue with the next step.
2. Locate the blown secondary fuses. (If more than one, select one at a time.)
3. Locate the circuit pack associated with the blown fuse selected in Step 2 by referring to Figure 12-2 and Table 12-13, and partially pull out the circuit pack from its slot.
4. Extract the blown fuse selected in Step 2. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
5. Replace the blown fuse.



Note: A blown fuse is indicated by a lit red LED.

Figure 12-2. **Secondary Fuses (FBA, FBB, FBC, and FBD)**

Table 12-13. Secondary Fuse Chart for System

Location	Type 77D (10 A) Fuse for +5 V Supply				
	FBA	FBB-1	FBB-2	FBB-3	FBB-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	NC
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	NC
M	SWIO-9	SWCS-7	SWCS-21	SWIO-19	SWIO-32
L	CLKGN-0	SWCS-6	SWCS-20	SWIO-18	SWIO-31
K	SWIO-8	SWCS-5	SWCS-19	SWIO-17	SWIO-30
J	SWIO-7	SWCS-4	SWCS-18	SWCS-32	SWIO-29
H	SWIO-6	SWCS-3	SWCS-17	SWCS-31	SWIO-28
G	SWIO-5	SWCS-2	SWCS-16	SWCS-30	SWIO-27
F	SWIO-4	SWCS-1	SWCS-15	SWCS-29	SWIO-26
E	SWIO-3	SWIO-16	SWCS-14	SWCS-28	SWIO-25
D	SWIO-2	SWIO-15	SWCS-13	SWCS-27	SWIO-24
C	SWIO-1	SWIO-14	SWCS-12	SWCS-26	SWIO-24
B	-	SWIO-13	SWCS-11	SWCS-25	SWIO-23
A	-	SWIO-12	SWCS-10	SWCS-24	SWIO-22
Location	Type 78J (7.5 A) Fuse for -5 V Supply				
	FBC	FBD-1	FBD-2	FBD-3	FBD-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	NC
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	NC
M	SWIO-9	SWCS-7	SWCS-21	SWIO-19	SWIO-32
L	CLKGN-0	SWCS-6	SWCS-20	SWIO-18	SWIO-31
K	SWIO-8	SWCS-5	SWCS-19	SWIO-17	SWIO-30
J	SWIO-7	SWCS-4	SWCS-18	SWCS-32	SWIO-29
H	SWIO-6	SWCS-3	SWCS-17	SWCS-31	SWIO-28
G	SWIO-5	SWCS-2	SWCS-16	SWCS-30	SWIO-27
F	SWIO-4	SWCS-1	SWCS-15	SWCS-29	SWIO-26
E	SWIO-3	SWIO-16	SWCS-14	SWCS-28	SWIO-25
D	SWIO-2	SWIO-15	SWCS-13	SWCS-27	SWIO-24
C	SWIO-1	SWIO-14	SWCS-12	SWCS-26	SWIO-24
B	-	SWIO-13	SWCS-11	SWCS-25	SWIO-23
A	-	SWIO-12	SWCS-10	SWCS-24	SWIO-22

NC Not Connected.

6. If the fuse:
   - Does not blow again, continue with Step 7.
   - 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 refer to your system administrator or your next level of support) and return to Step 2.
7. Insert the circuit pack that you pulled out in Step 3.
8. If the fuse:
   - Does not blow again and there are more blown secondary fuse indicators, return to Step 2; otherwise, continue with Step 9.
   - 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 refer to your system administrator or your next level of support) and return to Step 2.
9. 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-{1-32}, SWIO-{1-32} }

Power Circuit Pack Failure

This procedure is used if there is a power circuit pack failure indicator active.

1. Check to see if any bus alarm LED is lit on the alarm and fuse panel at the top of the switch bay. If there are bus alarm LEDs lit, refer to the section titled "Primary Fuses" (page 12-67) before performing this procedure.
2. For redundant controller power circuit pack (PWRF or PWRG) failure indicators, check fuse board FBI (redundant controller power module) for and blown fuse indicators. If there are blown fuse indicators active, refer to the section titled "Redundant Controller Power Circuit Pack Fuses" (page 12-81) before performing this procedure.
3. Check for lit red ALM LEDs on the power circuit packs in the module that contains the circuit pack indicating the alarm condition.

   If a red ALM LED is lit on only one power circuit pack within the module, use the next section titled "Single Power Circuit Pack Failure" (page 12-74). If there is more than one red ALM LED lit on power circuit packs within the module, use the section titled "Multiple Power Circuit Pack Failures" (page 12-75).

   If the red ALM LEDs are not lit on the power circuit packs go to the section indicated below:

   - "Redundant Controller Failure" (page 12-90) for redundant controller module circuit packs (CPU, MTC, SSC, ECI, SCI, UI, and PRI)
   - "Unit Controller Failure" (page 12-96) for unit controller circuit packs
   - "Interface and Switch Module Circuit Pack Failures" (page 12-97) for interface and switch module circuit packs (CLKGN, CLKDR, DS1IF, DS1IP, SWIF, MUX, SWCS, and SWIO)
   - "Protection Circuit Pack Failures" (page 12-108) for protection and protection switch circuit packs (DS1IP, SWIF-P [protection], DS1RY, MUXP, and MUXPS)

Single Power Circuit Pack Failure

This procedure is for single power circuit pack failure in the switch power module, redundant controller power module, or an interface 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 module (with the exception of one PWRF and one PWRG circuit pack failure in the redundant controller power module), refer to the next section titled "Multiple Power Circuit Pack Failures" (page 12-75).

⚠ CAUTION:
Never disengage or extract more than one power circuit pack at a time.

1. 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.

2. Locate and replace the power circuit pack indicating the alarm (LED lit) and mark the replaced circuit pack for later reference. Refer to Chapter 2 for extracting and installing circuit packs.

   The ALM LED should go off. If the ALM LED stays off, attach the alarm report to the failed circuit pack and you are done with this procedure. Otherwise, continue with the next step.

3. 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 — 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.
   - Redundant Controller 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 — if there is a blown fuse in the switch power module, go to the section titled "Secondary Fuses in Switch Power Module" (page 12-69). 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 module. Refer to the indicated section if one of the following conditions exist:

- In the redundant controller power module, the multiple failure consists of one of each of the PWRF and PWRG circuit packs refer to the previous section titled "Single Power Circuit Pack Failure" (page 12-74) for each failed power circuit pack.
- There is only a single power circuit pack failure within any module, refer to the previous section titled "Single Power Circuit Pack Failure" (page 12-74).

For the module containing the multiple power circuit pack failure refer to the section indicated:

- "Multiple Power Circuit Pack Failures in Interface Module" (page 12-75) for interface module power circuit packs.
- "Multiple Power Circuit Pack Failures in Switch Power or Auxiliary Power Module" (page 12-76) for switch and auxiliary power module power circuit packs.
- "Multiple Power Circuit Pack Failures in Redundant Controller Power Module" (page 12-77) for redundant controller power circuit packs.

Multiple Power Circuit Pack Failures in Interface Module

Perform this procedure to clear multiple power circuit pack failures within an interface module. If only one of the power circuit packs has a lit red ALM LED, go to the section titled "Single Power Circuit Pack Failure" (page 12-74).

CAUTION:
Never disengage or extract more than one power circuit pack at a time.

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 power circuit pack failure within an interface module.
2. Check to make sure that the latch on the power circuit packs 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 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 12-74). Otherwise, continue with this procedure.

3. Obtain new interface power circuit packs.
4. For each failed power circuit pack within an interface module do:
   a. Replace a power 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 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 before continuing.

      If the ALM LED is off, attach the alarm report to the failed 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-{1-32}`
   DS3PM circuit pack location: `DS3PM-{1-32}`

   This command takes up to 5 minutes to complete.
6. Check to see if there are any other red ALM LEDs lit on any of the interface power 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 12-96).

Multiple Power Circuit Pack Failures in Switch Power or Auxiliary Power Module

Perform this procedure to clear multiple power circuit pack failures within the Switch 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 12-74).

⚠ CAUTION:
Never disengage or extract more than one power circuit pack at a time.

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 power circuit pack failure within Switch and Auxiliary Power Modules.

2. Check to make sure that the latch on the power circuit packs 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 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 12-74). Otherwise, continue with this procedure.

3. Obtain new switch power or auxiliary power circuit packs.

4. Choose one of the power circuit pack with its 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 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.

6. Check to see if there are any other red ALM LEDs lit on any of the switch power or auxiliary power modules. If so, repeat this procedure from Step 3.

7. 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 switch power 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.

Multiple Power Circuit Pack Failures in Redundant Controller Power Module

Perform this procedure only if both PWRF and/or PWRG circuit packs are failed. If only one or one of each (one PWRF and one PWRG) circuit pack has its red ALM LED lit, refer to the section titled "Single Power Circuit Pack Failure" (page 12-74) for each failed power circuit pack(s).

CAUTION:
Never disengage or extract more than one power circuit pack at a time.

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 power circuit pack failure within the Redundant Controller Power Module.

2. Check to make sure that the latch on the power circuit packs 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 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 12-74). Otherwise, continue with this procedure.

3. Obtain new main controller power circuit packs.
4. Choose one of the power 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 there are any other red ALM LEDs lit on any of the redundant controller power circuit packs you haven't replaced. If there are, 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 redundant 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. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

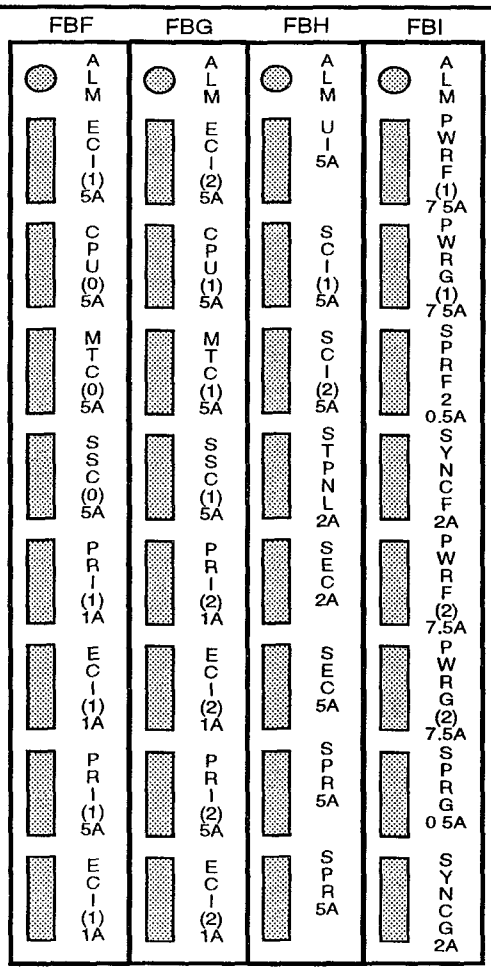
⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

Fuses in Redundant Controller 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 redundant controller power module. If there is only a minor alarm present and there is one or more red ALM LEDs lit on the fuse boards in the redundant controller power module, refer to the section titled, "Minor Alarms Due to Redundant Controller Failure" (page 12-114). Figure 12-3 shows the fuse boards associated with the redundant controller power module. Location of fuses are panel stamped on the DACS IV-2000 frame.

1. Locate the blown fuses in the redundant controller power module fuse boards.
2. For the circuit pack indicating the alarm, perform the appropriate procedure:
   - "Redundant Controller Power Circuit Pack Fuses" (page 12-81) for redundant power module power circuit packs (PWRF and PWRG)
   - "ECI Fuses" (page 12-82) for either ECI circuit pack
   - "Control Complex (CPU/MTC/SSC), SCI, UI, and Status Panel Fuses" (page 12-84) for redundant controller module circuit packs (excluding ECI, PRI, and SEC)
   - "Disk Drive Fuses" (page 12-86) for either disk drive
   - "Minor Alarms Due to Redundant Controller Failure" (page 12-114) for the tape drive.



Notes:

- Numbers in parentheses are circuit pack position numbers in the Redundant Controller Module. Fuse ratings are listed below the circuit pack identifier.
- The 7.5 amp fuses are the load fuses to the PWRF and PWRG power circuit packs.
- The 5 amp (2 amp for the Status Panel) fuses are the secondary fuses (or the +5 volt supply) to the circuit packs contained in the Redundant Controller Module.
- The 1 amp fuses associated with the ECI circuit packs are for +12 V and -12 V supplied to the CILINKS. When these fuses blow, communication with the CILINKS can be interrupted.
- The 2 amp fuse for the tape drive (SEC) is for the +12 volt supply to the tape drive.
- The 1 amp fuses for the disk drives (PRI) are for the +12 volt supply to the disk drives.
- The 2 amp fuses for SYNCF and SYNCG are for the -47 volt supply to the Synchronizer Module.
- The labels SPR, SPRF, and SPRG denote spare fuses that are not connected to any circuit pack.

Figure 12-3. **Redundant Controller Power Module Fuses (FBE, FBG, FBH, and FBI**

Redundant Controller Power Circuit Pack Fuses

This procedure is used for clearing blown fuses associated with redundant controller power circuit packs (fuse board FBI). For other blown fuses in the Redundant Controller Power Module refer to the previous section titled "Fuses in Redundant Controller Power Module" (page 12-79).

1. Check for blown fuses in fuse board FBI. If there are blown fuses, continue with this procedure; otherwise, go to the previous section titled "Power Circuit Pack Failure" (page 12-73).
2. Locate the blown fuses in fuse board FBI. If more than one, select one.
3. Extract the circuit pack associated with the fuse chosen in Step 2.
4. Replace the fuse chosen in Step 2. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
5. Reinsert the circuit pack pulled in Step 3.
6. If the fuse:
   - Does not blow, repeat Steps 2 through 5 for any additional blown fuses in fuse board FBI, then continue with Step 7.
   - 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 fuse in fuse board FBI go to Step 2. Otherwise, continue with the next step.
7. If there are any other blown fuses in fuse boards FBF, FBG, or FBH, refer to the next section titled "ECI Fuses" (page 12-82) for replacing additional fuses.

   If an ALM LED on any of the PWRF and PWRG circuit packs is lit, refer to the previous section titled "Power Circuit Pack Failure" (page 12-73).

   If the blown fuses were associated with at most one of each PWRF and PWRG power circuit pack and all of the ALM LEDs go out and the green LEDs on the PWRF and PWRG circuit packs are lit, you are done with this procedure; otherwise continue with the Step 8.

8. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

ECI Fuses

Perform this procedure only if there is a major alarm and there are blown 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 Redundant Controller Failure" (page 12-114).

1. If there are blown fuses in fuse board FBI, refer to the previous section titled "Redundant Controller Power Circuit Pack Fuses" (page 12-81) before performing the rest of this procedure.
2. Locate the blown fuses (5 amps) in fuse boards FBF and FBG associated with the ECI circuit pack(s). If more than one, select one.

NOTE:
The 1 amp fuses associated with the ECI circuit packs are connected to the CILINKs. When these fuses blow no alarm is issued and loss of communications with the CILINKs can occur. The section titled "Link Communication Failures" (page 12-29) provides procedures for reestablishing communications with the CILINKs.

3. Extract the ECI circuit pack associated with the fuse chosen in Step 2.
4. Replace the fuse chosen in Step 2. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
5. Reinsert the circuit pack pulled in Step 3.

6. If the fuse:

   - Does not blow, repeat Steps 2 through 5 for any additional blown fuses associated with ECI circuit packs (fuse boards FBF and FBG), and continue with Step 7.
   - 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 2 (refer to Chapter 2 for extracting and installing circuit packs, if necessary). After replacing the ECI circuit pack, make it for later reference, and replace the fuse chosen in Step 2 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 FBF and FBG) go to Step 2. If there are other blown fuses in the redundant controller power module, continue with the next section titled "Control Complex (CPU/MTC/SSC), SCI, UI, and Status Panel Fuses" (page 12-84) to replace additional fuses.

7. 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 8.

   a. 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 7-18), if necessary].

   b. At the terminal on the active ECI circuit pack, log into the DACS IV-2000 system. If you cannot log in, refer to the section titled "Link Communication Failures" (page 12-29).

   c. Restore the out-of-service ECI circuit pack by entering (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 2 minutes to restore.

8. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

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 do not continue 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}-{1-6}`

Control Complex (CPU/MTC/SSC), SCI, UI, and Status Panel Fuses

Perform this procedure only if there is a major alarm and there are blown fuses associated with control complex (CPU/MTC/SSC), SCI, and UI circuit packs, and the status panel. 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 Redundant Controller Failure" (page 12-114).

