AT&T 365-340-701
April, 1995

DACS IV-2000 (256) Digital Access and Cross-Connect System IV-2000 Release 4.0

Operations and Maintenance

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(AT&T 365-340-701)

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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 (256) Release 4.0.

Audience

This manual is intended for individuals who are responsible for the acceptance, provisioning, operations, and maintenance of the DACS IV-2000 (256) Release 4.0.

Document Summary

The parts of this document are summarized below:

- **Preface** provides the purpose, the audience, and a summary of this document. It also lists related documents and instructions for ordering the documents.
- **Chapter 1 - Introduction** provides an overview of the DACS IV-2000 and the 2000 family of transmission products.
- **Chapter 2 - Safety Precautions** contains general safety precautions pertaining to the DACS IV-2000.
- **Chapter 3 - Routine Maintenance** contains procedures for performing periodic maintenance of the DACS IV-2000.
- **Chapter 4 - Logging In and Out** contains procedures for logging in and out of the DACS IV-2000 and recovering from a system lock.
- **Chapter 5 - Provisioning and Deprovisioning** contains procedures for setting up the frame for service (provisioning), and for changing current setups (deprovisioning).
- **Chapter 6 - Frame Administration** contains procedures for booting the system, for database management, and for login administration.
- **Chapter 7 - Link Administration** contains procedures for changing link parameters and speed, and for adding and removing an interface terminal.
- **Chapter 8 - Cross-Connections** contains procedures for making cross-connections.
- **Chapter 9 - Test Access** contains procedures for using the test access capabilities.
- **Chapter 10 - Loopbacks** contains procedures for creating loopbacks for far-end testing.
- **Chapter 11 - Performance Monitoring** contains procedures for using the DS1 and DS3 performance monitoring (PM) features. Performance monitoring is used to detect and report the status of the DS1 and DS3 facilities.
- **Chapter 12 - Alarms** contains procedures for clearing critical, major, and minor alarms.
- **Chapter 13 - Diagnostic Messages** contains procedures for addressing diagnostic messages generated by the system.
- **Chapter 14 - Replacing and Installing Components** contains procedures for replacing malfunctioning or failed components in the DACS IV-2000, installing new hardware, and for changing older versions of system hardware to new versions (for example, MUX1 circuit pack to MUX2 circuit pack).

- **Chapter 15 - Acceptance Testing** contains procedures for tests necessary to verify the proper installation of a DACS IV-2000, or for tests for added interface bays to an existing system.
- **Chapter 16 - Emergency Power Removal/Restoral** contains procedures to remove and restore -48V power from/to the DACS IV-2000 in emergency situations (for example, earthquakes).
- **Appendix A - Alarm, Scan, and Control Points** provides information on alarm, scan, and control (AS&C) points provided with the DACS IV-2000.
- **Glossary** gives definitions of terms used in the DACS IV-2000 documents.
- **Acronyms** gives definitions of acronyms used in this document.
- **Index** gives page locations of information used in this document.

Conventions

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

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

For command output, only COMMAND mode responses (with the CILINK number parameter in the **ED-NE** command turned off) are shown.

Related Documents

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

- *DACS IV-2000 (256) Release 4.0 Reference Manual*, document number AT&T 365-340-700
  This document provides in-depth DACS IV-2000 information for network planners and maintenance engineers.
- *DACS IV-2000 (256) Release 4.0 Commands and Messages*, document number AT&T 365-340-702
  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 (256) Release 4.0 Quick Reference Job Aids*, document number AT&T 365-340-703
  These aids, produced on laminated sheets, contain command names, error codes, fuse locations, test access, port addressing, loopbacks, and monitored parameter default and range values.
- *DACS IV-2000 (256) Release 4.0 Applications, Planning, and Ordering*, document number AT&T 365-340-704
  This guide is designed for network planners, account representatives, account executives, and engineers. It contains descriptions of the DACS IV-2000 features, applications, and ordering information.
- *DACS IV-2000 (256) Release 4.0 Software Release Description*, document number AT&T 365-340-705
  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.

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Introduction

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Introduction

1

The DACS IV-2000 (256) Release 4.0 is a software-based, high-capacity, digital cross-connect system that merges cross-connect and multiplexer functions. It helps manage DS1, DS3, and EC-1[1] (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 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 1.728 Mbits/s signal level [in the case of an STS-1(cc-SPE) signal, a group of 30 1.728 Mbits/s is used]. DS3 signals are demultiplexed within the DACS IV-2000 into 28 DS1 signals to access the switch network. Each STS-1 signal is either cross-connected as a clear-channel STS-1 signal or is 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 accommodates SONET interfaces (STS-1 signals) to support SONET-to-SONET cross-connections as well as providing a gateway between asynchronous and SONET networks.

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

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 to be deployed economically in any size office.

2000 Product Family

AT&T is focused on a carefully planned and growing product family designed to provide total network solutions. The 2000 Product Family complies with the 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®-2000 Access System — a system that supports standard switch interfaces such as TR08 and TR303, as well as standard feeder interfaces at DS1 and SONET OC-3 rates.
- Business Remote Terminal-2000 (BRT-2000) — a terminal that provides access for businesses through sophisticated fiber optic telecommunications equipment.

DACS IV-2000 Features

New and enhanced features associated with Release 4.0 of the DACS IV-2000 (256) system are:

- Enhanced Secondary Storage System (SSC, PRI, and SEC circuit packs)
- Enhanced Synchronizer Module
- LED for Manual Protection Switch
- Duplex Power Feeders for new frame orders (existing frames can not be retrofitted)
- In-Service Upgrade from Release 3.0 (256) to Release 4.0 (256) [procedures are available for upgrading from previous 256 releases]

Refer to Chapter 2 of the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700) for information on the new and enhanced features.

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

- SONET Networking Capability
- Cross-Connections
  - — DS1 Cross-Connections, Bridging, and Rolling
  - — STS-1 Cross-Connections, Bridging, and Rolling
  - — VT1.5 Cross-Connections, Bridging, and Rolling
- Redlined or Special Service Connections
- Loopbacks
  - — DS1 Loopbacks
  - — DS3 Loopbacks
  - — STS-1 Loopbacks
  - — VT1.5 Loopbacks
- Test Access
  - — DS1 Test Access
  - — STS-1 Test Access
  - — VT1.5 Test Access
- Link Association
- Performance Monitoring
  - — DS1 Performance Monitoring
  - — DS3 Performance Monitoring

  - — STS-1 Performance Monitoring
  - — VT1.5 Performance Monitoring
- Main Controller Redundancy
  - — Administrative Links
  - — Dual Disk Capability
  - — Optical disk drive for secondary storage and database backup
- Nonvolatile Backup Memory
- Alarm Reporting
  - — Office Alarms
  - — Remote Alarms
  - — Circuit Pack Alarms
  - — Multiple Alarm Processing
- Deny UC Removal with Protected Circuit Pack
- Support for Operations Systems
  - — Bellcore Operations Systems
  - — AT&T Operations Systems
- User and OS Interfaces
  - — Security
  - — Security Audit
  - — Message Screening
  - — User Priority Levels
  - — Command Verification
  - — X.25 Packet Assembler/Disassembler (PAD)
  - — X.25 Flow Control
- Input Command Routing
- 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
- Automatic Circuit Pack Restoral

Refer to Chapter 2 of the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700) for detailed information on system features.

Software Architecture

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

- Redundant Controller System
  - — Two Control Complexes (CPU/MTC/SSC circuit packs)
  - — Switch Communications Interface
  - — Unit Interface
  - — Enhanced Communications Interface (ECI)
  - — Synchronizer Module
- Unit Controller System
  - — Unit Controllers
  - — Interface Circuit Packs
  - — DS3 Performance Monitoring (DS3PM) over a Telemetry Asynchronous Block Serial (TABS) protocol interface (optional).

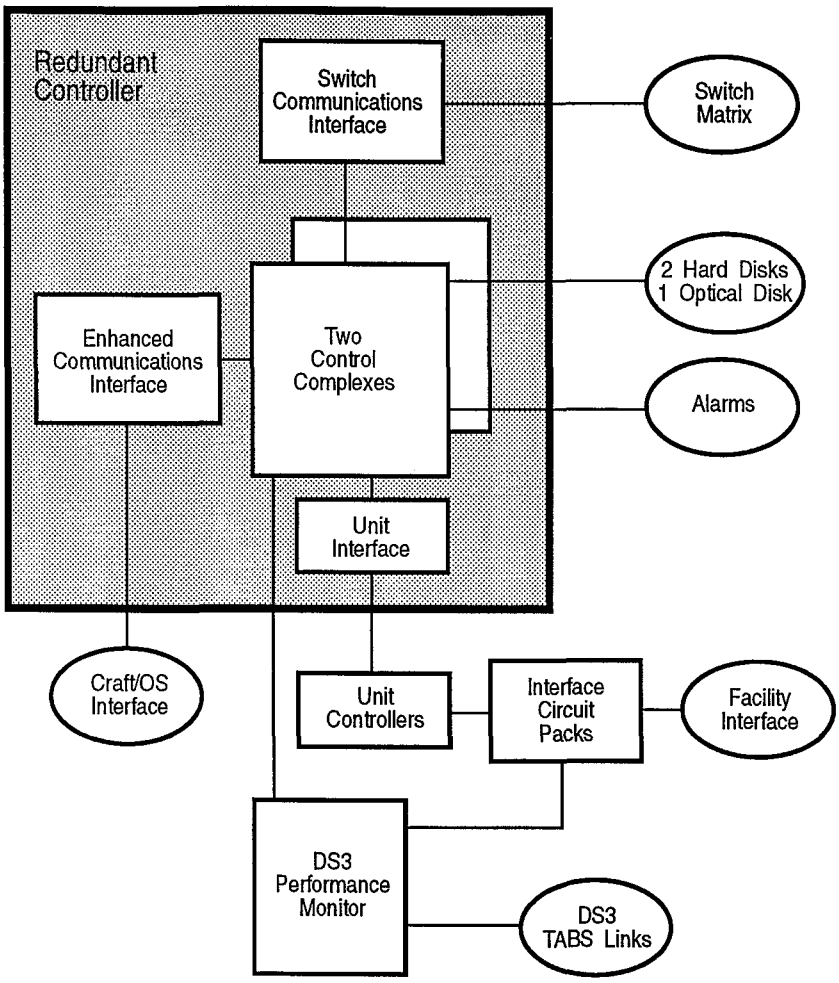


Figure 1-1. **System Software Architecture**

Redundant Controller System

The central components of the redundant controller system are the two control complexes:

- Runs application software to perform system administration functions including cross-connection, provisioning, test access, and synchronization for the SONET interfaces
- Serves as the central point of coordination for system maintenance functions such as diagnostics, fault recovery, and alarms

- Performs all database management functions for the system, with the secondary storage controller providing the interface between the main processor and the nonvolatile storage devices (disk and optical drives).

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

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

The two ECI circuit packs can be configured to provide redundancy.

The DACS IV-2000 Release 4.0 contains a Synchronizer Module which accepts two external DS1 timing references. In the event of a timing reference failure, the synchronizer automatically switches to the secondary reference. If both references fail, the synchronizer operates in a stratum 3 holdover mode. The synchronizer is fully protected; if one synchronizer side fails, the system switches to the other side.

Unit Controller System

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

- Providing communications with the interface circuit packs
- 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 DS3PM supports the TABS interface to the DS3 performance data.

NOTE:
The DS3PM is not required unless you are using TABS interface language.

Hardware

The DACS IV-2000 hardware is comprised of 2 to 9 bays containing a number of modules. Each module consists of an equipment shelf and its associated circuit packs. For detailed information on the hardware, refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

Bays

The DACS IV-2000 (256) hardware consists of an arrangement of 2 to 9 bays (one Switch Bay and up to eight Interface Bays). The different types of bays are:

- Switch (SW) Bay — provides control for the system, fuses, the cross-connections, and interbay cabling.
- DS1 Interface (INTFC) Bay — provides the interface for up to 868 DS1 signals (equivalent to 31 DS3 signals). This bay provides air baffles for cooling of the associated equipment.
- DS3 Interface (INTFC) Bay — provides the interface for up to 62 DS3 signals (equivalent to 1736 DS1 signals). This provides air baffles for cooling of the associated equipment.
- 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.

  This bay provides air baffles for cooling of the associated equipment.
- 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). This bay provides a fan assembly for cooling of the associated equipment.

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) Switch Power (SW PWR) Auxiliary Power (AUX PWR) Memory Storage (MEM) Synchronizer (SYNC) Switch (SW) Fuse and Alarm Panel (FS & ALM) 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 0 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 is decreased by 16 DS3 equivalent signals per such equippage.

† 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.

Unit Numbering

To provide a standard numbering convention for the DACS IV-2000 (256) system, the complete bay lineup for the system is considered. Figure 1-2 shows a DACS IV-2000 (256) system 9-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 of 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, the equipped shelves are units 14 and 15, while the unequipped shelves do not have unit labels.

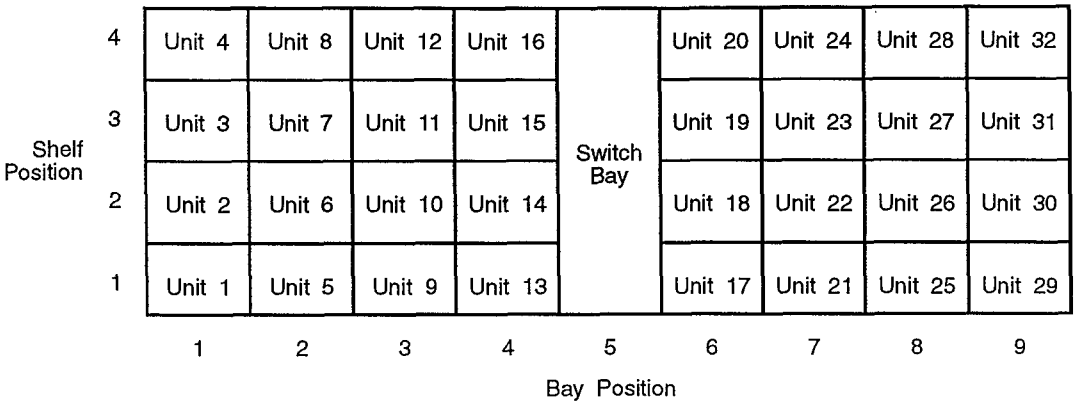


Figure 1-2. **Recommended Unit Numbering**

Circuit Pack Numbering

The numbering convention used in a central office environment generally differs from the numbering convention used for the DACS IV-2000. The DACS IV-2000 facility numbering convention uses DS3 or STS-1 equivalents that correspond to a multiplexer (MUX) circuit pack supporting one DS3, a 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 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, or an STS-1. Table 1-2 shows the valid slot numbers in the DACS IV-2000 frame.

Table 1-2. **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 14 on the MUX in slot 14 is numbered 14-14. The associated DS1 signals are numbered 14-14-1 through 14-14-28.

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.

Bay Mounting

The DACS IV-2000 Switch and Interface Bays are each 2 feet 2 inches wide, 7 feet high, and 12 inches deep (the Switch Bay is 13 inches deep). 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, Enhanced DS1 Interface, STS1/DS3 Interface, and Enhanced STS1/DS3/DS1 Interface Bays have forced-air cooling while the DS1 Interface, DS3 Interface, and STS1/DS3/DS1 Interface Bays are cooled by free convection. Bays equipped with a fan assembly take in air near the floor and exhausts it out the top rear of the bay. Unequipped circuit pack slots are not permitted and must either contain a circuit pack or be covered with filler assemblies so that cooling air does not escape, but is directed upward through the bay. On bays without a fan assembly, heat baffles are used between the shelves on the interface bays to direct rising heat away from the circuit packs, located above.

The initial or start-up configuration consists of a Switch Bay, two Cable End Guard Assemblies (which are 1 foot 1 inch wide and are used to store and protect the interbay cables until they are needed), and one Interface Bay. This initial configuration is 6 feet, 6 inches wide. The Switch and Cable End Guard Assemblies are delivered with interbay cabling for the maximum capacity. All bays are bolted to the floor during installation.

When a growth Interface Bay is provided, the Cable End Guard Assembly is moved out of the way, the growth bay is installed adjacent to the existing Interface Bay, connections are made between the growth bay and the Switch Bay, and the Cable End Guard Assembly is installed next to the growth 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. All bay positions must be filled because empty bay positions (gaps) are not permitted in the system lineup. When all available space is used on one side of the Switch Bay, the associated Cable End Guard Assembly is no longer required.

Interbay Cabling Arrangements

A DACS IV-2000 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 SMUX circuit packs in STS1 Interface Modules, to MUX circuit packs in DS3 Interface Modules, and to SWIF circuit packs in DS1 Interface Modules. Cables also connect unit controller (UC) circuit packs in STS1, DS3, and DS1 Interface Modules and DS3PM circuit packs in DS3 Interface Modules to the Switch Bay.

N-rate Cables

In a fully equipped frame, cables must carry 2048 N-rate signals between interface modules and the Switch Bay (512 service signals and 512 protection signals in each direction for a total of 2048). 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, omitting I, O, Q, and S. Each of the 16 groups contains 16 cables. These cables 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), and so on to J1-T through J16-T which serve SWIO-31 and SWIO-32. Table 1-3 shows the N-rate cable group that serves each SWIO circuit pack.

Since 2048 N-rate signals are handled, each of the 256 cables must carry 8 N-rate signals. Each cable also contains two-wire pairs to carry a clock/synchronizing signal so that each cable contains 20 wires. Any given cable serves four 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 and N-rate Cable groups J through T connect to interface modules on the right 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 one N-rate cable group; and two DS1 Interface Modules share an N-rate cable group. N-rate cable group A connects to the lowest module on the interface bay (Bay 4) closest to the switch complex, and the other N-rate cable groups run alphabetically upward and outward from the switch complex. N-rate cable groups starting with J serve the interface bays on the right side of the frame in a similar fashion.

Table 1-3. SWIO N-Rate Cable Connections

N-rate Cable Group	SWIO Circuit Packs		N-rate Cable Group	SWIO Circuit Packs	
	Cables J1-An — J8-An	Cables J9-An — J16-An		Cables J1-Bn — J8-Bn	Cables J9-Bn — J16-Bn
A	1	2	J	17	18
B	3	4	K	19	20
C	5	6	L	21	22
D	7	8	M	23	24
E	9	10	N	25	26
F	11	12	P	27	28
G	13	14	R	29	30
H	15	16	T	31	32

Control Cables

The 32 control cables that connect the unit controllers to the Switch Bay 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 by (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 mode 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 sixteen DS3PM circuit packs can be used, one for each DS3 Interface-32 or Interface-16 Module. Numbering of the control cables to DS3PM circuit packs to the left of the Switch Bay starts at J9 and runs upward and outward through J16. DS3PM circuit pack control cable numbers to the right of the Switch Bay start at J25 and run upward and outward through J32. These DS3PM circuit pack control cable designations are the same as some of the set used for unit controller control cables. However, there is no numbering conflict in a given frame because unit controller control cable designations J9 through J16 are used for Bays 1, and 2; and J17 through J24 are used for Bays 8 and 9. For any given configuration of DS3 Interface Modules in the frame, a combination of Bays 1, 2, 8, and 9 is not present, thereby allowing the use of the associated UC control cables for the DS3PM circuit packs. Table 1-4 contains the control cable assignments for each interface module unit location.

Table 1-4. Control Cable Assignments

Unit	Control Cable	Unit	Control Cable	Unit	Control Cable	Unit	Control Cable
1	J13	9	J5	17	J17	25	J25
2	J14	10	J6	18	J18	26	J26
3	J15	11	J7	19	J19	27	J27
4	J16	12	J8	20	J20	28	J28
5	J9	13	J1	21	J21	29	J29
6	J10	14	J2	22	J22	30	J30
7	J11	15	J3	23	J23	31	J31
8	J12	16	J4	24	J24	32	J32

Modules

There are eleven different DACS IV-2000 (256) modules. These modules are:

- Redundant Controller (RC) Module — manages the user interface (administrative links); performs user specified functions; coordinates database management, maintenance, and fault recovery operations; and provides primary and secondary program and database backup capabilities and the means to load new software release onto the frame.
- Redundant Controller Power (RC PWR) Module — provides the +5 Vdc, +12 Vdc, and -12 Vdc power and fuse protection for the RC Module. This module also provides the -48 Vdc power and fuse protection for the SYNC Module (TBS3 circuit packs).
- Synchronizer (SYNC) Module — generates the timing information for the DACS IV-2000.
- Switch (SW) Module — performs the DS1, STS-1, and VT1.5 cross-connection functions.
- Switch Power (SW PWR) Module — provides the +5 Vdc and fuse protection for the Switch Module and the fuse protection for the -5 Vdc power supplied by the AUX PWR module. This module also provides the +5 Vdc and -5 Vdc power and fuse protection for the SYNC Module.
- Auxiliary Power (AUX PWR) Module — provides the -5 Vdc power for the SW Module.

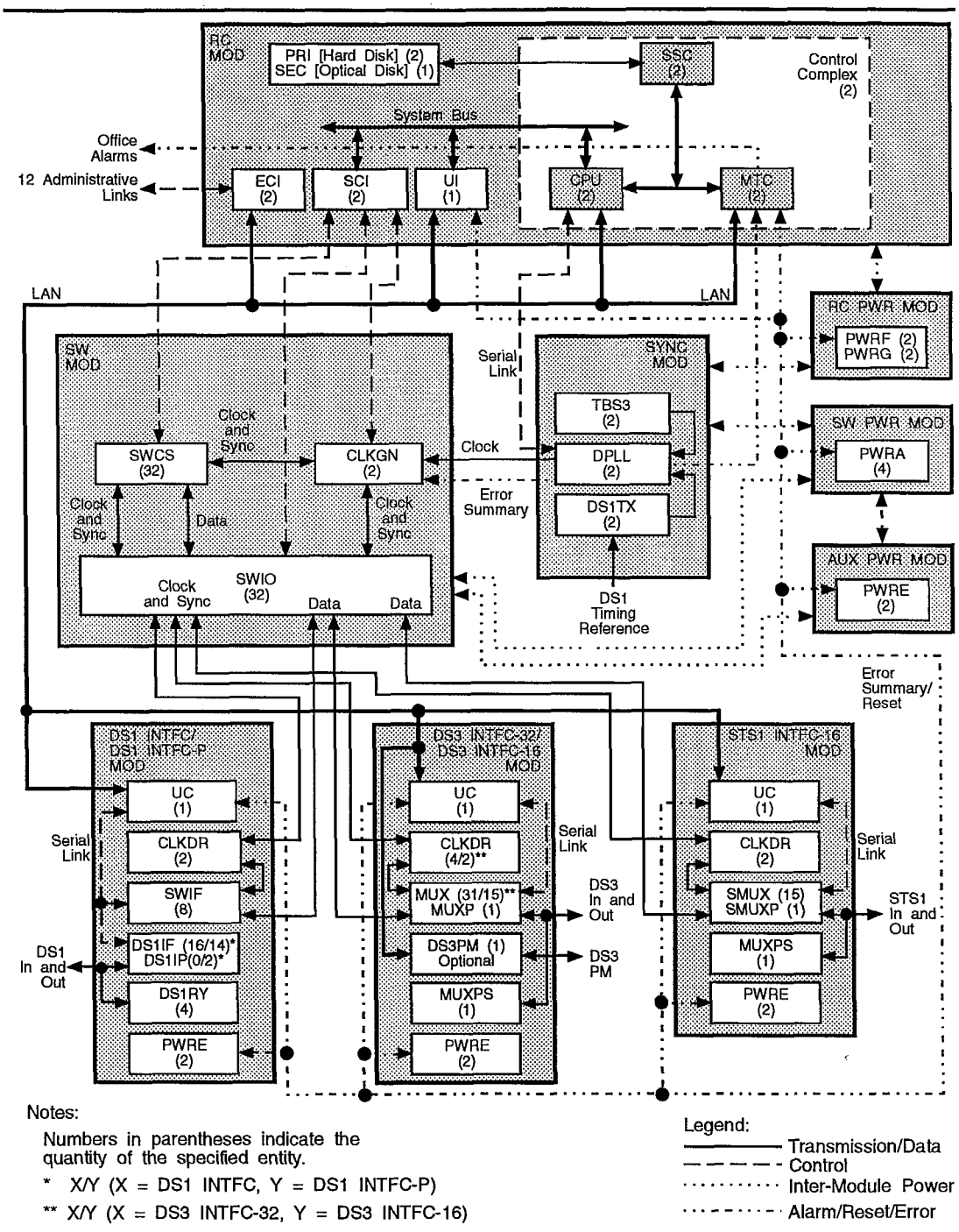


Figure 1-3. DACS IV-2000 (256) Release 4.0 Functional Block Diagram

- DS1 Interface (INTFC) Module — provides up to 224 DS1 interfaces for the incoming and outgoing DS1 facilities or network elements. These modules accept DS1 signals (in a format that is compatible with a DSX-1) and interface these signals to and from the Switch Module. Protection for the interfaces of these modules are provided by the DS1 Interface-Protection Module contained in the same DS1 Interface Bay.
- DS1 Interface-Protection (INTFC-P) Module — provides up to 196 DS1 interfaces for the incoming and outgoing DS1 facilities or network elements. These modules accept DS1 signals (in a format that is compatible with a DSX-1) and interface these signals to and from the Switch Module. These modules provide protection for itself in addition to the other DS1 Interface Modules (up to three) within the same DS1 Interface Bay.
- DS3 Interface-32 (INTFC-32) Module — provides up to 31 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a format compatible with a DSX-3 and interface the signals to and from the Switch Module.
- DS3 Interface-16 (INTFC-16) Module — provides up to 15 DS3 interfaces with protection for incoming and outgoing DS3 facilities. These modules accept DS3 signals in a format compatible with a DSX-3 and interface 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 interface 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 BXA and version 1 Synchronizer Module circuit packs) have LED indicators to aid in fault isolation. A full listing of circuit pack equipment is located in the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

Power

The DACS IV-2000 operates with one or two Lineage® 2000 (or equivalent) battery plants (-48 Vdc nominal) in the central office environment. Existing frames (upgraded to Release 4.0) use only one battery plant. New frame orders (which are wired to accommodate two battery plants) can use one or two battery plants.

For existing frames, there are seven power buses connected to the fuse and alarm panel and Redundant Controller Power Module 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.

For new frame orders, there are six power buses connected to the fuse and alarm panel from four feeders (A, B, C, and D) at two BDFBs (BDFB-A provides feeder A and B that power buses A, B, and E; BDFB-B provides feeders C and D that power buses C, D, and E). All feeders 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.

Fuses

Fuses are required for the Switch Bay Fuse and Alarm Panel, Switch Power Module, and Redundant Controller Power Module. 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703), and in the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

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 Redundant Controller Module, status panel (except FAR END LED), Switch Power Module, Switch Module, and provisioned interface modules circuit packs are lit on a module by module basis.
- RESET — resets the DACS IV-2000. The RESET switch starts the reset function when operated simultaneously with the RESET ENABLE switch. This combination allows the main controller to be booted manually. Requiring simultaneous operation of the RESET and RESET ENABLE switches helps prevent the reset function from being initiated accidentally.
- RESET ENABLE — See RESET above.

The status panel also has two TTY connectors (TTY1-1 and TTY2-1) that allow the communications interface terminal (CIT) to be used from the front of the frame. Twelve administrative link connectors are located on the back of the Redundant Controller Module. In addition, two connectors labelled Q2 1-1 and Q2 2-1 are reserved.

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

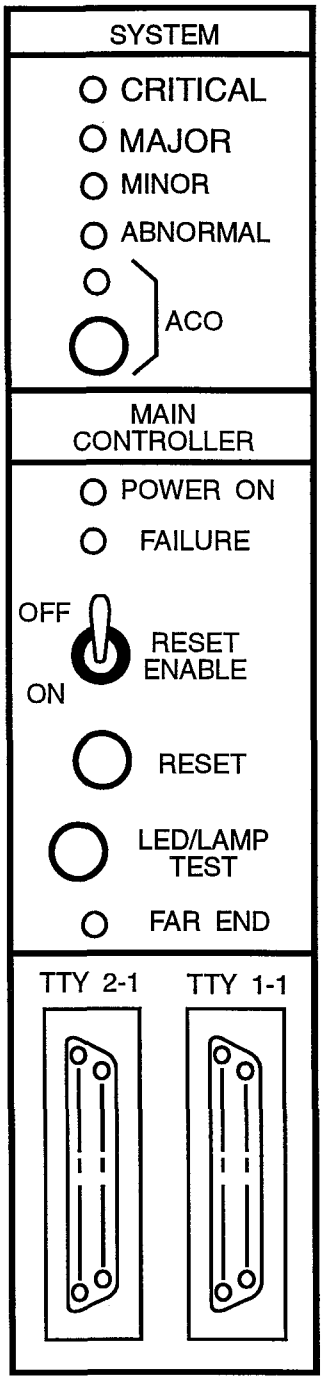


Figure 1-4. **Status Panel**

Equipment Indicators

All circuit packs (except BXA and version 1 Synchronizer Module circuit packs) have a red LED indicator for trouble isolation. The LEDs flash on and off at one-second intervals on circuit packs that have input DS1, DS3, STS-1, and VT1.5 signal failures or for timing reference failure for version 2 Synchronizer Module circuit packs. The LEDs stay on for internal circuit pack failures or in the case of interface or switch circuit packs (MUX, SMUX, SWIF, SWIO, and SWCS), for manual protection switches. 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 (active) control complex.

The version 2 Synchronizer Module circuit packs have both green and red LEDs. The green LED indicates that the associated circuit pack is active and the red LED indicates that the associated circuit pack has failed.

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

The 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 Connectors

The DACS IV-2000 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
- Timing reference signals for the Synchronizer Module

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 or header designation assembly 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 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

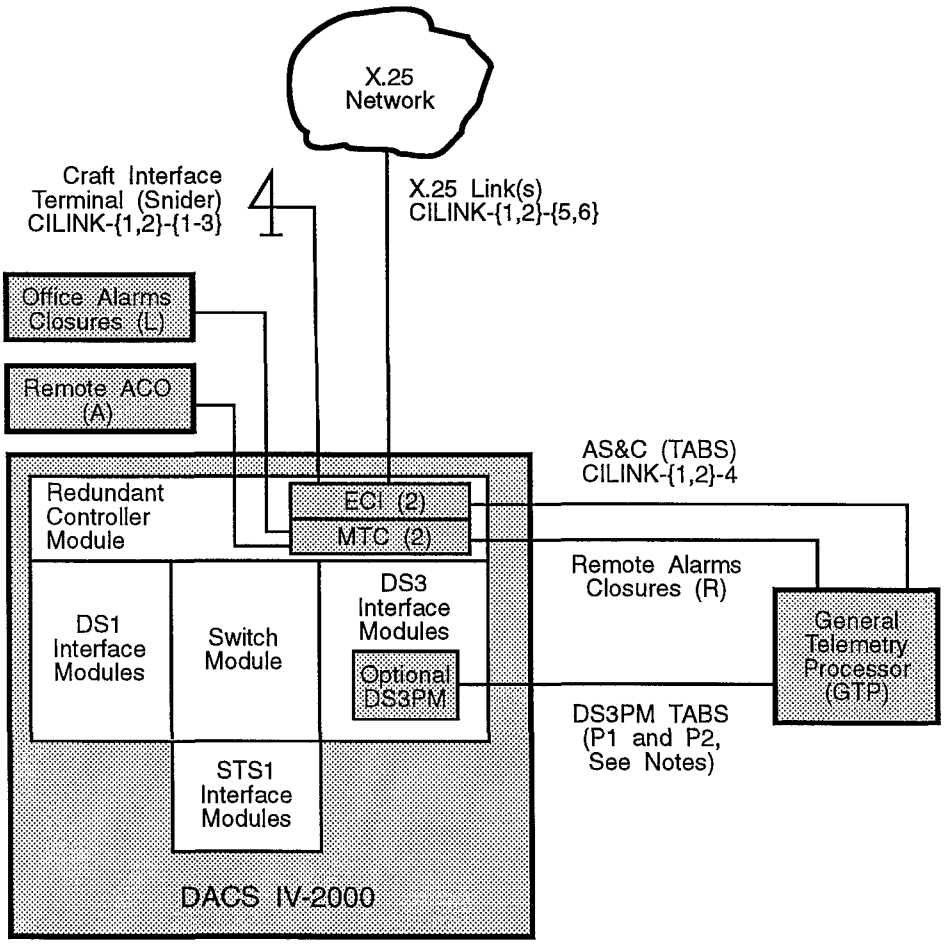
Interfaces

The DACS IV-2000 provides twelve administrative links (CILINKs).

Ten CILINKs are used to interface with Operations Systems (OSs) using a X.25 network (CILINK-{1,2}-{5,6}) and communications interface terminals using Snider protocol (CILINK-{1,2}-{1-3}). 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.

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

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



Notes:
1. One or two P links.
2. Up to eight DS3PM circuit packs per link.
3. Up to 16 DS3PM circuit packs per DACS IV-2000.

Figure 1-5. System Interfaces

Table 1-5. Interfaces

Interface (Figure 1-5)	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.

Table 1-5. Interfaces (Continued)

Interface (Figure 1-5)	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 ECI 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. Links 1-1 and 2-1 supports the local communications 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 operating at 300, 1200, 2400, 4800, or 9600 baud.
- Links 1-5, 1-6, 2-5, and 2-6 can operate as asynchronous terminal interfaces 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 (256) Release 4.0 software supports the message set for communication with Bellcore's Operations Systems/Intelligent Network Elements (OPS/INE) and Network Monitoring and Analysis (NMA) OSs. This message set (previously called Message Set 2 for releases before 3.0) is referred to as TL1, Issue 4.[1]

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.

Message Set 1 Command Mappings

For Release 3.0 and later, Message Set 1 is not supported. Therefore, Table 1-6 can be used to map pre-Release 3.0 Message Set 1 commands into their associated Release 4.0 commands.

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

Table 1-6. Message Set 1 to Release 4.0 Command Mappings

Message Set 1 Commands	Release 4.0 Commands	Message Set 1 Commands	Release 4.0 Commands
ABT-CMD	ABT-CMD	ED-SECU-LINK	ED-SECU-LINK
ACT-ECHO-LINK	ACT-ECHO-LINK	ED-STATE-EQPT	ED-STATE-EQPT
ACT-USER	ACT-USER	ENT-AUTOCMPN-T1	ENT-AUTOCMPN-T1
ALW-LPBK-T1	ALW-LPBK-T1	ENT-EQPT	ENT-EQPT
ALW-LPBK-T3	ALW-LPBK-T3	ENT-TSTPT-T1	ENT-TSTPT-T1
ALW-PMREPT-T1	ALW-PMREPT-T1	EX-EQPT	EX-EQPT
ALW-PMREPT-T3	ALW-PMREPT-T3	INH-LPBK-T1	INH-LPBK-T1
ALW-SW-EQPT	ALW-SW-EQPT	INH-LPBK-T3	INH-LPBK-T3
CANC-ECHO-LINK	CANC-ECHO-LINK	INH-PMREPT-T1	INH-PMREPT-T1
CHG-ACCMD-T1	CHG-ACCMD-T1	INH-PMREPT-T3	INH-PMREPT-T3
CHG-LGN	ED-SECU-USER	INH-SW-EQPT	INH-SW-EQPT
CHG-TACC-T1	CHG-TACC-T1	INIT-REG-T1	INIT-REG-T1
CONN-BDCST-T1	ENT-CONF-T1	INIT-REG-T3	INIT-REG-T3
CONN-CRS-T1	ENT-CRS-T1	INIT-SYS	INIT-SYS
CONN-CRS1-T1	ENT-CRS-T1	LGN-USER	ACT-USER
CONN-PM-T1	CONN-PM-T1	LGT-USER	CANC-USER
CONN-ROLL-T1	ENT-ROLL-T1	OPR-ACO-ALL	OPR-ACO-ALL
CONN-TACC-T1	CONN-TACC-T1	OPR-LPBK-T1	OPR-LPBK-T1
CPY-MEM	CPY-MEM	OPR-LPBK-T3	OPR-LPBK-T3
CPY-TH-T1	CPY-TH-T1	RLS-LPBK-T1	RLS-LPBK-T1
CRTE-EQPT	ENT-EQPT	RLS-LPBK-T3	RLS-LPBK-T3
CRTE-LGN	ENT-SECU-USER	RLS-TSTPT-T1	RLS-TSTPT-T1
DGN-DET-EQPT	DGN-DET-EQPT	RMV-EQPT	RMV-EQPT
DISC-CRS-T1	DLT-CRS-T1	RMV-LINK	RMV-LINK
DISC-CRS1-T1	DLT-CRS-T1	RST-EQPT	RST-EQPT
DISC-EQPT	DLT-EQPT	RST-LINK	RST-LINK
DISC-PM-T1	DISC-PM-T1	RTRV-ALM-ALL	RTRV-ALM-ALL
DISC-TACC	DISC-TACC	RTRV-ALM-EQPT	RTRV-ALM-EQPT
DLT-EQPT	DLT-EQPT	RTRV-ALM-LINK	RTRV-ALM-LINK
DLT-LGN	DLT-SECU-USER	RTRV-ALM-NE	RTRV-ALM-COM
DLT-SECU-AUD	DLT-SECU-AUD	RTRV-ALM-T1	RTRV-ALM-T1
ED-ATTR-EQPT	SET-ATTR-EQPT	RTRV-ALM-T2	RTRV-ALM-T2
ED-ATTR-T1	SET-ATTR-T1	RTRV-ALM-T3	RTRV-ALM-T3
ED-ATTR-T2	SET-ATTR-T2	RTRV-ATTR-EQPT	RTRV-ATTR-EQPT
ED-ATTR-T3	SET-ATTR-T3	RTRV-ATTR-T1	RTRV-ATTR-T1
ED-DATE	ED-DATE	RTRV-ATTR-T2	RTRV-ATTR-T2
ED-PRMTR-EQPT	ED-EQPT	RTRV-ATTR-T3	RTRV-ATTR-T3
ED-PRMTR-LINK	ED-PRMTR-LINK	RTRV-CMD-STAT	RTRV-CMD-STAT
ED-PRMTR-NE	ED-NE	RTRV-COND-EQPT	RTRV-COND-EQPT
ED-PRMTR-T1	ED-T1	RTRV-COND-LINK	RTRV-COND-LINK
ED-PRMTR-T3	ED-T3	RTRV-COND-T1	RTRV-COND-T1

Table continued on next page.

Table 1-6. Message Set 1 to Release 4.0 Command Mappings (Continued)

Message Set 1 Commands	Release 4.0 Commands	Message Set 1 Commands	Release 4.0 Commands
RTRV-COND-T2	RTRV-COND-T2	SET-TH-T3	SET-TH-T3
RTRV-COND-T3	RTRV-COND-T3	STA-SCANPM-T1	STA-SCANPM-T1
RTRV-CRS	RTRV-CRS	STP-SCANPM-T1	STP-SCANPM-T1
RTRV-CRS-T1	RTRV-CRS-T1	SW-DX-EQPT	SW-DX-EQPT
RTRV-DROPCRS-T1	RTRV-DROPCRS-T1	SW-TOPROTN-EQPT	SW-TOPROTN-EQPT
RTRV-ECHO-LINK	RTRV-ECHO-LINK	SW-TOWKG-EQPT	SW-TOWKG-EQPT
RTRV-HDR	RTRV-HDR	TEST-CABLE	TEST-CABLE
RTRV-LPBK-T1	RTRV-LPBK-T1	TEST-TRMSN-T1	TEST-SW-CONTROL
RTRV-LPBK-T3	RTRV-LPBK-T3	TEST-SW-CONTROL	TEST-TRMSN-T1
RTRV-PATH-T1	RTRV-PATH-T1	TEST-UNIT-CABLE	TEST-UNIT-CABLE
RTRV-PM-T1	RTRV-PM-T1	REPT ALM EQPT	REPT ALM EQPT
RTRV-PM-T3	RTRV-PM-T3	REPT ALM LINK	REPT ALM LINK
RTRV-PMCNFGRN-T1	RTRV-PMCNFGRN-T1	REPT ALM NE	REPT ALM COM
RTRV-PMSCHED-T1	RTRV-PMSCHED-T1	REPT ALM T1	REPT ALM T1
RTRV-PMSCHED-T3	RTRV-PMSCHED-T3	REPT ALM T2	REPT ALM T2
RTRV-PRMTR-EQPT	RTRV-EQPT	REPT ALM T3	REPT ALM T3
RTRV-PRMTR-LINK	RTRV-PRMTR-LINK	REPT BKUP	REPT BKUP
RTRV-PRMTR-NE	RTRV-NE	REPT CMPR MEM	REPT CMPR MEM
RTRV-PRMTR-SFTWR	RTRV-PRMTR-SFTWR	REPT DBCHG	REPT DBCHG
RTRV-PRMTR-T1	RTRV-T1	REPT DGNDET EQPT	REPT DGNDET EQPT
RTRV-PRMTR-T3	RTRV-T3	REPT DISC TACC	REPT DISC TACC
RTRV-PRVG-USER	RTRV-SECU-USER	REPT DLTCRS T1	REPT DLTCRS T1
RTRV-SCANTH-NE	RTRV-SCANTH-NE	REPT DROPCRS T1	REPT DROPCRS T1
RTRV-SECU-AUD	RTRV-SECU-AUD	REPT EVT T1	REPT EVT T1
RTRV-SECU-LINK	RTRV-SECU-LINK	REPT EVT T3	REPT EVT T3
RTRV-STATE-EQPT	RTRV-STATE-EQPT	REPT EXCPTN SYS	REPT EXCPTN SYS
RTRV-STATE-T1	RTRV-STATE-T1	REPT LOCL IN	REPT LOCL IN
RTRV-SYSID	RTRV-SYSID	REPT PM T1	REPT PM T1
RTRV-T1ID	RTRV-T1ID	REPT PM T3	REPT PM T3
RTRV-TACC-T1	RTRV-TACC-T1	REPT RMV EQPT	REPT RMV EQPT
RTRV-TH-T1	RTRV-TH-T1	REPT RMV LINK	REPT RMV LINK
RTRV-TH-T3	RTRV-TH-T3	REPT RST EQPT	REPT RST EQPT
SCHED-PMREPT-T1	SCHED-PMREPT-T1	REPT RST LINK	REPT RST LINK
SCHED-PMREPT-T3	SCHED-PMREPT-T3	REPT RSTCRS T1	REPT RSTCRS T1
SET-SCANTH-NE	SET-SCANTH-NE	REPT SW EQPT	REPT SW
SET-SID	SET-SID	REPT T1ID	REPT T1ID
SET-TH-T1	SET-TH-T1	REPT TRMSN T1	REPT TRMSN T1

Safety Precautions

2

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Contents

Safety Precautions

2

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

Sensitivity to Electrical Discharges

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

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

DS1 Facility Continuity Checking

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

- If the power is not applied to the interface bay(s) and the circuit packs are unplugged, 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 DSX-1, perform a one-way cross-connection (input to output) and use a DS1 test set to verify the DS1 leads at the DSX-1.

Circuit Packs

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

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

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

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

PWRE Circuit Packs

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

ECI Circuit Packs (CILINK States)

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

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.

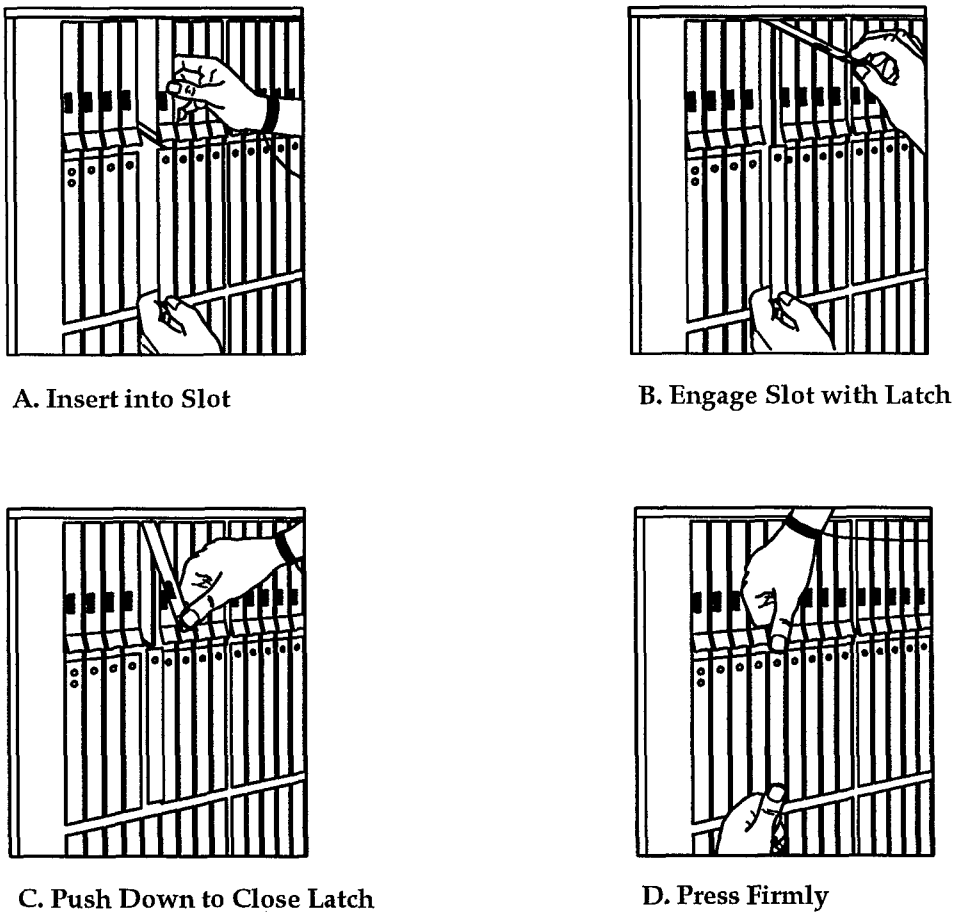
CAUTION:
Never extract a circuit pack that is carrying service, as it affects traffic. First perform a manual protection switch (`SW-TOPROTN-EQPT` command) on the circuit pack to be extracted.

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

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

Installing Circuit Packs

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



A. Insert into Slot

B. Engage Slot with Latch

C. Push Down to Close Latch

D. Press Firmly

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

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

Alarm and Diagnostic Reportks

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

Fuses

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

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

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

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

CAUTION:
If a blown fuse or dummy fuse exists in the ED9C-114-30 Fuse and Alarm Panel, and it is necessary to work on the backplane, it is recommended that the alarm lamp and fuse be removed proir to any work on the backplane.

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

Table 2-1. Fuses

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

See notes at end of table.

Table continued on next page.

Table 2-1. Fuses (Continued)

Type	Location	Amperage	Comcode	Quantity
WP91768,L115	ED-9C114-30 Fuse Panel	12	407749847	6
WP91768,L114	ED-9C114-30 Fuse Panel	10	405750431	See Note 1
WP91768,L107	ED-9C114-30 Fuse Panel	2	406747527	1
77D	Switch Power Module	10	406547067	See Note 2
78J	Switch Power Module	7.5	406547307	See Note 3
WP90247,L314	Redundant Controller Power Module	7.5	406520833	4 on ED-9C055 (fuse board I)
WP90247,L313	Redundant Controller Power Module	5	406520825	See Note 4
WP90247,L309	Redundant Controller Power Module	2	406520791	See Note 5
WP90247,L306	Redundant Controller Power Module	1	406520783	See Note 6
WP90247,L303	Redundant Controller Power Module	0.5	406520767	2 on ED-9C055 (fuse board I)

Notes:

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

Replacing Fuse and Alarm Panel Fuses

These procedures gives instructions on the proper extraction and installation of fuses in the ED-2C940-30 and ED-9C114-30 Fuse and Alarm Panels. Fuses must only be extracted when instructed to by other procedures or your system administrator.

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

Extracting ED-2C940-30 Fuse Panel Fuses

To extract the ED-2C940-30 Fuse and Alarm Panel fuses, refer to the section titled "Primary Fuses" (page 12-71) to determine the order in which these fuses are replaced:

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

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

Extracting ED-9C114-30 Fuse Panel Fuses

To extract the ED-9C114-30 Fuse and Alarm Panel fuse:

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

   Alarm lamp extinguishes
4. Pull the alarm lamp and blown fuse out of its socket.

5. Remove blown fuse from the alarm lamp.

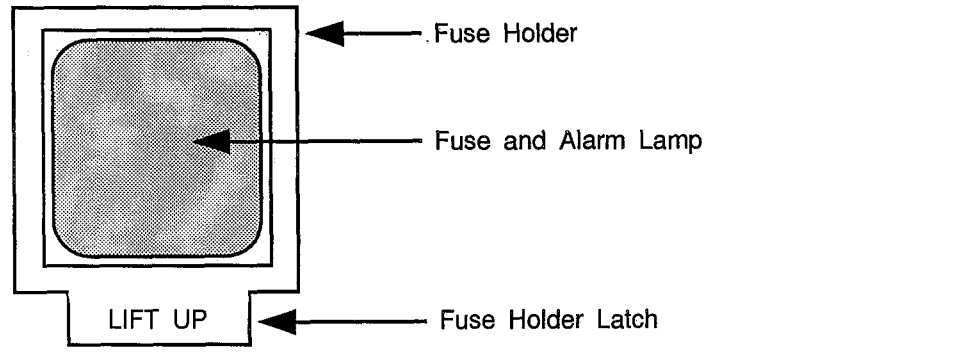


Figure 0-1. **ED-9C114-30 Fuse Panel Fuse and Holder Assembly**

Installing ED-2C940-30 Fuse Panel Fuses

To install the ED-2C940-30 Fuse and Alarm Panel fuses, refer to the section titled "Primary Fuses" (page 12-71) to determine the order in which these fuses are replaced:

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

Installing ED-9C114-30 Fuse Panel Fuses

To install the ED-9C114-30 Fuse and Alarm Panel fuses:

1. Insert the new fuse (same amperage as the blown fuse) into the alarm lamp.
2. Insert the alarm lamp with fuse straight into the socket of the Fuse and Alarm Panel until it snaps into place.
3. Lower the fuse holder until it snaps into place.
4. Re-install the circuit pack associated with the replaced fuse. Refer to the section titled "Installing Circuit Packs" (page 2-3), if necessary.

Disk Drives

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

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

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

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

Procedures for using the SEC disk drive are located in Chapter 6, procedures for maintenance of the SEC disk drive are in Chapter 3, and procedures for replacing the one or both PRI disk and SEC disk drives are in Chapter 14.

PRI Disk Drives

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

SEC Disk Drive

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

⚠ CAUTION:
Under certain circumstances multiple taps on the Release button causes the SEC cartridge to eject. Follow all procedures and do not depress the Release button more than once.

Optical Disk Cartridges

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

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

The following optical disk cartridges are the only types approved for use on the DACS IV-2000 (256) Release 4.0:

- J98786SD-5, List 1 — For new frame orders and upgrades from DACS IV-2000 (256) Release 3.0
- J98786SD-5, List 2 — Change notice applications only
- J98786SD-5, List 3 — Blank optical disk cartridge
- J98786SD-5, List 4 — Spare Release 4.0 optical disk cartridge
- J98786SD-5, List B — System start-up optical disk cartridge (new frame only)

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

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

- Keep magnets away from the optical disk cartridge.
- Store the optical disk cartridge away from strong magnetic fields, such as those produced by electric motors or large magnets.
- Store the optical disk cartridges in a dust-free environment.
- Avoid using the optical disk cartridges where there is likely to be a wide variation in temperature or a high humidity. The condensation formed under these conditions can make it impossible for the optical drive to read or write from/to the optical disk cartridge.

- Do not store where the temperature can exceed 50° C (122° F) or where the relative humidity can exceed 80%.

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

Fan Assemblies

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

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

Routine Maintenance

3

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Contents

Routine Maintenance

3

This chapter provides routine maintenance procedures for the DACS IV-2000 (256) Release 4.0.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Routine Maintenance Checklist

Table 3-1 is a routine maintenance checklist that lists the routine maintenance activities and the recommended intervals.

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

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

Activity	Recommended Frequency	Date Last Performed				
Database Backup	Daily					
Clean SEC Disk Drive Optical Lens	Once A Month (more frequently if the environment is particularly dusty*)					
Clean Optical Cartridges	Once A Month (more frequently if the environment is particularly dusty or you are experiencing problems with read/write activities†)					
Change Fan Filter For fan assemblies: ED-2C816-30,G1 ED-2C906-30 ["Changing the Fan Filter" (page 3-20)] For fan assemblies: ED-9C130-30,G1 ED-9C130-30,G2 ["Fan Filter Alarm" (page 12-131)]	Once Every 3 Months (or more often as required)					
Test Remote Alarm Surveillance Capability	Once Every Year					

* If the lens is cleaned on a regular basis and you are experiencing problems with read/write activities, try another optical disk cartridge and, if the problems persist, replace the SEC disk drive using the procedure titled "Replacing the SEC Disk Drive" (page 14-9).

† Try a second optical disk cartridge and, if you still experience the same problem, replace the SEC disk drive using the procedure titled "Replacing the SEC Disk Drive" (page 14-9).

Database Backup

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

Manual Database Backup

The following procedure is used to make backup copies of the database onto the secondary disk drive. Daily backup of the database is essential. In addition, the date and time 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:
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. Insert an optical disk cartridge to be used for the backup into the SEC disk drive by referring to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26). The optical disk cartridge used can be new or have been used before in the same frame (that is, the TID of the optical disk cartridge must match the TID of the system).

3. Verify that the TID on the optical disk cartridge matches the system TID or is NOT FOUND (if the disk has never been used for a database backup) by entering the following command.

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

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

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

   Where:

   g = Target ID

   If the TID shown in parameter *g* is NOT FOUND or is the same as the TID shown on the date and time header line, continue with the next step. Otherwise, eject the optical disk cartridge and redo this procedure from Step 2.

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

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

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

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

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

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

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

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

   Where:

   h = Date: {00-99}{01-12}{01-31}

   i = Time: {00-23}{00-59}{00-59}

NOTE:
The date and time stamp (parameters h and i) associated with the SEC disk is the date and time of the last **CPY-MEM** command from PRI to SEC was executed. The data and time stamp associated with the PRI disks is the data and time that the last manual or autonomous (for example, applying journal files) transfer from WKG to PRI occurred.

7. Record the date and time of the database backup from the response of the **RTRV-SYSID** command in the frame log.

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

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

   Where

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

9. If your office procedures require, eject the optical disk cartridge (label it as necessary) and store it in its protective case.

NOTE:
The optical disk cartridge can not be removed from the SEC disk drive until the green ON LED is extinguished.

Scheduled Database Backup

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

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

1. Insert an optical disk cartridge to be used for the backup into the SEC disk drive by referring to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26). The optical disk cartridge used can be new or has been used before in the same frame (that is, the TID of the optical disk cartridge must match the TID of the system).
2. Verify that the TID on the optical disk cartridge matches the system TID or is `NOT FOUND` (if the disk has never been used for a database backup) by entering the following command.

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

   Where:

   a = Target ID (optional)

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

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

   Where:

   g = Target ID

   If the TID shown in parameter *g* is `NOT FOUND` or is the same as the TID shown on the date and time header line, continue with the next step. Otherwise, eject the optical disk cartridge and redo this procedure from Step 1.

3. Schedule daily database backups by entering the following command:

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

   Where:

   a = Target ID (optional)

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

Cleaning the SEC Optical Lens

The following procedure is used for cleaning the optical drive lens of the SEC disk drive, using the AT&T Optical Drive Lens Cleaning Kit (Part No. 406942102). This maintenance procedure should be performed at least once a month. It should be performed more often during periods of heavy usage (such as initial testing) to maintain reliability of optical drive operations.

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

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

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

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

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

   RTRV-NE;

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

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

   Where:

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

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

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

3. Check the date (DAYWK) and time (TMDAY) parameters (*m* and *l*, respectively), looking for any automatic backups scheduled during the next 30 minutes. If date and time values do not appear in the message, no automatic backups are scheduled.

   - If no backups are scheduled for the next 30 minutes, continue this procedure at Step 4.
   - If backups are scheduled for the next 30 minutes, you can either wait for the scheduled backup to complete or get permission from your system administrator or next level of support to cancel the scheduled backup (using the **ED-NE** command). When you know the system is ready, continue this procedure at Step 4.