1. If there are blown fuses in fuse board FBI, refer to the previous section titled "Redundant Controller Power Circuit Pack Fuses" (page 12-81) before performing the rest of this procedure.
2. Locate the blown fuses (5 amps) in fuse boards FBF, FBG, and FBH (exclude PRI and SEC fuses). If more than one, select one.
3. Extract the circuit pack associated with the fuse chosen in Step 2.
4. Replace the fuse chosen in Step 2. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
5. Reinsert the circuit pack pulled in Step 4.

6. If the fuse:

   - Does not blow, repeat Steps 2 through 5 for any additional blown fuses in fuse boards FBF, FBG, and FBH (exclude ECI, PRI, and SEC fuses), and continue with Step 7.
   - 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 fuse in fuse boards FBF, FBG, FBH (exclude ECI, PRI, and SEC fuses) go to Step 2. If there are other blown fuses in the redundant controller power module, continue with the next section titled "Disk Drive Fuses" (page 12-86) to replace additional fuses.

7. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

⚠ 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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

8. If there are any disk drive (PRI-1 and PRI-2) blown fuses, refer to the next section titled "Disk Drive Fuses" (page 12-86).

   If the major alarm LED stays lit and there are red ALM LEDs lit on any of the control complex, SCI, and UI circuit packs, refer to the section titled "Redundant Controller Failure" (page 12-90).

Disk Drive Fuses

Perform this procedure only if both disk drives are OOS-FLT due to fuses blowing. If one disk drive is still in service and the other disk drive's fuse blew, refer to the section titled "Minor Alarms Due to Redundant Controller Failure" (page 12-114). If there are other blown fuses in the redundant controller power module, refer to the previous procedures to replace blown fuses.

1. Locate the blown 5 amp and/or 1 amp PRI fuses. Select one disk drive to replace fuses for.
2. Extract the disk drive chosen in Step 1.
3. Replace the fuse(s) associated with the disk drive chosen in Step 1. Use fuse tool (COMCODE WP90247,List 201) to extract fuses.
4. Reinsert the disk drive pulled in Step 2.
5. If the fuse(s):
   - Does not blow, repeat Steps 1 through 4 for the other disk drive, and continue with Step 6.
   - Blows again, obtain a new disk drive and replace the disk drive chosen in Step 1. After replacing the disk drive, mark the disk drive with the TID of the frame and replace the fuse(s) again.

     If the fuse(s) blow again, return the original disk drive 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 disk drive.
6. Repeat Steps 1 through 5, if necessary until all PRI blown fuse problems are cleared.
7. If you replace one disk drive, go to Step 8. If you replaced both disk drives, go to Step 9. If you did not replace any disk drives, restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center (if available).

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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

8. If you replaced one disk drive, perform the following procedure to restore the replaced disk drive:

   a. Initialize the replaced disk drive by entering the following command:

      `CPY-MEM:`*[a]*`::INIT,`*d*`,FORMAT;`

      Where:

      a = Target ID (optional)

      d = Disk drive location: `PRI-{1,2}`

      This command takes up to 2 minutes to complete.

   b. Restore the disk drive that was replaced 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 15 minutes to complete.

      After completion, the contents of the in-service disk drive are copied to the new disk drive, and you are done with this procedure.

9. If you replaced both disk drives, perform the following procedure to restore the disk drives:

   a. Change the state of the MC by entering the following command:

      `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

      Where:

      a = Target ID (optional)

   b. Initialize both disk drives by entering the following command for each disk drive:

      `CPY-MEM:`*[a]*`::INIT,`*d*`,FORMAT;`

      Where:

      a = Target ID (optional)

      d = Disk drive location: `PRI-{1,2}`

      This command takes up to 2 minutes to complete.

c. Restore both disk drives to service by entering the following command for each disk drive:

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

Where:

a = Target ID (optional)

b = Disk drive location: **PRI-{1,2}**

This command takes up to 1 minute to complete.

d. Load a DACS IV-2000 Release 3.0 program tape in the tape drive. Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary.

e. Restore the tape drive to service by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 3 minutes to complete.

f. Copy the programs from the tape to the disk drives by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete.

g. Copy the database in the MC's working memory (WKG) to the disk drives by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 15 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 section titled "Restoring Databases from Tape to Disk" (page 6-24).

h. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

Redundant Controller Failure

Perform this procedure if a major alarm indicator is present for a redundant controller module circuit pack. If there is only a minor alarm and any ALM LED is lit in the redundant controller module, refer to the section titled "Minor Alarms Due to Redundant Controller Failure" (page 12-114).

1. Check for blown fuses in the redundant power module (red ALM LED lit on any of the fuse boards (FBF, FBG, FBH, or FBI). If there are blown fuse, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-79) before performing this procedure.

   Check the power circuit packs in the redundant controller 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 12-73) before performing this procedure.

2. Locate the circuit packs in the redundant controller with their ALM LED lit.
3. For the circuit pack indicating the error, refer to the appropriate section:
   - "ECI Circuit Pack Failure" (page 12-90) for ECI circuit packs
   - "Control Complex (CPU/MTC/SSC), SCI, and UI Circuit Pack Failure" (page 12-93) for all redundant controller module circuit packs excluding ECI, PRI, and SEC
   - "Replacing Both Disk Drives" (page 14-5) if both disk drives (PRIs) have failed
   - "Replacing One Disk Drive" (page 14-3) if only one disk drive (PRI) has failed

ECI Circuit Pack Failure

Perform this procedure if there is a major alarm associated with the ECI circuit pack(s).

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. 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 craft 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.

3. Install an ECI circuit pack in place of the one extracted in Step2. Refer to Chapter 2 for installing circuit packs, if necessary.
4. Repeat Steps 2 and 3 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, and UI Circuit Pack Failure" (page 12-93).

   If both ECI circuit packs were replaced and at least one control complex (CPU/MTC/SSC set) does not indicate a failure (ALM LEDs not lit), perform Step 5. If only one ECI circuit pack was replaced, perform Step 6.
5. If both ECI circuit packs were replaced, restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center (if available).

⚠ 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 MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

6. 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 2 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. 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 you need to access the TTY connectors at the back of the Switch Bay, remove the stile strip that covers the TTY connectors.

⚠ CAUTION:
Ground yourself by wearing the wrist strap provided with the equipment.

b. 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 7-18)]. 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 7-18), if necessary], and perform the rest of this procedure using the new terminal configuration.

c. At the terminal on the working ECI circuit pack, log into the DACS IV-2000 system. If you cannot log in, refer to the section titled "Link Communication Failures" (page 12-29).

d. 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 about 2 minutes to be restored. A REPT RST EQPT *message appears when the ECI circuit pack is restored.*

e. 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}-{1-6}**

f. If you disconnected a terminal in Step 7a, disconnect your terminal and reconnect the disconnected terminal. Refer to the section titled "Adding a Terminal to a Snider Link" (page 7-18), if necessary.

g. Reconnect your terminal to the TTY1 of the ECI circuit pack you removed it from in Step 6b. Refer to the section titled "Adding a Terminal to a Snider Link" (page 7-18), if necessary.

h. If necessary, replace the stile strip removed in Step 6a.

⚠ CAUTION:
Ground yourself by wearing the wrist strap provided with the equipment.

Control Complex (CPU/MTC/SSC), SCI, and UI Circuit Pack Failure

Perform this procedure if there is a major alarm associated with control complex, SCI, and UI 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 Redundant Controller Failure" (page 12-114). If either ECI circuit pack's ALM LED is lit refer to the previous section "ECI Circuit Pack Failure" (page 12-90) before performing this procedure.

NOTE:
If the active control complex fails, the main controller failure (FAILURE) 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 5 minutes to complete. After completion, the main controller failure (FAILURE) 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 Redundant Controller Failure" (page 12-114) 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 7-18), if necessary), determine the state of all the circuit packs in the redundant 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: IS
MTC-1: IS
SSC-0: IS
SSC-1: IS
SCI-1: IS
SCI-2: IS
PRI-1: IS
PRI-2: IS
ECI-1: IS
ECI-2: IS
UI: 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 redundant controller module failures.

NOTE:
If an MTC circuit pack diagnostic failure occurs, it is possible that the pack indicating the problem is fault free and the MTC circuit pack in the other control complex is at fault. This is specifically true for the MTC Alarm Generation Diagnostic, which can cause an error message. Under these circumstances it is required to replace both MTC circuit packs.

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. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
3. If you were not able to enter the **RTRV-STATE-EQPT** command, replace the CPU, SSC, and MTC (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. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

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 circuit pack), it is recommended that you still perform a manual reset/MC restore to ensure system integrity.

The MC takes up to 30 minutes to restore. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-8).

Unit Controller Failure

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 12-67) 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 12-73) 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)
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-{1-32}

   This command takes up to 5 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 the next step.
6. Obtain a new UC circuit pack for the failed one, and replace the failed UC circuit pack. After extracting the failed UC circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
7. 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-{1-32}

   This command takes up to 5 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 and Switch 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 system 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 (SW Circuit Packs)
- N-Rate Clock Failure (CLKDR to SWIO)
- N-Rate Parity Failure (SWIO to interface Circuit Packs)
- MUX, SWIF, or SMUX Faults (N-Rate Parity Failure to/from SWIO)

Constantly Lit RED ALM LED on Interface or Switch 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 12-108).

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 and SWCS circuit packs must be cleared first before clearing failures of interface circuit packs (that is, MUXs, DS1IFs, SWIFs, SMUXs).

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.

⚠ 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.*

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 12-105) 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 12-106) 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 12-67) before performing this procedure.
2. Check to see if a red ALM LED on 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 12-73) 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-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, SWIF-{1-32}-{1-8,P}, DS1IF-{1-32}-{1A-8B}, SWIO-{1-32}, SWCS-{1-32}, CLKGN-{0,1}, CLKDR-{1-32}-{1-4} }`

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 5.

   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-FRCD-FLT, allow the circuit pack to switch to protection by entering the following command:

   ALW-SW-EQPT:*[a]*:*b*::**PROTN;**

   Where:

   a = Target ID (optional)

   b = Circuit pack location: **{ MUX-{1-32}-{1-31}, SUMX-{1-32}-{1-15}, SWIF-{1-32}-{1-8}, SWCS-{1-32}, SWIO-{1-32} }**

5. 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: **{1-32}-{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: {1-32}-{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 10-8). Otherwise, continue with the Step 7.

   If the red ALM LED on the on the MUX circuit pack does not turn off (approximately 20 seconds) after establishing the loopback, continue with Step 7.

   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 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: {1-32}-{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: {1-32}-{1-15}

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 Release 3.0, Commands and Messages* manual (AT&T 365-340-402).

   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 10-14). Otherwise, continue with the next step.

   If the red ALM LED on the 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.

7. 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-{1-32}, SWIO-{1-32}, CLKGN-{0,1}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, SWIF-{1-32}-{1-8,P}, DS1IF-{1-32}-{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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) for information on diagnostic tests that are performed.

8. Obtain a new circuit pack of the same type as the circuit pack selected in Step 4.
9. If the failed circuit pack selected in Step 4 is not a MUX, SMUX, or DS1IF circuit pack, go to Step 10. For MUX, SMUX, or DS1IF 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, SMUX, or DS1IF circuit pack location:
      { MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, DS1IF-{1-32}-{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:

      - MUX circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   c COMPLD
    /* LOC:UTYPE:...:CLEI:STATE */
    "d:::PCODE=f,CCODE=g,PLBO=h,CLBO=i,FNCT=q:::x"
;
```

      Check the values of the PLBO (provisioned setting) and CLBO (circuit pack setting) parameters.

      - SMUX circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   c COMPLD
    /* LOC:UTYPE:...:CLEI:STATE */
    "d:::PCODE=f,CCODE=g,PLBO=h,CLBO=i:::w:x"
;
```

      Check the values of the PLBO (provisioned setting) and CLBO (circuit pack setting) parameters.