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

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

   Where:

   a = Target ID (optional)

The system responds with the following message:

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

Where:

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

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

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

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

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

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

Where:

a = Target ID (optional)

The system responds with the following message:

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

Where:

b = State: { IS, OOS }

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

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

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

   Where:

   a = Target ID (optional)

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

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

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

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

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

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

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

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

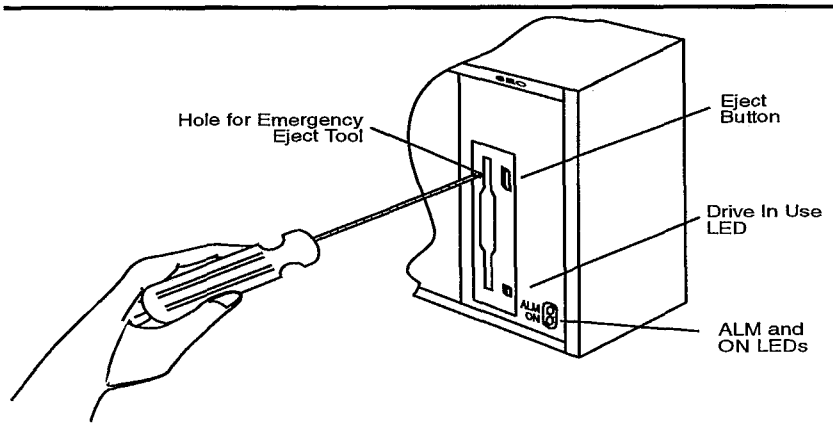


Figure 3-1. **Using the Emergency Eject Tool**

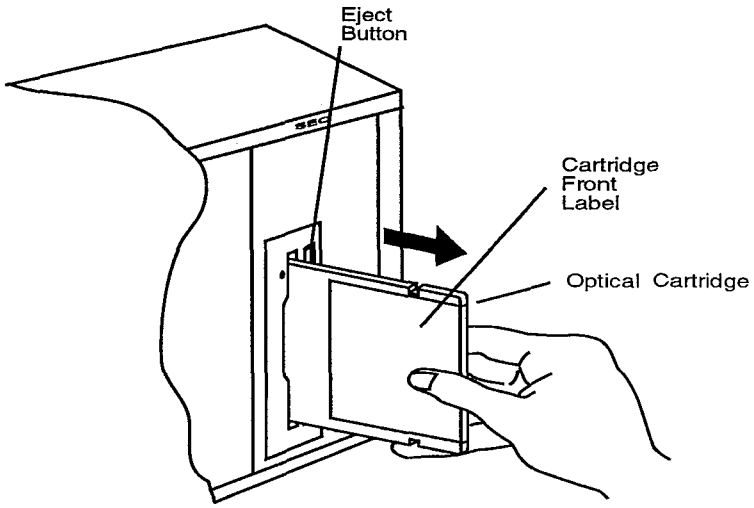


Figure 3-2. **Removing an Optical Cartridge**

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

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

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

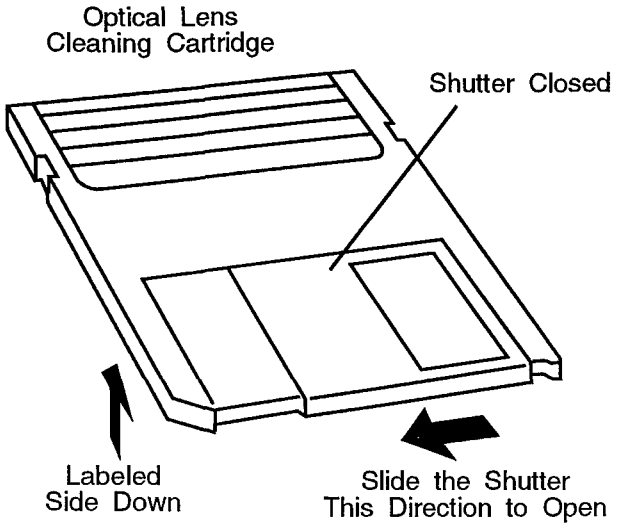


Figure 3-3. **Optical Lens Cleaning Cartridge — Shutter Closed**

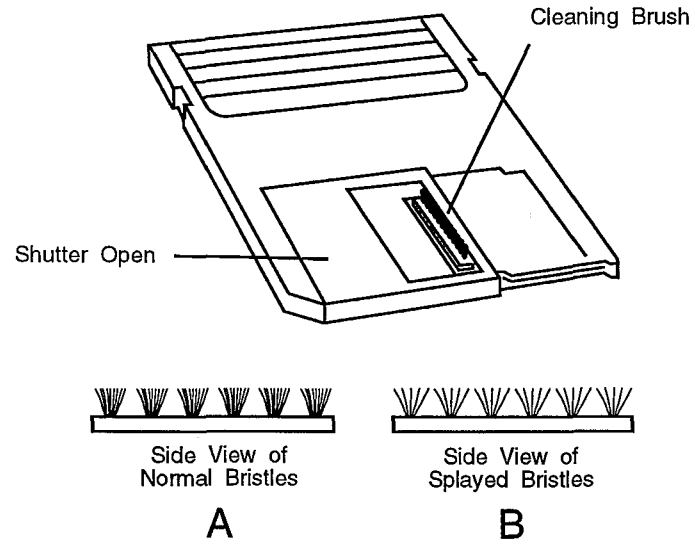


Figure 3-4. **Optical Lens Cleaning Cartridge — Shutter Open**

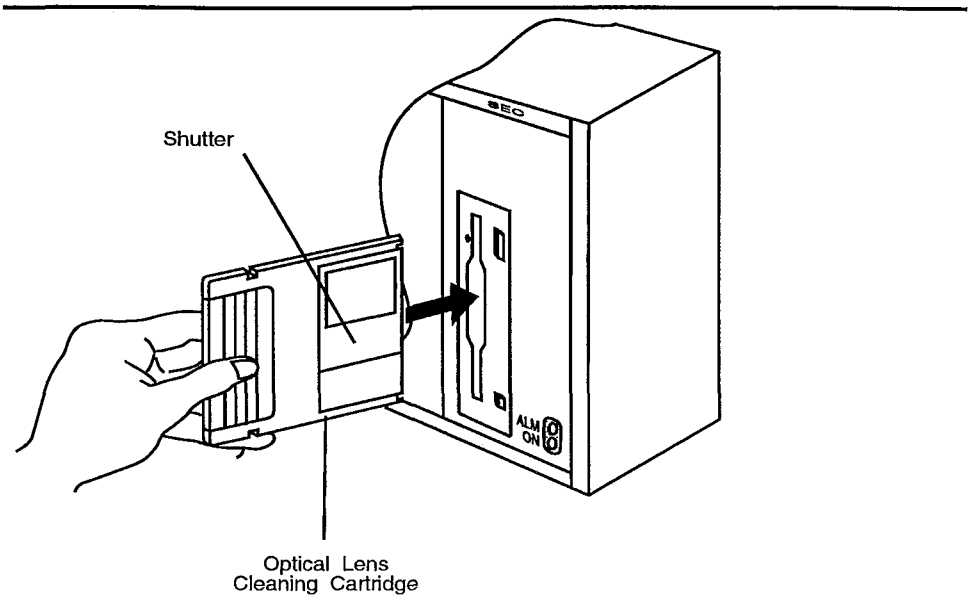


Figure 3-5. **Inserting a Cartridge into the SEC Disk Drive**

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

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

12. Gently push (do not force) the optical lens cleaning cartridge towards the back of the SEC disk drive until it is flush with the surface of the SEC disk drive.

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

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

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

14. Repeat Steps 12 and 13 four to five times. When the optical lens cleaning cartridge is pushed into the SEC disk drive, its flipping mechanism causes the brush inside to stand up. By repeating Steps 12 and 13, dust and particles on the lens are removed by the brush. Normally, you repeat Steps 12 and 13 four or five times to clean the optical lens completely.

15. After cleaning the optical lens, extract the optical lens cleaning cartridge from the SEC disk drive by pulling the cleaning cartridge straight out of the slot.
16. Store the optical lens cleaning cartridge in its case.
17. If you extracted an optical cartridge in Steps 7, 8, and 9, insert the optical cartridge marked in Step 9 into the slot of the SEC disk drive (refer to Figure 3-5). Otherwise, continue with Step 19.
18. If the SEC disk drive was in the IS state originally (Step 5), restore the SEC disk drive to service by entering the following command.:

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

    Where:

    a = Target ID (optional)

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

Cleaning Optical Cartridges

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

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

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

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

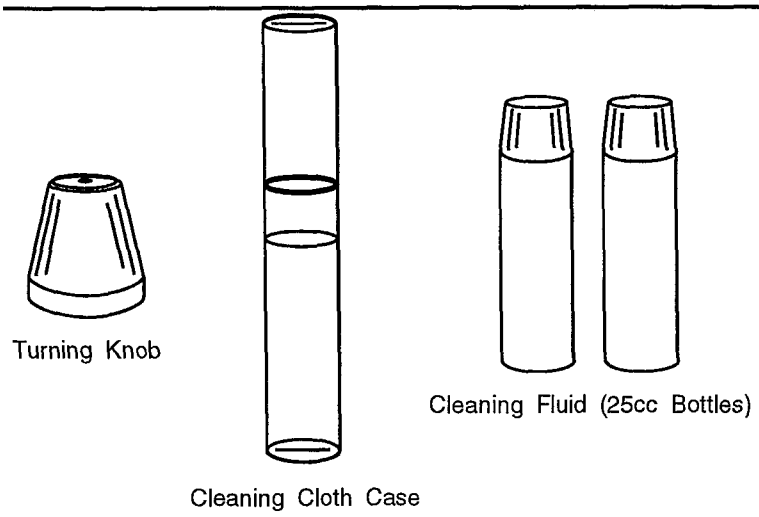


Figure 3-6. **Optical Cartridge Cleaning Kit Components**

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

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

      Where:

      a = Target ID (optional)

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

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

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

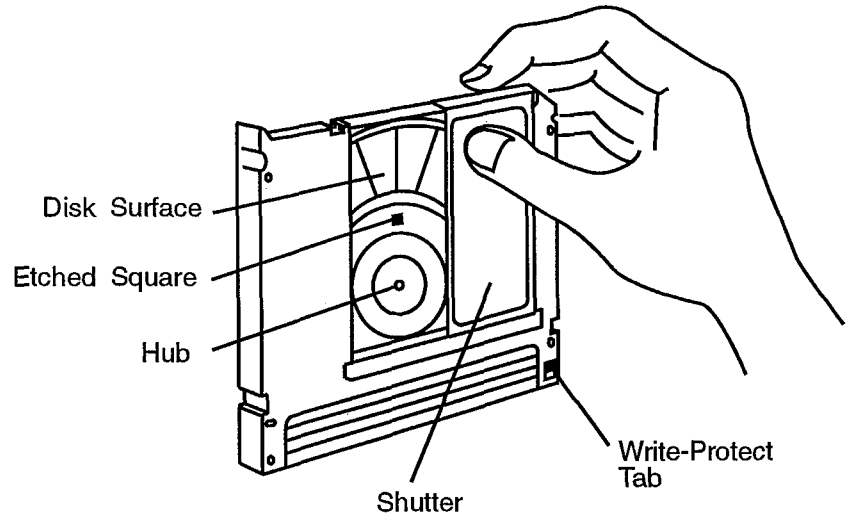


Figure 3-7. **Exposing the Optical Cartridge Disk Surface**

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

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

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

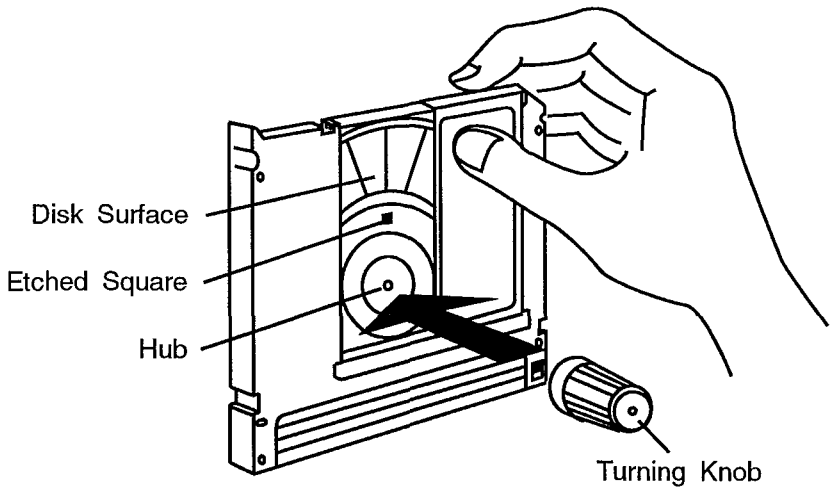


Figure 3-8. **Attaching the Turning Knob to the Optical Cartridge**

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

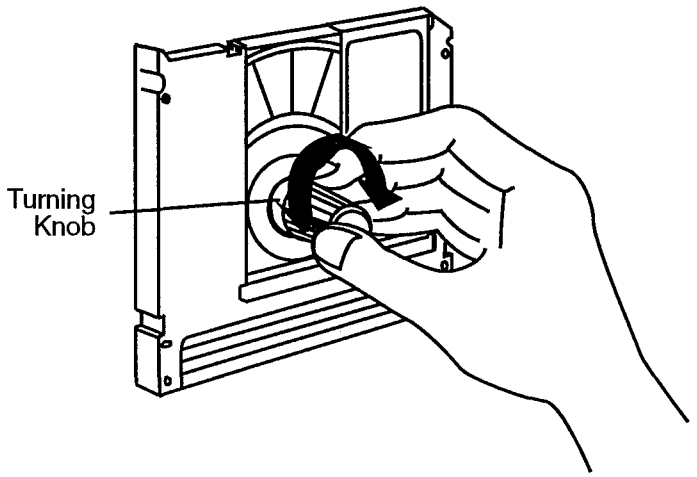


Figure 3-9. **Rotating the Turning Knob on an Optical Cartridge**

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

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

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

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

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

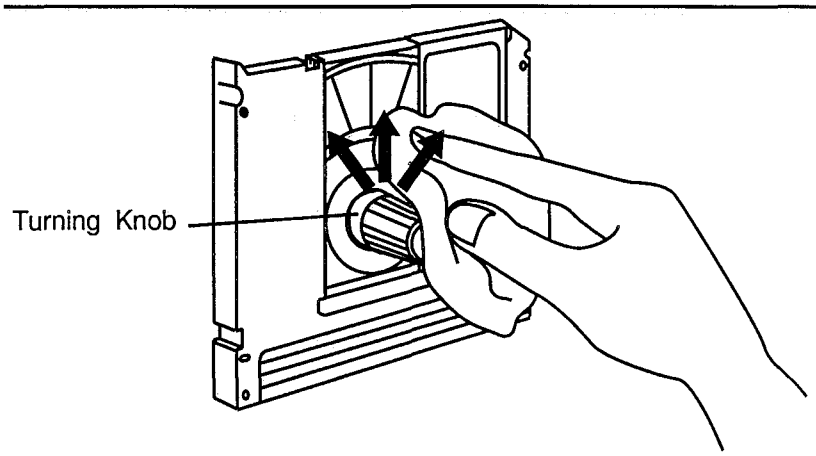


Figure 3-10. **Wiping the Disk Surface of an Optical Cartridge**

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

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

Changing the 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 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 12-131)].

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.

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

   In about 10 seconds after removing the fuse, the system generates a `REPT ALM EQPT` *message. The red ALM LED is lit on the fan assembly and the fans start to operate at high speed.*
4. Pull the AUX Fan Assembly fuse on the main fuse panel (Fuse B13-2 for ED-2C940-30 Fuse Panel; Fuse C17 for ED-9C114-30 Fuse Panel). Refer to Chapter 2 for extracting fuses, if necessary.
5. Check to see that the red ALM LED goes out indicating there is no power to the fan assembly.

6. Before performing any maintenance function on the fan assembly, check that the fans are no longer spinning by listening for noise and feeling for vibrations.

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

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

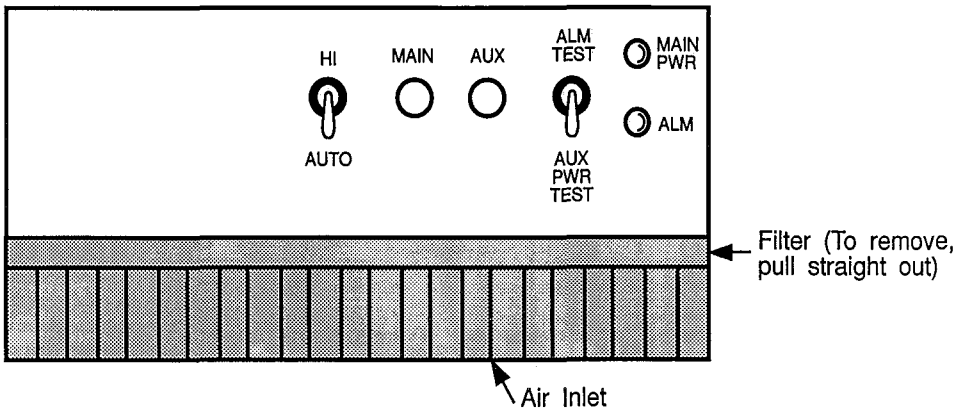


Figure 3-11. **ED-2C816-30,G1 and ED-2C906-30 Fan Assembly — Air Filter Location**

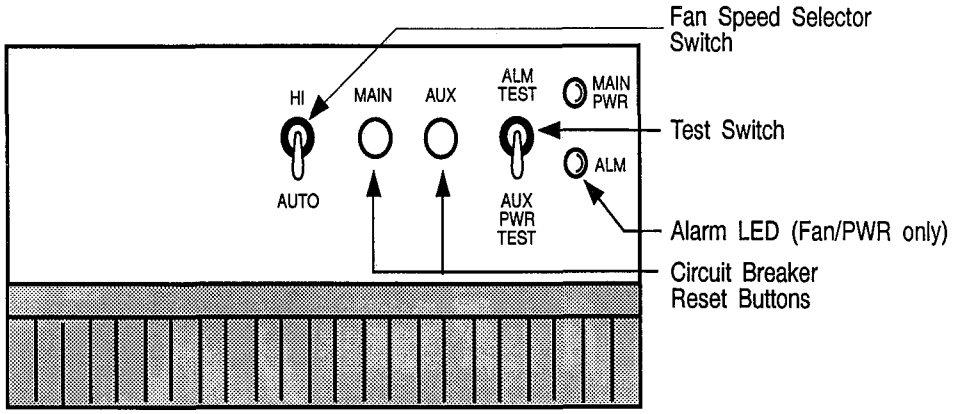


Figure 3-12. **ED-2C816-30,G1 and ED-2C906-30 Fan Assembly — Switch and LED Locations**

17. Perform the alarm failure test by placing the test switch (refer to Figure 3-12) in the ALM TEST position and holding it (approximately 20 seconds) while observing the following:
    - After approximately 10 seconds:
        - — The fan assembly red ALM LED turns on.
        - — The fan assembly green MAIN PWR LED remains lit.
        - — The fans start operating at high speed.
        - — The system responds with the following message:

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

18. Perform the auxiliary power test by placing the test switch (refer to Figure 3-12) in the AUX PWR TEST position and holding it (approximately 15 seconds) while observing the following:
    - Immediately:
      - — The fan assembly red ALM LED turns on.
      - — The fan assembly green MAIN PWR LED turns off.
      - — The fans start operating at high speed.
      - — The system responds with the following message:

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

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

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

    Where:

    a = Target ID (optional)

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

Testing Remote Alarm Surveillance

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

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

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

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

   Where:

   a = Target ID (optional)

   The following output response appears (pertinent parameter shown):

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

   Where:

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

   If there are any alarms (a value shown for parameter *c*), refer to the section titled "Isolating Failures" (page 12-10) for clearing alarms before performing this procedure.
3. Identify six DS1 ports that are not in service (IDLE-REL [idle-released] state) by entering the following command for six DS1 ports:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

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

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

Where:

e = DS1 port location: `{1-32}-{1-31}-{1-28}`

o = Input port state

p = Output port state

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

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

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

Where:

a = Target ID (optional)

b = DS1 port location: **{ {1-32}-{1-31}-{1-28}, SWIF-{1-32}-{1-8}, UNIT-{1-32}, MUX-{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:NTFCNCDE,CTYPE */
    "g:h,..."
;
```

Where:

g = DS1 port location: `{1-32}-{1-31}-{1-28}`

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

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

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

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{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)

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

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

   Where:

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

   o = Failure threshold: {0-500}

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

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

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

   Where:

   a = Target ID (optional)

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

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{1-32}-{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 does not occur, contact your system administrator for assistance in reestablishing the remote alarm surveillance capability after finishing this procedure.

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

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

    Where:

    a = Target ID (optional)

    b = DS1 port location: `{ {1-32}-{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)

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

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

    Where:

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

    If there are any alarms (a value shown for parameter *c*), refer to the section titled "Isolating Failures" (page 12-10) for clearing alarms before performing this procedure.

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

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

Logging In and Out

4

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Contents

Logging In and Out

4

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 is capable of operating at the following speeds:

```
300
1200
2400
4800
9600
```

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

NOTE:
For more information on user logins and passwords, refer to the section titled "Interface Security" in Chapter 1 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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

   The password is not echoed on screen.

Using X.25 Links

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

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

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

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

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

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

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

   Where:

   a = Target ID (optional)

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

   This command takes up to 1 minute to complete.

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

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

   Where:

   a = Target ID (optional)

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

   d = Password: <6-8 legal characters>

NOTE:
For more information on user logins and passwords, refer to the section titled "Interface Security" in Chapter 1 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Logging Out

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

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

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

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

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

   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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for more information on security link parameters and superusers and the section titled "Changing Link Security Parameters" (page 7-17) for information on changing security link parameters.

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

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

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

   Where:

   a = Target ID (optional)

   b = Administrative link location: **CILINK-{1,2}-{1-6}** (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. Determine how long the link is locked out by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

   i = Lock-out time: 1-30

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

Out-of-Service Links

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

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

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

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

   If the state of the link is OOS-FLT or OOS-PRTCL, (parameter *e*), go to the section titled "Link Communication Failures" (page 12-29) to clear link failures.

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

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

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

   Where:

   a = Target ID (optional)

   b = Administrative link location: `CILINK-{1,2}-{1-6}`

   This command takes up to 1 minute to complete.

Terminal/Link Parameter Mismatch

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

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

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

   g = Baud rate: { 300, 1200, 2400, 4800, 9600 }

   k = Flow control: { DC3, ACK }

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

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

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

Provisioning and Deprovisioning

5

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Provisioning and Deprovisioning

5

This chapter contains procedures to provision and deprovision DACS IV-2000 equipment. If you are changing equipment from earlier versions, 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702). Appendix I of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual contains a list of all the provisionable parameters within the DACS IV-2000.

This chapter consists of procedures for the following:

- Provisioning the Network Element:
  - — Target ID
  - — Alarm Delay (equipment and non-SONET facilities terminating on DS1IF and MUX circuit packs)
  - — Protection Switching Autolock
  - — Automatic Database Backup
  - — Critical Alarm Reporting
  - — Network Element Performance Monitoring Parameters

  - — Database Change Report Messages for manual input commands
  - — Protection Identification
  - — Transport Self-Identification (TRANSID) Network Element information
  - — Identifying CILINK associated with output messages in message headers
  - — Activate alarm for failures of backups to secondary memory
  - — Activate the output of a carriage return every 15 minutes
  - — Power feed distribution (standard or duplex battery distribution feeder boards [BDFBs])
- Provisioning Equipment:
  - — Interface Modules (Units)
  - — MUX circuit packs
  - — Line Build Out (LBO)
  - — SMUX circuit packs
  - — SWIF and DS1IF circuit packs
  - — EQL and DS1 Code Type (Linecode)
  - — DS3PM circuit packs
  - — PMGR1 circuit packs
- Provisioning PMGR1 Circuit Packs for DS1 Performance Monitoring
  - — SWIF/MUX circuit pack slot designation
  - — Network Element parameters
- Provisioning DS1 Facilities
  - — Framing
  - — DS1 Code Type (Linecode)
  - — Alarm Level
  - — Disabling AIS for unterminated DS1 ports
- Provisioning DS3 Facilities
  - — Signal Format
  - — Enable/Disable DS3 IDLE signal
  - — Remote multiplex communications
  - — Alarm Level

- Provisioning STS-1 Signals on EC-1 Facilities
  - — Transmit Path ID
  - — SONET Alarm Soak Times (Set and Clear)
  - — Alarm Level
- Provisioning VT1.5 Signals on EC-1 Facilities
  - — Alarm Level
- Configuring EC-1 Ports for Various Terminating Equipment (STS-1, VT1.5, 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. Provisioning the DACS IV-2000 consists of the following three functions:

- Setting up the Network Element (NE) — provide information for target ID (TID), alarm delay for all equipment and non-SONET facilities terminating on DS1IIF and MUX circuit packs, protection switching autolock, automatic database backup, critical alarm reporting, DS1, DS3, VT1.5, and STS-1 performance monitoring, database change reports for manual input commands, protection identification (that is, signal an alarm on a traffic carrying circuit pack when it is being protected), CILINK number identification, activate alarm for failures of backups to SEC disk drive, automatic carriage return generation, power feeder configuration, and TRANSID network element information.
- 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, and VT1.5 Facilities — provide information associated with DS1, DS3, STS-1, and VT1.5 signals including signal format, DS1 code type (linecode), remote multiplexers (DS3), alarm levels, STS-1 transmit path ID, and SONET alarm soak times (STS-1).

Table 5-1. **Provisioning Sequence**

Entity	Number of Circuit Packs Required	Supporting Entity
CC (1)	8	none
PRI (2)	1	none
SEC	2	none
SYNC (3)	6	none
CLKGN	2	none or SYNC (4)
ECI (2)	2	CC
SWCS	32	CLKGN
SWIO (5)	2	CLKGN
UNIT (7)	1	none
DS3PM	1	UNIT
CLKDR (5)	2 or 4 (6)	UNIT, SWIO
PMGR	1	CLKDR
MUXP	1	CLKDR
MUX	1	MUXP
SMUXP	1	CLKDR
SMUX	1	SMUXP
DS1RY	1	UNIT
SWIF	1	CLKDR
DS1IP	1	SWIF-P, DS1RY
DS1IF	2	SWIF, DS1IP (8)

Notes:

1. Must be provisioned as a group (CPU, MTC, SSC, UI, SCI). If both controller sides are not provisioned, an alarm is raised.
2. If both ECIs or PRIs are not provisioned, an alarm is raised.
3. SYNC is provisioned as a group (DPLL, DS1TX [TX], and TBS3 [TB]). If all circuit packs on both SYNC sides are not present, alarms are raised.
4. SYNC is required if CLKGN3 circuit packs are present (to support SONET)
5. Must be provisioned in pairs.
6. Depending on the type of interface module
7. DS1 Interface Module requires supporting DS1 Interface-Protection Module.
8. The supporting DS1IP circuit pack can be in another DS1 Interface Module.

Provisioning the Network Element

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

- Target ID (TID) — provides the unique identifier for the DACS IV-2000 frame.
- Alarm Delay and Clear Alarm Delay — sets the delay for an alarm indication after the system software has detected an alarm condition associated with all equipment and non-SONET facilities terminating on DS1IF or MUX circuit packs. Alarms are issued for conditions that do not autonomously clear within the set delay time. The clear delay indicates the minimum amount of time an alarm must be clear before clearing the indicators associated with non-SONET facilities terminating on DS1IF or MUX circuit packs.
- Protection Switching Autolock — sets values for preventing circuit packs from switching back to working. This feature prevents excessive switching caused by an intermittent problem. After a threshold of switches has been detected a circuit pack is locked in protection. Refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700) for more information on protection switching.
- Automatic Database Backup — provides a mechanism for performing automatic database backups. Refer to"Database Backup" (page 3-3) for more information on performing database backups.
- Critical Alarm Reporting Setup — activates a critical alarm when a specified number of EC-1/VT1.5/DS1 facility failures (FAC failure type), equipment failure (EQPT failure type), or a combination of both (BOTH failure type) has been detected. Critical alarms are indicated by a red LED on the status panel marked CR, an audible alarm, and a remote critical alarm. Also, a `REPT ALM COM` message is issued by the frame indicating a `*C` in the alarm code field, and either FAC (facility) or INT (equipment) in the condition type field indicating whether it was a facility or equipment generated alarm.
- DS1 Performance Monitoring — sets system values for DS1 performance monitoring. Refer to Chapter 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.
- Database Report Messages — allow or disallow `REPT DBCHG` messages to be output for manual command input. Autonomous database change reporting is not affected by the setting of this parameter.

- Protection Identification — specifies whether the system illuminates the alarm LED for SWIF, SWCS, SWIO, MUX, and SMUX circuit packs when they are in the protected state.
- CILINK number identification — activates the output of CILINK information in the message headers of all output messages.
- Backup alarm feature — activates (when set to ON) an alarm when a failure of a backup to secondary memory occurs.
- Carriage Return — activates (when set to ON) the output of a carriage return on the CILINKs every 15 minutes
- Power feeder configuration — specify the wiring of the frame for power distribution. For existing frames (software upgrades), the frame is wired in the standard configuration (one battery distribution feeder board [BDFB]). For new frame orders, the frame is wired in the duplex configuration (one or two BDFBs can be used).

The following procedure is used to provision the network element:

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

   RTRV-NE: *[a]*;

   Where:

   a = Target ID (optional)

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

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

   Where:

   f = Alarm delay: {1-30}

   g = Alarm clear delay: {1-20}

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

   i = Autolock switching interval: {1-60}

   j = Autolock release time: {1-24}

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

   l = Time of day: 0000-2359

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

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

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

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

q = Equipment type: { CPE, NET }
This parameter is part of the Transport Self-Identification (TRANSID) information.

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 }

x = Database change messages: { OFF, ON }

y = CILINK number in message headers: { ON, OFF }

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

aa = Backup alarm feature: { ON, OFF }

ab = Automatic carriage return: { ON, OFF }

ac = Equipment power: { SPLX, DPLX }

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

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

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

Where:

a = Target ID (optional)

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

d = Alarm delay: { **{1-30}, CURVAL** }
Alarm delay in seconds for all equipment and non-SONET facilities terminating on DS1IF or MUX circuit packs.
Initial system value: **10**

e = Alarm clear delay: { {1-20}, CURVAL }
Alarm clear delay in seconds for non-SONET facilities terminating on DS1IF or MUX circuit packs.
Initial system value: 10

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

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

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

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

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

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

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

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

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

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

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

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

r = 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

s = 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**

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

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

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

w = CILINK number in message headers: { **ON, OFF, CURVAL** }
Specifies whether the system includes the CILINK number in the message header of all output messages.
Initial system value: **OFF**

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

y = Backup alarm feature: { **ON, OFF, CURVAL** }
Specifies whether the system activates an alarm when a failure of a backup to secondary memory has occurred.
Initial system value: **OFF**

z = Automatic carriage return: { **ON, OFF, CURVAL** }
Specifies whether the system outputs a carriage return to the CILINKs every 15 minutes.
Initial system value: **ON**

aa = Equipment power: { **SPLX, DPLX, CURVAL** }
Specifies the wiring configuration of the frame. Existing frames that are software upgraded use the standard power configuration (**SPLX**), while new frames use the duplex power configuration (**DPLX**).
Initial system value: **SPLX**

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 performing a system reset.

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

Where:

a = Target ID (optional)

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

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

NOTE:
This procedure is performed after all the necessary equipment has been installed into the DACS IV-2000 frame. Procedures for equipping interface modules can be found in the section titled "Equipping Interface Modules" (page 14-44). When adding new interface modules to a frame that is in service, refer to the appropriate procedure in the section titled "Equipping Interface Modules" (page 14-44) first. When adding new interface circuit packs (DS1IF, SWIF, MUX, and SMUX), refer to the sections titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23), for MUX or SMUX circuit packs, or "Provisioning SWIF and DS1IF Circuit Packs" (page 5-31), for DS1IF and SWIF circuit packs, and do not perform 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) 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.

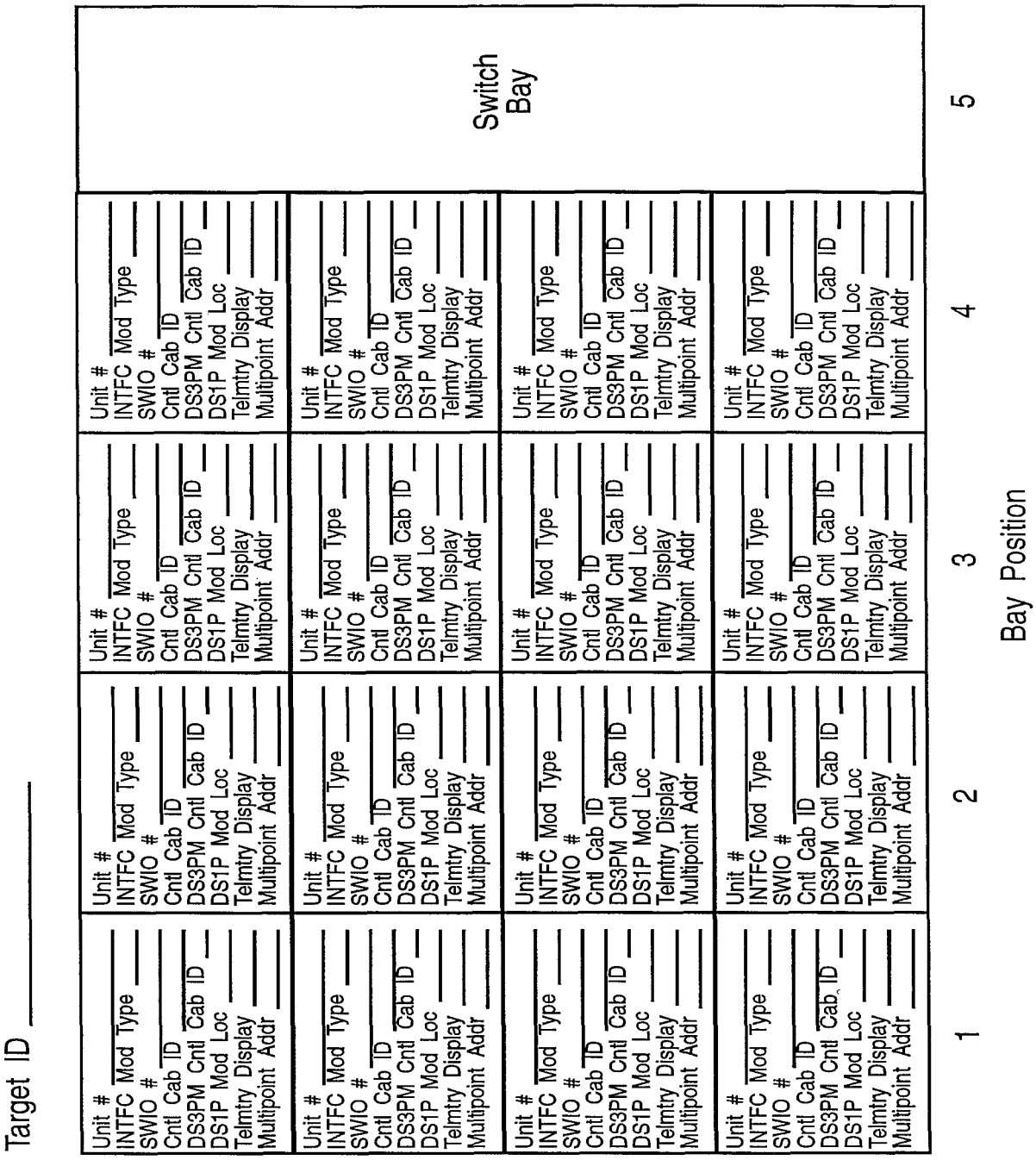


Figure 5-1. **Interface Modules Provisioning Worksheet (Sheet 1 of 2)**

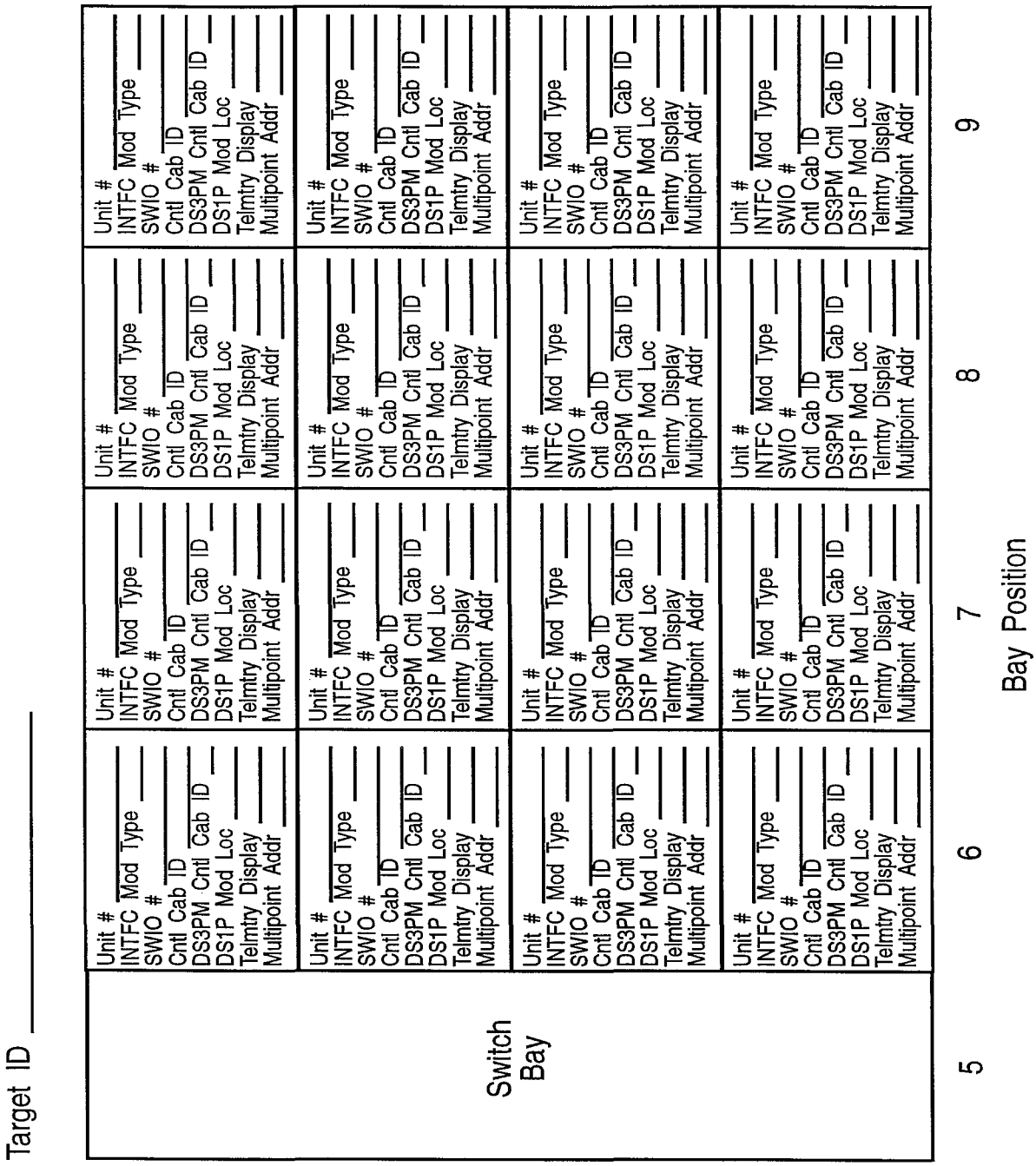


Figure 5-1. **Interface Modules Provisioning Worksheet (Sheet 2 of 2)**

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. The top row of SWIO circuit packs is associated with interface bays 6 through 9 and the bottom row of SWIO circuit packs is associated with interface bays 1 through 4.

e. Enter the control cable ID (`Cntl Cab ID`) associated with the shelf position of the interface modules identified in Step 2b. Control cables numbered J-1 to J-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. Control 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. Control cable IDs can also be identified in Figure 2 or 3 of the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

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-9 to J-16 (to the left of the Switch Bay) and J-25 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 (`Multi-point 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 cabled can be left empty. BXA circuit packs can only be inserted into unused interface circuit pack (SWIF and DS1IF) slots, and must not be inserted in any other circuit pack slot (that is, DS1RY, CLKDR, and interface protection).

4. Check the CLKGN circuit packs to determine which version is installed (CLKGN2 or CLKGN3). If CLKGN3 circuit packs are installed or you are going to be provisioning STS1 Interface Modules and CLKGN2 circuit packs are installed, perform the following procedure before continuing with Step 5:

   a. If CLKGN2 circuit packs are installed and/or the Synchronizer Module is not equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs, refer to the section titled "Equipping the Synchronizer Module" (page 14-35) before continuing with this procedure.

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

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

      Where:

      a = Target ID (optional)

      b = Synchronizer side location: `SYNC-{0,1}`

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

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

Where:

e = Synchronizer side location: SYNC-{0,1}

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

If either synchronizer side has a basic state of AVAIL or OOS, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-20) before continuing with this procedure.

5. 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}**

A sample output is:

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

Where:

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

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

If the basic state is EQPD, continue with Step 6. 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 5. Refer to Chapter 2 for installing circuit packs, if necessary.

7. Create the SWIO circuit pack 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-{1-32}

   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 (if provisioned to do so) 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, if provisioned), press the LED/LAMP TEST button on the status panel at the front of the frame.

NOTE:
The ACO LED lights for as long as the LED/LAMP TEST button is depressed.

12. Check to see that the LEDs on the circuit packs light in the order shown below:

Order	Module
1	Switch center stage (SWCS) circuit packs
2	Switch input/output (SWIO) circuit packs
3	Synchronizer*
4	Redundant Controller
5	Redundant Controller Power
6	Auxiliary Power
7	Switch Power
8	Interface module (left to right, bottom to top)†

* Synchronizer version 1 circuit packs do not contain LEDs. Therefore, these circuit packs are not included as part of the LED Test function. Version 2 circuit packs are included as part of the LED Test function.

† Interface Bay modules vary depending on the type of bay (DS1, STS1/DS3/DS1, DS3, or STS1/DS3 Interface Bay).

NOTE:
If the LED test sequence does not begin immediately, the system may be executing another command (for example, autonomous database backup). If the LEDs do not light in the order given, an input command in one of the preceding steps was entered incorrectly. You must deprovision the interface module that was entered [refer to the section titled "Deprovisioning" (page 5-73)] and repeat this procedure from Step 8 with the correct information.

Provisioning Synchronizer Module Circuit Packs and Timing References

This procedure is used to provision the Synchronizer Module circuit packs to assign the DS1 reference clocks from the Building Integrated Timing Supply (BITS) source to the DS1TX (TX) circuit packs.

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

1. Check the Synchronizer Module to make sure the DPLL, TBS3, and DS1TX circuit packs are of the same version (version 1 or 2). If different versions exist, contact your system administrator or next level of support for assistance and do not continue this procedure until instructed.
   - The equipment codes for version 1 Synchronizer Module circuit packs are:
     - — DPLL1 (AWP9)
     - — TBS31 (AWS3)
     - — DS1TX1 (AWS5)
   - The equipment codes for version 2 Synchronizer Module circuit packs are:
     - — DPLL2 (AWP15)
     - — TBS32 (AWS8)
     - — DS1TX2 (AWS9)
2. Provision the side 0 DPLL circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: `[ AWP9, AWP15 ]`
   DPLL1 circuit packs are `AWP9` and DPLL2 circuit packs are `AWP15`.

3. Provision the side 0 TBS3 (TB) circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: `[ AWS3, AWS8 ]`
   TBS31 circuit packs are `AWS3` and TBS32 circuit packs are `AWS8`.

4. Provision the side 0 DS1TX circuit pack, and provision the DS1 references by entering the following command:

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

   Where:

   a = Target ID (optional)

   j = Circuit pack code name: `[ AWS5, AWS9 ]`
   DS1TX1 circuit packs are `AWS5` and DS1TX2 circuit packs are `AWS9`.

   k = Primary timing reference location: `[ 1, 2 ]`
   Specifies which TX port the primary synchronization reference is connected to.

   l = Secondary timing reference location: `[ 1, 2 ]`
   Specifies which TX port the secondary synchronization reference is connected to. The value specified for this parameter must be the other TX port from the one assigned in parameter *k*.

   m = Timing link interface port 1 framing format: `[ ESF, SF ]`
   Specifies the framing format of the DS1 reference clock 1.

   n = Timing link interface port 2 framing format: `[ ESF, SF ]`
   Specifies the framing format of the DS1 reference clock 2.

   o = Timing link interface port 1 line code: `[ AMI, B8ZS ]`
   Specifies the line code of the DS1 reference clock 1.

   p = Timing link interface port 2 line code: `[ AMI, B8ZS ]`
   Specifies the line code of the DS1 reference clock 2.

5. Retrieve the state of the CLKGN circuit packs to determine which side is active (ACT) and which side is standby (STBY) by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:CLKGN-0&&-1;`

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "CLKGN-0:f"
   "CLKGN-1:f"
;
```

   Where:

   f = State of CLKGN circuit packs: { ACT, STBY }

6. Restore the synchronizer side associated with the active CLKGN circuit pack to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to 1 minute to complete. For version 2 synchronizer circuit packs, the green ACT LED on the DPLL and TBS3 circuit packs light once the synchronizer side is restored.

7. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 6 (active side) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: `TX-[0,1]`

   This command takes up to 1 minute to complete. For version 2 DS1TX (AWS9) circuit packs, the green ACT LED lights after the DS1TX circuit pack is restored. After the DS1TX circuit pack is restored the synchronizer is in the normal operating mode.

8. Restore the synchronizer side associated with the standby CLKGN circuit pack to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to 1 minute to complete.

9. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 8 (standby side) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: `TX-[0,1]`

   This command takes up to 1 minute to complete.

   If either synchronizer side does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 10.

10. Check the frame to determine which version of CLKGN circuit packs are installed by entering the following command:

    `RTRV-EQPT:`*[a]*`:CLKGN-0&&-1;`

    Where:

    a = Target ID (optional)

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<>::STATE */
   "CLKGN-0::PCODE=f,CCODE=g::..."
   "CLKGN-1::PCODE=f,CCODE=g::..."
;
```

    Where:

    f = Provisioned circuit pack code: `[ AWR7, AWR11 ]` CLKGN2 circuit packs are `AWR7` and CLKGN3 circuit packs are `AWR11`.

    g = Circuit pack code: `[ AWR7, AWR11 ]`

    If CLKGN3 circuit packs are installed, you are done with this procedure. Otherwise replace CLKGN2 circuit packs with CLKGN3 circuit packs by referring to the section titled "Changing Clock Generator From CLKGN2 (AWR7) to CLKGN3 (AWR11)" (page 14-37).

Provisioning MUX and SMUX Circuit Packs

This procedure allows you to provision a MUX/SMUX circuit pack in a DS3 Interface/STS1 Interface Module. This procedure must **not** be used to change a MUX1 (AKM52) to a MUX2 (AKM68B) circuit pack. Refer to the section titled "Changing Multiplexer From MUX1 (AKM52) to MUX2 (AKM68B)" (page 14-73) 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 5-70).

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 DSX-3/STSX-1 connection to avoid transient alarms. To operate line loopbacks refer to the section titled "Operating Near-End DS3 Loopbacks" (page 10-13) for MUX circuit packs or "Operating Near-End STS-1 Loopbacks" (page 10-21) for SMUX circuit packs.

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

1. Retrieve the state of the MUX/SMUX circuit pack slot you are provisioning by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: `{ MUX-{1-32}-{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"
;
```

   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, AVAIL, or PNDG

   If the basic state of the MUX/SMUX slot is ACT, POS, EQPD, or PNDG, the MUX/SMUX slot must be deprovisioned. Refer to the section titled "Deprovisioning MUX or SMUX Circuit Packs" (page 5-93) before continuing this procedure.

3. If a MUX/SMUX circuit pack is currently installed in the MUX/SMUX slot, go to Step 8. If a bus extender (BXA) circuit pack is currently inserted in the MUX/SMUX slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

4. Set the LBO of the MUX/SMUX circuit pack to be installed by performing Steps 1 and 2 of the section titled"Setting Line Build Out (LBO)" (page 5-26). After setting the LBO continue with this procedure.

5. Install the MUX/SMUX circuit pack into the MUX/SMUX circuit pack slot. Refer to Chapter 2 for installing circuit packs, if necessary.

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

6. Verify that the provisioned (PR-LBO) and circuit pack (CP-LBO) LBO settings match by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PLBO=h,CLBO=i:..."
;
```

Where:

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

h = Provisioned LBO setting: { INIT, OUT, IN }.

i = Circuit pack LBO setting: { OUT, IN }

7. If the LBO settings match (the value INIT indicates an unset value and the setting of the circuit pack is used), continue with the next step. Otherwise, change the provisioned LBO setting to match the setting from Step 4 by entering the following command:

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

   Where:

   a = Target ID (optional)

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

A sample output is:

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

Where:

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

f = Equipment state: basic states are AVAIL or POS

If the basic states of the MUX/SMUX circuit pack is AVAIL, go to Step 9 to manually provision the MUX/SMUX circuit pack. If the basic states of the MUX/SMUX circuit pack is POS, you are done with this procedure.

9. Provision the MUX/SMUX circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

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

Setting Line Build Out (LBO)

This procedure is used to initially set the Line Build Out (LBO) for MUX/SMUX circuit packs.

1. Determine the length and type of the cable connected to the working MUX or SMUX circuit packs from office records.
2. Determine whether LBO must be set to **IN** or **OUT** (refer to Table 5-2), and set saddle switches for MUX1 (AKM52/52B) circuit packs (refer to Figure 5-2), MUX2 (AKM68B) 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}** }

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

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d:...:PLBO=h,CLBO=i:..."
;
```

   Where:

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

   h = Provisioned LBO setting: { INIT, OUT, IN }.

   i = Circuit pack LBO setting: { OUT, IN }

   If the desired setting does not appear in the output response, go to Step 2. Otherwise, you are done with this procedure.

Table 5-2. **DS3 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 Combination*	KS19224, List 2 Cable	734A Cable	735A Cable	735A/ 734A Cable Combination*
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.

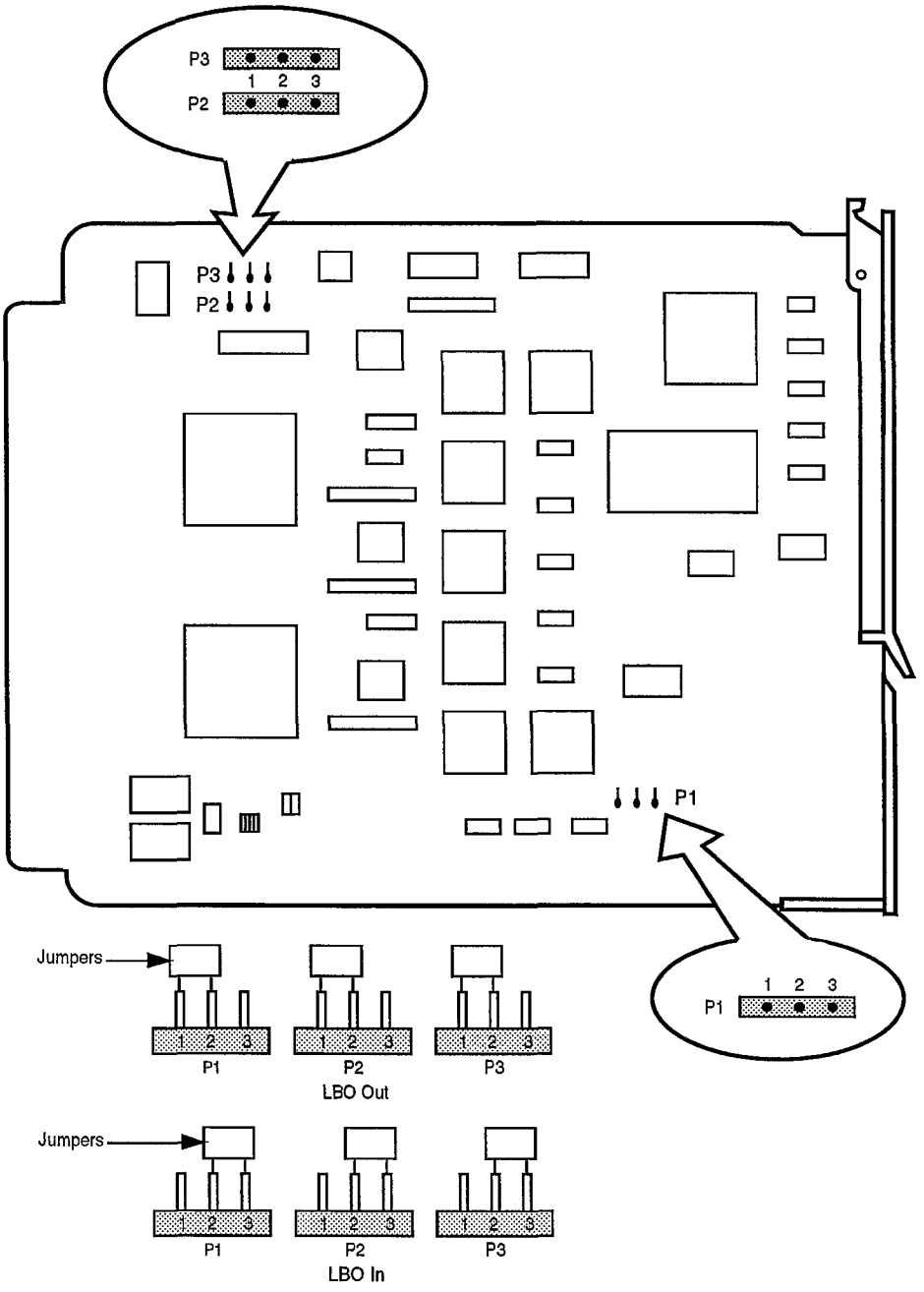


Figure 5-2. **LBO Saddle Switches on MUX1 (AKM52/52B) Circuit Packs**

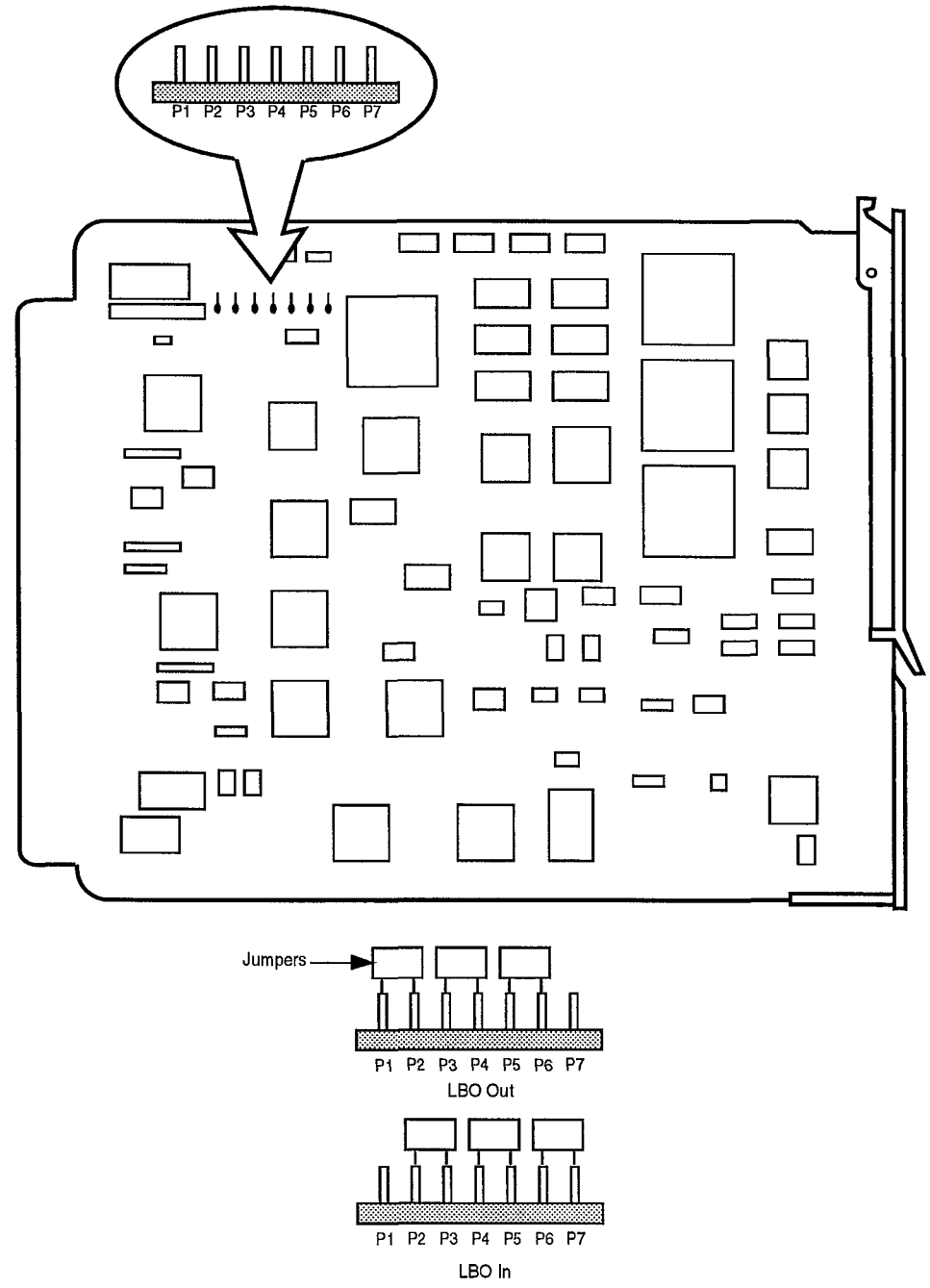


Figure 5-3. **LBO Saddle Switches on MUX2 (AKM68B) Circuit Packs**

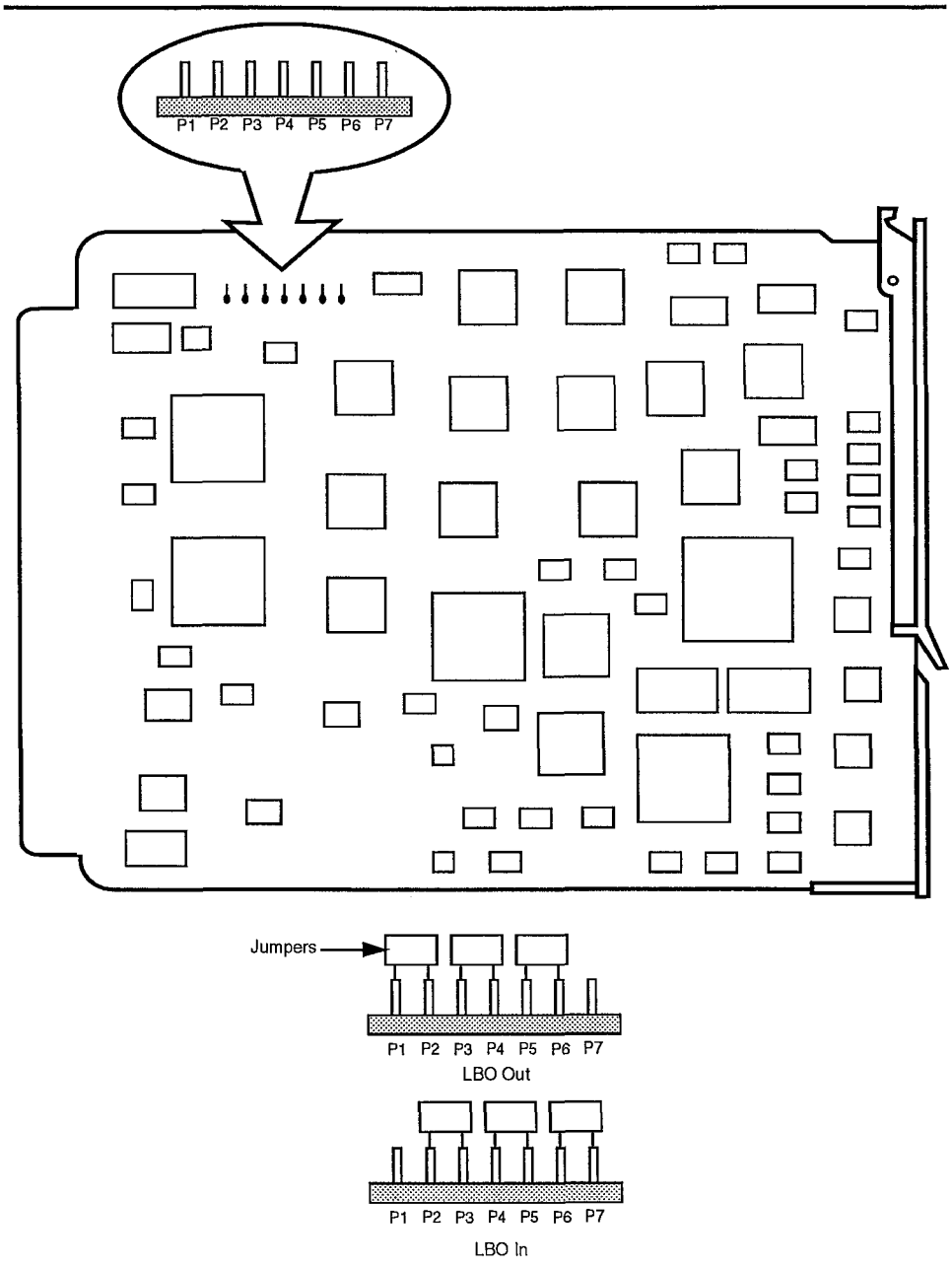


Figure 5-4. **LBO Saddle Switches on SMUX1 (AKM84) Circuit Packs**

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 14-69) for changing SWIF circuit packs.

CAUTION:
Before performing this procedure, clear any alarms and protection switches involving the DS1 interface protection group for which you are provisioning a SWIF and two DS1IF circuit packs.