- DS1IF circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   c COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: :<PCODE=f, CCODE=g, PEQL=j, CEQL=k, FNCT=q>: :x"
;
```

  Check the values of the PEQL (provisioned setting) and CEQL (circuit pack setting) parameters.

If the values match, set the value of the new MUX, SMUX, or DS1IF circuit pack to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-23) for MUX and SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-33) for DS1IF circuit packs] and continue with Step 10.

If the values do not match, continue with Step 9c.

c. Extract the MUX, SMUX, or DS1IF 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 5-23) for MUX and SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-33) for DS1IF circuit packs].

e. Reinstall the MUX, SMUX, or DS1IF circuit pack extracted in Step 9c. Refer to Chapter 2 for installing circuit packs, if necessary.

   If the red ALM LED on the MUX, SMUX, or DS1IF circuit pack does not turn off (approximately 20 seconds), set the value of the new MUX, SMUX, or DS1IF circuit pack obtained in Step 8 to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-23) for MUX and SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-33) for DS1IF circuit packs] and continue with Step 10.

   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.

10. Replace the failed circuit pack selected in Step 4 and attach the alarm report to the failed circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    If the red ALM LED on the circuit pack does not turn off (approximately 20 seconds), 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 (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

11. If the circuit pack you replaced in Step 10 is a SWIO circuit pack, continue to the next step. Otherwise, go to Step 15.

NOTE:
The CLKDR circuit pack is an extension of the SWIO circuit pack and can be contributing to the SWIO circuit pack failure.

12. Obtain a new CLKDR circuit pack and replace the failed one. After extracting the failed CLKDR circuit pack attach the alarm report to is. 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 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 (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

13. Replace the CLKDR circuit pack that you extracted in Step 12 with the original CLKDR circuit pack (one with alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

14. Replace the SWIO circuit pack that you extracted in Step 10 with the original SWIO circuit pack (one with the alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

15. Since replacing the 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 5) 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-1 for SWCS and SCI-2 for SWIO). 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-{1-32}, SWIO-{1-32} }`

   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 the next step.

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 the next step.

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-{1,2}`
   SCI-1 is associated with SWCS circuit packs and SCI-2 is associated with SWIO 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 the next step.

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 the next step.
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-{1-32}, SWIO-{1-32} }

   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 the next step.
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 the next step.

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: `GLKGN-{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 the next step.

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 the next step.

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 12-108). If the red ALM LED is lit on one of the DS1RY or MUXPS circuit packs, go to the subsection titled "Failed DS1RY or MUXPS Circuit Packs" (page 12-109).

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-{1-32}, SMUXP-{1-32}, DS1IP-{1-32}-{PA,PB}, SWIF-{1-32}-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 and replace the failed one. After extracting the failed circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

3. 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 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-{1-32}, DS1RY-{1-32}-{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 and replace the failed one. After extracting the failed circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

3. Check to see if the red ALM LED on the circuit pack is off.

   If it is off, your 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 switch bay fan assemblies ED-2C816-30,G1 or ED-2C906-30 are caused by main power being lost (blown fuse or circuit breaker) or fan failure. An alarm for switch bay fan assembly ED-9C130-30-30,G1 or STS1/DS3 Interface Bay fan assembly ED-9C130-30-30,G2 are caused by main or auxiliary power being lost (blown fuse or circuit breaker), fan failure, or dirty or clogged air filter.

1. Determine which fan assemblies has an alarm LED lit and what type of fan assemblies (ED-2C816-30,G1, ED-2C906-30, ED-9C130-30-30,G1, and ED-9C130-30-30,G2) have failed. If more than one, choose one.

NOTE:
For fan assemblies ED-2C816-30,G1 and ED-2C906-30, the ED number is located on the rear of the fan assembly. For fan assemblies ED-9C130-30-30,G1 and G2, the ED number is located on the front of the fan assembly.

2. 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 Table 12-14 for fuse locations. Replace blown fuses. If there are no blown fuses go to Step 4.

Table 12-14. Fuse Chart for Fan Assemblies (Switch and Interface Bays)

Power Source	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8
Main	A16	B18	A17	E6-1	A19	B19	A18
Auxiliary	D16	D15	C17	B13-2	C19	D17	D19

Note: All load fuses (labeled with *-1*) for bays 2, 3, 4, 6, 7, and 8 are 10 A and all indicator fuses (labeled with *-2*) are 0.5 A. The switch bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5 A.

3. If you replace a fuse associated with fan assembly ED-9C130-30-30,G1 or ED-9C130-30-30,G2, press the RESET button on the fan assembly.
4. If the fuse(s) you replaced in Step 2 blow again, replace the fan assembly by refer to the procedure titled "Replacing a Fan Assembly" (page 14-12).

5. If a circuit breaker on the fan assemble selected in Step 1 has triggered, press the circuit breaker reset button (MAIN or AUX) on the fan assembly. For fan assemblies ED-9C130-30-30,G1 and ED-9C130-30-30,G2 the RESET button on the fan assembly must also be pressed. If the circuit breaker has not triggered, go to Step 8.
6. If the circuit breaker triggers again, replace the fan assembly by referring to the section titled "Replacing a Fan Assembly" (page 14-12).
7. If the yellow FILTER LED is lit, perform the procedure in the next section titled "Fan Filter Alarm" (page 12-111) before continuing with this procedure. Otherwise, continue with the next step.
8. If after replacing the fuse(s), resetting the circuit breakers, and if necessary the fan filter and/or resetting the fan assembly the ALM or FAN/PWR LED remains lit, replace the fan assembly by referring to the section titled "Replacing a Fan Assembly" (page 14-12).

Fan Filter Alarm

This procedure is used to replace the fan assembly air filter for a STS1/DS3 Interface Bay or a switch bay that has been upgraded to the ED-9C130-30-30,G1 fan assembly.

You need a fan assembly air filter WP-92310,L100 (COMCODE 406747972) for each fan assembly with its yellow FILTER alarm LED lit.

⚠ 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, choose one if more than one.
2. Extract the air filter from the fan assembly selected in Step 1 by pulling on the tabs on both end of the filter. Refer to Figure 12-4.

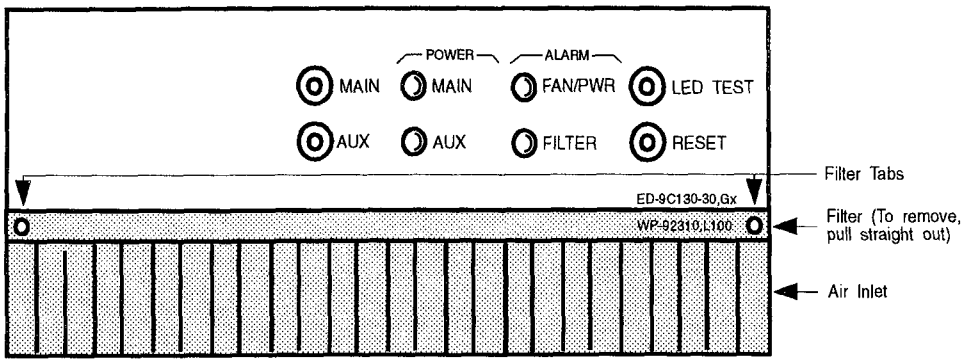


Figure 12-4. **Fan Assembly — ED-9C130-30,G1 or ED-9C130-30,G2 Air Filter Location**

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 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 12-4.
7. Push the reset button on the fan assembly selected in Step 1 to clear the fan filter alarm.
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: EXJIT, EXPHR, FRQOF, LOS,OOF, PHSTP, SYNCPRI, SYNCSEC, TRBER, and TRMNBER. For all other alarm conditions and equipment locations refer to the section titled "Prioritizing Alarms" (page 12-10) for clearing the alarm.

1. Contact your system administrator or next level of support to coordinate the effort to clear the external timing reference failure.
2. When instructed to do so change the synchronizer mode to holdover by referring to the section titled "Changing Synchronizer Modes" (page 6-19).
3. Have the personnel responsible for the BITS timing reference fix the indicated failure.
4. When instructed to do so change the synchronizer mode to phase-locked mode (normal mode) by referring to the section titled "Changing Synchronizer Modes" (page 6-19).

Minor Alarms Due to Redundant Controller Failure

Perform this procedure if a minor alarm indication is for a failed control complex, one of the disk drives, or tape drive fuses.

If there is major alarm indication and there is a failure in the redundant controller module, refer to the section titled "Redundant Controller Failure" (page 12-90).

NOTE:
If the main controller failure alarm (FAILURE LED) is active, a side switch may be occurring. During this time (up to 5 minutes) the main controller failure alarm remains active. After the standby control complex becomes active the main controller failure alarm clears and a minor alarm is issued for the failed control complex.

1. Check for blown fuses associated with the failed control complex, disk drive, or tape drive. Fuses for control complexes, disk drives, and the tape drive are located in fuse boards FBF, FBG, and FBH.

   If the only alarm condition is associated with the tape drive (SEC) and the SEC fuses are not blown, refer to the section titled "CPY-MEM Command Failure" (page 13-8).

   If there are no blown fuses, go to Step 3; otherwise continue with the next step.

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 refer 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 refer 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 disk drive and/or the tape drive, continue with Step 4; otherwise perform the following procedure:

   a. Determine the state of all the circuit packs in the redundant 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: IS
MTC-1: IS
SSC-0: IS
SSC-1: IS
SCI-1: IS
SCI-2: IS
PRI-1: IS
PRI-2: IS
ECI-1: IS
ECI-2: IS
UI: 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 redundant 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.

NOTE:
If an MTC circuit pack diagnostic failure occurs, it is possible that the pack indicating the problem is fault free and the MTC circuit pack in the other control complex is at fault. This is specifically true for the MTC Alarm Generation Diagnostic, which can cause an error message. Under these circumstances it is required to replace both MTC circuit packs.

b. If the state of the circuit packs in one of the control complexes (CPU/MTC/SSC) 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 5 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 3c. Otherwise, continue with Step 4.

c. 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. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

d. 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 5 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.

4. If a ALM LED remains lit that is associated with a disk drive, retrieve the state of the disk drive by entering the following command:

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

Where:

a = Target ID (optional)

b = Disk drive location: PRI-{1,2}

If the state of the disk drive is OOS-MTCE, go to Step 5. Otherwise, refer to the section titled "Replacing One Disk Drive" (page 14-3).

5. If the state of the disk drive is OOS-MTCE, restore the 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 15 minutes to complete. After completion of this command, the contents of the in-service disk drive are copied to the disk drive you restored.

   If the ALM LED remains lit on the disk drive you restored, refer to the section titled "Replacing One Disk Drive" (page 14-3). Otherwise, you are done with this procedure.

PMGR1 and DS3PM Circuit Pack Failures

This procedure clears all DS3PM 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 DS3PM circuit packs are out of the fault (FLT) state.

1. If a DS3PM circuit pack (failure indicated in the **RTRV-ALM-EQPT** response) and its red ALM LED is not lit, check the DS3PM multipoint asynchronous interface (TABS link) connection to the P1 and P2 connectors.

   If the TABS link is not connected to the P1 and P2 connectors, make the connection and continue with Step 8. If the TABS link is connected to the P1 and P2 connectors, continue with Step 2.

2. Determine the state for each PMGR1 or DS3PM 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-{1-32}-{1-31}, SWIF-{1-32}-{1-8} }**
   DS3PM circuit pack location: **DS3PM-{1-32}**

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 DS3PM 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-{1-32}-{1-31}, SWIF-{1-32}-{1-8} }`

     Diagnostics take up to 15 minutes to complete This report is used for further reference and/or trouble report generation.

   - **DS3PM Circuit Pack**:

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

     Where:

     a = Target ID (optional)

     b = DS3PM circuit pack location: `DS3PM-{1-32}`

     This command takes up to 5 minutes to complete.

     If the failed DS3PM circuit pack restores without indicating failure and there are not other PMGR1 and DS3PM circuit pack failures, do not continue 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 DS3PM circuit pack make sure the TABS link jumpers of the new circuit pack are in the same position of the failed DS3PM circuit pack. Refer to Figure 12-5 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 DS3PM circuit pack, continue with the next step.

   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 DS3PM circuit packs, you are done with this procedure. If there are more PMGR1 or DS3PM circuit packs that have failed, go to Step 1.

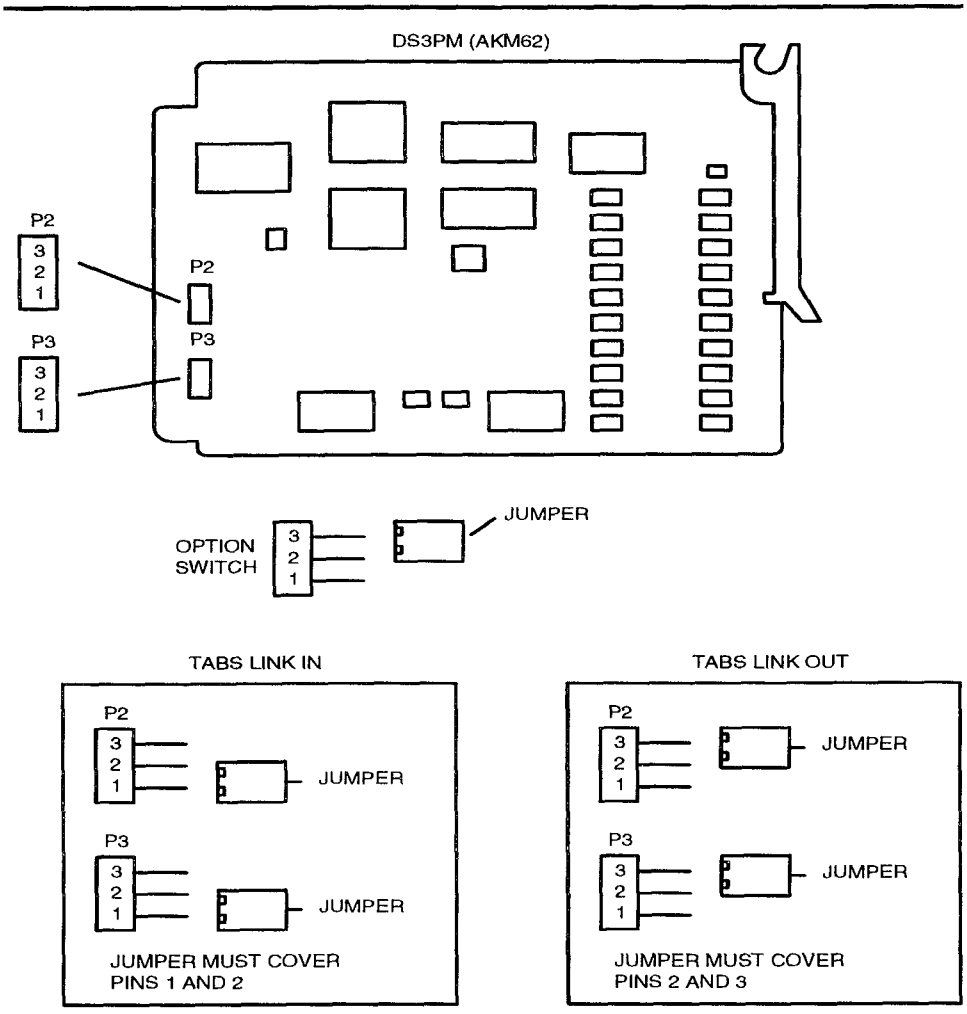


Figure 12-5. Location of Option Switches on DS3PM TABS Link

8. If you replaced a DS3PM circuit pack or connected the TABS link to the DS3PM circuit pack, restore the DS3PM circuit pack to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3PM circuit pack location: **DS3PM-{1-32}**

   If the red ALM LED on a DS3PM 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 DS3PM circuit packs, go to Step 1; otherwise do not continue 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 DS3PM circuit pack failures, return to Step 1.

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 12-10) 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 system. If you cannot log in, refer to the procedure titled "Link Communication Failures" (page 12-29).

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

13

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Diagnostic Messages

13

This chapter consists of procedures required to clear problems that are indicated by diagnostic messages generated by the DACS IV-2000 system 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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, CPU-{0,1}, UI, MTC-{0,1}, SSC-{0,1}, CC-{0,1}, PRI-{1,2}, SEC, ECI-{1,2}, CILINK-{1,2}-{1-6}, SCI-{1,2}, CLKGN-{0,1}, SWCS-{1-32}, SWIO-{1-32}, UC-{1-32}, DS3PM-{1-32}, MUX-{1-32}-{1-31}, MUXP-{1-32}, SMUX-{1-32}-{1-15}, SMUXP-{1-32}, SWIF-{1-32}-{1-8,P}, DS1IF-{1-32}-{1A-8B}, DS1IP-{1-32}-{PA,PB}, MUXPS-{1-32}, DS1RY-{1-32}-{1-4}, SYNC-{0,1}, TX-{0,1}, TXPT-{0,1}-{1,2}, DPLL-{0,1}, TB-{0,1} }

NOTE:

CLKDR circuit packs are not valid locations for this parameter. Diagnostics cannot be performed on CLKDR circuit packs because CLKDRs are not controller-visible (that is, there is no interface between the CLKDR circuit packs and the main controller).

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**, **MTC-{0,1}**, **SSC-{0,1}**, **PRI-{1,2}**, **SEC**, **ECI-{1,2}**, **SCI-{1,2}**, and **CILINK-{1,2}-{1-6}**.

For the **MUX-{1-32}-{1-31}** and **SWIF-{1-32}-{1-8}** slots, a PMGR1 circuit pack can be present.

Unit controller circuit packs cannot be diagnosed if they are failed with the **DGN-DET-EQPT** command. However, the **RST-EQPT::UC-{1-32};** 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) for detailed information.

Diagnostics can take up to 15 minutes to complete.

2. Determine contents of parameters *e* and *g* from the following output message:

```
/* LOC:PHASES,RESULT,EXPECTED,MEASURED */
"e :f ,g ,h ,i"
.
.
.
"e :f ,g ,h ,i"
;
```

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 13-1 to clear the failed equipment.

NOTE:
If an MTC circuit pack diagnostic failure occurs, it is possible that the pack indicating the problem is fault free and the MTC circuit pack in the other control complex is at fault. This is specifically true for the MTC Alarm Generation Diagnostic, which can cause a error message. Under these circumstances it is required to replace both MTC 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).

Table 13-1. Clearing Diagnostic Failures

Equipment	Procedure
CC CPU UI MTC SSC SCI ECI	Go to the section titled "Replacing Main Controller Circuit Packs (Diagnostic Failures)" (page 14-9).
PRI	Go to the section titled "Replacing One Disk Drive" (page 14-3) for single disk drive failures or the section titled "Replacing Both Disk Drives" (page 14-5) for failures of both disk drives.
SEC	Go to the section titled "Replacing the Tape Drive" (page 14-8).
DPLL SUNC TB (TBS31) TX (DS1TX) TXPT	Go to the section titled "Synchronizer Module Failure" (page 12-35).
UC	Go to the section titled "Unit Controller Failure" (page 12-96).
CLKGN CLKDR SWCS SWIO MUX SMUX SWIF* CILINK DS1IF DS1IP DS1RY DS3PM MUXPS MUXP SMUXP	Go to the section titled "Interface and Switch Module Circuit Pack Failures" (page 12-97).

* 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 contents of parameter *b* from the `REPT DGNDET EQPT` output message:

```
/* LOC:PHASES,RESULT,EXPECTED,MEASURED */
"b :c ,d ,e ,f"
;
```

NOTE:
For details about the contents of parameter *c* (PHASES), see the appendix on "Diagnostic Tests" in the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

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 contents of parameters *e* and *g* from the following output message:

```
/* LOC:PHASES,RESULT,EXPECTED,MEASURED */
"e :f ,g ,h ,i"
.
.
.
"e :f ,g ,h ,i"
;
```

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 13-1 to clear the failed equipment.

If the results did not identify a failed test, contact your system administrator or your next level of support for further technical assistance.

NOTE:

If an MTC circuit pack diagnostic failure occurs, it is possible that the pack indicating the problem is fault free and the MTC circuit pack in the other control complex is at fault. This is specifically true for the MTC Alarm Generation Diagnostic, which can cause a error message Under these circumstances it is required to replace both MTC circuit packs.

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 **CPY-MEM** command denial, go to the next section titled "CPY-MEM Command Failure" (page 13-8). 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 12-121).

   Refer to the *DACS IV-2000 Release 3.0 Commands and Messages* manual (AT&T 365-340-402) 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 tape is bad
- SSC circuit pack failed
- The SEC failed
- One PRI failed
- Both PRIs failed

1. If you did not specify the tape drive (SEC) in the **`CPY-MEM`** command or if parameter *f* of the `REPT EXCPTN SYS` message does not begin with `000000e8` (`e8` indicates SEC failure and `f0/f1` indicate PRI-1/PRI-2 failure, respectively), go to Step 2. Otherwise perform the following procedure:

   a. Remove the tape 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.

   b. Load a different Release 3.0 tape into the tape drive (refer to "Using the Tape Drive" (page 6-20), if necessary).

   c. Restore the tape drive to service by entering the following command:

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

      Where:

      a = Target ID (optional)

      This command takes up to 5 minutes to complete.

      If this command fails, check and/or replace the tape and/or tape drive, as necessary.

   d. Re-enter 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)

   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 000000f0 and PRI-1 is in the OOS-FLT state, or if parameter *f* begins with 000000f1 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 Disk Drive" (page 14-3).

      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 5 minutes to complete.

5. Log on to the DACS IV-2000 system. 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. Re-enter 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).

      You are now done with this procedure.

8. If you did not specify the tape drive (SEC) in the **CPY-MEM** command, go to Step 9. Otherwise, perform the following procedure:

   a. Replace the tape drive by using the section titled "Replacing the Tape Drive" (page 14-8). The tape that is loaded into the tape drive in "Replacing the Tape 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 re-enter 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 20 minutes to restore if you entered the **RST-EQPT** *command.*

c. Re-enter 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 do not continue with this procedure.

9. If you did not specify the disk drive (PRI) 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)

If the MC is in the OOS-MCOND state, go to Step 9c. Otherwise, continue with Step 9b.

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 tape drive from service by entering the following command:

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

a = Target ID (optional)

This command takes up to 1 minute to complete.

d. Load a tape that has been formatted for Release 3.0, contains the Release 3.0 programs and the latest copy of the database into the tape drive. Refer to the section titled "Using the Tape Drive" (page 6-20), if necessary

e. Restore the tape drive to service by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 5 minutes to complete.

If this command fails, check and/or replace the tape and/or tape drive, as necessary.

f. Remove one of the 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 5 minutes to complete.

g. Pull the disk drive you removed in Step 9f from its slot.

h. Format the remaining disk drive by entering the following command:

CPY-MEM:*[a]*:::INIT,*d*,FORMAT;**

Where:

a = Target ID (optional)

d = Disk drive location: **PRI-{1,2}**

This command takes up to 2 minutes to complete.

If this command is denied, go to Step 10.

i. Copy the Release 3.0 programs onto the disk by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 10.

j. Copy the database onto the disk by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 10.

k. Restore the MC to the in-service (IS) state 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 30 minutes to reset. For more information on booting the DACS IV-2000 system, refer to the section titled "Reset and Boot" (page 6-8).

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. Re-enter 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 disk drive removed in Step 9f.

- Restore the 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 3 minutes to complete.

  If it completes, you are done with this procedure. Otherwise replace this disk drive using the section titled "Replacing One Disk Drive" (page 14-3).

10. Perform the following procedure using the disk drive which was removed in Step 9f:

    a. Retrieve the state of the MC by entering the following command:

    RTRV-STATE-EQPT:*[a]*:**MC**;

    Where:

    a = Target ID (optional)

    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) 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 1 minute to complete.

    d. Pull the disk drive you removed in Step 10c from its slot, and insert the disk drive removed in Step 9f into its slot.

e. Format the disk drive inserted in Step 10d by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = Disk drive location: `PRI-{1,2}`

This command takes up to 2 minutes to complete.

If this command is denied, go to Step 11.

f. Restore the 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 3 minutes to complete.

If this command is denied, go to Step 11.

g. Copy the Release 3.0 programs onto the disk by entering the following command:

`CPY-MEM:`*[a]*`:::SEC,PRI,PROG:Y;`

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 11.

h. Copy the database onto the disk by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 11.

i. Restore the MC to the in-service (IS) state 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 30 minutes to reset. For more information on booting the DACS IV-2000 system, refer to the section titled "Reset and Boot" (page 6-8).

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. Re-enter 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 contents of parameter *c* and *e* 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 */
   "b,c,d,e:f,g,h"
;
```

   If parameter *c* (LOC1) is UC-{1-32} and parameter *e* (LOC2) is an interface circuit pack, continue with the next step. Otherwise, go to Step 4.

2. 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-{1-32}**

3. 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-{1-32}**

4. Verify that the MC is in the IS state by entering the following command:

   RTRV-STATE-EQPT:*[a]*:**MC**;

   Where:

   a = Target ID (optional)

5. 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 20 minutes to restore.

6. Make certain that all databases are current by entering the following command:

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

   Where:

   a = Target ID (optional)

7. If the REPT CMPR MEM message is not cleared after entering the **CPY-MEM** command, contact your system administrator or next level of support for technical assistance to clear the trouble.

REPT FAN FILTER Message

The REPT FAN FILTER message indicates that the fan filter in the switch bay fan assembly (ED-2C816-30,G1 or ED-2C906-30 only) needs replacing. To replace the fan filter, refer to the section titled "Changing the Fan Filter" (page 3-13).

Replacing Components

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Replacing Components

14

This chapter provides procedures for replacing certain failed components (found as the result of trouble clearing activities of Chapters 12 and 13) and 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

Procedures included in this chapter for changing older version equipment to newer versions are:

- Unit controller: UC1 (AKM59) to UC2 (AKM59B)
- Switch interface: SWIF1 (AKM49) to SWIF2 (AKM50)
- Switch interface-protection: SWIF1 (AKM49) to SWIF2 (AKM50)
- Power supply: PWRE2 (556B) to PWRE3 (556C)
- Multiplexer-protection: MUXP1 (AKM55) to MUXP2 (AKM70)
- Multiplexer: MUX1 (AKM52) to MUX2 (AKM68)
- Interface module: DS3 Interface-32 Module to STS1 Interface-16 Module
- Interface module: DS3 Interface-16 Module to STS1 Interface-16 Module

Replacing Failed CLKGN

This procedure is used to replace a failed clock generator (CLKGN). The CLKGNs are installed in pairs and one protects the other in case of a failure. In normal operation one of the CLKGNs is standby (STBY) and the other is active (ACT). Under normal operations when one of the CLKGNs 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)

   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 1 minute 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.

   If the red ALM LED on the CLKGN circuit pack that you replaced does not go out, refer to the section titled "Interface and Switch Module Circuit Pack Failures" (page 12-97).

Replacing One Disk Drive

CAUTION:
Replace a disk drive only if directed to do so by your system administrator, or trouble clearing procedures in Chapters 12 and 13.

The following procedure is used to replace a system disk drive that has failed and its mate (redundant) disk drive is still in service.

If both disk drives have failed, refer to the next section titled "Replacing Both Disk Drives" (page 14-5).

1. Obtain a new disk drive.
2. Determine the state of the two disk drives by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:PRI-1&-2;`

   Where:

   a = Target ID (optional)

   The failed disk drive is in the OOS-FLT state, and the disk drive's red ALM LED is turned on.
3. Extract the failed disk drive from the slot by carefully operating the latch. Grasp the disk drive by the chassis and pull straight out to remove the disk drive from the slot.
4. To insert the new disk drive, hold the disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the disk drive into the slot. Push at the bottom and the top with one slow, continuous motion until the disk drive stops. When the disk drive is firmly in place, close the latch.

5. Initialize the new disk drive by entering the following command:

   CPY-MEM:*[a]*:::**INIT,***d*,**FORMAT;**

   Where:

   a = Target ID (optional)

   d = Disk drive location: **PRI-{1,2}**

   This command takes up to 2 minutes to complete.

6. Restore the replaced 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 15 minutes to complete.

   During execution of this command, the contents of the in-service disk drive are copied to the new disk drive, and you are done with this procedure.

Replacing Both Disk Drives

CAUTION:
Replace disk drives only if directed to do so by your system administrator, or trouble clearing procedures in Chapters 12 and 13.

If both disk drives fail and the DACS IV-2000 system enters the OOS-MCOND state, perform this procedure to replace both failed disk drives and restore the MC to the in-service (IS) state.

If only one disk drive has failed, refer to the previous section titled "Replacing One Disk Drive" (page 14-3).

1. Obtain two new disk drives.
2. Extract one of the failed disk drives from its slot by carefully operating the latch. Grasp the disk drive by the chassis and pull straight out to remove the disk drive from its slot. Repeat this step for the other failed disk drive.
3. To insert the new disk drive, hold the new disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the disk drive into its slot. Push at the bottom and the top with one slow, continuous motion until the disk drive stops. When the disk drive is firmly in place, close the latch. Repeat this step for the other failed disk drive.
4. Initialize the new disk drives by entering the following command for each disk drive:

   `CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

   Where:

   a = Target ID (optional)

   d = Disk drive location: `PRI-{1,2}`

   This command takes up to 2 minutes to complete.
5. Restore the disk drives to service by entering the following command for each disk drive:

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

   Where:

   a = Target ID (optional)

   b = Disk drive location: `PRI-{1,2}`

   This command takes up to 3 minutes to complete.

6. Remove the tape 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.

7. Load a Release 3.0 tape in the tape drive. If necessary, refer to the procedure titled "Using the Tape Drive" (page 6-20).

8. Restore the tape drive to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

   If this command fails, check and/or replace the tape and/or tape drive, as necessary.

9. Copy the programs from the tape to the disk drives by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete.

10. Copy working memory to the disk drives by entering the following command:

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

    Where:

    a = Target ID (optional)

    This command takes up to 3 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 Tape to Disk" (page 6-24)**.

11. Restore the MC to the in-service (IS) state 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 30 minutes to reset. For more information on booting the DACS IV-2000 system, refer to the section titled "Reset and Boot" (page 6-8).

Replacing the Tape Drive

Replace the tape drive *only* if directed to do so by your system administrator, next level of support, or if indicated in trouble clearing procedures in Chapters 12 and 13.

1. Obtain a new tape drive.
2. Remove the tape 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.

3. Disengage the tape drive from the slot by carefully operating the latch. Extract the tape drive with one slow, continuous motion.
4. Insert the new tape drive into the slot. Raise the latch and push on the bottom part of the tape drive until the latch engages the slot (do not push with the latch). Close the latch (push down) to secure the tape drive.

   The LED on the tape drive indicates access or usage of the tape drive and does not indicate a failure condition.

5. Load a DACS IV-2000 Release 3.0 tape in the tape drive. If necessary, refer to "Using the Tape Drive" (page 6-20).
6. Restore the tape drive to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 3 minutes to complete.

Replacing Main Controller Circuit Packs (Diagnostic Failures)

Perform this procedure only in response to a failed diagnostic message. Do *not* use this procedure to replace the disk drive or the tape drive. Use the sections titled "Replacing One Disk Drive" (page 14-3), "Replacing Both Disk Drives" (page 14-5), or "Replacing the Tape Drive" (page 14-8).

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 redundant controller power module that is lit, go to the section titled "Power Circuit Pack Failure" (page 12-73).
2. Locate the circuit pack in the redundant controller module that failed diagnostics.
3. If only one circuit pack (CPU, MTC, or SSC) in one control complex (CC) 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}

    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 5 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. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

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 5 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 3 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}-{1-6}`

5. If the SCI, UI, or 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. Restore the MC to service by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel or by using the remote reset function at the central maintenance center.

⚠ 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 MC takes up to 30 minutes to restore. For more information on booting, refer to the section titled "Reset and Boot" (page 6-8).

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. Otherwise, you are done with this procedure.

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 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 12.

1. Obtain a replacement fan assembly that matches the type of failed fan assembly and go to the identified section:
   - ED-2C816-30,G1 — rear mounted Switch Bay fan assembly without the enhanced alarm reporting feature. Refer to the section titled **"Replacing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 14-12)**.
   - ED-2C906-30 — front mounted Switch Bay fan assembly without the enhanced alarm reporting feature. Refer to the section titled "Replacing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 14-12)
   - ED-9C130-30,G1 — front mounted Switch Bay fan assembly with the enhanced alarm reporting feature. Refer to the section titled "Replacing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-20).
   - ED-9C130-30,G2 — front mounted STS1/DS3 Interface Bay fan assembly with the enhanced alarm reporting feature. Refer to the section titled "Replacing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-20).

⚠ CAUTION:
Fan assembles must be replaced within 40 minutes of failure to prevent any service disruption due to excessive heat.

Replacing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly

This procedure is used to replace older fan assemblies (ED-2C816-30,G1 [rear mounted] or ED-2C906-30 [front mounted]) contained in the Switch Bay.

Powering Down the Fan

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.

   For fan assembly ED-2C816-30,G1, continue with the next section titled "Removing a ED-2C816-30,G1 Fan Assembly" (page 14-13). For fan assembly ED-2C906-30, continue with the section titled "Removing an ED-2C906-30 Fan Assembly" (page 14-14).

Removing a ED-2C816-30,G1 Fan Assembly

1. Remove the right and left stile strips and the lower backplane cover from the rear of the switch bay.
2. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 14-1.
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 14-1).

NOTE:
One of the screws holds the electrical ground wire.

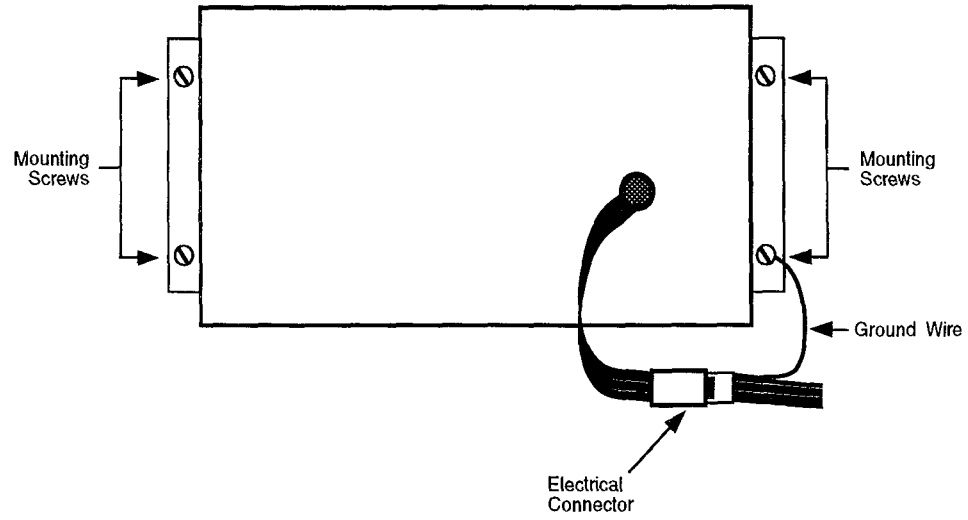


Figure 14-1. ED-2C816-30,G1 Fan Assembly (Rear View)

4. From the back of the frame, slide out the failed fan assembly.

⚠ CAUTION:
When extracting the fan assembly, be careful with the N-rate cables.

5. Install the new fan assembly by referring to the section titled "Installing the Fan Assembly (ED-2C816-30,G1 or ED-2C906-30)" (page 14-15).

Removing an ED-2C906-30 Fan Assembly

1. Remove the lower backplane cover from the rear of the switch bay.
2. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 14-2.

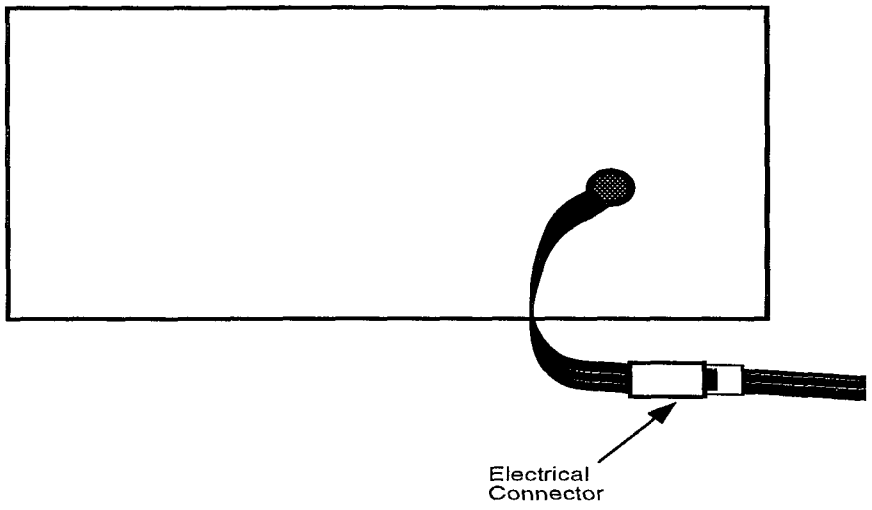


Figure 14-2. **ED-2C906-30 Fan Assembly (Rear View)**

3. Remove the right and left stile strips from the front of the switch 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 14-3).
5. 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.

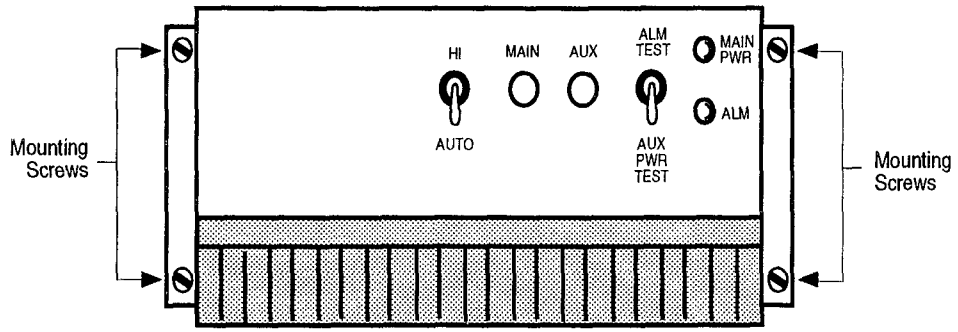


Figure 14-3. **ED-2C906-30 Fan Assembly (Front View)**

Installing the Fan Assembly (ED-2C816-30,G1 or ED-2C906-30)

1. Insert the new fan assembly and secure with the four mounting screws. For the ED-2C816-30,G1 fan assembly, make sure one of the screws secures the ground wire (refer to Figure 14-1).

CAUTION:
When installing the new fan assembly, be careful with the 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 switch bay.
4. Make sure that the air inlet below and in front of the fan assembly is unobstructed.

Powering Up the Fan

1. Reinsert the AUX Fan Assembly Fuse (Fuse B13-2).
2. Check to see that the red ALM LED is on and the fans are operating at *high* speed.
3. Reinsert the Main Fan Assembly Fuse (Fuse E6).
4. 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).

   Go to the next section titled "Checking the Fan Assembly" (page 14-16).

Checking the Fan Assembly

1. Check to see that the fan assembly is operational in both the AUTO and HI speed positions (refer to Figure 14-4, 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.

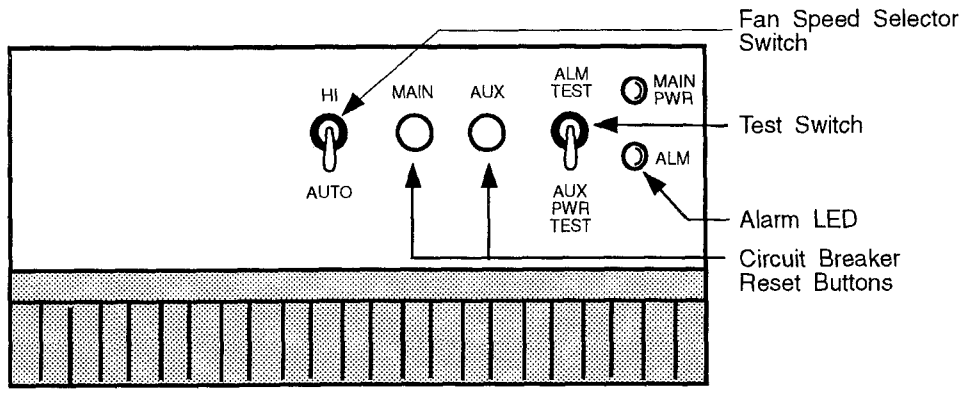


Figure 14-4. **Fan Assembly — Test Switch and Alarm LE**

2. Perform the alarm failure test by placing the test switch (refer to Figure 14-4) 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 */
    "MP: 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 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 */
    FAN:CL,INT,NSA,,,NEND::,NIMAN
;
```

Where:

b = Autonomous sequence number: 001-999

3. Perform the auxiliary power test by placing the test switch (refer to Figure 14-4) 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 */
    "MP: 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 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 */
    FAN:CL,INT,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: 001-999

Replacing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly

Powering Down the Fan

1. Pull the main Fan Assembly Fuse on the fuse panel of the failed fan assembly. Refer to Table 14-1 for fuse location.

Table 14-1. Fuse Chart for Fan Assemblies (Switch and Interface Bays)

Power Source	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8
Main	A16	B18	A17	E6-1	A19	B19	A18
Auxiliary	D16	D15	C17	B13-2	C19	D17	D19

Note: All load fuses (labeled with *-1*) for bays 2, 3, 4, 6, 7, and 8 are 10 A and all indicator fuses (labeled with *-2*) are 0.5 A. The switch bay fan assembly fuses are indicator fuses rated at 0.5 A.

2. Pull the AUX Fan Assembly fuse on the fuse panel of the failed fan assembly. Refer to Table 14-1 for fuse location.
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 the Fan Assembly (ED-9C130-30,G1 or ED-9C130-30,G2)

1. Remove the lower backplane cover from the rear of the bay containing the failed fan assembly.
2. Disconnect the electrical connector at the back of the fan assembly. Refer to Figure 14-5.
3. Remove the right and left stile strips from the front of the bay containing the failed fan assembly.
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 14-6).

5. 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.

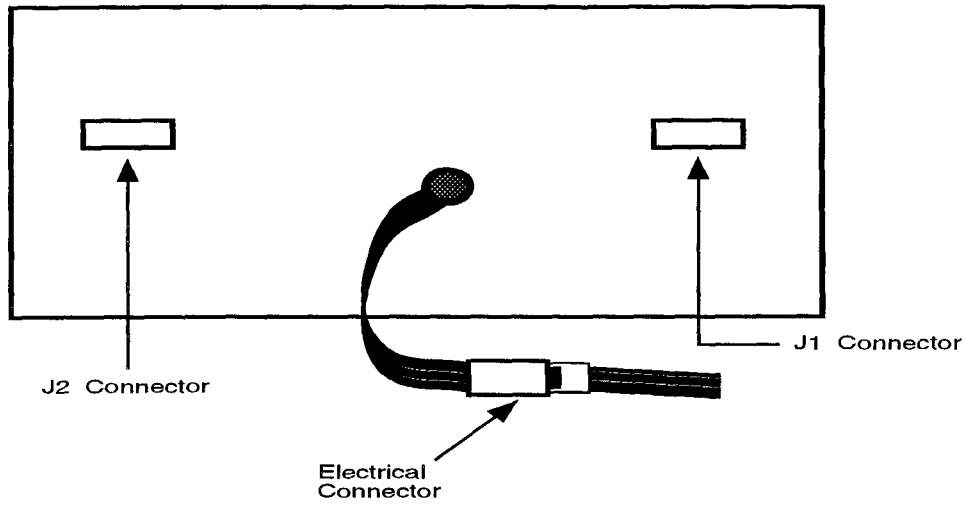


Figure 14-5. ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly (Rear View)

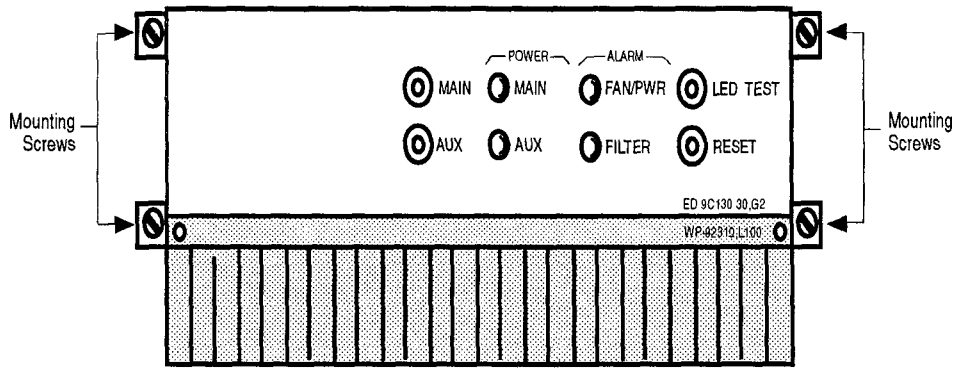


Figure 14-6. ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly (Front View)

Installing the Fan Assembly (ED-9C130-30,G1 or ED-9C130-30,G2)

1. Insert the new fan assembly and secure with the four mounting screws. Refer to Figure 14-6.

⚠ CAUTION:
When installing the new fan assembly, be careful with the N-rate cables.

2. Reinstall the right and left stile strips to the front of the bay containing the new fan assembly.
3. Reconnect the electrical connector in the back of the fan assembly. The connector plug is keyed to attach only one way. Refer to Figure 14-5.
4. Reinstall the lower backplane cover to the rear of the bay containing the new fan assembly.
5. 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.
6. Make sure that the air inlet below the fan assembly is unobstructed.

Powering Up the Fan

1. Reinsert the AUX Fan Assembly Fuse for the new fan assembly. Refer to Table 14-1 for fuse location.
2. Reinsert the Main Fan Assembly Fuse for the new fan assembly. Refer to Table 14-1 for fuse location.

   Go to the next section titled "Initializing the Fan Assembly" (page 14-23).

Initializing the Fan Assembly

The fan assembly provides constant cooling to the system by measuring the system impedance and setting the fan speed accordingly. This procedure is required for the fan to learn about the system airflow impedance.

⚠ CAUTION:
It is important to perform this procedure 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 can ***not*** *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 14-6, if necessary.

   After 5 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 2 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 2 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.

   Go to the next sectino titled "Checking the Fan Assembly" (page 14-24).

Checking the Fan Assembly

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.

This procedure tests 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 14-1.

   The red FAN/PWR LED on the fan assembly turns on and 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`

   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 14-6, if necessary.

   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`

   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 14-1.

   The red FAN/PWR LED on the fan assembly turns on and 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`

   If the alarm LED does not turn on, contact your system administrator or next level of support for assistance.

5. Replace the auxiliary fuse pull 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 14-6, if necessary.

   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`

   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 14-6, if necessary.

   All four LEDs on the fan assembly turn off for 2 seconds, turn on for 2 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.

Changing Unit Controller From UC1 (AKM59) to UC2 (AKM59B)

This procedure allows you to change a unit controller (UC) circuit pack from UC1 (AKM59) to UC2 (AKM59B).

The UC2 supports the functions of MUX2 (AKM68), MUXP2 (AKM70), SWIF2 (AKM50), and PMGR1 (AKM66) circuit packs. Therefore, the UC2 must be provisioned before any MUX2, MUXP2, SWIF2, or PMGR1 circuit packs are provisioned.

NOTE:
DS3 Interface-32 Modules require the installation of the PWRE3 (556C) power supplies if MUX2 circuit packs are going to be provisioned. Refer to the procedure titled "Changing Power Supply From PWRE2 (556B) to PWRE3 (556C)" (page 14-32) to change the PWRE2 power supply to the PWRE3 before provisioning any MUX2 circuit packs in a DS3 Interface-32 Module.

1. Determine the state of the UC1 circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   If the basic state of the UC1 is OOS, go to Step 3; otherwise, continue with Step 2.

2. Remove the UC1 circuit pack from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   A major (MJ) alarm occurs on the UC circuit pack when the UC circuit pack is removed from service.

3. Extract the UC1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
4. Install the UC2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.
5. Restore the UC2 circuit pack to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   The major alarm on the UC circuit pack clears (CL) when the UC circuit pack is restored to service.

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.

NOTE:
The UC2 (AKM59B) circuit pack must be provisioned in the DS1 Interface Module before changing from SWIF1 to SWIF2. Refer to the previous section titled "Changing Unit Controller From UC1 (AKM59) to UC2 (AKM59B)" (page 14-26) for changing UC1 circuit packs, if necessary.

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-{1-32}-{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-{1-32}-{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-{1-32}-{1-8}**

   The green LEDs on the DS1RY circuit packs turn off to indicate the protection switch is no longer active. 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.

NOTE:
The UC2 (AKM59B) circuit pack must be provisioned in the DS1 Interface Module before changing from SWIF1 to SWIF2. Refer to the section titled **"Changing Unit Controller From UC1 (AKM59) to UC2 (AKM59B)" (page 14-26)** for changing UC1 circuit packs, if necessary.

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-{1-32}-P`

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 major (MJ) 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-{1-32}-P**

4. Install the SWIF2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm on the SWIF protection circuit pack clears (CL) when the SWIF2 circuit pack is installed.

Changing Power Supply From PWRE2 (556B) to PWRE3 (556C)

This procedure allows you to change the DS3 Interface Module power supplies from PWRE2 (556B) to PWRE3 (556C).

The 556C power supply supports the functions of the MUX2 (AKM68) and MUXP2 (AKM70) circuit packs in DS3 Interface Modules. Therefore, both 556C power supplies must be installed before any MUX2 and MUXP2 circuit packs are provisioned in a DS3 Interface Module.

NOTE:
DS3 Interface-32 Modules require the installation of the 556C power supplies if MUX2 circuit packs are going to be provisioned. The 556C power supplies are not required for DS3 Interface-16 Modules.

1. Extract **one** 556B power supply from the DS3 Interface Module. Refer to Chapter 2 for extracting a circuit pack if necessary.

   A major (MJ) alarm occurs when the power supply circuit pack is extracted.

CAUTION:
Do not extract more than one power supply circuit pack at a time.

2. Install the 556C power supply. Refer to Chapter 2 for installing circuit packs, if necessary.

NOTE:
The major alarm on the power supply clears (CL) after the new power supply circuit pack is installed.

3. Verify both power supplies are operating by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = PWRE circuit pack location: `PWRE-{1-32}-1&-2`

   Refer to the section titled "Power Circuit Pack Failure" (page 12-73) to clear power supply alarms if either power supply indicates an alarm.

4. Extract the other 556B power supply from the DS3 Interface Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A major (MJ) alarm occurs when the power supply circuit pack is extracted.

CAUTION:
Do not extract more than one power supply circuit pack at a time.

5. Install the 556C power supply. Refer to Chapter 2 for installing circuit packs, if necessary.

   The major alarm on the power supply clears (CL) after the new power supply circuit pack is installed.

6. Verify both power supplies are operating by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = PWRE E circuit pack location: **PWRE-{1-32}-1&-2**

   Refer to the section titled "Power Circuit Pack Failure" (page 12-73) to clear power supply alarms if either power supply indicates an alarm.

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 (AKM68) circuit pack. Therefore, the MUXP2 circuit pack must be provisioned before any MUX2 circuit packs are provisioned in a DS3 Interface Module.

NOTE:
The UC2 (AKM59B) circuit pack must be provisioned in the DS3 Interface Module before changing from MUXP1 to MUXP2.

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-{1-32}`

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: **MUX-{1-32}**

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 From MUX1 (AKM52) to MUX2 (AKM68)

This procedure allows you to change a multiplexer (MUX) circuit pack from MUX1 (AKM52) to MUX2 (AKM68).

NOTE:
The following circuit packs must be provisioned in the DS3 Interface Module before changing from MUX1 to MUX2: PWRE3 (556C) power supplies, UC2 (AKM59B), and MUXP2 (AKM70). Refer to necessary change procedures earlier in this chapter to change PWRE2, UC1, and MUXP1 circuit packs.

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-{1-32}-{1-31}`

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-{1-32}-{1-31}`

   The green LED on the MUXPS circuit pack is lit to indicate a protection switch is active. A minor (MN) alarm occurs on the MUX when the MUX1 circuit pack is switch 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 5-1 and 5-2. 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*::**AKM68;**

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: **MUX-{1-32}-{1-31}**

6. Install the MUX2 circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

7. 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-{1-32}-{1-31}**

   The green LED on the MUXPS circuit pack turns off to indicate the protection switch is no longer active. The minor alarm on the MUX clears (CL) when service is switched to the MUX2 circuit pack.

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. 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-{1-32}**

   From the following output response, note the SWIO and J-Cable information for re-provisioning 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-{1-32}

   l = Switch connection equipment location: SWIO-{1-32}
   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-J32

2. Deprovision the DS3 Interface-32 Module by referring to the section titled "Deprovisioning DS3 or STS1 Interface Modules" (page 5-78).
3. Remove all circuit packs from the upper half of the DS3 Interface-32 Module, with the exception of the PWRE3 (556C) circuit pack.
4. At the Switch Bay, remove the higher numbered SWIO circuit pack pair as identified in the information obtained in Step 1.
5. Replace the SWIO circuit packs removed in Step 4 with blank circuit packs (list number 846103760).
6. 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.
7. Replace the MUXP circuit pack with the SMUXP (AKM85) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
8. Verify that the Unit Controller (UC) is an UC2 (AKM59B) circuit pack. If not, replace the UC circuit pack with an UC2 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 9 through 16.

9. From the back of the DS3 Interface-32 Module, remove the backplane cover from the module.
10. Carefully disconnect and remove the Protection Bus Cables (four connections) from the upper half of the module (connector locations J105 through J108).
11. 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).
12. Verify that connector J104 is still in place on the bottom half of the module.
13. Replace the backplane cover on the DS3 Interface-32 Module.

14. From the front of the DS3 Interface-32 Module, place the chassis covers over the upper half of the module which is exposed (list number 846519528 on the left hand side, list number 846519536 on the right hand side).
15. Place the blank cover (list number 846138337) over the open space between the chassis covers installed in Step 14.
16. 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.
17. Update the Interface Modules Provisioning Worksheet [Table 5-1, before the section titled "Provisioning Interface Modules (Units)" (page 5-10)] with the new STS1 Interface-16 Module information.
18. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-10).
19. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-20).

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. 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-{1-32}**

   From the following output response, note the SWIO and J-Cable information for re-provisioning 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-{1-32}`

   l = Switch connection equipment location: `SWIO-{1-32}`
   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-J32`

2. Deprovision the DS3 Interface-16 Module by referring to the section titled "Deprovisioning DS3 or STS1 Interface Modules" (page 5-78).

3. 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.

4. Replace the MUXP circuit pack with the SMUXP (AKM85) circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

5. Verify that the Unit Controller (UC) is an UC2 (AKM59B) circuit pack. If not, replace the UC circuit pack with an UC2 circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
6. 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.
7. Update the Interface Modules Provisioning Worksheet [Table 5-1, before the section titled "Provisioning Interface Modules (Units)" (page 5-10)] with the new STS1 Interface-16 Module information.
8. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-10).
9. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-20).

Acceptance Testing

15

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Acceptance Testing

15

This chapter consists of procedures required for acceptance testing of the DACS IV-2000 system. 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 system, 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 Release 3.0 Commands and Messages* manual (AT&T 365-340-402).

Testing the System

Testing of the DACS IV-2000 system 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 consist of performing a visual inspection of the frame and checking the following:

- Link Operation
- Frame Alarm Operation
- Interbay (N-rate) cables
- External Cables
- Fan Assembly
- Protection Switch Function
- Alarm and Telemetry Outputs

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 assume that the system has been initialized and that the frame entities have been provisioned. Procedures for provisioning system entities are located in Chapter 5 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 that it is given in this chapter. Also, obtain office or equipment records for the system you are testing.

Visual Inspections

Refer any problems found in this procedure that are not corrected easily to the installation group.

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. If you are accepting the switch bay, make sure the disk drive and the tape drive are completely engaged.