1. Retrieve the state of the DS1IF slots you are provisioning by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{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"
;
```

   Where:

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

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

   If the basic states of the DS1IF slots are ACT, POS, EQPD, or PNDG, the DS1IF slots must be deprovisioned. Refer to the section titled"Deprovisioning DS1 Interface (DS1IF) Circuit Packs" (page 5-89) 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}**

   A sample output is:

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

   Where:

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

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

   If the basic state of the SWIF slot is ACT, POS, EQPD, or PNDG, the SWIF slot must be deprovisioned. Refer to the section titled"Deprovisioning SWIF Circuit Packs" (page 5-91) before continuing this procedure.

4. If a DS1IF circuit pack is currently installed in the DS1IF *A* slot, go to Step 6. If a bus extender (BXA) circuit pack is currently inserted in the DS1IF *A* slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

5. Install a DS1IF circuit pack into the DS1IF *A* slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the DS1IF slot when you install the DS1IF circuit pack.

6. If a DS1IF circuit pack is currently installed in the DS1IF *B* slot, go to Step 8. If a bus extender (BXA) circuit pack is currently inserted in the DS1IF *B* slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

7. Install a DS1IF circuit pack into the DS1IF *B* slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the DS1IF slot when you install the DS1IF circuit pack.

8. If a SWIF circuit pack is currently installed in the SWIF slot, go to Step 10. If a bus extender (BXA) circuit pack is currently inserted in the SWIF slot you are provisioning, extract it. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

9. Install a SWIF circuit pack into the SWIF slot. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm clears (CL) for the SWIF slot when you install the DS1IF circuit pack.

10. If you installed any DS1IF circuit packs in previous steps, for the DS1IF circuit packs installed set the equalizer and DS1 code type (linecode) by referring to the next section titled "Setting Equalizer (EQL) and DS1 Code Type" (page 5-35) [use the software method, where possible]. After setting the equalizer and DS1 code type continue with this procedure.

11. Retrieve the state of the DS1IF circuit packs by entering the following command:

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

    Where:

    a = Target ID (optional)

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

    A sample output is:

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

    Where:

    e = DS1IF circuit pack location: DS1IF-{1-32}-{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 12 to manually provision the DS1IF circuit packs. If the basic states of the DS1IF circuit packs are POS, go to Step 13.

12. Provision the DS1IF circuit packs by entering the following command:

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

    Where:

    a = Target ID (optional)

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

13. Retrieve the state of the SWIF circuit pack by entering the following command:

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

    Where:

    a = Target ID (optional)

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

    A sample output is:

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

    Where:

    e = SWIF circuit pack location: SWIF-{1-32}-{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, you are done with this procedure.

14. Provision the SWIF circuit pack by entering the following command:

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

    Where:

    a = Target ID (optional)

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

Setting Equalizer (EQL) and DS1 Code Type

When provisioning a DS1IF circuit pack, the equalizer (EQL) settings can be done via software by using the **ED-EQPT** command (software method), or by setting hardware switches on the circuit pack and using the **ED-EQPT** command (hardware method).

The recommended method is the software method since the software overrides the hardware settings except in the case where the switches have been set to invalid combinations.

The following section addresses the software method. If you prefer to use the hardware method, skip to the section titled "Hardware Method" (page 5-39).

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=***e]*;

   Where:

   a = Target ID (optional)

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

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

Table 5-3. DS1 Cable Length (Feet) Supported for EQL Setting — No DSABs

Equalizer Setting	To DSX-1		To Network Element	
	1249-Type Cable (26GA)	600-Type Cable (22GA)	1249-Type Cable (26GA)	600-Type Cable (22GA)
20	0-90	0-133	0-540	0-788
40	>90-180	>133-267	>90-630	>133-922
60	>180-270	>267-400	>180-720	>267-1055
80	>270-360	>400-533	>270-810	>400-1188
100	>360-450	>533-655	>360-900	>533-1310

Note: In DSX runs, it is assumed that the distance from the other side of the patch to the next network element is at the maximum of 450/655 feet (one-half the total allowable distance between network elements). For runs between network elements, an additional 450/655 feet can be added to the upper limit, thereby causing overlapping ranges in the **To Network Element** column.

Table 5-4. DS1 600-Type Cable (22GA) Length (Feet) Supported for EQL Setting — DSABs using 50 feet of 1249-Type Cable (26GA) to the DACS IV-2000 Frame

Equalizer Setting	To DSX-1 (1 DSAB)	To Network Element (1 DSAB)	To Network Element (2 DSAB)
20	0-63	0-718	0-648
40	>63-197	>63-852	0-782
60	>197-330	>197-985	>127-915
80	>330-463	>330-1118	>260-1048
100	>463-585	>463-1240	>393-1170

Note: In DSX runs, it is assumed that the distance from the other side of the patch to the next network element is at the maximum of 585 feet (one-half the total allowable distance between network elements using two DSAB Bays). For runs between network elements, an additional 585 feet can be added to the upper limit, thereby causing overlapping ranges in the **To Network Element** columns.

3. Verify the EQL settings by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d:...:PEQL=j,CEQL=k,..."
;
```

   Where:

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

   j = Provisioned EQL setting: `{ INIT, 20, 40, 60, 80, 100, 20*, 40*, 60*, 80*, 100* }`
   The value `INIT` indicates unprovisioned state. An asterisk (*) indicates the EQL setting is provisioned through circuit pack insertion.

   k = Circuit pack EQL setting: `{ INIT, 20, 40, 60, 80, 100, INVALID }`
   The value `INVALID` indicates the switches on the DS1IF circuit pack are set improperly.

   If the desired setting does not appear or the value `INIT` appears, repeat Step 2 of this procedure. If the value `INVALID` appears do not continue this procedure but; refer to the section titled "Hardware Method" (page 5-39) to continue setting the EQL.

4. Using office records, determine the DS1 code type (B8ZS or AMI) for each of the 14 channels of the DS1IF circuit pack.

5. Set the DS1 code type (linecode) by entering the following command:

   ED-T1:*[a]*:*b*::::[**LINECDE=***k*];

   Where:

   a = Target ID (optional)

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

   k = Linecode setting: **{ B8ZS, AMI, INIT, CURVAL }**

6. Verify the DS1 code type (linecode) setting by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:ACTSIG:<> */
   "e:...:<LINECDE=u>"
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   u = DS1 code type: { AMI, B8ZS, AMI*, B8ZS*, INIT }
   An asterisk (*) indicates the signal is provisioned through circuit pack insertion rather than through a command.

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

Hardware Method

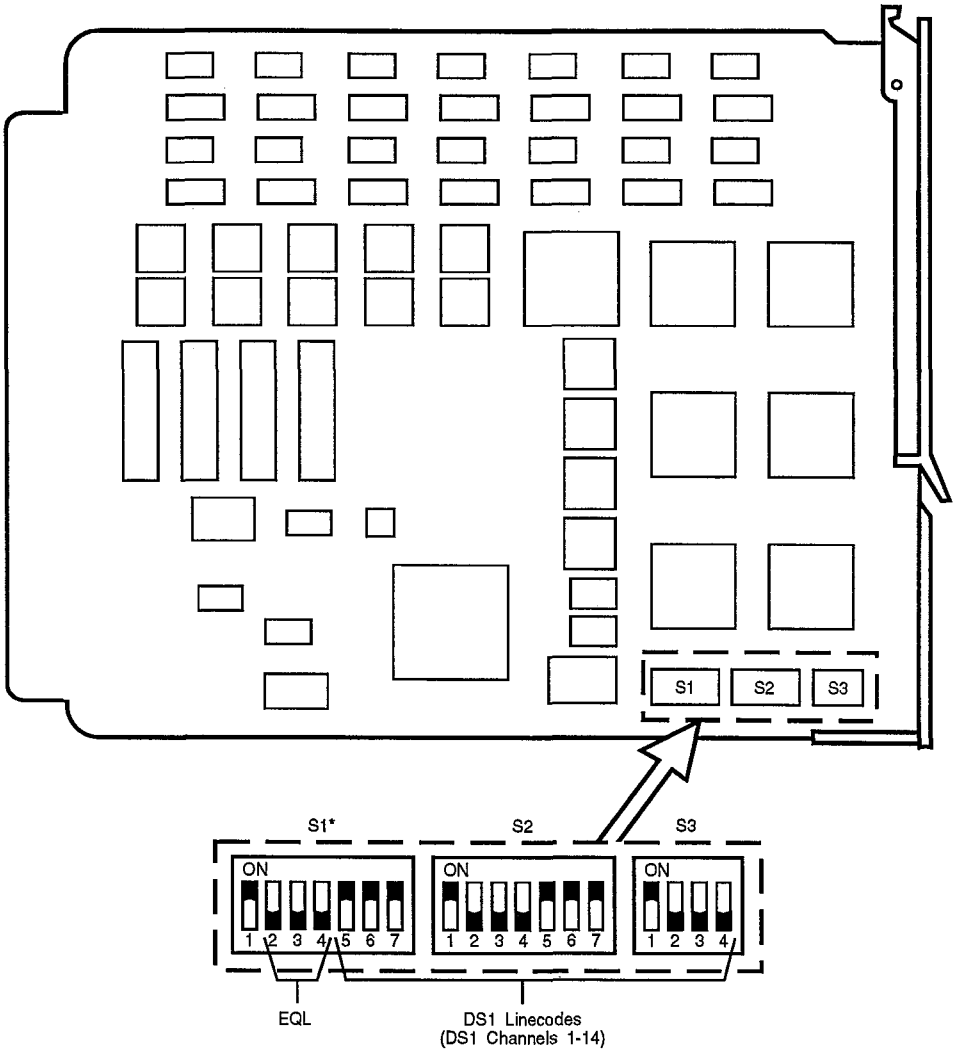
1. Determine the length and type of the cable connected to the DS1IF circuit packs from office records.
2. Determine proper EQL setting (refer to Table 5-3 or 5-4).
3. Extract the DS1IF circuit pack (refer to Chapter 2 if necessary), and set the EQL switches using Tables 5-3 or 5-4 and 5-5, and Figure 5-5.

Table 5-5. EQL Switch Positions

Equalizer Setting	S1 Switch Positions*		
	2	3	4
20	OFF	OFF	OFF
40	OFF	OFF	ON
60	OFF	ON	OFF
80	OFF	ON	ON
100	ON	OFF	OFF

* All 14 DS1 channels of a DS1IF are controlled by these switches; per channel equalization is not available. If switches are set to values other than those shown, the circuit pack does not operate properly.

4. Using office records, determine the DS1 code type (B8ZS or AMI) for each of the 14 channels of the DS1IF circuit pack.
5. Set the DS1 code type (linecode) switches as shown in Figure 5-5 and Table 5-6.



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

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

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

DS1 Channel (14 per DS1IF)	Switch Position	Settings	
		for AMI	for B8ZS
1	S1,5	ON	OFF
2	S1,6	ON	OFF
3	S1,7	ON	OFF
4	S2,1	ON	OFF
5	S2,2	ON	OFF
6	S2,3	ON	OFF
7	S2,4	ON	OFF
8	S2,5	ON	OFF
9	S2,6	ON	OFF
10	S2,7	ON	OFF
11	S3,1	ON	OFF
12	S3,2	ON	OFF
13	S3,3	ON	OFF
14	S3,4	ON	OFF

6. Initialize the EQL parameter by entering the following command:

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

   Where:

   a = Target ID (optional)

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

7. Initialize the DS1 Code Type (linecode) parameter by entering the following command:

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

   Where:

   a = Target ID (optional)

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

8. Reinstall the DS1IF circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

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) through a TABS link (P link). In order for the TABS link to receive the alarm and control data, the DS3PM circuit pack must be optioned by setting the two option switches on the DS3PM circuit pack.

There are two P links for bays on the left side of the Switch Bay and two P links for bays on the right side of the Switch Bay. Each P link can accommodate eight DS3PM circuit packs. The P links must be terminated by a resistor on the DS3PM circuit pack. The resistor is optioned IN or OUT with the two option switches on the DS3PM circuit pack.

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. Figure 5-6 shows a typical P link arrangement for a maximum configuration of DS3PM circuit packs. In Figure 5-6, the DS3PM circuit packs in units 12 and 24 have the terminating resistor set to the IN position and all other DS3PM circuit packs are set to OUT.

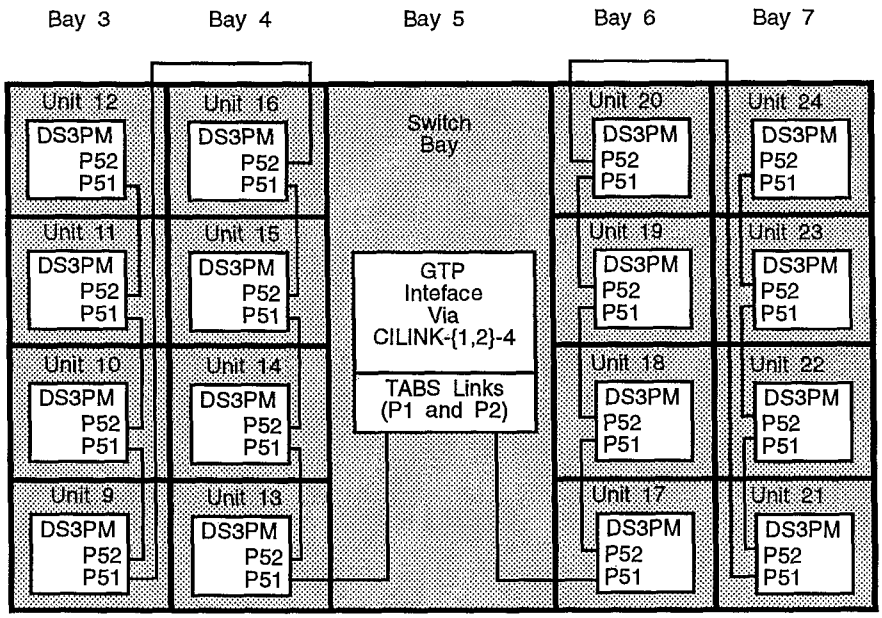


Figure 5-6. Typical Maximum Configuration of TABS Link (P Links) for DS3PM Circuit Packs

There are three ways to determine which DS3PM circuit pack must have its terminating resistor set to IN:

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

The P link connections to the 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 two option switches set to the IN position. All others in the series must be set to the OUT position.

NOTE:
If you are rearranging the frame or adding DS3PM circuit packs, you must maintain the wiring arrangement for the DS3PM circuit packs and be sure that the last one in the series is set to IN, with all others set to OUT.

1. Determine the interface module (Unit Number), the multipoint address (which is the Unit Number minus one), and control cable identification (J9-J16 for left of Switch Bay DS3PM circuit packs and J25-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. To provision the DS3PM circuit pack TABS LINK OUT, place a jumper to cover Pins 2 and 3 on both option switches. Refer to Figure 5-7 for location of the option switches.
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): `J{9-15,25-32}`

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

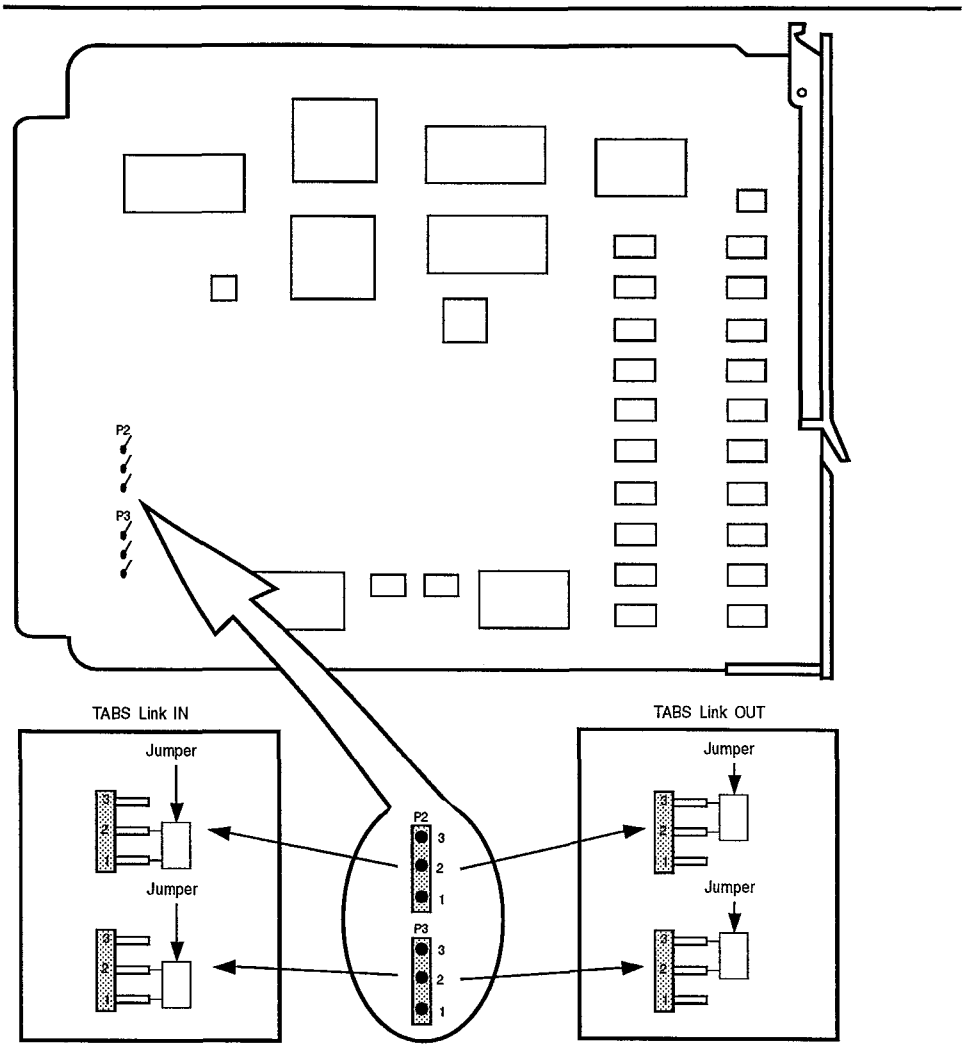


Figure 5-7. Location of Option Switches on DS3PM1 (AKM62) TABS Link

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 for DS1 PM

NOTE:
PMGR1 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 interface module configuration constraints, the number of PMGR1 circuit packs per interface module is limited.

- UC2 circuit pack memory (scan performance monitoring has a higher demand on memory than full-time/camp-on performance monitoring).
- Only one PMGR1 circuit pack can be provisioned to perform scan performance monitoring per SWIO circuit pack pair.

Table 5-7 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	
	Scan	Full-Time/Camp-On
DS3 Interface-32	0	16
	1	8
	2	2
DS3 Interface-16	0	15
	1	8
DS1 Interface	7	8
	1/0*	7
DS1 Interface-Protection	0	7
	1/0†	6

* Zero if there is a scan performance monitoring PMGR1 circuit pack in the associated DS1 Interface-Protection Module.

† Zero if there is a scan performance monitoring PMGR1 circuit pack in the associated DS1 Interface Module.

1. Take down or roll over any cross-connections, disconnect any test access, and remove any loopbacks involving the interface circuit pack to be replaces with a PMGR circuit pack.

⚠ CAUTION:
This step must be completed before you proceed.

2. Verify that each DS1 port on the MUX or SWIF to be replaced is in the IDLE-REL state by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: DS1GRP-{1-32}-{1-31}

   A sample output is:

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

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = DS1 input port state

   g = DS1 output port state

   All DS1 ports associated with the selected DS1 interface group must be in the IDLE-REL state (parameters *f* and *g*) before continuing.

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

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

   Where:

   a = *a* =Target ID (optional)

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

A sample output is:

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

Where:

e = MUX or SWIF circuit pack location: `{ MUX-{1-32}-{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. Delete the DS1IF and SWIF circuit pack slots or MUX circuit pack slot from the database by entering the following command for each circuit pack:

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

   Where:

   a = Target ID (optional)

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

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.

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 5-89) for replacing DS1IF circuit packs with BXA circuit packs, if necessary.

6. Create the PMGR1 circuit pack in the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

   The minor alarm clears (CL) for the MUX or SWIF slot when the PMGR1 circuit pack is created.

8. Provision the PMGR1 circuit pack by entering the following command:

   ED-EQPT:*[a]*:*b*:::**AKM66**:*[***FNCT=***h]*;

   Where:

   a = Target ID (optional)

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

   h = Function 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}** }

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:...:PCODE=f,CCODE=g,FNCT=q,...:aa"
;
```

   Where:

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

   f = Provisioned circuit pack code: AKM66 is setting for PMGR1 circuit packs

   g = Circuit pack code: AKM66 is setting for PMGR1 circuit packs

   q = Circuit pack function: { PM, PM-SCAN }

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

   If the state of the MUX or SWIF slot is not POS, go to Step 5. If any of the other parameters do not contain the desired values, go to Step 8. Otherwise, you are done with this procedure.

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 5-63),"Provisioning VT1.5 Facilities" (page 5-67), and "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-70) 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 NDRVN or INIT and the DS1 is not monitored.

l = Signal format: { ESF, SF, UNFR }

s = Output mode: { NORM, TERM, AIS, QRSS }

u = DS1 code type: { AMI, B8ZS, AMI*, B8ZS*, INIT }
An asterisk (*) indicates the signal is provisioned through circuit pack insertion rather than through a command.

w = Far-end notification: { ANSI, NOT-ANSI }

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

3. Change the necessary T1 parameters by entering the following command:

ED-T1:*[a]*:*b*::::[**BER=***d*,**ISTAT=***g*,**FMT=***h*,**OMODE=***j*,
LINECDE=*k*,**FENDNTE=***l*];

Where:

a = Target ID (optional)

b = DS1 port location: { {1-32}-{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 }
INC and MINC are far-end conditions, all others are near-end conditions.

j = Location: { NEND, FEND }

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

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-T1** command is issued for that T1. The **RTRV-COND-T1** command can be used to retrieve alarm conditions with an NA alarm level.

6. Change current alarm level information by entering the following command:

   SET-ATTR-T1:*[a]*:*b*:::*d*:,*[f]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {1-32}-{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
   When NEND is specified, only the notification code for near-end conditions (LOS, T-BER, DS1-AIS, YEL, and LOF) are set. When FEND is specified, only the notification code for far-end conditions (INC and MINC) are set. FEND can only be specified for DS1 signals within DS3s (that is, only if MUX-{1-32}-{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.

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 whether the DS3 signal is formatted for ASYNC or CBIT. If a DS3 port is communicating with a FEAC type of remote multiplexer, the CBIT signal format must be specified.
- DS3 IDLE Signal — specifies (when enabled) whether the DS3 IDLE signal is transmitted when all 28 DS1 tributaries in a DS3 are in the IDLE-REL (idle-released) state.
- Remote Multiplexer — specifies whether the selected DS3 signal is to communicate with a remote multiplexer (for example, a DDM-1000 multiplexer using SBIT communications). The DACS IV-2000 has the capability of communicating with a variety of remote multiplexers at the far end. In order to communicate with the far-end multiplexer, the system must be properly provisioned to match the far end. When attempting to provision the system for a far-end multiplexer, consider the mandatory parameter of the **ED-T3** command for the far-end alarm and control (FEAC) type of remote multiplexer communication. For FEAC, the mandatory **DS3FORMAT** parameter value is **CBIT**. In addition, alarm notification levels can be set for far-end facility and equipment failures with the **SET-ATTR-{T1|T2|T3}** and **SET-ATTR-EQPT** commands.

NOTE:
Remote multiplexer communication is supported by the MUX2 (AKM68B) 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 }
For MUX1 circuit packs, the only valid conditions are the near-end conditions: T-BER, LOS, OOF, and AIS. For MUX2 circuit packs, the near end-end conditions are: T-BER, LOS, OOF, AISFRAMED, AISUNFRAMED, IDLE, ALLDS2SOOF, and DS3FRMTMISMTCH and the far-end conditions are: INC, OOF, AIS, IDLE, YEL, and SBITFAIL.

j = Location: { NEND, FEND }

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

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-T3** command is issued for that T3. The **RTRV-COND-T3** command can be used to retrieve alarm conditions with an NA alarm level.

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 and far-end conditions)
It is recommended that this parameter is set to **MJ** (major) for the condition group **FAULT**, to **MN** (minor) for the condition group **AIS** and far-end conditions, and to **NA** (no alarm) for the condition group **IDLE** for each DS3 signal to be put into service to aid in any future troubleshooting of DS3 facilities.

e = Condition group: { **FAULT, AIS, IDLE, ALL** }
If **FEND** is specified for parameter *f*, this parameter must be set to **ALL**.

- **FAULT** — indicates the condition types: LOS, T+BER, and OOF.
- **AIS** — indicates the condition types: AIS, AISFRAMED, and AISUNFRAMED.
- **IDLE** — indicates the condition types: IDLE and ALLDS2SOOF.
- **ALL** — for parameter f set to **NEND**, indicates all condition groups (**FAULT**, **AIS**, and **IDLE**); for parameter f set to **FEND**, indicates all far-end conditions (INC, OOF, AIS, IDLE, YEL, and SBITFAIL).

f = Location: { **NEND, FEND** }
Default value: **NEND**
FEND can only be specified for DS3 signals associated with a MUX2 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. If the DS3 facility you are provisioning is to be communicating with a remote multiplexer, verify and set alarm notification levels for the associated DS1, DS2, and far-end equipment by performing the following procedure:

   a. Retrieve current alarm level information for DS2 tributaries by entering the following command:

      RTRV-ATTR-T2:*[a]*:*b*;

      Where:

      a = Target ID (optional)

      b = DS3 port location: { **{1-32}-{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"
;
```

Where:

g = DS3 port location: {1-32}-{1-31}

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

i = Condition Type: OOF

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

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-T2** command is issued for that T2. The **RTRV-COND-T2** command can be used to retrieve alarm conditions with an NA alarm level.

b. Change current alarm level DS2 tributary information by entering the following command:

SET-ATTR-T2:*[a]*:*b*:::*d*;

Where:

a = Target ID (optional)

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

d = Notification code: **{ MJ, MN, NA }**
Initial system value: **NA**

c. Verify the settings using the **RTRV-ATTR-T2** command as shown in Step 8a.