4. Look for broken or bent pins near the edges of each backplane; damage can occur to these pins even with 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 TTY1-1 or TTY2-1 connector behind the main controller **OR** to the TTY1-1 or TTY2-1 connector on the status panel in the front of the bay using an adaptor (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 BUSA, BUSB, BUSC, BUSD, and BUSE fuse lamps on the fuse and alarm panel at the top of the frame are *not* lit.

    If any lamps are lit, have the installation group correct the problem before continuing.
12. Verify that the green LEDs are lit and the red LEDs are off on all (PWRA, PWRE, PWRF, and PWRG) 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 system.

1. Verify that your terminal is set for the following major characteristics:

   Baud: 1200
   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.

2. At the `login:` prompt, enter the system login.
3. At the `password:` prompt, enter the system password.

   The password is not *echoed on screen.*

4. Specify your network element (obtained from office records) by entering:

   ED-NE:::::*c***;**

   Where:

   c = Target ID. <1 to 18 characters>

5. Verify that you entered the correct network element by entering the following command:

   RTRV-NE;

   If the desired target ID is not displayed, redo Step 4 to enter the correct target ID.

6. 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}`

7. Verify the time and date by entering the following command:

   RTRV-HDR:*[a]*;

   Where:

   a = Target ID (optional)

   If the information entered is not what you wanted, repeat Step 6 to enter the date and time correctly.

8. Determine the software version that is loaded on the system by entering the following command:

   RTRV-NE:*[a]*;

   Where:

   a = Target ID (optional)

   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.

9. 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)

10. 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}-{1-6}**

Frame Alarm Operation

This procedure is used to check the LED test function and to test the frame alarm operation.

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)

   The LEDs light in the following order:

Order	Equipment
1	Redundant Controller, Switch Power Module, and Auxiliary Power Module
2	SWCS Circuit Packs
3	SWIO Circuit Packs
4	Interface Modules 1-32 in order*

* Interface module (unit) LEDs light only if provisioned

   If they do not light in the order given, refer the problem to the installation group.

3. Determine the states of the SWCS circuit packs by entering the following command:

   RTRV-STATE-EQPT:*[a]*:**SWCS-1&&-32**;

   Where:

   a = Target ID (optional)

4. Choose any SWCS circuit pack that is in the IS state and its mate is in the IS state (for example, choose SWCS-1 if SWCS-1 and SWCS-2 are in the IS 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 MINOR 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 that is in the IS state and its mate is in the IS state and is not the mate of the SWCS circuit pack extracted in Step 3 (refer to Chapter 2 for extracting circuit packs, if necessary).

   Wait for the alarm delay interval (up to 30 seconds). Wait for the MAJOR 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

Switch cables have two labels. One label identifies the cable that connects to the interface shelf. This label is marked in the format **Jn-a**. The other label identifies the cable end that connects to the switch shelf. This label is marked in the format **JnS-a**.

For example, a switch cable ID identified in the DACS IV-2000 system database as C-J12 corresponds to a physical cable labeled J12-C at the interface shelf end and J12S-C at the switch shelf end.

The following procedure is used to test the cables connecting the switch input/output (SWIO) circuit packs in the Switch Bay 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. PMGR circuit packs must be removed from the system in order to perform this procedure.

Specifying a range J1-X through J16-X, where X is one of the allowed connector letter suffixes, tests all N-rate connectors assigned to two DS1 Interface Modules (which can include one DS1 Interface-Protection Module) or one DS3 or STS1 Interface-16 Module.

Similarly, specifying a range J1-X through J16-X, where X is one of the allowed connector letter suffixes, tests half of the N-rate connectors assigned to one 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 in "DS1 Facility Continuity Checking" (page 2-2), for more information, if necessary.*

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 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,C,D,E,F,G,H,J,K,L,M,N,P,R,T}-J1&&-J16

   For a DS3 Interface-32 Module, test the N-rate cables by entering, the following command twice for each N-rate cable:

   TEST-CABLE:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Switch Cable ID:
   {A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,T}-J1&&-J16

NOTE:
The format of the switch cable ID corresponds to the physical labels on the cable. The format of this identifier is **a-Jn** where:

a = a letter between A and T (excluding I, O, Q, and S)

n = a number between 1 and 16.

3. Check the output message. If the result of any test is `FAILED`, 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 Release 3.0 Commands and Messages* manual [AT&T 365-340-402].)

   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 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 system. 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 system that can be looped back at the far-end equipment toward the DACS IV-2000 system 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 15-10).
- 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 15-11).
- 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 15-12).
- To test cables in a system that have only DS3 interfaces (grooming applications) and are connected to external multiplexing equipment such as the AT&T DDM-1000, go to the section titled "DS3 Interfaces" (page 15-13).

⚠ 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.*

DS1 Interface Modules

This procedure is used to test the cables terminating on DS1 Interface Modules.

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: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module location: `{1-32}-{1-7}-{1-28}`

   The test runs for 5 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.

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: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module location: `{1-32}-{1-15}-{1-28}`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module: `{1-32}-{1-7}-{1-28}`

   Test runs for 5 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: `{1-32}-{1-15}-{1-28}`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module: `{1-32}-{1-7}-{1-28}`

   Test runs for 5 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).

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 15-1).

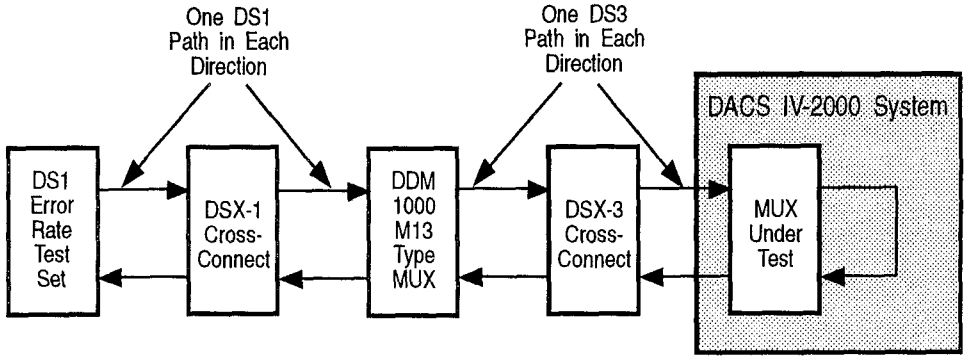


Figure 15-1. **External Cable Test (Only DS3 Interfaces)**

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: {1-32}-{1-7}-{1-28}
   DS1 Interface Module: {1-32}-{1-8}-{1-28}
   DS3 Interface-32 Module: {1-32}-{1-31}-{1-28}
   DS3 Interface-16 Module: {1-32}-{1-15}-{1-28}
   STS1 Interface-16 Module: {1-32}-{1-15}-{1-28}

NOTE:
The port numbers must be the same, in effect looping back the port internal to the switch.

Fan Assembly (ED-9C130-30,G1 or ED-9C130-30,G2)

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.

This procedure tests the main and auxiliary power alarm capabilities, power source switching and LED functionality.

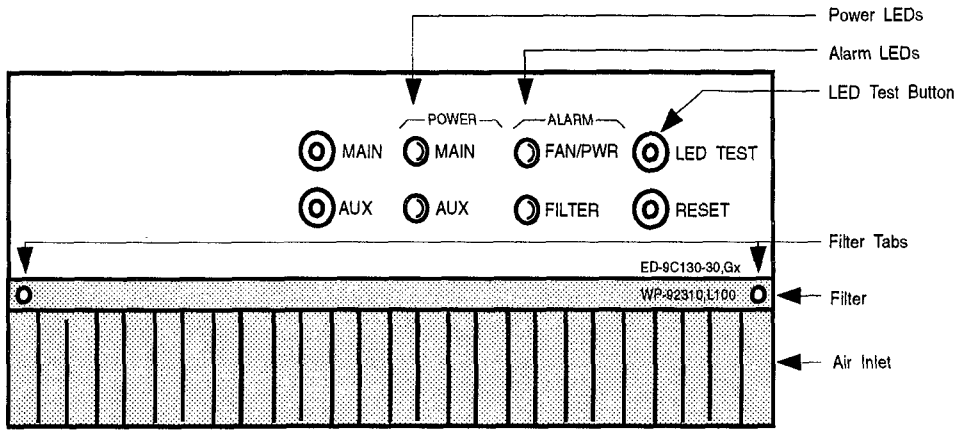


Figure 15-2. Fan Assembly — ED-9C130-30,G1 and ED-9C130-30,G2 (Front View)

1. Be sure that the air inlet below the fan assembly is unobstructed (see Figure 15-2).
2. Make sure that a fan filter (WP-92310,L100) is present and installed properly.

   If the fan filter is missing, refer the problem to the installation group.

3. 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 15-1).

   The red FAN/PWR LED on the fan assembly turns on and 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`

   If the alarm LED does not turn on, refer the problem to the installation group.

Table 15-1. **Fuse Chart for Fan Assemblies (Switch and Interface Bays)**

Power Source	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8
Main	A16	B18	A17	E6-1	A19	B19	A18
Auxiliary	D16	D15	C17	B13-2	C19	D17	D19

Note All load fuses (labeled with *-1*) for bays 2, 3, 4, 6, 7, and 8 are 10 A and all indicator fuses (labeled with *-2*) are 0 5 A. The switch bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5 A

4. Replace the main fuse pulled in Step 3 in the Fuse and Alarm panel.
5. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 15-2, if necessary.

   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`

   The FAN/PWR LED turns off.

   If the LED does not turn off, refer the problem to the installation group.

6. Pull the auxiliary fuse for the fan assembly being tested from the Fuse and Alarm panel (refer to Table 15-1).

   The red FAN/PWR LED on the fan assembly turns on and 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`

   If the alarm LED does not turn on, refer the problem to the installation group.

7. Replace the auxiliary fuse pull in Step 6 in the Fuse and Alarm panel.

8. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 15-2, if necessary.

   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`

   The FAN/PWR LED turns off.

   If the LED does not turn off, refer the problem to the installation group.

9. Press and release the LED TEST button on the fan assembly. Refer to Figure 15-2, if necessary.

   All four LEDs on the fan assembly turn off for 2 seconds, turn on for 2 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 ten 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-{1-32}-{1-8}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-5} }`

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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

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.

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-{1-32}-{1A-8B}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }`

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, or SMUX circuit pack associated with the cross-connect 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{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 system 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.

1. Extract one SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
2. If the yellow MINOR 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 is activated, extract a second SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. If the red MAJOR 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.

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 15-2).

The procedure for testing a new interface bay consists of performing a visual inspection of the frame and checking the following:

- Interbay (N-rate) Cables
- External Cables
- Protection Switch Function
- Fan Assemblies (STS1/DS3 Interface Bays)

These procedures assume that the installation group has provisioned the units in the interface bay. A procedure for provisioning the DACS IV-2000 equipment is located in Chapter 5.

NOTE:
The procedures must only be performed in the sequence that they are given. Also, obtain any office or equipment records for the system you are expanding with an interface bay.

Visual Inspections

Refer any problems found in this procedure that are not corrected easily to the installation group.

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. If you are accepting the switch bay, make sure the disk drive and the tape drive are completely engaged.
4. Look for broken or bent pins near the edges of each backplane; damage can occur to these pins even with 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 TTY1-1 or TTY2-1 connector behind the main controller **OR** to the TTY1-1 or TTY2-1 connector on the status panel in the front of the bay using an adaptor (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 BUSA, BUSB, BUSC, BUSD, and BUSE fuse lamps on the fuse and alarm panel at the top of the frame are **not** lit.

    If any lamps are lit, have the installation group correct the problem before continuing.
12. Verify that the green LEDs are lit and the red LEDs are off on all (PWRA, PWRE, PWRF, and PWRG) power supply circuit packs.

    If any red LEDs are lit or green LEDs are out, have the installation group correct the problem before continuing.

Interbay (N-Rate) Cables

Switch cables have two labels. One label identifies the cable that connects to the interface shelf. This label is marked in the format **Jn-a**. The other label identifies the cable end that connects to the switch shelf. This label is marked in the format **JnS-a**.

For example, a switch cable ID identified in the DACS IV-2000 system database as C-J12 corresponds to a physical cable labeled J12-C at the interface shelf end and J12S-C at the switch shelf end.

The following procedure is used to test the cables connecting the switch input/output (SWIO) circuit packs in the Switch Bay 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. PMGR circuit packs must be removed from the system in order to perform this procedure.

Specifying a range J1-X through J16-X, where X is one of the allowed connector letter suffixes, tests all N-rate connectors assigned to two DS1 Interface Modules

(which can include one DS1 Interface-Protection Module) or one DS3 or STS1 Interface-16 Module.

Similarly, specifying a range J1-X through J16-X, where X is one of the allowed connector letter suffixes, tests half of the N-rate connectors assigned to one 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.*

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 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,C,D,E,F,G,H,J,K,L,M,N,P,R,T}-J1&&-J16`

   For a DS3 Interface-32 Module, test the N-rate cables by entering, the following command twice for each N-rate cable:

   `TEST-CABLE:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = Switch Cable ID:
   `{A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,T}-J1&&-J16`

NOTE:
The format of the switch cable ID corresponds to the physical labels on the cable. The format of this identifier is **a-Jn** where:

a = a letter between A and T (excluding I, O, Q, and S)

n = a number between 1 and 16.

3. Check the output message. If the result of any test is *FAILED*, 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 Release 3.0 Commands and Messages* manual [AT&T 365-340-402].)

   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 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 system. 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 system that can be looped back at the far-end equipment toward the DACS IV-2000 system 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 15-24).
- 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 15-25).
- 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 15-26).
- To test cables in a system that have only DS3 interfaces (grooming applications) and are connected to external multiplexing equipment such as the AT&T DDM-1000, go to the section titled "DS3 Interfaces" (page 15-27).

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.*

DS1 Interface Modules

This procedure is used to test the cables terminating on DS1 Interface Modules.

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: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module location: `{1-32}-{1-7}-{1-28}`

   The test runs for 5 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.

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: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module location: `{1-32}-{1-15}-{1-28}`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module: `{1-32}-{1-7}-{1-28}`

   Test runs for 5 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: `{1-32}-{1-15}-{1-28}`

   e = DS1 port that is used to test with.
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS1 Interface-P Module: `{1-32}-{1-7}-{1-28}`

   Test runs for 5 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).

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 15-3).

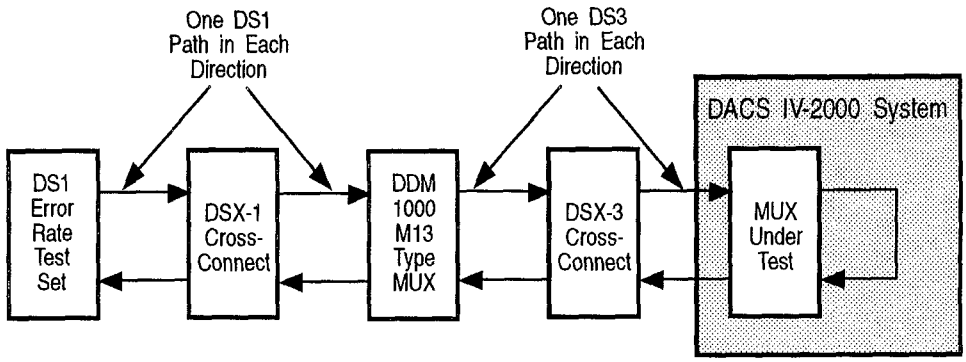


Figure 15-3. **External Cable Test (Only DS3 Interfaces)**

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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

NOTE:
The port numbers must be the same, in effect looping back the port internal to the switch.

4. Set the DS1 error rate test set so that you are receiving error-free transmission (**0** bit-errors).
5. Using the DS1 error rate test set transmitter, insert bit errors. Verify transmission by observing bit errors on the receiver.
6. Disconnect the cross-connection 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
7. Repeat this procedure for each remaining cable (terminating on the selected DS3 Interface Module) to be tested.
8. When you have completed testing all DS3 interfaces, remove the test set transmitter and receiver from the external equipment.

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 ten 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-{1-32}-{1-8}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-5} }`

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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

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.

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-{1-32}-{1A-8B}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }`

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, or SMUX circuit pack associated with the cross-connect 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: `{1-32}-{1-7}-{1-28}`
   DS1 Interface Module: `{1-32}-{1-8}-{1-28}`
   DS3 Interface-32 Module: `{1-32}-{1-31}-{1-28}`