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.

d. Verify and set alarm level information for DS1 tributaries by performing Steps 5, 6, and 7 of the section titled "Provisioning DS1 Facilities" (page 5-49).

e. Retrieve current alarm level information for far-end equipment by entering the following command:

RTRV-ATTR-EQPT:*[a]*:*b*:::,,FEND;

Where:

a = Target ID (optional)

b = DS3 port location: { {1-32}-{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,FEND"
;
```

Where:

g = DS3 port location: {1-32}-{1-31}

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

i = Condition Type: { MUX, DS1IF, COM, ACPWR }

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

NOTE:
If NA is displayed for the notification code parameter, this indicates that a condition that causes an alarm is not displayed when the **RTRV-ALM-EQPT** command is issued for far-end equipment. The **RTRV-COND-EQPT** command can be used to retrieve alarm conditions with an NA alarm level.

f. Change current alarm level far-end equipment information by entering the following command:

SET-ATTR-EQPT:*[a]*:*b*:::*d*;

Where:

a = Target ID (optional)

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

d = Notification code: { MJ, MN, NA }
Initial system value: MJ

g. Verify the settings using the **RTRV-ATTR-EQPT** command as shown in Step 8e.

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-EQPT** command and change the necessary parameters.

9. 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 5-70) 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 }**

   - **FAULT** — indicates the condition types: LOS, T-BERL, LOF, LOP, and SLMF.
   - **AIS-TEL** — indicates the condition types: AISL, AISP, and YEL.
   - **FERF** — indicates the condition type: FERF.
   - **ALL** — indicates all condition groups (**FAULT**, **AIS-YEL**, and **FERF**).

7. Verify the settings using the **RTRV-ATTR-EC1** command as shown in Step 5.

NOTE:
If an alarm condition is currently active on an EC-1 port, the new notification code specified does not take effect until after the current condition is cleared.

If any parameters are not set to the desired values, 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 5-63) and "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-70) 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 NDRVN or INIT and the VT1.5 is not monitored.

   s = Output mode: { NORM, TERM, AIS }

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

3. Change the necessary VT1.5 parameters by entering the following command:

   ED-VT1:*[a]*:*b*::::[**ISTAT=***g*,**OMODE=***j*];

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: { **{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 }

   - FAULT — indicates the condition type: LOP.
   - AIS-YEL — indicates the condition types: AISP and YEL.
   - ALL — indicates all condition groups (FAULT and AIS-YEL).

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

NOTE:

If an alarm condition is currently active on 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 signals with the type of terminating equipment connected to the DACS IV-2000 SMUX circuit packs. Since the DACS IV-2000 can cross-connect STS-1, VT1.5, and DS1 signals, you must match the signal type of SMUX circuit packs with the type of signal to be cross-connected.

NOTE:
When SMUX circuit packs are initially provisioned, the Active Signal Type defaults to DS1. If STS-1 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 changed to a different signal type. If you attempt to change a port that is not in the IDLE state, the **ED-PORT** command used in this procedure is denied with the error code SNVS.

1. From office records determine the equipment connected to the SMUX circuit pack port that is being changed (for example, for VT1.5 mappings, bit or byte synchronous DS1 mapping or asynchronous DS1 mapping).
2. Retrieve current provisioning information for the EC-1 port that you are changing by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Port location:
   EC-1 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=,VTMAP=g,RCVVTMAP=>: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: Reserved for future use.

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: Reserved for future use.

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** is 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.
- **VTLOCK** — specifies an STS-1(VT1.5) signal for locked virtual tributary mode (can not transport asynchronously mapped SPE).

e = 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 VT1.5 signals, one of the modes **UNSPEC**, **BIT**, or **BYTE** is selected according to the signal format of the far-end equipment. For DS1 signals, **ASYN** is selected. 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. In addition, procedures are provided to deprovision individual interface circuit packs (DS1IF, SWIF, MUX, and SMUX) and replace them with BXA circuit packs.

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

Deprovisioning 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 5-78).

1. Disconnect or roll over any cross-connections, disconnect any test access, release any loopbacks, release any testports, 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-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{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 4.

3. Delete the DS1IF circuit pack(s) from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{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 or any of the ports is provisioned as a testport.

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

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{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 6.

5. Delete the SWIF circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

6. Retrieve the state of the DS1RY circuit packs in the DS1 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1RY circuit pack location: **DS1RY-{1-32}-1&&-4**

   A sample output is:

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

   Where:

   e = DS1RY circuit pack location: DS1RY-{1-32}-{1-4}

   f = Equipment state: basic states are IS or OOS

   If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 8.

7. Delete the DS1RY circuit packs from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1RY circuit pack location: **DS1RY-{1-32}-{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.

8. Retrieve the state of the CLKDR circuit packs in the DS1 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location: **CLKDR-{1-32}-1&-2**

   A sample output is:

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

   Where:

   e = CLKDR circuit pack location: CLKDR-{1-32}-{1-2}

   f = Equipment state: basic states are IS or OOS

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

9. Delete the CLKDR circuit packs from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

10. Remove the UC circuit pack from service by entering the following command:

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

    Where:

    a = Target ID (optional)

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

    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.

11. Delete the DS1 Interface Module from the database by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DS1 Interface Module location: **UNIT-{1-32}**

    The major alarm clears (CL) for the UC slot when you remove the DS1 Interface Module from the database. After the alarm clears, you are done with this procedure.

Deprovisioning DS1 Interface-Protection Modules

This procedure is used to deprovision DS1 Interface-Protection Modules. DS1 Interface Modules associated with the DS1 Interface-Protection Module to be deprovisioned must be deprovisioned *first*. If there are any DS1 Interface Modules associated with the selected DS1 Interface-Protection Module that is not deprovisioned, refer to the previous section titled "Deprovisioning DS1 Interface Modules" (page 5-73) 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-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-1A&&-7B**

   A sample output is:

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

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{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 4.
3. Delete the DS1IF circuit pack(s) from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1IF circuit pack location: **DS1IF-{1-32}-{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 or any of the ports is provisioned as a testport.

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

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{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 6.

5. Delete the SWIF circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

   a = Target ID (optional)

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

A sample output is:

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

Where:

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

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

If the basic state is ACT, the selected equipment cannot be deprovisioned until traffic is switched to other equipment. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 8.

7. Delete the DS1IP circuit pack(s) from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = SWIF circuit pack location: `SWIF-{1-32}-{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 10.

9. Delete the protection SWIF circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

10. Retrieve the state of the DS1RY circuit packs in the DS1 Interface-Protection Module by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DS1 relay circuit pack location: **DS1RY-{1-32}-1&&-4**

    A sample output is:

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

    Where:

    e = DS1RY circuit pack location: DS1RY-{1-32}-{1-4}

    f = Equipment state: basic states are IS or OOS

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

11. Delete the DS1RY circuit packs from the database by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DS1RY circuit pack location: **DS1RY-{1-32}-{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.

12. Retrieve the state of the CLKDR circuit packs in the DS1 Interface Module by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = CLKDR circuit pack location: **CLKDR-{1-32}-1&-2**

    A sample output is:

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

    Where:

    e = CLKDR circuit pack location: CLKDR-{1-32}-{1-2}

    f = Equipment state: basic states are IS or OOS

    If the basic state is IS, continue with the next step. If the basic state is OOS, continue with Step 14.

13. Delete the CLKDR circuit packs from the database by entering the following command:

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

    Where:

    a = Target ID (optional)

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

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

14. Remove the UC circuit pack from service by entering the following command:

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

    Where:

    a = Target ID (optional)

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

    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. 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. After the alarm clears, you are done with this procedure.

Deprovisioning DS3 or STS1 Interface Modules

This procedure is used to deprovision DS3 Interface-16, DS3 Interface-32, 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 circuit packs in the DS3 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = MUX/SMUX circuit pack location: { MUX-{1-32}-{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 4.

3. Delete the MUX/SMUX circuit packs from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location:
   DS3 Interface-32 Modules: **MUX-{1-32}-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.

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

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

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

   e = Equipment state: basic states are AVAIL, EQPD, PNDG, STBY, or OOS

   If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 6.

5. Delete the MUXP/SMUXP circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

6. Retrieve the states of the CLKDR circuit packs in the DS3/STS1 Interface Module by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location:
   DS3 Interface-32 Modules: **CLKDR-{1-32}-1&&-4**
   DS3/STS1 Interface-16 Modules: **CLKDR-{1-32}-1&&-2**

   A sample output is:

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

   Where:

   e = CLKDR circuit pack location: CLKDR-{1-32}-{1-4}

   f = Equipment state: basic states are IS or OOS

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

7. Delete the CLKDR circuit packs from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = CLKDR circuit pack location:
   DS3 Interface-32 Modules: **CLKDR-{1-32}-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.

8. 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 11. 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}**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "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 9. If the basic state is OOS, continue with Step 10. If the basic state is AVAIL, continue with Step 11.

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

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

   Where:

   a = Target ID (optional)

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

   After removing the DS3PM circuit pack from service, continue with Step 10.

10. 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 Step 11.

11. Remove the UC circuit pack from service by entering the following command:

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

    Where:

    a = Target ID (optional)

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

    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.

12. Delete the DS3/STS1 Interface Module from the database by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DS3/STS1 Interface Module location: **UNIT-{1-32}**

    The major alarm for the UC slot clears (CL) when you remove the DS3/STS1 Interface Module from the database. After the alarm clears, you are done with this procedure.

Deprovisioning DS1 Interface (DS1IF) Circuit Packs

This procedure is used to deprovision DS1IF circuit packs. DS1IF circuit packs must be deprovisioned *before* the associated SWIF circuit pack. After deprovisioning DS1IF circuit packs, the associated SWIF circuit pack can be deprovisioned using the next section titled "Deprovisioning SWIF Circuit Packs" (page 5-91).

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}**

   A sample output is:

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

   Where:

   e = DS1IF circuit pack location: DS1IF-{1-32}-{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 4.

3. Delete the DS1IF circuit pack(s) from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

4. If you are replacing DS1IF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 5, 6, and 7 for each DS1IF circuit pack you are replacing. Otherwise, you are done with this procedure.

5. Extract the DS1IF circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

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

6. 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.

7. 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 5-89) 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}**

   A sample output is:

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

   Where:

   e = SWIF circuit pack location: SWIF-{1-32}-{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 4.
3. Delete the SWIF circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: **SWIF-{1-32}-{1-8}**
4. If you are replacing SWIF circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 5, 6, and 7 for each SWIF circuit pack you are replacing. Otherwise, you are done with this procedure.

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

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

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

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

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

7. Create the SWIF circuit pack slot in the database so that auto-provisioning can occur if the slot is equipped with a SWIF circuit pack at a later date by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   A sample output is:

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

   Where:

   e = MUX/SMUX circuit pack location: { MUX-{1-32}-{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 4.
3. Delete the MUX/SMUX circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = MUX/SMUX circuit pack location: **{ MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }**
4. If you are replacing MUX/SMUX circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 5, 6, and 7 for each MUX/SMUX circuit pack you are replacing. Otherwise, you are done with this procedure.

5. Extract the MUX/SMUX circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

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

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

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

7. Create the MUX/SMUX circuit pack slot in the database so that auto-provisioning can occur if the slot is equipped with a MUX/SMUX circuit pack at a later date by entering the following command:

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

   Where:

   a = Target ID (optional)

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

Deprovisioning DS3PM Circuit Packs

This procedure is used to deprovision DS3PM circuit packs.

1. 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}**

2. Delete the DS3PM circuit pack 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}**

3. Obtain a BXA1 circuit pack.
4. Extract the DS3PM circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the BXA circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

NOTE:
The BXA circuit pack is needed for proper air flow through the DS3 Interface Module.

6. Adjust the TABS link for the remainder of the DS3PM circuit packs associated with the side of the Switch Bay the DS3PM circuit pack removed in this procedure. Refer to the section titled "Provisioning DS3PM Circuit Packs" (page 5-42) for information on the TABS link. Before extracting a DS3PM circuit pack to adjust the TABS link jumper, use the **RMV-EQPT** command to remove the DS3PM circuit pack from service. After you reinstall a DS3PM circuit pack, use the **RST-EQPT** command to restore the DS3PM circuit pack to service.

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 or test access and loopbacks 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} }**

   A sample output is:

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

   Where:

   e = MUX or SWIF circuit pack location: { MUX-{1-32}-{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, test access, or loopback connections are disconnected. If the basic state is AVAIL, the selected equipment is already deprovisioned; go to Step 5.

3. If the basic state of the PMGR1 is POS, determine if the PMGR1 is performing SCAN DS1 performance monitoring by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = PMGR1 circuit pack location: **DS1GRP-{1-32}-{1-31}**

   If there is no performance monitoring taking place for the specified PMGR1 circuit pack the following response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If there is performance monitoring taking place for the specified PMGR1 circuit pack the following response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MONPORT:PORT,STATE */
   "d:e,f"
;
```

   Where:

   d = Monitored DS1 port location: {1-32}-{1-31)-{1-28}

   e = Monitoring DS1 port location: {1-32}-{1-31)-{1-28}

   f = Monitored DS1 port state: { PM-REL, PM-CMPN, PM-AUTOCMPN-IDLE, PM-AUTOCMPN, PM-SCAN, PM-SCAN-IDLE }

   If the PMGR1 is performing SCAN DS1 performance monitoring (parameter *f* indicates a state of PM-SCAN or PM-SCAN-IDLE), check with your system administrator before stopping the scanning. If scanning is to be stopped, refer to the section title "Stopping DS1 Scan Performance Monitoring" (page 11-20) 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.

4. Delete the PMGR1 circuit pack from the database by entering the following command:

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

   Where:

   a = Target ID (optional)

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

5. If you are replacing PMGR1 circuit pack(s) with bus extender (BXA) circuit pack(s), perform Steps 6, 7, and 8 for each PMGR1 circuit pack you are replacing.
6. Extract the PMGR1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

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

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

7. Install the BXA circuit pack. Refer to Chapter 2 for 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.
8. Create the BXA slot(s) in the database so that auto-provisioning can occur if the slot(s) is equipped with SWIF or MUX circuit pack(s) at a later date by entering the following command:

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

   Where:

   a = Target ID (optional)

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

Checking for Non-driven (NDRVN) and Framed DS1 Ports

This procedure identifies DS1 ports in the DACS IV-2000, running Release 4.0, that are set to NDRVN and have a framing format set (SF or ESF). The procedure sets those ports to unframed (UNF). The six phases of this procedure and approximate implementation times are given below:

- Phase I - Preconditioning (30 minutes)
- Phase II - System Setup (10 minutes)
- Phase III - Database Backup (30 minutes)
- Phase IV - Format Check and Update (2 hours)
- Phase V - Database Backup (30 minutes)
- Phase VI - Clean Up (20 minutes)

If your office procedure requires you to set ports to unframed, continue with this procedure. Otherwise, do not perform this procedure. If this procedure is performed, all alarms on DS1 ports are suppressed.

NOTE:
The following notes and precautions must be understood before using this procedure.

- Coordinate this procedure with the alarm monitoring group, if applicable.
- The person(s) performing this procedure must be trained and have an understanding of the DACS IV-2000 system.
- Read each step completely before performing the action specified.
- Do not enter a second command until the first command has completed. Wait for the appropriate response before continuing to the next step.
- Do not proceed if a command does not successfully complete; contact your next level of support.
- Autonomous log out occurs when the link's inactivity timer is exceeded. You are required to log back into the system.
- Perform this procedure in the sequence provided beginning with Step 1.
- Monitor the system for alarms or trouble reports for a period of 48 hours prior to implementing this procedure.
- If any problems or service loss occur, contact your next level of support immediately.
- Monitor the system for alarms or trouble reports for a period of 48 hours prior to implementing this procedure.
- If any problems or service loss occur, contact your next level of support immediately.

Phase I - Preconditioning

This phase ensures that you have reviewed this procedure to ensure that all required materials are available.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example: wrist strap, or grounded shoes, etc. must be worn) at all times.

1. Contact your next level of support to verify that the procedure to be used is the current version.

⚠ CAUTION:
If the procedure to be used is not the current version, do not continue.

2. Verify the presence of the following materials and documents:
   - Two (2) Release 4.0.1 optical disks
   - One (1) Terminal (for DACS IV-2000 frame)
   - One (1) Printer with ample supply of paper (for DACS IV-2000 frame)
   - One (1) RS-232 (25 pin) cable (for DACS IV-2000 frame)
   - *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-802)

⇒ NOTE:
If all the material and documents are not available, do not continue; contact your next level of support.

3. Synchronize the office clock, the DACS IV-2000 time, and all watches to the Customer Network (that is, ADTSS, etc.) time.

⇒ NOTE:
Call the Maintenance Center to verify the time.

4. Notify the alarm monitoring system that this procedure will be implemented on the system.

5. Obtain a User ID and password for the DACS IV-2000 from the System Administrator with the following parameter values:
   - UCFC/UCAL: `P5&M5&T5&S5&PM5` (any order)
   - UCPL: `5`
   - Message Screening: `DBALL`
   - Dialogue Mode: `MENU`
   - User Type: `HUMAN`
6. Carefully read the Notes (precautions and recommendations for this procedure) listed in the section titled "Checking for Non-driven (NDRVN) and Framed DS1 Ports" (page 5-99) before continuing.
7. If a communication line not going through the DACS IV-2000 is required, verify it is present and functional (that is, phone attached and working).

⚠ CAUTION:
Do NOT test the cellular phone inside the central office.

8. This completes the Preconditioning Phase of this procedure.

Phase II - System Setup

This phase ensures the printer is properly equipped to keep a record of the change procedure, all test access (TACC) connections are removed, all equipment alarms are removed, and all remote links are removed from service.

⚠ CAUTION:
After entering an input command into the DACS IV-2000, you must wait for its associated output message response (`COMPLD`) before entering another command.

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example; wrist strap, or grounded shoes, etc. must be worn) at all times.

9. Connect a terminal to CILINK-1-1 at the rear of the Switch bay of the DACS IV-2000. Refer to the section titled "Adding a Terminal to a Snider Link" in Chapter 7, if necessary.

CAUTION:
There must be no connection on CILINK-1-1 at the front of the Status Panel.

10. Connect a printer to the terminal and verify that the printer is ready (power on) and properly equipped (paper, ribbon, etc.). If the printer is not properly equipped, clear the problem before continuing. Refer to the section titled "Adding a Printer" in Chapter 7, if necessary.
11. Log in on CILINK-1-1 with the temporary login and password. Refer to the section titled "Logging In" in Chapter 4, if necessary.
12. Verify that you have the values listed in Step 5 by entering the following command:

    `RTRV-SECU-USER:`*[a]*`;`

    Where:

    a = Target ID

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

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* UID:,UCFC/UCAL:<> */
    "... :,e:UCPL=f,SCREEN=g,DMODE=h,UTYPE=i, ... "
;
```

    Where:

    e = UCFC/UCAL: `{P, M, T, S, PM}[1-5]`

    f = UCPL: `1-5`

    g = Message screening: `{ INPUT, AUTO, ALL, DBAUTO, DBALL }`

    h = Dialog mode: `{ MENU, COMMAND }`

    i = User type: `{ HUMAN, MACHINE }`

    If any of the parameters do not match the ones in Step 5, contact your system administrator to have the values changed before continuing.

13. Determine the software currently operating in the system with the following command:

    RTRV-NE:*[a]*;

    Where:

    a = Target ID

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "... ,e: ... "
;
```

    Where:

    b = Software version: `4-00-1-r`

    Verify the `SFTWR-VRSN` is `4-00-1-r` or higher. If it is not, contact your system administrator or next level of support for further assistance. Do not continue this procedure until instructed to do so.

14. Determine if there are any current equipment alarms by entering the following command:

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

    Where:

    a = Target ID

    If no alarms exist , the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If the above message does not appear, refer to the section titled "Isolating Failures" in Chapter 12 to clear your alarms before continuing this procedure.

15. This completes the System Setup Phase of this procedure.

Phase III - Database Backup

This phase ensures that a current database backup to optical disk is made. If problems arise during this procedure, this database backup may be necessary for restoration.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example: wrist strap, or grounded shoes, etc. must be worn) at all times.

16. Place a blank label on the appropriate backup optical disk in order to record the date and time of the database backup.
17. Back up to the database by referring to the section titled "Backing Up Database to SEC Disk" in Chapter 6.

Phase IV - Format Check and Update

This phase finds all ports set for NDRVN and SF or ESF. The procedure sets all the ports that are in one of these two conditions to have the framing format of UNF.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example: wrist strap, or grounded shoes, etc. must be worn) at all times.

18. Determine if any DS1 ports are set to SF and NDRVN by entering the following command:

CAUTION:
This command must be performed during an "off-shift".

```
RTRV-T1:[a]:UNIT-1&&-32::::ISTAT=NDRVN,FMT=SF;
```

Where:

a = Target ID

If no DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of SF, the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

If one or more DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of SF, the following message appears (only pertinent parameters are shown:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   b: ... ISTAT=NDRVN,FMT=SF
;
```

If any ports have input status (ISTAT) of NDRVN and DS1 signal format (FMT) of SF, then continue with Step 19. Otherwise, continue with Step 20.

19. Change the DS1 ports set to SF and NDRVN to UNF by entering the following command:

```
ED-T1:[a]:b::::::FMT=UNFR;
```

Where:

a = Target ID (optional)

b = DS1 port: `[ [1-32]-[1-31]-[1-28], DS1GRP-[1-32]-[1-31], UNIT-[1-32] ]`

All ports determined from the previous Step 18.

20. Determine if any DS1 ports are set to ESF and NDRVN with the following command:

    RTRV-T1:[a]:UNIT-1&&-32::::ISTAT=NDRVN,FMT=ESF;

    Where:

    a = Target ID

    If no DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of ESF, the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If one or more DS1 ports have an input status (ISTAT) of not driven (NDRVN) and a framing format of ESF, the following message appears (only pertinent parameters are shown:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:<> */
   b: ... ISTAT=NDRVN,FMT=ESF
;
```

    If any ports have an ISTAT of NDRVN and DS1 Signal Format (FMT) of ESF, then continue with the Step 21. Otherwise, continue with Step 22.

21. Change the DS1 ports set to ESF and NDRVN to UNF by entering the following command:

    ED-T1:*[a]*:*b*::::FMT=UNFR;

    Where:

    a = Target ID (optional)

    b = DS1 port: `[ {1-32}-{1-31}-{1-28},`
    `DS1GRP-{1-32}-{1-31}, UNIT-{1-32} ]`

    All ports determined from Step 20.

22. This completes the Format Check and Update Phase of this procedure.

Phase V - Database Backup

This phase ensures that a current database backup to optical disk is made. If problems arise after this procedure, this database backup may be necessary for restoration.

⚠ CAUTION:
*After entering an input command into the DACS IV-2000, you must wait for its associated output message response (*COMPLD*) before entering another command.*

When working on the DACS IV-2000, ESD grounding procedures must be followed (for example: wrist strap, or grounded shoes, etc. must be worn) at all times.

23. Obtain the disk used in Phase III.
24. Back up the database by referring to the dection titled "Backing Up Database to SEC Disk" in Chapter 6.
25. This completes the Database Backup Phase of this procedure.

Phase VI - Clean Up

This phase checks the current system status. All alarms can be cleared to leave the system in a stable state.

26. Determine if there are any current equipment alarms by entering the following command:

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

    Where:

    a = Target ID

    If no alarms exist , the following message appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    If the above message does not appear, refer to the section titled "Isolating Failures" in Chapter 12 to clear your alarms before continuing this procedure.

27. Notify the alarm monitoring center that this procedure has been completed on this system.
28. If a communication line was established in Step 7, it should be removed now.
29. This completes the Clean Up Phase of this procedure.

Frame Administration

6

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Frame Administration

6

This chapter consists of procedures required for the administration of the DACS IV-2000. Included are procedures for creating, changing, and removing logins; using the SEC disk drive; and managing the database.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Upgrading with New Software Release

Procedures for upgrading from previous releases of the DACS IV-2000 (256) system to Release 4.0 are located in the *DACS IV-2000 (256) Release 4.0 Software Release Description* (AT&T 365-340-705) that accompanies the new software release. Refer to that document, and follow the procedures for upgrading hardware and software.

Memory Entities

Frame administration consists of maintaining the integrity among the different memory entities within the DACS IV-2000 and login access to the frame (login administration). The memory structure of the DACS IV-2000 consists of:

- Main Controller RAM (Working Memory or WKG) — stores the DACS IV-2000 database. The database is stored in RAM on the main controller's active central processing unit (CPU) circuit pack (CPU with green LED lit). When the main controller is in the in-service (IS) state, the system database in the CPUs' RAM (working memory) is equivalent to the data in the switch matrix hardware. When the main controller is not in service (OOS-FLT, OOS-MTCE, or OOS-MCOND) the working memory is not guaranteed to be the same as the memory in the switch matrix hardware.
- Primary Disk (Primary Storage or PRI) — provides primary nonvolatile backup of the DACS IV-2000 database. There are two copies of the system database stored on each PRI disk. During a system boot or a restore of the main controller, the most recent copy of the system database is read from disk into working memory. After the system is booted, as long as the main controller is in the in-service (IS) state, the two copies of the system database on the PRI disks are kept up to date with changes made to the cross-connect map and provisioning information by placing entries in a journal file on the selected PRI disk. Every fifteen minutes, the PRI disk copies of the database are brought in sync with the working memory (WKG) database (sequentially, the first copy is completed before the second copy is started) and the journal file is deleted.
- Secondary Disk (Secondary Storage or SEC) — provides four functions:
  - — Mechanism for software distribution
  - — Secondary nonvolatile backup of the DACS IV-2000 database
  - — Out-of-system (off line) storage of the system database
  - — Initialization of database with *System Start-up* disk

  The initial software release and future software release upgrades are distributed on optical disk cartridges. The optical disk cartridges offer an economical way to distribute large amounts of data (up to 128 Mbytes) to the field reliably. Backups of the PRI disk (primary storage) can be made to the SEC disk to ensure a backup of the database is available in case of database corruption or failure of the PRI disk drive. It is recommended that one system database backup be made on the SEC disk each day the system is in service.

Memory Interactions

Memory interactions are ways in which the programs and database move among the various memory entities (WKG, PRI, and SEC). Figure 6-1 illustrates the memory interactions.

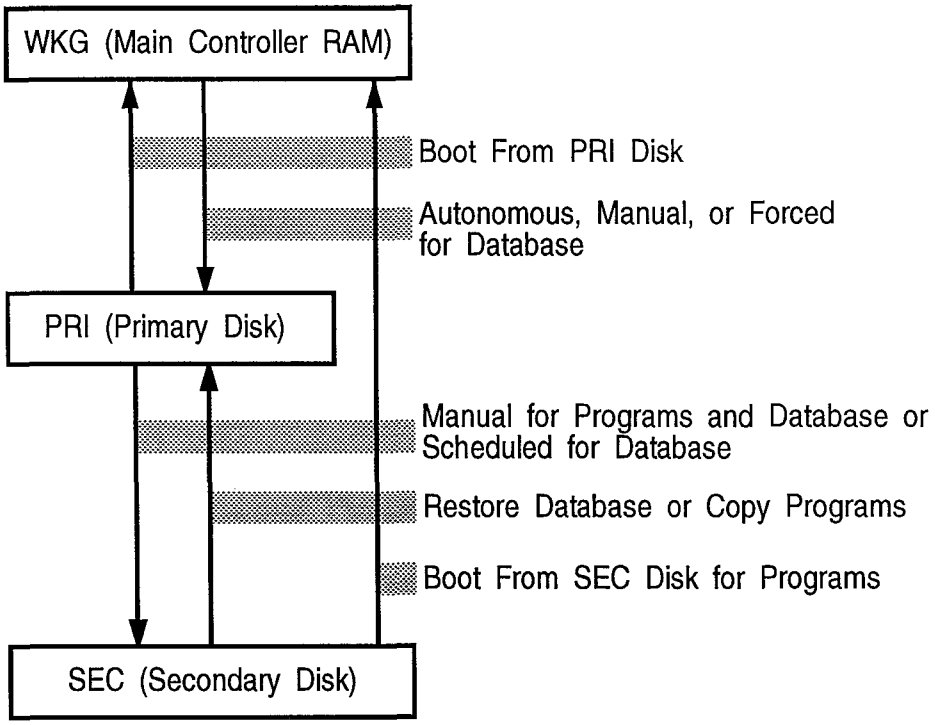


Figure 6-1. **Data Transfers Between Memory Entities**

Memory Integrity Defensiveness Features

With the DACS IV-2000, there are several operational activities that could result in loss of service or otherwise compromise the integrity of the system. The following list outlines these activities and describes the defensiveness measures in place to ensure system integrity:

- Protection Against System Database Corruption — If during the boot of the DACS IV-2000, the system database is not successfully loaded or it is determined to be corrupted, or if the CPU journal file is not successfully applied, the switch maps in the switch matrix hardware remain unchanged causing no loss-of-service. The DACS IV-2000 remains in the OOS-MCOND (out-of-service maintenance condition) state, allowing you to resolve the problem without losing service.

  If the system database is determined to be corrupted when the system is in service, the system enters the OOS-MCOND state to prevent any effect on the switch matrix hardware and any loss of customer traffic.

NOTE:
To warn you of database corruption, the DACS IV-2000 outputs either `CAN'T BOOT DB` or `CAN'T BOOT JOURNALS` messages.

- Protection Against Backing Up an Initialized Database— It is very dangerous to have an initialized system database on the PRI disk, especially if you are unaware the database is in such a state. The danger lies in booting the system when the system is carrying traffic. The result of such an action is loss of service for the entire DACS IV-2000.

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

- Protection Against Booting an Initialized System Database — If the system database to be booted is initialized, the DACS IV-2000 outputs the following warning message stating that the database on the PRI disks has no units provisioned and that the main controller (MC) is being brought to the OOS-MCOND state:

  ```
  DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO OOS-MCOND
  ```

- Protection Against Inserting a PRI or SEC Disk Drive from a Different Frame — This is a potentially dangerous situation. If a system database from a different frame is booted, the switch matrix hardware is remapped using the wrong system database, causing a loss of service for the entire DACS IV-2000.

  The Media Validation feature was created to prevent such an occurrence. When a PRI or SEC disk drive is formatted (with the **`CPY-MEM`** command), System Identifiers (System Type and System Release) are saved on the PRI or SEC disk. The Target ID is saved on the PRI or SEC disk when the

first copy is made to the disk. In addition, the Target ID is stored in EEPROM on the SSC circuit pack for preservation across system resets and power outages. The Media Validation feature consists of checking in three major functional areas, as follows:

— System Boot — When the system is booted, the Target ID stored in the on-line SSC is transferred to working (WKG) memory. This WKG memory Target ID is compared against the Target ID saved on each PRI or SEC disk to be brought into service. If there is any mismatch, the system boots into the OOS-MCOND state and the following message is output:

```
/* ***BOOT DEVICE FAILED MEDIA VALIDATION*** */
```

— PRI and SEC Disk Restoration — Wen a PRI disk drive is restored (with the **RST-EQPT** command), Media Validation compares the WKG memory against the System Identifiers saved on the PRI disk. If there is any mismatch, the command is denied with the error code SMVF and the following message is output:

```
/* This command was denied because the System Identifiers */
/* (System_Type, System_Release, and TID) stored on the (FROM) MEMORY */
/* TYPE and System Identifiers stored on the (TO) MEMORY TYPE of the */
/* DACS IV-2000 (256) are different. Use the RTRV-SYSID command to retrieve */
/* the System Identifiers stored in memory for comparison. /*
```

When the SEC disk drive is restored, Media Validation compares the WKG memory against only the Target ID saved on the SEC disk. SEC disks that come from the factory with the TID set to DEFAULT match any TID set in WKG memory (that is, the SEC disk is always bootable until the value DEFAULT is changed by copying data to the SEC disk). The system allows a SEC disk drive to be restored if the System Type or System Release is different, since software release upgrades necessitates this.

— **CPY-MEM** Program and Database Transfers — When programs and databases are transferred between the PRI and SEC disks, Media Validation verifies the System Identifiers saved on the SEC disk are valid. All transfers to the SEC disk, program transfers from the SEC disk, and database transfer from the SEC disk with the **YES** option verifies the System Type and System Release match. Database transfer from the SEC disk with the **UPGRADE** option does not verify System Type and System Release (they are verified after Media Validation passes, and the command is denied with the error code SDNC if invalid).

- Protection Against Inserting a pre-PRI5 Disk Drive — If a pre-PRI5 disk drive is installed, the main controller (MC) is placed in the OOS-MCOND state (a major alarm is raised on the MC), the installed pre-PRI5 disk drive is placed in the OOS-FLT state, and the remaining in-service PRI5 disk drive enters the OOS-MTCE state. In the event that a pre-PRI5 disk drive is

installed, extract the pre-PRI5 disk drive, update the database on the remaining PRI5 disk drive (WKG to PRI database update), reset the frame, and install, initialize, and restore a PRI5 disk drive.