   DS3 Interface-16 Module: `{1-32}-{1-15}-{1-28}`
   STS1 Interface-16 Module: `{1-32}-{1-15}-{1-28}`

8. Repeat this procedure for all other service DS1IF, MUX, and SMUX circuit packs.

Fan Assembly for STS1/DS3 Interface Bays

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.

This procedure tests the main and auxiliary power alarm capabilities, power source switching and LED functionality.

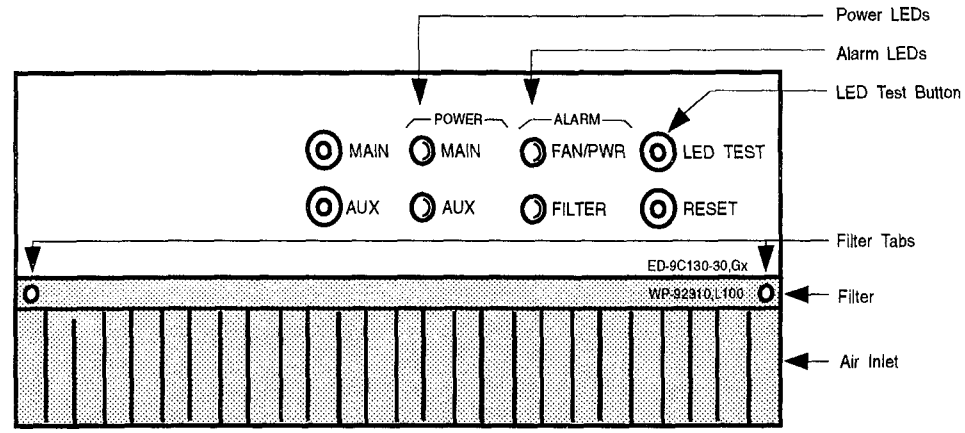


Figure 15-4. Fan Assembly — ED-9C130-30,G1 and ED-9C130-30,G2 (Front View)

1. Be sure that the air inlet below the fan assembly is unobstructed (see Figure 15-4).
2. Make sure that a fan filter (WP-92310,L100) is present and installed properly.

   If the fan filter is missing, refer the problem to the installation group.

3. 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 15-2).

   The red FAN/PWR LED on the fan assembly turns on and 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`

   If the alarm LED does not turn on, refer the problem to the installation group.

Table 15-2. **Fuse Chart for Fan Assemblies (Switch and Interface Bays)**

Power Source	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8
Main	A16	B18	A17	E6-1	A19	B19	A18
Auxiliary	D16	D15	C17	B13-2	C19	D17	D19

Note: All load fuses (labeled with *-1*) for bays 2, 3, 4, 6, 7, and 8 are 10 A and all indicator fuses (labeled with *-2*) are 0.5 A. The switch bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5 A.

4. Replace the main fuse pulled in Step 3 in the Fuse and Alarm panel.
5. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 15-4, if necessary.

   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`

   The FAN/PWR LED turns off.

   If the LED does not turn off, refer the problem to the installation group.

6. Pull the auxiliary fuse for the fan assembly being tested from the Fuse and Alarm panel (refer to Table 15-2).

   The red FAN/PWR LED on the fan assembly turns on and 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`

   If the alarm LED does not turn on, refer the problem to the installation group.

7. Replace the auxiliary fuse pull in Step 6 in the Fuse and Alarm panel.

8. Press the reset button on the fan assembly to clear the alarm LED on the fan assembly. Refer to Figure 15-4, if necessary

   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`

   The FAN/PWR LED turns off.

   If the LED does not turn off, refer the problem to the installation group.

9. Press and release the LED TEST button on the fan assembly. Refer to Figure 15-4, if necessary.

   All four LEDs on the fan assembly turn off for 2 seconds, turn on for 2 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.

Alarm, Scan, and Control (AS&C) Points

A

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Alarm, Scan, and Control Points

A

This appendix is provided to describe the interface between the DACS IV-2000 system and telemetry operations systems (OSs). The AS&C points are used with administrative link (CILINKs 1-4 and 2-4). CILINKs 1-4 and 2-4 support both the TABS (telemetry asynchronous block serial) and TBOS (telemetry byte oriented serial) protocols as defined in AT&T Compatibility Bulletin No. 149 entitled *Maintenance Standards for Digital Transmission Standards, Issue 3.* Both protocols use a polling format between the telemetry system and the DACS IV-2000 system with the telemetry system initiating all communications by sending a request message to the DACS IV-2000 system 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 while TBOS only supports the point-to-point architecture. CILINKs 1-4 and 2-4 are used as a dedicated links.

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 system. This information is available as both dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 system 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 system. This information is available as dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 system to the telemetry remote).
- Control Points — provide the telemetry remote with operational control of certain aspects of the DACS IV-2000 system. This information is available as dedicated binary bit positions in the telemetry messages (received by the DACS IV-2000 system 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 system 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).
- No Alarm (NA) — is set whenever one or more non-service-affecting conditions of a less serious impact on the DACS IV-2000 system than is warranted by a MN alarm exists (for example, a DS1 AIS).

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 system, 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 system, 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 system 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 and DS3 Interface Modules there are control points included in the extended facility set. In addition, for DS3 Interface Modules 9 through 16, the extended facility set includes detailed set information. Selecting the extended facility set automatically includes the transmission of the summary and detailed sets. Due to the large number of displays in the detailed alarm sets, only the summary set is supported by the TBOS protocol. 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-TSY-000047, Issue 2, 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), SCI, and/or UI circuit packs are preventing the execution of system control functions. The point CC: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 auto-lock). 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 or SSC Fail
	3	A	SEC or SSC Fail
	4	A	Switch Power Fail SA
	5	A	Switch 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 Fail SA
	11	A	SWIO Fail NSA
	12	A	DS1 Interface Module UC Fail or OOS
	13	A	DS1 Interface Module Power Fail
	14	A	CC 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
	27	A	MUX./PMGR1/SMUX Fail NSA
	28	A	Fan Fail

* A = Alarm
S = Scan

Table continued on next page.

Table A-1. **Summary Display Set Scan Points (Continued)**

Display	Point No.	Type *	Description
0	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	-	Unassigned
	50	S	CILINK 1-4 OOS or Lock-Out
	51	S	Transfer to SEC Fail
	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

* A = Alarm
S = Scan

Table continued on next page.

Table A-1. Summary Display Set Scan Points (Continued)

Display	Point No.	Type *	Description
0	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

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-TSY-000047, Issue 2. 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 system 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 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 system 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-7 define the scan and control points required for each module or assembly of the DACS IV-2000 system. Scan points are divided by type into alarm and scan points, and alarm points are further designated as either NSA or SA.

RC, SYNC, and SW Modules

Tables A-2 and A-3 list the detailed Redundant Controller Synchronizer, and Switch Module scan and control points, respectively.

Table A-2. **Detailed Display Set (RC/SYNC/SW Modules) — Scan Points**

Display	Point No.	Type *	Description
1	1	A	MC Fail or OOS
	2	A	PRI or SSC (or PRI-1) Fail
	3	A	SEC or SSC (or SEC) Fail
	4	A	Switch Power Fail SA
	5	A	Switch Power Fail NSA
	6	A	MC Power Fail NSA
	7	A	CLKGN Fail SA
	8-9	A	CLKGN-{0,1} Fail NSA
	10	A	Frame Audit Fail
	11	A	Fan Fail
	12-43	A	SWIO-{1-32} 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	SYNCPRI Active Timing Reference
	50-51	S	CLKGN-{0,1} Active
	52	S	SYNCSEC Active Timing Reference
	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
	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

* A = Alarm
S = Scan

Table continued on next page.

Table A-2. Detailed Display Set Scan Points (RC/SYNC/SW Modules) (Continued)

Display	Point No.	Type *	Description
2	1-32	A	SWIO-{1-32} Fail SA
	33	A	SWCS 32 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
	58-62	-	Unassigned
	63	A	PRI-2 Fail or OOS
	64	-	Reserved
3	1-32	S	SWIO-{1-32} Protection Switch Active
	33-36	-	Unassigned
	37	A	DS1TX-0 (side)-1 (port hardware) Fail NSA
	38	A	DS1TX-0 (side)-2 (port hardware) Fail NSA
	39	A	DS1TX-1 (side)-1 (port hardware) Fail NSA
	40	A	DS1TX-1 (side)-2 (port hardware) Fail NSA
	41	A	DS1TX-0 (side)-1 (reference 1) Fail NSA
	42	A	DS1TX-0 (side)-2 (reference 2) Fail NSA
	43	A	DS1TX-1 (side)-1 (reference 1) Fail NSA
	44	A	DS1TX-1 (side)-2 (reference 2) Fail NSA
	45	A	SYNC PRI (reference) Fail NSA
	46	A	SYNC SEC (reference) Fail NSA
	47	A	SYNC Mode (reference) Fail NSA
	48-63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Scan Points (Continued)

Display	Point No.	Type *	Description
4	1-16	S	SWIO Pair {1-16} Protection Switch Auto-Locked
	17-48	S	SWIO-{1-32} Protection Switch Locked
	49-63	-	Unassigned
	64	-	Reserved
5	1-31	A	SWCS-{!-32} Fail SA
	32-63	A	SWCS-{1-32} Fail NSA
	64	-	Reserved
6	1	S	SWCS Protection Auto-Locked
	2-32	S	SWCS-{1-31} Protection Switch Active
	33-63	S	SWCS-{1-31} Protection Switch Locked
	64	-	Reserved

* A = Alarm
S = Status

Table A-2. Detailed Display Set (RC/SYNC/SW 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 Make Timing Reference
	6	SYNCSEC Make Timing Reference
	7-64	Unassigned
2	1-32	SWIO-{1-32} Make Protection Switch
	33-64	Unassigned
3	1	SWIO-1 Lock Protection
	2	SWIO-1 Unlock Protection
	3	SWIO-2 Lock Protection

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display	Point No.	Description
	4	SWIO-2 Unlock Protection
	5	SWIO-3 Lock Protection
	6	SWIO-3 Unlock Protection
	7	SWIO-4 Lock Protection
	8	SWIO-4 Unlock Protection
	9	SWIO-5 Lock Protection
	10	SWIO-5 Unlock Protection
	11	SWIO-6 Lock Protection
	12	SWIO-6 Unlock Protection
	13	SWIO-7 Lock Protection
	14	SWIO-7 Unlock Protection
	15	SWIO-8 Lock Protection
	16	SWIO-8 Unlock Protection
	17	SWIO-9 Lock Protection
	18	SWIO-9 Unlock Protection
3	19	SWIO-10 Lock Protection
	20	SWIO-10 Unlock Protection
	21	SWIO-11 Lock Protection
	22	SWIO-11 Unlock Protection
	23	SWIO-12 Lock Protection
	24	SWIO-12 Unlock Protection
	25	SWIO-13 Lock Protection
	26	SWIO-13 Unlock Protection
	27	SWIO-14 Lock Protection
	28	SWIO-14 Unlock Protection
	29	SWIO-15 Lock Protection
	30	SWIO-15 Unlock Protection
	31	SWIO-16 Lock Protection
	32	SWIO-16 Unlock Protection
	33	SWIO-17 Lock Protection
	34	SWIO-17 Unlock Protection

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display	Point No.	Description
3	35	SWIO-18 Lock Protection
	36	SWIO-18 Unlock Protection
	37	SWIO-19 Lock Protection
	38	SWIO-19 Unlock Protection
	39	SWIO-20 Lock Protection
	40	SWIO-20 Unlock Protection
	41	SWIO-21 Lock Protection
	42	SWIO-21 Unlock Protection
	43	SWIO-22 Lock Protection
	44	SWIO-22 Unlock Protection
	45	SWIO-23 Lock Protection
	46	SWIO-23 Unlock Protection
	47	SWIO-24 Lock Protection
	48	SWIO-24 Unlock Protection
	49	SWIO-25 Lock Protection
	50	SWIO-25 Unlock Protection
	51	SWIO-26 Lock Protection
	52	SWIO-26 Unlock Protection
	53	SWIO-27 Lock Protection
	54	SWIO-27 Unlock Protection
	55	SWIO-28 Lock Protection
	56	SWIO-28 Unlock Protection
	57	SWIO-29 Lock Protection
	58	SWIO-29 Unlock Protection
	59	SWIO-30Lock Protection
	60	SWIO-30 Unlock Protection
	61	SWIO-31 Lock Protection
	62	SWIO-31 Unlock Protection
	63	SWIO-32 Lock Protection
	64	SWIO-32 Unlock Protection

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display	Point No.	Description
4	1-31	SWCS-{1-32} Switch to Protection
	32-64	Unassigned
5	1	SWCS-1 Lock Protection
	2	SWCS-1 Unlock Protection
	3	SWCS-2 Lock Protection
	4	SWCS-2 Unlock Protection
	5	SWCS-3 Lock Protection
	6	SWCS-3 Unlock Protection
	7	SWCS-4 Lock Protection
	8	SWCS-4 Unlock Protection
	9	SWCS-5 Lock Protection
	10	SWCS-5 Unlock Protection
	11	SWCS-6 Lock Protection
	12	SWCS-6 Unlock Protection
	13	SWCS-7 Lock Protection
	14	SWCS-7 Unlock Protection
	15	SWCS-8 Lock Protection
	16	SWCS-8 Unlock Protection
	17	SWCS-9 Lock Protection
	18	SWCS-9 Unlock Protection
	19	SWCS-10 Lock Protection
	20	SWCS-10 Unlock Protection
	21	SWCS-11 Lock Protection
	22	SWCS-11 Unlock Protection
	23	SWCS-12 Lock Protection
	24	SWCS-12 Unlock Protection
	25	SWCS-13 Lock Protection
	26	SWCS-13 Unlock Protection
	27	SWCS-14 Lock Protection
	28	SWCS-14 Unlock Protection

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display	Point No.	Description
5	29	SWCS-15 Lock Protection
	30	SWCS-15 Unlock Protection
	31	SWCS-16 Lock Protection
	32	SWCS-16 Unlock Protection
	33	SWCS-17 Lock Protection
	34	SWCS-17 Unlock Protection
	35	SWCS-18 Lock Protection
	36	SWCS-18 Unlock Protection
	37	SWCS-19 Lock Protection
	38	SWCS-19 Unlock Protection
	39	SWCS-20 Lock Protection
	40	SWCS-20 Unlock Protection
	41	SWCS-21 Lock Protection
	42	SWCS-21 Unlock Protection
	43	SWCS-22 Lock Protection
	44	SWCS-22 Unlock Protection
	45	SWCS-23 Lock Protection
	46	SWCS-23 Unlock Protection
	47	SWCS-24 Lock Protection
	48	SWCS-24 Unlock Protection
	49	SWCS-25 Lock Protection
	50	SWCS-25 Unlock Protection
	51	SWCS-26 Lock Protection
	52	SWCS-26 Unlock Protection
	53	SWCS-27 Lock Protection
	54	SWCS-27 Unlock Protection
	55	SWCS-28 Lock Protection
	56	SWCS-28 Unlock Protection

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display	Point No.	Description
5	57	SWCS-29 Lock Protection
	58	SWCS-29 Unlock Protection
	59	SWCS-30 Lock Protection
	60	SWCS-30 Unlock Protection
	61	SWCS-31 Lock Protection
	62	SWCS-31 Unlock Protection
	63-64	Unassigned

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.

Table A-3. 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

* A = Alarm
S = Scan

Table continued on next page.

Table A-3. Detailed Display Set (DS1 INTFC Module) — Scan Points (Continued)

Display	Point No.	Type *	Description
1	55-58	A	DS1RY-{1-4} Fail SA
	59	A	SW 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

Table A-4. Detailed Display Set (DS1 INTFC Module) — Control Points

Display	Point No.	Description
1	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

Table continued on next page.

Table A-4. Detailed Display Set (DS1 INTFC Module) — Control Points (Continued)

Display	Point No.	Description
	11	Unassigned
	12	DS1IF-{6A,6B} Switch to Protection
	13	Unassigned
	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
1	30-31	Unassigned
	32	DS1IF-{4A,4B} Lock Protection
	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

DS3 Interface Modules

The same points are assigned to the DS3 Interface-16 or DS3 Interface-32 Modules although some of the points are not needed for the smaller capacity module (those referring to MUX number 17-32 or CLKDR number 3-4). 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}).

Table A-5. **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	A	DS3PM Fail NSA
	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
	32-63	A	MUX/PMGR-{1-32} Fail NSA
	64	-	Reserved

* A = Alarm
S = Scan

Table continued on next page.

Table A-5. Detailed Display Set (DS3 INTFC Module) — Scan Points (Continued)

Display	Point No.	Type *	Description
4	1-31	A	Incoming DS3 Signal-{1-31} LOS/BER
	32-62	A	Incoming DS3 Signal-{1-31} OOF
	63	A	MUXP (MUX-32) Fail SA
	64	-	Reserved
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

Table A-6. 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

Table continued on next page.

Table A-6. Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)

Display	Point No.	Description
2	12	MUX-6 Unlock Protection
	13	MUX-7 Lock Protection
	14	MUX-7 Unlock Protection
	15	MUX-8 Lock Protection
	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
	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

Table continued on next page.

Table A-6. **Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)**

Display	Point No.	Description
2	42	MUX-21 Unlock Protection
	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
	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

Extended Display Sets

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-8, A-9, A-10, and A-11 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-8 lists these scan points. These scan points require four additional displays for each DS1 Interface Module.

Table A-7. **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

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-9 lists these points. These scan points require four additional displays for each DS3 Interface Module.

Table A-8. **Extended Display Set (DS3 INTFC Module) — 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

* A = Alarm

Table continued on next page.

Table A-8. Extended Display Set (DS3 INTFC Module) — Scan Points (Continued)

Display	Point No.	Type *	Description
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
	43-49	A	DS3 25, DS2-{!-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

STS1 Interface Module AS&C Points

All AS&C points for STS1 Interface Modules are provides 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-10 and A-11 lists the extended set scan and control points, respectively.

Table A-9. **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
	46-63	-	Unassigned
	64	-	Reserved
2	1-15	A	SMUX-{1-15} Fail SA
	16	A	SMUXP (SMUX-16) Fail SA
	17-31	A	SMUX-{1-15} Fail NSA
	32	A	SMUXP (SMUX-16) Fail NSA
	33-47	A	Incoming STS-1 Signal-{1-15} LOX/T-BERL
	48-62	A	Incoming STS-1 Signal-{1-15} LOF

* A = Alarm
S = Scan

Table continued on next page.

Table A-9. Extended Display Set (STS1 INTFC Module) — Scan Points (Continued)

Display	Point No.	Type *	Description
2	63	-	Unassigned
	64	-	Reserved
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

Table A-10. 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

Table continued on next page.

Table A-10. Extended Display Set (STS1 INTFC Module) — Control Points (Continued)

Display	Point No.	Description
	20	SMUX-2 Unlock Protection
	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
1	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

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 AS&C Points

Tables A-12 (scan points) and A-13 (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 16 and the maximum number of DS1 Interface Modules is 32, the switch is limited to a capacity of 256/248 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 DACS IV-2000 system can be equipped in a variety of configurations with different combinations of DS1, DS3, and STS1 interfaces. The configuration with the most displays has 32 DS1 Interface Modules and no DS3 Interface or STS1 Interface Modules and requires 70 detailed displays (6 for the Redundant Controller, Switch, Synchronizer, and Switch Power Modules and 64 for 32 DS1 Interface Modules).

Table A-11. **Number of Scan Point Displays**

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
RC, SYNC, and SW Module	1	6	0
DS1 Interface Module	32	2	4
DS3 Interface Module (1-8)	8	5	4
DS3 Interface Module (9-16)	8	0	9
STS1 Interface Module	16	0	5

Table A-12. Number of Control Point Displays

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
RC, SYNC, and SW Module	1	5	0
DS1 Interface Module	32	1	0
DS3 Interface Module (1-8)	8	2	0
DS3 Interface Module (9-16)	8	0	2
STS1 Interface Module	16	0	1

Detailed AS&C with Extended Facility Scan

Tables A-12 (scan points) and A-13 (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 and STS1 Interface Modules is 16 and the maximum number of DS1 Interface Modules is 32, the switch is limited to a capacity of 256/248 DS3/STS1 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 198 (6 for the redundant controller, synchronizer, switch, and switch power modules and 192 for the 64 DS1 Interface Modules) for a DACS IV-2000 system configuration consisting of a fully equipped switch, 32 DS1 Interface Modules, and no DS3 Interface Modules. 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.

Display Numbering

Table A-14 lists the AS&C display numbering assignments.

Table A-13. Scan Point Display Numbering

Scan Display	Control Display	Module
0	-	Summary (entire system)
1-6	1-5	Redundant Controller Module, Synchronizer Module, Switch Module, and Switch Power 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
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

Table continued on next page.

Table A-13. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
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
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

Table continued on next page

Table A-13. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
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
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

Table continued on next page.

Table A-13. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
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
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

Table continued on next page.

Table A-13. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
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

Glossary

A

Active
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 Delay
Specifies the alarm delay (in seconds) for software-detected alarm conditions. Initial value is 20 seconds.

Alarm Indication Signal (AIS)
A signal transmitted downstream if the incoming signal is defective.

All ones Signal
Signal which is defined to contain all ones in the terminal-to-terminal mode.

Alphanumeric Characters
Letters and digits.

Alternate Mark Inversion
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: major, minor, or no alarm.

Autolock
When the system autolocks an circuit pack, it switches to protection and forbids return to the working circuit pack even if the trouble clears. This is usually 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.

Autolock Switching Interval
An interval in minutes (see autolock number of switches).

Autonomous
Done by the system without direction by you.

Auto-provisioning
Put into the provisioned state automatically by the system.

B

B3ZS
Bipolar with 3-zero substitution, a DS3 line code.

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 variations (BPV) or parity (PTY). (Initial value is BPV.)

Bipolar Variation
A variation of the alternating +1, -1 pattern in a 3-level code.

Bit Error Rate Threshold
3 stands for 0.001, 6 stands for 0.000001.

Blue Code
Same as AIS.

Boot
To transfer contents of backup memory into the system's working memory.

Broadcast
Form a bridge connection.

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 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.

CBIT
A DS3 line code in which parity checks on blocks of data are used to detect bits in error.

Clear (CL)
An alarm condition no longer exists.

Command Mode
One of two modes used to communicate with the DACS IV-2000 system. This mode involves entering commands directly into the system without any prompts.

Condition
The type of alarm indication.

Control Cable ID
Specifies the controller cable identification associated with an interface module or a DS3 performance monitor (DS3PM) circuit pack (J cable).

Control Complex
A set of circuit packs (CPU/MTC/SSC) that provide all control functions for the DACS IV-2000 system. For the redundant controller, two control complexes are provided for increased reliability of the main controller.

Cross-Connect
A piece of hardware used to interconnect line-terminating equipment, multiplexers, and other equipment.

Crosstalk
A signal induced into one transmission line from another transmission line.

Current Value
In the dialog mode, it 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
A device used with a multiplexed signal for recovering signals combined within it and restoring the distinct individual channels of these signals.

Diagnose
Test a circuit pack; also a trouble condition in which a diagnostic test is in progress.

Display Number
Specifies a TABS or TBOS 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 driven port is being monitored, and a good signal is expected.

DS1 Code Type
The code type for a DS1 interface port. Code type can be: an asterisk (*), which denotes that the port was provisioned by a circuit pack insertion rather than by a command; or INIT, which represents an unset (initialized) value. (Initial value is INIT.)

DS1GRP
A group of 28 DS1 ports in either an SWIF or a MUX circuit pack.

DS1 Port
Terminates a DS1 signal on either a DS1IF (one of 14 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 Mb/s (ANSI T1.107). A DS1 signal is produced by combining 24 DS0 signals (8 bits per DS0) and one synchronizing bit, thereby transmitting 193 bits per frame.

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, which handles 28 DS1 signals.

DS3 Format
Specifies the line format of a DS3 interface port. DS3 performance monitoring is performed when CBIT is specified and there is a DS3PM provisioned in the DS3 Interface Module. Initial value is M13, the common multiplexer format.

DS3 Idle Signal
A signal applied to any DACS IV-2000 system output port that is not cross-connected to an input port. This signal lets *down stream* network elements know that the facility is operating normally even through the DACS IV-2000 system 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 Mb/s (ANSI T1.107). A traffic-carrying DS3 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.

DSX-1, 2, 3
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).

E

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

Echo
Display an input at a terminal (a user ID is echoed, but a password is not).

Enter
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 communication 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 communication link.

Equalizer
A circuit adjustment used to maintain signal strength between desired limits.

Equipped
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 system that carries a transmission signal (such as a DS1 or STS-1 signal).

Fault
The circuit pack has a hard (not temporary) fault and can not be able to 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 (193 bits in a DS1 signal), which contains twenty-four 8-bit bytes and a synchronizing frame bit.

G

Grooming
Rearrangement of DS1/VT1.5 signals in DS3/STS-1 signals.

H

Hardware ID
Specifies the hardware identification (type and version) of a circuit pack. INIT is the initial system value.

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 minutes, and SS is the seconds.

Hierarchy
An orderly ranking or sequence of elements, such as that of menus presented at a terminal.

Hit
A disruption of service that lasts for less than 1 second. Same as outage.

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
It is transmitted downstream automatically from an idle output port, and it can also be transmitted down stream by manual command from a cross-connected output port. DS1 idle code (the same as DS1 alarm indication signal) consists of all ones.

In Service
The circuit pack is performing normal service functions, either active or standby.

Input Status
The input signal status of a DS1, DS3, VT1.5, or STS-1 interface port . Status can be

- **DRVN** (driven) — where a signal is expected at the port, and the port is being monitored for failures
- **NDRVN** (not driven) — where no valid signal is expected at the port, and the port is not being monitored for failures
- **INIT** (initialized) — or unset meaning that the port is considered not driven until a valid signal is detected, at which time it becomes driven
- **QRSS** — where a DS1 port is provisioned as the quasi-random signal source for the system

(Initial values are INIT for a DS1 interface port and DRVN for a DS3, VT1.5, and STS-1 interface port., and DRVN for DS1 ports of an DS3 interface port)

J

Jitter
Short-term variations in 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 of which originates the line signal and the other terminates the line signal.

Line BuildOut
An attenuating (signal-reducing) element used to keep DS3 output signal strength between desired limits. The line buildout setting for MUX circuit packs include

- **IN** — the line buildout is in use, reducing the output signal strength
- **OUT** — the line buildout is not in use
- **INIT** — initialized (unset)

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. Overhead added 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-{1-32} is a literal character; the braces and the second hyphen are not literal characters.

Location
The specific circuit pack, interface module, interface port, or communication link involved.

Loopback
A circuit arrangement that causes a received signal to be returned to its source.

Loopback State
Specifies the state of DS1, VT1.5, and STS-1 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.

Maintenance
The circuit pack has been locked into a non-service-providing state by a manual command.

Maintenance Condition
A circuit pack state in which some normal service functions are suspended, either because of a problem or in order to perform special functions (copy memory) that cannot be performed while normal service is being provided.

Mapped
Cross-connected.

Memory Class
Specifies a class of memory, which can be either:

- **PROG** — software release
- **DBASE** — database

Memory Data
Specifies the data (8 hexadecimal digits) associated with a memory type.

Memory Location
Specifies the equipment, DS1 interface port, DS3 MUX port, or STS-1 SMUX port location associated with a memory type.

Memory Type
Specifies the memory device of

- **WKG** — working (system) random access memory
- **PRI** — primary backup (disk)
- **SEC** — secondary backup (tape), INIT.

Menu/Prompt Mode
One of two modes used to communicate with the DACS IV-2000 system. When operating in this mode, the system lets you choose commands from menus and then prompts you for information to complete the command.

Multipoint Address
Specifies the Layer 2 (multipoint) address used on a TABS link.

N

N-Rate Cable
A cable that carries an N-rate signal (27.648 Mb/s), which includes 14 DS1 signals , 1 STS-1(cc-SPE) signal, or 14 STS-1(VT1.5) signals and timing information. There are four N-rate cable groups. They are:

- **R1** — from SWIF or MUX to SWIO
- **X1** — from SWIO to SWCS
- **Y1** — from SWCS to SWIO
- **T1** — from SWIO to SWIF or MUX

Network Element
A DACS IV-2000 frame is a network element.

Notification Code
The notification code for alarm and status conditions, which include:

- **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.

O

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. OOS is also used for out-of-synchronism.

Outage
A disruption of service that lasts for more than one second. Same as hit.

Output Mode
Specifies what is being transmitted from a DS1, VT1.5, or STS-1 output port. The modes are

- **NORM** — normal cross-connected data
- **TERM** (terminated) — IDLE code
- **AIS** — alarm indication signal
- **QRSS** — an externally generated DS1 test signal, assumed to be quasi-random

Initial value is NORM.

P

Parity Check
To determine whether a block of digital data has been corrupted in transmission, you can use an even-parity format in which an extra bit is added to the block at the transmitter if necessary so that the block always contain an even number of one bits. A parity-checking circuit at the receiving end can determine whether an error has occurred in transmission. An odd-parity format can also be used for the same purpose.

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)
Overhead (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 how often (in seconds) the system expects a poll request from a telemetry remote on a TABS or TBOS link.

Port
The place of access on an interface circuit pack that connects the DACS IV-2000 system to a DS1, DS3, or 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 a interface link.

Provisioned
The circuit pack is ready to perform its intended function. A provisioned circuit pack can be ACT, IS, STBY, POS, or 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)
It generates a specific, reproducible but complicated digital test signal that resembles a normal traffic-carrying DS1 signal.

R

Red-lined
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.

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 (or can be) 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.

Side Switch
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
Gives the software version information for the system. The software ID contains:

- a one-digit number giving the software release
- a two-digit number giving the issue
- a one-digit number giving the point 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
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, whether it is ready for normal use, etc.

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 a STS1 port on an SMUX circuit pack. If the value UNIT is given, it indicates all the STS1 interface ports in that STS1 Interface Module.

STS Envelope Capacity
Bandwidth within and aligned to the STS frame that carries the STS synchronous payload envelope (SPE).

SSTS Path Overhead
Nine evenly distributed path overhead bytes per 125µs starting at the first byte of the STS SPE. STS path overhead provides for communication between a point of creation 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-1 Signal
The basic building block signal in the SONET standard (ANSI T1.105 and Bell Communications Research's Technical Reference, TR-TSY-000253). An STS-1 signal has a data rate of 51.84 Mb/s. 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 125µs. 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*.

STS Synchronous Payload Envelope (STS SPE)
A 125µs frame structure composed of STS path overhead and bandwidth for payload.

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 synchronous 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.

Subrate
In the Digital Data System, a data bit rate that is either 2.4, 4.8, or 9.6 kb/s.

T

Terminated
Output mode in which idle code is transmitted downstream.

Test Mode
Specifies the test access mode.

Transport Overhead
The overhead (informational bytes that contain the line and section overhead) added to the STS SPE for transmission.

Tributary
One of the 28 DS1 (1.544 Mb/s) channels in a DS3 (44.736 Mb/s) signal or one of 28 VT1.5 (1.728 Mb/s) channels in an STS-1 (51.84 Mb/s) signal.

U

UCAL
Specifies the user community authorization level: 5 means a superuser (system administrator); 1 means 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
- **DS1** — for DS1 Interface Module
- **DS1P** — for DS1 Interface-Protection Module.
- **16STS** — for STS1 Interface-16 Module

V

Virtual Tributary (VT)
A structure designed for transporting and switching some STS1 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 Mb/s. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies 3 columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies 12 columns of the 9-row structure and for VT1.5s contain 4 VTs per group.

VT Envelope Capacity
Bandwidth within and aligned to the VT Superframe that is available for the VT Synchronous Payload Envelope.

VT Group
A nine-row by twelve-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 500μs located at the first byte of the VT SPE. VT path overhead provides for communication between the point of creation 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 500s superframe structure overlaid on and aligned to a 125s STS1 SPE. Contained within this structure is the VT payload pointer and the VT SPE.

VT Synchronous Payload Envelope (VT SPE)
A 500μs 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 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 system implements the wideband loopback as a terminal loopback (the loopback point is in the cross-connect network).

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