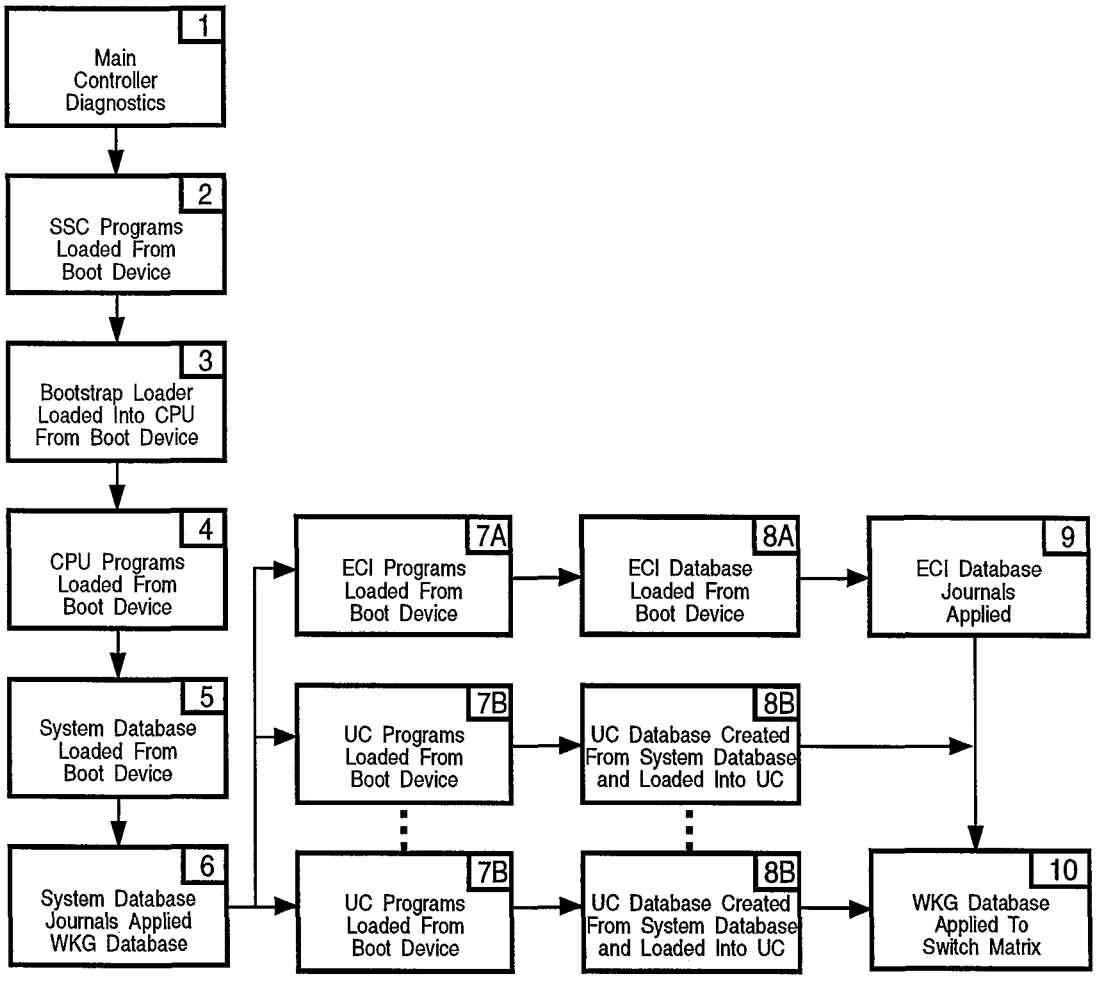
Table 6-1 lists defensiveness features of the DACS IV-2000 and their associated software releases.

Table 6-1. Defensiveness Features

Defensibility Feature	Software Release Available					
	256 Redundant Controller				512	
	R2.1	R2.2	R3.0	R4.0	R2.2	R3.0
Two copies of the database stored on PRI and SEC	X	X	X	X	X	X
No change to switch matrix if database is corrupted	X	X	X	X	X	X
No change to switch matrix if boot from SEC	X	X	X	X	X	X
SEC validation	X	X	X	X	X	X
Eliminated the command `CPY-MEM:::INIT,PRI,DBASE;`		X	X	X	X	X
Prevent saving an initialized database on SEC	X	X	X	X	X	X
Eliminated the command `CPY-MEM:::WKG,SEC,DBASE;`	X	X	X	X	X	X
Added the command `CPY-MEM:::WKG,PRI,DBASE,FORCED;`	X	X	X	X	X	X
Halt booting an initialized database		X	X	X	X	X
Media Validation (enhanced boot, restore, and copy defensibility)			X	X	X	X
Database TID Verification				X	X	X
Prevent the insertion of older versions of PRI disk drives				X		
Limit performance monitoring reports to 3600 lines per hour				X	X	X

Reset and Boot

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



Boot From PRI Disk — Steps 1 through 10*
`INIT-SYS:::::9;` — Steps 1 through 10*
`RST-EQPT::MC;` — Steps 1 through 6, 8A, 8B, 9, and 10
Boot From SEC Disk — Steps 1 through 4, and 7A
`RST-EQPT::MC:,SEC;` — Steps 1 through 4
`INIT-SYS:::::5;` — Steps 5, 6, 8A, 8B, 9, and 10

* Step 7B is executed only if *release query fails*, or if the UC circuit pack(s) are booted from firmware.

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

Full System Boot (Reset)

This procedure is used to reset the DACS IV-2000. Messages ending in a semicolon (;) and the `BOOT IN PROGRESS` message are normal reset status messages. All other messages are error messages.

⚠ 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.

NOTE:
If the baud rate of the CILINK that your terminal is connected to is not set to the initial system value, system response messages will not be displayed until the reset is complete (that is, the ECI database is applied overriding the initial system value).

1. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. During a system reset ECI-1 becomes the master and ECI-2 becomes the slave for the TABS link.
2. If the frame is connected to a DACSmate® Database Manager PC, disconnect the cable connected to the LAN interface adaptor.

NOTE:
xxx: `PC UNIT MODE` messages appear during a reset if the DACS IV-2000 is connected to a DACSmate Database Manager PC. If you receive these messages the DACS IV-2000 is connected to a DACSmate Database Manager PC. Disconnect the DACSmate Database Manager PC and reset the frame.

3. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button at the frame or by entering the following command (if possible):

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

   Where:

   a = Target ID (optional)

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, ECI, and UC circuit pack ALM LEDs*
   - *Standby MTC, SCI, and UI circuit pack ALM LEDs*
   - *MJ and MC FAIL ALM LEDs on the status panel and HDA*

   If no equipment alarms existed before the reset, the following messages are output, not necessarily in the order shown (some of the messages can also appear during the `BOOT IN PROGRESS` *messages):*

```
ECI{1,2}: RESET
EC{1,2}: STARTUP Pass
CPU{0,1}: STARTUP Pass
SSC{0,1}: STARTUP Pass
BOOT FROM {PRI{0,1}, SEC}
```

   When the system is booting from the SEC disk and there is a formatted and initialized optical disk (no programs) or a bad SEC disk drive or from the PRI disks and the PRI disk drives do not contain the programs or are bad, the system outputs the above `RESET` *and* `STARTUP` *messages along with any error messages indicating what caused the boot failure. The system also continues to attempt to boot alternating control complexes. If you get any boot failure messages, replace the optical disk with a Release 4.0 software optical disk and reset the system using the RESET ENABLE and RESET switches.*

b. After successful completion of the CPU on-board diagnostics the green LED on the active CPU circuit pack lights.

c. After the MTC circuit packs associated with the active control complex are initialized, the following red ALM LEDs are turned off:

   - SSC and CPU circuit pack ALM LEDs
   - MJ and MC FAIL ALM LEDs on the status panel

d. After successful completion of the ROM-based diagnostics, the SSC firmware tries to locate a boot device. First, the SSC powers up the selected PRI disk drive and attempts to read its SSC programs. If successful, the PRI disk drive becomes the boot device and booting continues. Otherwise, the same action is attempted with the other PRI disk drive. If the second PRI disk drive is also not bootable, the SSC tries the SEC disk drive.

e. Once the active CPU detects that the SSC has booted its SSC programs, the bootstrap loader is read from the boot device.

   During the remainder of the reset process, `BOOT IN PROGRESS` *messages are output periodically. These messages appear for timing purposes only and do not indicate failure.*

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

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

h. If no valid system database is found on the PRI disk drive, if the boot device is the SEC disk drive, if Media Validation fails, or if the database has no units provisioned, the boot continues, but the system is not put in-service (IS). The system remains in the OOS-MCOND state, and the state of the switch matrix hardware is unchanged.

i. Programs are downloaded into the ECIs and the UCs which are provisioned in the system database now resident on the CPU (if no system database was loaded into the CPU, then only the ECI programs are transferred).

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

k. After the ECI and all UC circuit packs are finished booting and a valid database is loaded, the system database is applied to the switch matrix hardware.

   If power was not lost to both ECI circuit packs, the red ALM LEDs of the ECI circuit packs turn off. If the red ALM LEDs for both ECI circuit packs remain lit, the time-of-day clock needs to be reset (you are directed to do this later in this procedure, if necessary).

l. After the reset is complete, the UC alarm LEDs extinguish and the following messages are output:

   - If the boot device is the PRI disk drive:

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

   - If the boot device is the SEC disk drive:

     `REPT RMV EQPT` (MC in the OOS-MCOND state)
     `REPT ALM EQPT` (disk drive [PRI] major alarm)

- If the time-of-day clock needs to be reset, the following two messages appear (Step 7 instructs you to set the time-of-day clock):

```
    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE) */
    "ECI-1:INT,\"ECASE=TODC RC= SEQ= PROC= FILE= DP=1\",
    TODC,
    \"00 00 00 00\""
;

    TID YY-MM-DD HH:MM:SS
A   a REPT EXCPTN SYS
    /* LOC:CTYPE,CONDDESCR (MULTI-LINE), */
    /* EIDDET, */
    /* MEASURED (MULTI-LINE) */
    "ECI-2:INT,\"ECASE=TODC RC= SEQ= PROC= FILE= DP=1\",
    TODC,
    \"00 00 00 00\""
;
```

  Where:

  a = Autonomous sequence number: `001-999`

4. Log into the DACS IV-2000 (refer to logging in procedures in Chapter 4, if necessary).
5. Determine the state of the MC by either:
   - Checking the `REPT RST EQPT`/`REPT RMV EQPT` and/or `REPT ALM EQPT` messages.
   - Entering the following command:

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

     Where:

     a = Target ID (optional)

     A sample output is:

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

     Where:

     f = Equipment state: `{ IS, OOS-MCOND, OOS-FLT }`

   If the state of the MC is in-service (IS), go to Step 7. If the state of the MC is out-of-service maintenance condition (OOS-MCOND), go to Step 6. If the state of the MC is out-of-service fault condition (OOS-FLT), refer to the procedure titled "Redundant Controller Failure" (page 12-105).

6. If the system boots in the OOS-MCOND state, the reason is determined from the boot messages. At this point, there is an initialized system database in working memory and many system services are unavailable since the system is not in-service.

   For the listed condition do the following:

   - If you received the following message:

     `DATABASE HAS NO UNITS PROVISIONED - BRINGING MC TO OOS-MCOND`

     an initialized database was copied from the PRI disk to WKG memory.

     If your frame is carrying traffic, obtain the most recent optical disk backup of the system database and refer to the section titled "Restoring Databases from SEC Disk to PRI Disk" (page 6-35) later in this chapter.

CAUTION:
If the optical disk backup is not up to date, there can be a loss of service. If the most recent optical disk backup is not up to date, refer to office records and manually update the lost information (using the appropriate procedures) after performing the rest of this procedure.

If your frame is **not** carrying traffic and you want an initialized database booted (check with your system administrator before booting an initialized database), restore the main controller by entering the following command:

`RST-EQPT:`*`[a]`*`:MC:,::FRCD;`

Where:

a = Target ID (optional)

The MC takes up to 5 minutes to restore.

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

  `BOOT FROM TAPE`

  both PRI disk drives are either failed or extracted from the Redundant Controller Module.

NOTE:
The term `TAPE` is functionally equivalent to the optical disk cartridge.

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

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

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

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

Where:

a = Target ID (optional)

A sample output is:

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

Where:

e = Disk drive location: `PRI-{1,2}`

f = Equipment state: `{ IS, OOS-MTCE, OOS-FLT }`

If the state of one PRI disk drive is OOS-FLT, replace the PRI disk drive by referring to the section titled "Replacing One PRI Disk Drive" (page 14-4). If both PRI disk drives are OOS-FLT, replace both PRI disk drives by referring to the section titled "Replacing Both PRI Disk Drives" (page 14-6). Otherwise continue with the next step.

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

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

Where:

a = Target ID (optional)

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

This command takes up to 5 minutes to complete.

- If the system booted in the OOS-MCOND state because of system database corruption (for example, you received `CAN'T BOOT DB` or `CAN'T BOOT JOURNALS` messages), you must retrieve the most recent optical disk backup of the system database and go to the section titled "Restoring Databases from SEC Disk to PRI Disk" (page 6-35).

- If the system booted in the OOS-MCOND state because of the boot device failed media validation, perform the following procedure:

  a. Determine the content of the System Identifiers by entering the following command:

  RTRV-SYSID:*[a]*::::**[DBINTEG=***c***]**;

  Where:

  a = Target ID (optional)

  c = Database integrity check: { **VERIFY, NOVAL** }
  Specifying **VERIFY** checks the contents of the optical disk cartridge (SEC disk drive).

  The following output appears:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
    CALCK,HEADCK,INTEGCK */
    "d,e,f,g"                    (Working Memory)
    "d,e,f,g,h"                  (PRI Disk Drive)
    "d,e,f,g,h,i,j,k,l,m,n"      (SEC Disk Drive)
;
```

  Where:

  d = Memory type: { WKG, PRI-{1,2}, SEC }

  e = Data transfer ID block: { PROG, DBASE, WKG }

  f = System type: { <1-20 Legal Characters>, NOT FOUND }

  g = System software release: { 4-00-{1-99}-r, NOT FOUND }

  h = Target ID: { <1-18 TID Legal Characters>, NOT FOUND }

  i = Date of backup: { {00-99}{01-12}{01-31}, NOT FOUND }
  For the SEC disk drive, specifies the date of the last **CPY-MEM** command from PRI to SEC was executed. For a PRI disk drive, specifies the date when the last manual or autonomous (for example, applying journal files) transfer from WKG to PRI occurred.

  j = Time of backup: { {00-23}{00-59}{00-59}, NOT FOUND }
  For the SEC disk drive, specifies the time of the last **CPY-MEM** command from PRI to SEC was executed. For a PRI disk drive, specifies the time when the last manual or autonomous (for example, applying journal files) transfer from WKG to PRI occurred.

k = Patch number: { <1-40 Legal Characters>, NOVAL }
Specifies the latest software patch made to the software release. NOVAL indicates no patches have been made.

l = Calculated checksum: { <8 Digit Hex Number> }
Specifies the calculated checksum for the database on the optical disk cartridge. This parameter must match the header checksum (parameter *m*). If these parameters do not match, the integrity of the database on the optical disk cartridge can not be assured.

m = Header checksum: { <8 Digit Hex Number> }
Specifies the checksum stored in the database header on the optical disk cartridge. This parameter must match the calculated checksum (parameter *l*). If these parameters do not match, the integrity of the database on the optical disk cartridge can not be assured.

n = Integrity check: { PASS, FAIL }
Specifies the result of the comparison of the calculated and header checksum values. A FAIL result indicates the database on the optical disk cartridge can be corrupted.

b. From the output of the **RTRV-SYSID** command determine the TIDs of the two PRI disk drives and WKG memory.

c. Extract the PRI disk drive that does not belong, and reboot the system. If you need to replace the wrong PRI disk drive with a new one, refer to the section titled "Replacing One PRI Disk Drive" (page 14-4).

d. If the PRI disk drives are good, and WKG memory has the wrong TID, correct the WKG memory TID by entering the following command:

SET-SID:*[a]*::::*c*;

Where:

a = Target ID (optional)

c = WKG memory target ID: { <1-18 TID Legal Characters>, CURVAL }

7. If you received the two `REPT EXCPTN SYS` messages indicating the time-of-day clock needs to be reset and the red ALM LEDs of the ECI circuit packs are lit, edit the time-of-day clock by entering the following command:

   `ED-DATE:`*`[a]`***`:::`***`[c]`***`,`***`[d]`***`;`**

   Where:

   a = Target ID (optional)

   c = Date: `{00-39, 81-99}{01-12}{01-31}` (optional)

   d = Time: `{00-23}{00-59}{00-59}` (optional)

8. If you disconnected a DACSmate Database Manager PC in Step 2, reconnect it to the LAN interface adaptor on the frame.

Manual Control Complex Side Switch

This procedure is used when you need to manually switch the standby control complex (CC) to the active control complex.

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

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

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 12-10) before performing this procedure.

2. Put the main controller (MC) in the OOS-MCOND state by entering the following command:

   `ED-STATE-EQPT:`*`[a]`***`:MC::OOS-MCOND;`**

   Where:

   a = Target ID (optional)

3. Perform a control complex side switch so that the standby control complex (control complex without the green LED lit) becomes the active control complex by entering the following command:

   `RST-EQPT:`*`[a]`***`:MC::::`***`[e]`***`;`**

   Where:

   a = Target ID (optional)

   e = Control complex (to become active) location: `CC-{0,1}`

   This command takes up to 5 minutes to complete.

Manual Synchronizer Side Switch

This procedure is used when you need to manually switch the standby synchronizer side to the active synchronizer side (for example, during maintenance of the external timing reference connections to a synchronizer side). This procedure must only by performed when instructed to do so by the system administrator or another procedure.

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

   RTRV-STATE-EQPT:*[a]*:SYNC-0&SYNC-1;

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f "
   "DPLL-0:f "
   "TB-0:f "
   "SYNC-1:f "
   "DPLL-1:f "
   "TB-1:f "
;
```

   Where:

   f = *State of synchronizer side:* { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

   If any entity 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. If either synchronizer side is in the OOS or OOS-MTCE state, restore it to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer location: SYNC-[0,1]

   This command takes less than 1 minute to complete. The synchronizer side restored to service becomes the STBY *synchronizer side.*

3. Retrieve the state of the DS1TX circuit pack (TX) of the standby synchronizer to determine if it is in the IS (in-service) state by entering the following command for both TXs:

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

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: TX-{0,1}

   The following output response appears:

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

   Where:

   b = DS1TX circuit pack location: TX-{0,1}

   f = State of DS1TX circuit pack: { ACT, AVAIL, IS, OOS, OOS-MTCE, OOS-MTCELIM, OOS-FLT, OOS-FEF }

   If the standby DS1TX circuit pack is in the OOS-FLT or OOS-FEF state, clear the failure before performing this procedure by referring to the section titled "Prioritizing Alarms" (page 12-10).

4. If the DS1TX circuit pack of the standby synchronizer side is in the OOS or OOS-MTCE state, restore the DS1TX circuit pack to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1TX circuit pack location: TX-{0,1}

   This command takes less than 1 minute to complete.

5. Switch the standby synchronizer side to the active state by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Standby synchronizer location: `SYNC-[0,1]`

   This command takes less than 1 minute to complete.

   After the switch is complete all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs. For version 2 synchronizer circuit packs, the green ACT LEDs of the active synchronizer side light while the green ACT LEDs of the standby synchronizer side turn off, and the synchronizer mode changes to FST, then changes to NORM.

   Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

Manual Timing Reference Side Switch

This procedure is used to manually switch the primary and secondary timing references that are received by the DS1TX circuit packs from standby to active and from active to standby (for example, during maintenance of one of the external timing references).

NOTE:
The timing reference can only be switched on the active synchronizer side.

Perform this procedure only when instructed to do so by the system administrator or by another procedure.

1. Determine the active timing reference by entering the following command:

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

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* SMODE,ACTIVE_REF */
   "NORM,d"
;
```

   Where:

   d = Active timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

   The synchronizer side associated with the active timing reference is the active synchronizer side. For version 2 synchronizer circuit packs, the green ACT LEDs are also lit to indicate the active side.

NOTE:
The synchronizer mode must be NORM to switch the timing reference side.

2. Make sure no alarms are active on the standby timing reference associated with the active DS1TX circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Standby timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

If there are no alarms, the following output response appears:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
;
```

If there is an active alarm, the following output response appears:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
    "h:i,j,k,,,NEND"
;
```

Where:

h = Standby timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }

i = Notification code: { MJ, MN }

j = Condition type: { EOR, EXJIT, FRQOF, LOS, OFF, PHSTP, TRBER, TRMNBER }

k = Service affecting: { SA, NSA }

If there is an active alarm, note the alarm condition (parameter *j*) and clear the failure before performing this procedure by referring to the section titled "External Timing Reference (BITS) Failure" (page 12-134).

3. Switch the standby timing reference (SYNCPRI-{0,1} or SYNCSEC-{0,1} associated with the active synchronizer side) to the active timing reference by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Standby timing reference location: { SYNCPRI-{0,1}, SYNCSEC-{0,1} }
   Specifies the location of the standby timing reference associated with the active synchronizer side.

   This command takes less than 1 minute to complete.

   Executing the SW-DX-EQPT command on the timing reference will cause the synchronizer mode to change to FST, then to NORM for the version 2 circuit packs.

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 (only pertinent parameters are shown):

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

   Where:

   c = Synchronizer mode: `{ NORM, HLDOVR, FST, FRNG }`

2. Change the synchronizer mode of operation by entering the following command:

   `SET-SYNCN:`*[a]*`:SYNCN:::`*d*`;`

   Where:

   a = Target ID (optional)

   d = Synchronizer mode: `{ NORM, HLDOVR, FST }`
   The available modes of operation of concern for this procedure are:

   - `NORM` (phase-locked mode) — used when switching to normal operation after external maintenance is done. This mode can only be specified if the synchronizer side was previously switched manually to the `HLDOVR` mode. Otherwise, this command is denied.
   - `HLDOVR` (holdover mode) — used to maintain output frequency during external maintenance. Clock reference is tied to the internal Stratum 3 clock (TBS3 circuit pack).

- FST (fast mode) — used to provide loop time constraints that allow fast lock to the reference input(s). If continuous autonomous switching (oscillation) occurs between timing references on a single SYNC side, this mode is used to lock to a known good DS1 timing reference. Locking to the DS1 timing reference must only be done if the DS1 timing reference is good.

This command takes less than 1 minute to complete. When changing to holdover mode, the following happens:

- A REPT ALM EQPT message (minor alarm) appears indicating the Synchronizer is in holdover mode.
- A REPT ALM EQPT message appears on each DS1TX circuit pack indicating an OOS-MTCELIN state (major alarm).
- All LEDs on version 2 DS1TX circuit packs extinguish.
- All timing references for version 2 Synchronizer circuit packs continue to be monitored.

When changing to normal mode, a REPT ALM EQPT *message appears indicating the* SYNCHLDOVR *alarm condition has cleared.*

- A REPT ALM EQPT message appears, indicating the holdover has cleared. Major alarms are retired and the Synchronizer goes to FST before it goes to NORM.
- The green ACT LED on the version 2 DS1TX circuit pack on the active side lights.

Software Release and Databases

This section contains procedures for retrieving software release information, using and formatting an optical disk cartridge, backing up and restoring the system database, and backing up the software release.

Be sure you have a optical disk cartridge that has been formatted for the current software release when backing up the system database or software release. You can format optical disk cartridges on the DACS IV-2000; they must be formatted before restoring the SEC disk drive. Chapter 2 contains information on the approved optical disks supported by the DACS IV-2000 (256).

Retrieving Software Release Information

This procedure is used to retrieve software release information, including software patches that may have been made to the DACS IV-2000 frame. This procedure contains information for interpreting the data retrieved.

1. Retrieve the software release information by entering the following command:

   `RTRV-PRMTR-SFTWR:[a];`

   Where:

   a = Target ID (optional)

   The following output response appears:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* REFERENCE_#,DATE,COMMENT,PATCH_# */
    "c,d,
     AT&T Proprietary Copyright (c) 1995 AT&T All Rights Reserved"
    ;
```

   Where:

   c = Reference number: `4-00-{1-99}-r-{0-99}.{0-99}.{0-99}`
   The first four components indicate the software release, point release, issue of the point release, and the load indicator [`r` indicates a DACS IV-2000 (256) software load]. The last three components are used by AT&T for the purpose of identifying the software running on a DACS IV-2000.

   d = Date: `{00-99}{01-12}{01-31}`
   The first component is the last two digits of the year, the second component is the month, and the last component is the day associated with the reference number in parameter c.

   The data retrieved from this command is used to identify the version of the software release. This information is needed for AT&T technical support.

Optical Disk Cartridge Description

The front of the optical disk cartridge is the side with the manufacturer's label on the silver shutter. Figure 6-3 shows the front of an optical disk cartridge. At the bottom of the optical disk cartridge is a label put on during software manufacturing identifying the contents. In addition, space is provided on the identification label for customer information labeling.

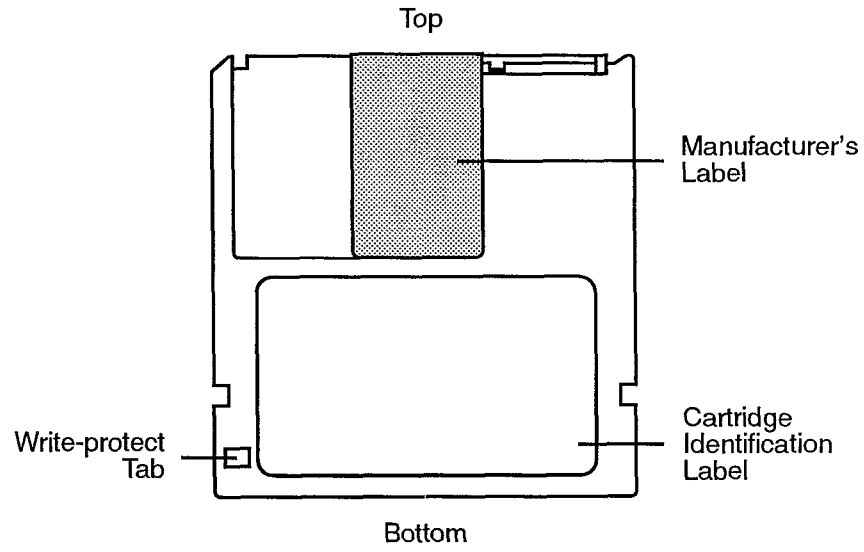


Figure 6-3. **Optical Disk Cartridge (Front View)**

The back of the optical disk cartridge is the side with the silver shutter and the write-protect tab in the lower right-hand corner (refer to Figure 6-4). The write-protect tab has two positions as follows:

- With the black square positioned towards the top of the optical disk cartridge, the write-protect window is closed and writing is possible; write-protection is OFF. See Figure 6-4, left side.
- With the black square positioned towards the bottom of the optical disk cartridge, the write-protect window is open and writing is impossible; write-protection is ON. See Figure 6-4, right side.

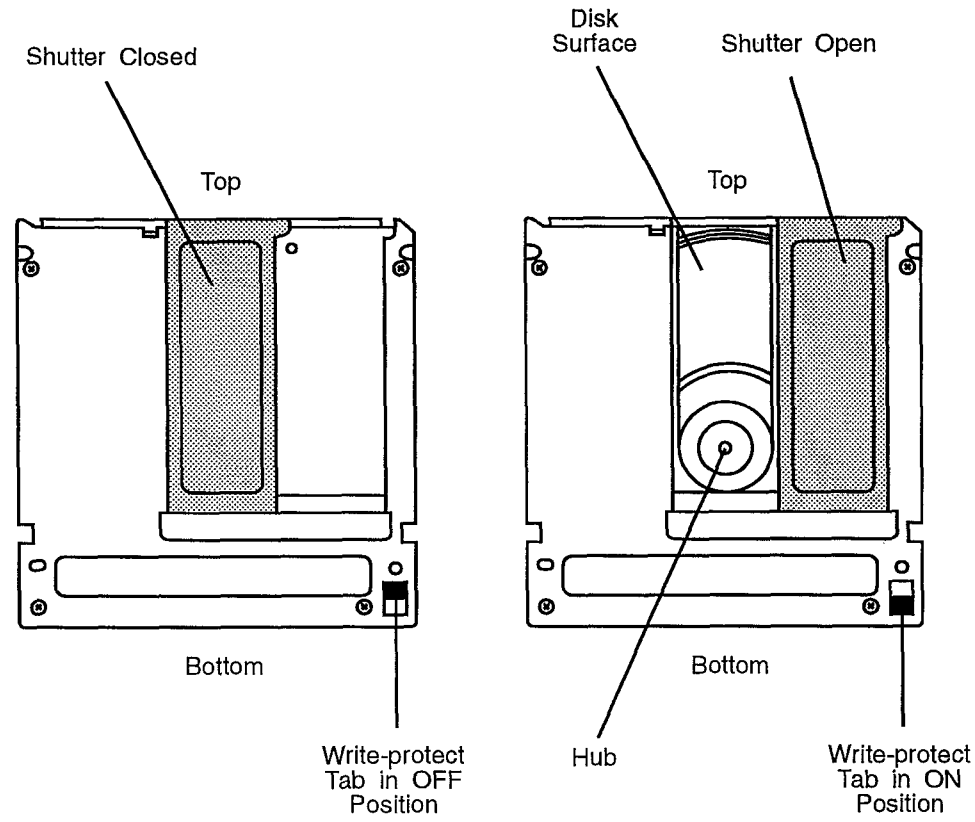


Figure 6-4. **Optical Disk Cartridge (Rear Views)**

Extracting/Installing Optical Disk Cartridge

This procedure is used to extract an optical disk cartridge from the SEC disk drive and/or install an optical disk cartridge into the SEC disk drive.

1. Power down the SEC disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

2. If there is an optical disk cartridge in the SEC disk drive, press the eject button at the top of the SEC disk drive (refer to Figure 6-5).

NOTE:
The optical disk cartridge can not be removed from the SEC disk drive until the green ON LED is extinguished.

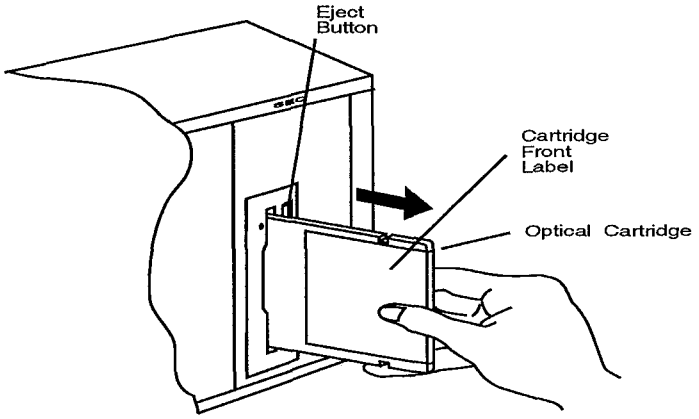


Figure 6-5. **Removing an Optical Disk Cartridge**

3. If the optical disk cartridge ejected, continue with the next step. Otherwise, perform the following procedure to eject the optical disk cartridge:
   a. Insert the emergency eject tool (Part No. 406923292) into the hole provided in the SEC disk drive (refer to Figure 6-6 for location of hole and required orientation for inserting the tool).

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

   b. Insert the tool straight back into the hole, being careful not to tilt it towards the top, sides, or bottom of the SEC disk drive.
   c. Exert enough pressure on the tool until the optical disk cartridge pops out of the SEC disk drive approximately one inch.

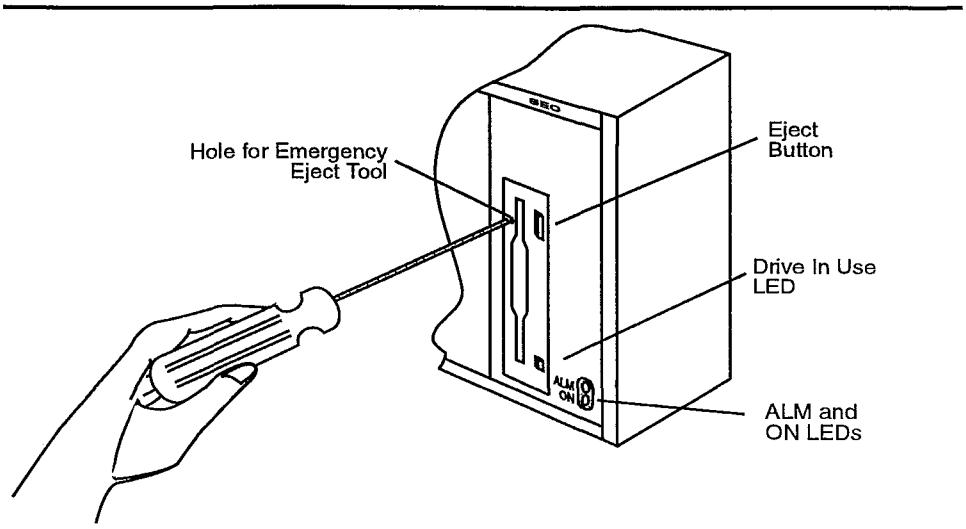


Figure 6-6. **Using the Emergency Eject Tool**

4. Pull the optical disk cartridge out of the SEC disk drive (refer to Figure 6-5) and store it in its container.
5. If you are restoring the latest database copy or loading the software release, obtain the optical disk cartridge containing the necessary data. Otherwise, obtain a formatted optical disk cartridge.
6. Take the optical disk cartridge obtained in Step 5 from its container and insert it in the SEC disk drive and push it in until it is flush with the SEC disk drive face.
7. Power up the SEC disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED lights.

   If the optical disk cartridge is install incorrectly or unformatted, this command is denied with the error code ENMD. Install the optical disk cartridge properly or format the optical disk cartridge [refer to the section titled "Formatting a Blank Optical Disk Cartridge" (page 6-29) for formatting an optical disk cartridge].

   If the SEC disk drive is installed incorrectly or has failed, this command is denied with the error code ENEQ. Install the SEC disk drive properly or replace the SEC disk drive [refer to the section titled "Replacing the SEC Disk Drive" (page 14-9) for replacing the SEC disk drive].

Formatting a Blank Optical Disk Cartridge

This procedure must only be used to format a J98786SD-5 List 3 DACS IV-2000 (256) Release 4.0 Blank Optical Cartridge which has never been used before.

⚠ CAUTION:
Do not use this procedure on an optical disk cartridge containing the software release and/or a database.

1. Insert the new J98786SD-5 List 3 DACS IV-2000 (256) Release 4.0 Blank Optical Cartridge into the SEC disk drive making sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 6-25), if necessary].
2. Attempt to restore the SEC disk drive to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   If this command fails, continue with Step 3.

   If this command completes (the green ON LED lights), the optical disk in the SEC disk drive has already been formatted. Perform the following procedure to remove the optical disk cartridge:

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

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

      Where:

      a = Target ID (optional)

      This command takes up to 1 minute to complete. After completion the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

   b. Eject the optical disk cartridge and go back to Step 1.

3. Determine the contents of the optical disk cartridge by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

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

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
    CALCK,HEADCK,INTEGCK */
    ...
    "SEC,PROG,NOT FOUND,NOT FOUND,,,,,,"
    "SEC,DBASE,NOT FOUND,NOT FOUND,NOT FOUND,NOT FOUND,NOT FOUN,,,,D"
    ...
;
```

   If the above message appears with the NOT FOUND values, continue with the Step 4.

   If the parameters in the SEC, PROG and SEC, DBASE data lines are anything other than NOT FOUND, the optical disk cartridge in the SEC disk drive has already been formatted. Perform the following procedure to remove the optical disk cartridge:

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

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

      Where:

      a = Target ID (optional)

      This command takes up to 1 minute to complete. After completion the green ON LED is extinguished and a minor (MN) alarm is present on the frame.

   b. Eject the optical disk cartridge and go back to Step 1.

4. Format the J98786SD-5 List 3 DACS IV-2000 (256) Release 4.0 Blank Optical Cartridge by entering the following command:

   CPY-MEM:*[a]*:::**INIT,SEC,FORMAT;**

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete.

Backing Up Software Release to SEC Disk

The following procedure is used to make backup copies of the software release on the SEC disk. There is no reason to use this procedure with the J98786SD-5, List 1 or List 4 optical disk cartridges. (A copy of the software is already on these optical disks.) The main controller must be in the in-service (IS) state to perform this procedure.

⚠ CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 to the optical disk, make sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 6-25), if necessary]. The backup fails with the error code ENRE *if the optical disk is write-protected.*

1. Load a formatted optical disk in the SEC disk drive. If necessary, refer to the previous section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26).
2. Copy the software release from the PRI disk to the SEC disk by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 8 minutes to complete. Wait for the COMPLD *response before continuing with the next step.*

   If the software backup is aborted, redo this step or if necessary, replace the optical disk cartridge with a new one [refer to the section titled "Extracting/ Installing Optical Disk Cartridge" (page 6-26) for replacing optical disk cartridges, if necessary] before redoing this step.

⚠ CAUTION:
If the software backup is aborted for any reason, do not use the optical disk cartridge with the aborted backup on it for loading software.

3. Power down the SEC disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED is extinguished.

4. If your office procedures require, eject the optical disk cartridge (label it as necessary) and store it in its protective case.

NOTE:
The optical disk cartridge can not be removed from the SEC disk drive until the green ON LED is extinguished.

Backing Up Database to SEC Disk

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

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

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

CAUTION:
In procedures involving the transfer of data from the DACS IV-2000 to the optical disk, make sure the write-protect tab is in the OFF (writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 6-25), if necessary]. The backup fails with an error code of ENRE *if the optical disk is write-protected.*

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

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

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

   Where:

   a = Target ID (optional)

   If any alarms or protection switches (condition type of INHSWPR) are present, go to the section titled "Isolating Failures" (page 12-10) before performing this procedure.

2. Load a formatted disk into the SEC disk drive, if necessary. Refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26) earlier in this chapter if necessary.
3. Update the database on the PRI disks by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete. Wait for the COMPLD *response before continuing with the next step.*
4. Backup the database to SEC disk by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   If the database backup is aborted, redo this step or if necessary, replace the optical disk cartridge with a new one [refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26) for replacing optical disk cartridges, if necessary] before redoing this step.

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

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

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

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

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

   Where:

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

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

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

7. Power down the SEC disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED is extinguished.

8. Eject the optical disk cartridge and store it in its protective case.

NOTE:
The optical disk cartridge can not be removed from the SEC disk drive until the green ON LED is extinguished.

Restoring Databases from SEC Disk to PRI Disk

This procedure is used to restore the database from a backup disk to the PRI disk if the PRI disk drive is in-service (IS). This procedure **must** only be used when instructed to do so by another procedure (after consulting with the system administrator or next level of support) or by the system administrator.

CAUTION:
*This procedure overwrites the database on the PRI disk drive if the PRI disk drive is in-service (IS). This is **not** a daily operation, and must only be performed after consulting your system administrator or next level of support.*

NOTE:
The write-protect tab must be in the ON (not-writable) position [refer to the section titled "Optical Disk Cartridge Description" (page 6-25), if necessary] during this procedure.

1. Place the main controller in the out-of-service maintenance condition (OOS-MCOND) state using the command:

   `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

   Where:

   a = Target ID (optional)

   The MJ and MC FAIL alarm LEDs on the status panel turn on.

2. Load the disk with the latest database backup in the SEC disk drive. If necessary, refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26) earlier in this chapter.

3. Check the date and time of the database backup, the software release (including the latest software patch made) of the optical disk database, and the TID associated with the stored database information by entering the following command:

   RTRV-SYSID:*[a]*;

   Where:

   a = Target ID (optional)

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

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

   Where:

   g = System software release: { 4-00-{0-99}-r, NOT FOUND }

   h = Target ID: { <1—18 TID Legal Characters>, NOT FOUND }

   i = Date: { {00-99}{00-12}{00-31}, NOT FOUND }

   j = Time: { {00-23}{00-59}{00-59}, NOT FOUND }

   k = Patch number: { <1-40 Legal Characters>, NOVAL }

   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 (including the latest software patch) is the same as that currently in working memory, and the TID of the disk matches the TID of the frame. If any of the information is not correct, get the correct optical disk and go back to Step 2.

4. Power up the SEC disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED lights.

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

5. Copy the database from the SEC disk to the PRI disk drive by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 12.5 minutes to complete.

   If REPT EXCPTN SYS messages appear during the **CPY-MEM** command, refer to the section titled "CPY-MEM Command or Database Backup Failure" (page 13-8) to clear the problem before continuing with this procedure.

6. Remove the optical disk cartridge from the SEC disk drive by referring to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26).

   If your office procedures require that a optical disk cartridge be used for automatic database backups, install that optical disk cartridge into the SEC disk drive after extracting the optical disk cartridge used in this procedure.

7. Reset the system by entering the following command:

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

   Where:

   a = Target ID (optional)

   The system takes up to 30 minutes to reset. For more information on booting the DACS IV-2000, see the section titled "Reset and Boot" (page 6-7).

   If during the system reset you receive the following message:

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

   contact your system administrator or next level of support immediately for further assistance in loading the system database.

Login Administration

These procedures involve activities that are normally performed by a system administrator. They consist of creating a new user of the DACS IV-2000, changing the parameters associated with a user's login, and deleting a user from the system.

To perform any of the following procedures, you must be a system administrator or have received privileges from your system administrator.

Valid User IDs (UID)/Passwords

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

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

The DACS IV-2000 (256) 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. Create a user login by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = User ID: <1 to 10 UID legal characters>

   d = Password: <6 to 8 PSWD legal characters>

   e = User Privilege Code (UCFC/UCAL pair): { P{1-5}, M{1-5}, T{1-5}, S{1-5}, PM{1-5} }

   f = User Community Priority Level (UCPL): {1-5}
   Default value: 5 for superuser, 1 for all other users

g = Message Screening: { INPUT, AUTO, ALL, DBAUTO, DBALL }
Default value: DBALL

h = Dialog Mode: { MENU, COMMAND }
Default value: COMMAND

i = User Type: { HUMAN, MACHINE }
Default value: MACHINE

j = Message Echo: { ON, OFF }
Default value: OFF
For more information on using the input command routing feature, refer to the section titled "Using the Input Command Routing Feature (Message Echo)" (page 7-26).

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

Changing Logins

1. Change a user login by entering the following command:

To change login parameters other than password:
ED-SECU-USER:*[a]*:*[b]*:::*[d]*,*[e]*,,*[f]*:[UCPL=*g*,SCREEN=*h*,DMODE=*i*,
UTYPE=*j*,ECHO=*k*;

Where:

a = Target ID (optional)

b = Current User ID: <1 to 10 UID legal characters>

d = New User ID: <1 to 10 UID legal characters>

e = Current Password: <6 to 8 PSWD legal characters>

f = User Privilege Code (UCFC/UCAL pair): { P{1-5}, M{1-5}, T{1-5}, S{1-5}, PM{1-5}, CURVAL }
Default value: CURVAL

g = User Community Priority Level (UCPL): { {1-5}, CURVAL }
Default value: CURVAL

h = Message Screening: { INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }
Default value: CURVAL

i = Dialog Mode: { MENU, COMMAND, CURVAL }
Default value: CURVAL

j = User Type: { HUMAN, MACHINE, CURVAL }
Default value: CURVAL

k = Message Echo: { ON, OFF, CURVAL }
Default value: CURVAL
For more information on using the input command routing feature, refer to the section titled "Using the Input Command Routing Feature (Message Echo)" (page 7-26).

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 (256) Release 4.0 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 j*> Where: *b* = UID, *c* = CTAG, *e* = UCFC/UCAL *f* = UCPL, *g* = Message Screening, *h* = Dialog Mode, *i* = User Type, *j* Message Echo	COMPLD
ENT-SECU-USER	ENT SECU USER	DENY
INIT-SYS	INIT SYS::MC:*c*:5 Where: *c* = CTAG	COMPLD
INIT-SYS	INIT SYS	DENY

Retrieving Security Audit Events

This procedure is used to retrieve security-related events that are stored in the DACS IV-2000 security audit database. This procedure is restricted to system administrators with 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"
     ;
     ```

     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 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 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"
;
```

   Where:

   c = Status of deleted recorded event: `{ COMPLD, DENY, AUTO }`

   - — `COMPLD` — indicates the recorded event (command) successfully completed.
   - — `DENY` — indicates the recorded event (command) was denied.
   - — `AUTO` — indicates the recorded event is due to an autonomous DACS IV-2000 action.

   d = Date of deleted recorded event:
   `{00-39,86-99}{01-12}{01-31}`

   e = Time of deleted recorded event: `{00-23}{00-59}{00-59}`

   f = Link location of deleted recorded event: `CILINK-{1,2}-{1-6}`

   g = User ID used for deleted recorded event

h = Command and modifiers or autonomous event deleted. Refer to Table 6-2 for list of commands and autonomous events.

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

Retrieving Command Status

This procedure is used to retrieve the current status of previously entered commands. The **RTRV-CMD-STAT** command can be entered when the main controller (MC) is out-of-service (OOS).

1. Retrieve command status by entering the following command:

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

   Where:

   a = Target ID (optional)

   c = Command correlation tag (CTAG):
   { <1-10 CTAG legal characters>, **ALL** }
   Default: **ALL**
   Specifying **ALL** retrieves all commands waiting to be executed.
   Specifying any other valid string retrieves all commands that match the entered command CTAG.

   If no commands are match the specified command CTAG or no commands are waiting to execute when **ALL** is specified, the following is the output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If there are commands waiting to execute, the following is the output response (first command listed is the next to be executed):

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

Where:

c = Command CTAG: <1-10 CTAG legal characters>
Specifies the CTAG entered for the listed command.

d = Input command: { <Valid command verb>, INTERNAL, INTERNAL-{000-999} }
Specifies the input command to be executed. The value INTERNAL (with or without a string of digits) indicates a command generated by the system

e = Command status: { IP, UNKN, WTRSCE }
Specifies the status of the associated command.

- **IP** — indicates the associated command is currently being executed.
- **UNKN** — indicates the associated command is unknown. That is, the system can not find the command.
- **WTRSCE** — indicates the associated command is waiting for resources. That is, the command is in the command queue.

Aborting Commands

This procedure is used to abort the execution of the last command that you entered. The **ABT-CMD** command can only be entered when the main controller (MC) is in-service (IS). The command that is aborted returns an error response indicating (through the error code) that execution was aborted. The following is a list of abortable commands.

```
DGN-DET-EQPT                          RTRV-{EC1|T1|T3|VT1}
RTRV-ALM-{EC1|T1|T3|VT1}              RTRV-ALM-ALL
RTRV-ALM-COM                          RTRV-ALM-EQPT
RTRV-ALM-LINK                         RTRV-ATTR-{EC1|T1|T2|T3|VT1}
RTRV-ATTR-EQPT                        RTRV-COND-{EC1|T1|T2|T3|VT1}
RTRV-COND-EQPT                        RTRV-COND-LINK
RTRV-CONF-{STS1|T1|VT1}               RTRV-CRS
RTRV-CRS-{STS1|T1|VT1}                RTRV-DROPCRS-{STS1|T1|VT1}
RTRV-ECHO-LINK                        RTRV-EQPT
RTRV-HDR                              RTRV-LPBK-{EC1|T1|T3|VT1}
RTRV-MSG-{EC1|VT1}                    RTRV-NE
RTRV-PATH-{STS1|T1|VT1}               RTRV-PM-{EC1|T1|T3|VT1}
RTRV-PMCNFGRN-T1                      RTRV-PMMODE-{EC1|VT1}
RTRV-PMSCHED-{EC1|T1|T3|VT1}          RTRV-PORT
RTRV-PRMTR-LINK                       RTRV-SCANTH-NE
RTRV-SECU-AUD                         RTRV-SECU-USER
RTRV-STATE-{EC1|T1|VT1}               RTRV-STATE-EQPT
RTRV-SYNCN                            RTRV-TACC-{EC1|T1|VT1}
RTRV-TH-{EC1|T1|T3|VT1}               RTRV-TH-NE
TEST-CABLE                            TEST-SW-CONTROL
TEST-TRMSN-T1                         TEST-UNIT-CABLE
```

1. Abort the last entered command by entering the following command:

   ABT-CMD:*[a]*;

   Where:

   a = Target ID (optional)

   The following output response indicates successful completion of the abort command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   The aborted command returns an error response indicating the command is aborted.

Link Administration

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Link Administration

7

This chapter contains procedures for the DACS IV-2000 administrative links. CILINK-{1,2}-{1-3} are provisioned for Snider protocol. CILINK-{1,2}-4 can be provisioned for TABS, TBOS, or Snider protocol. CILINK-{1,2}-{5,6} are provisioned for X.25 protocol. The TTY1-1 and TTY2-1 (CILINK-1-1 and CILINK-2-1, respectively) connectors on the back of the Redundant Controller Module access the same CILINK as the TTY1-1 and TTY2-1 connectors on the status panel.

⚠ CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors or both 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 7-4).

NOTE:
The parameters of a user logged in to a link always override the parameters of the link itself.

Using Two Terminals to Change Snider Link Parameters

This procedure is used to change parameters associated with a Snider link using two terminals.

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

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

   Where:

   a = Target ID (optional)

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

2. Log in to the other terminal by entering the user identification (UID) at the `login:` prompt.

NOTE:
If the other terminal is at a remote location, contact the appropriate personnel to assist you with these procedures.

3. At the `password:` prompt, enter your password.

   Your password is not echoed back.

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` for `CILINK-{1,2}-{1,3,4}` and `2400` for `CILINK-{1,2}-2`
   It is recommended that you use the initial system value for the baud rate.

   f = Message screening: `{ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `ALL`

   g = Dialog mode: `{ MENU, COMMAND, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `COMMAND`

   i = Flow control: `{ DC3, ACK, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `DC3`

6. Restore the link by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Snider link location: `CILINK-{1,2}-{1-4}`

   This command takes up to 1 minute to complete.

7. Log off the link by entering the following command:

   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

This procedure is used to change parameters associated with a Snider link using one terminal.

1. Select one of the unterminated Snider links to change the parameter(s) of the link you are using.
2. Determine the baud and flow control parameters of the unterminated Snider link and the link you are using by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

   d = Link location: `CILINK-{1,2}-{1-3}`

   g = Baud rate: `{ 300, 1200, 2400, 4800, 9600 }`

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

3. Restore the unterminated Snider link you selected by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Snider link location: **CILINK-{1,2}-{1-4}**

   This command takes up to 1 minute to complete.

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. Figure 7-1 shows the location of the CILINK TTY connectors.

NOTE:
CILINK 1-1 and 2-1 use EIA-232-D connectors; all other CILINKs use EIA-449 connectors. CILINKs 1-2, 1-3, 1-4, 2-2, 2-3, and 2-4 are interoperable with EIA-232-D via the use of the suggested adaptors. For DACS IV-2000-to-terminal communication, it is suggested the ED-2C646,G2 adapter be used. For DACS IV-2000-to-OS via modem communication, it is suggested the ED-2C646,G1 adapter be used.

Links 1-2 and 2-2 are electrically compatible with the EIA-232-D (with the suggested adaptors) standard up to 9600 baud. Links 1-3 and 2-3 are electrically compatible with the EIA-232-D (with the suggested adaptors) standard up to 9600 baud. These links may operate above these data rates. However, the four per cent rise time specification of EIA-232-D is violated.

7. Enter your user ID at the `login:` prompt.

   If you do not receive the `login:` prompt, press the **<RETURN>** or **<ENTER>** key on your terminal. If you still do not receive the `login:` prompt, your terminal may not be set to the correct speed.

8. Enter the password at the *password:* prompt.

   Your password is not echoed back.

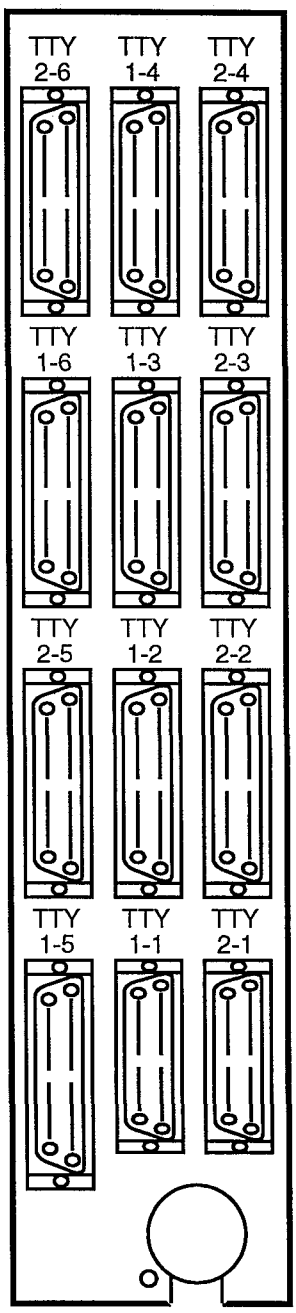


Figure 7-1. CILINK Connectors at the Back of the Redundant Controller Module

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** for **CILINK-{1,2}-{1,3,4}** and **2400** for **CILINK-{1,2}-2**
    It is recommended that you use the initial system value for the baud rate.

    f = Message screening: **{ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }** (optional)
    Default: **CURVAL**
    Initial system value: **ALL**

    g = Dialog mode: **{ MENU, COMMAND, CURVAL }** (optional)
    Default: **CURVAL**
    Initial system value: **COMMAND**

    i = Flow control: **{ DC3, ACK, CURVAL }** (optional)
    Default: **CURVAL**
    Initial system value: **DC3**

11. Restore the link you changed by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Snider link location: **CILINK-{1,2}-{1-4}**

    This command takes up to 1 minute to complete.

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.

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

This procedure is used to change parameters associated with TABS/TBOS links.

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)

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

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

   Where:

   d = Link location: CILINK-{1,2}-4

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

2. If the state of the TABS/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*::,,,*[g]*,*[h]*;

   Where:

   a = Target ID (optional)

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

   g = Telemetry set: **{ SUMMARY, DETAILED, EXTENDED, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **EXTENDED**

   h = Poll timing: **{ 10-60, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **20**

4. If you changed the telemetry set parameter, wait at least one polling interval (about 20 seconds) before continuing with this procedure.

5. 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**

   This command takes up to 1 minute to complete.

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

This procedure is used to change the link protocol (TABS, TBOS, or Snider) of CILINKs 1-4 or 2-4.

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)

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

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

   Where:

   d = Link location: CILINK-{1,2}-4

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

2. If the state of the link is OOS-MTCE, go to Step 3. Otherwise, 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 }` (optional)
     Default: `CURVAL`
     Initial system value: `2400`
     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`

   - **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 7-22).

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

This procedure is used to change parameters associated with X.25 links.

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)

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

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

   Where:

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

   e = Login UID: <1-10 UID Legal Characters>

2. If necessary, notify users to log out (all UIDs associated with CILINKs 1-5, 1-6, 2-5, and 2-6).

3. Determine the state of the link you are changing by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

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

   If the state of the link is OOS-MTCE, go to Step 5. Otherwise, go to Step 4.

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

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

   Where:

   a = Target ID (optional)

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

5. Edit the desired X.25 link parameter(s) of the link you are changing by entering the following command:

   ED-PRMTR-LINK:*[a]*:*b*::,*[e]*,*[f]*,*[g]*,,:*[j]*,*[k]*,*[l]*,*[m]*,*[n]*,*[o]*,*[p]*,*[q]*,*[r]*,*[s]*,*[t]*,*[u]*,*[v]*,*[w]*,*[x]*,*[y]*;

   Where:

   a = Target ID (optional)

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

   e = Baud rate: **{ 300, 1200, 2400, 4800, 9600, CURVAL, NOVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **9600**
   It is recommended that you use the initial system value for the baud rate.

f = Message screening: { INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL } (optional)
Default: CURVAL
Initial system value: ALL

g = Dialog mode: { MENU, COMMAND, CURVAL } (optional)
Default: CURVAL
Initial system value: COMMAND

j = Link window size K: { 2-7, CURVAL } (optional)
Default: CURVAL
Initial system value: 7

k = Counter N2: { 2-15, CURVAL } (optional)
Default: CURVAL
Initial system value: 7

l = Timer T1: { 2-20, CURVAL } (optional)
Default: CURVAL
Initial system value: 3

m = Timer T3: { 4-120, CURVAL } (optional)
Default: CURVAL
Initial system value: 26

n = Network window size W: { 1-7, CURVAL } (optional)
Default: CURVAL
Initial system value: 2

o = Packet size P: { 128, 256, CURVAL } (optional)
Default: CURVAL
Initial system value: 128

p = Timer T20: { 30-180, CURVAL } (optional)
Default: CURVAL
Initial system value: 180

q = Timer T22: { 30-180, CURVAL } (optional)
Default: CURVAL
Initial system value: 180

r = Timer T23: { 30-180, CURVAL } (optional)
Default: CURVAL
Initial system value: 180

s = Timer T25: { 30-200, CURVAL } (optional)
Default: CURVAL
Initial system value: 200

t = Timer T26: { 30-180, CURVAL } (optional)
Default: CURVAL
Initial system value: 180

u = Counter R20: `{ 1-10, CURVAL }` (optional)
Default: `CURVAL`
Initial system value: `1`

v = Counter R22: `{ 1-10, CURVAL }` (optional)
Default: `CURVAL`
Initial system value: `1`

w = Counter R23: `{ 1-3, CURVAL }` (optional)
Default: `CURVAL`
Initial system value: `1`

x = Counter R25: `{ 0-3, CURVAL }` (optional)
Default: `CURVAL`
Initial system value: `0`

y = D bit: `{ ON, OFF, CURVAL }` (optional)
Default: `CURVAL`
Initial system value: `ON`

6. Restore the link you changed by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   This command takes up to 1 minute to complete.

7. If necessary, notify the users logged out during Step 2 that the link has been restored.

Changing Link Security Parameters

This procedure is used to set or change security parameters associated with CILINKs. Parameters set in this procedure provide for autonomously logging off users that remain inactive for a specified amount of time and locking out CILINKs when a specified number of invalid login sessions are attempted. The DACS IV-2000 issues an alarm with the code FRD to indicate security violations resulting in a link lock-out.

NOTE:
Only users with a User Privilege Code (UPC) of S4 or higher can execute this procedure.

1. Change or set link security parameters by entering the following command:

   ED-SECU-LINK:*[a]*:*b*::*[d]*:*[e]*,*[f]*,*[g]*;

   Where:

   a = Target ID (optional)

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

   d = Inactivity: `{ 0-60, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `10` (minutes)
   Specifies the number of minutes allowed before a user session is logged off autonomously due to inactivity. Specifying `0` disables this feature (that is, user sessions are not logged off autonomously).

   e = Number of invalid sessions: `{ 1-10, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `5`
   Specifies the number of invalid login session setup attempts in a given interval (parameter *f*) before a CILINK is lock-out.

   f = Interval: `{ 0-90, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `30` (minutes)
   Specifies the number of minutes that make up an interval for the count of invalid login session setup attempts (parameter *e*). Specifying `0` disables the link lock-out feature (that is, links are not locked-out due to invalid login session attempts).

   g = Lock-out time: `{ 1-30, CURVAL }` (optional)
   Default: `CURVAL`
   Initial system value: `10` (minutes)
   Specifies the number of minutes that a link is locked-out due to invalid login session setup attempts. A `REPT ALM LINK` message is issued with the alarm code `FRD` when a link is locked-out.

2. Verify security parameter settings by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

   f = Inactivity: `0-60`

   g = Number of invalid sessions: `1-10`

   h = Interval: `0-90`

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

3. If the desired values are not shown redo this procedure from Step 1.

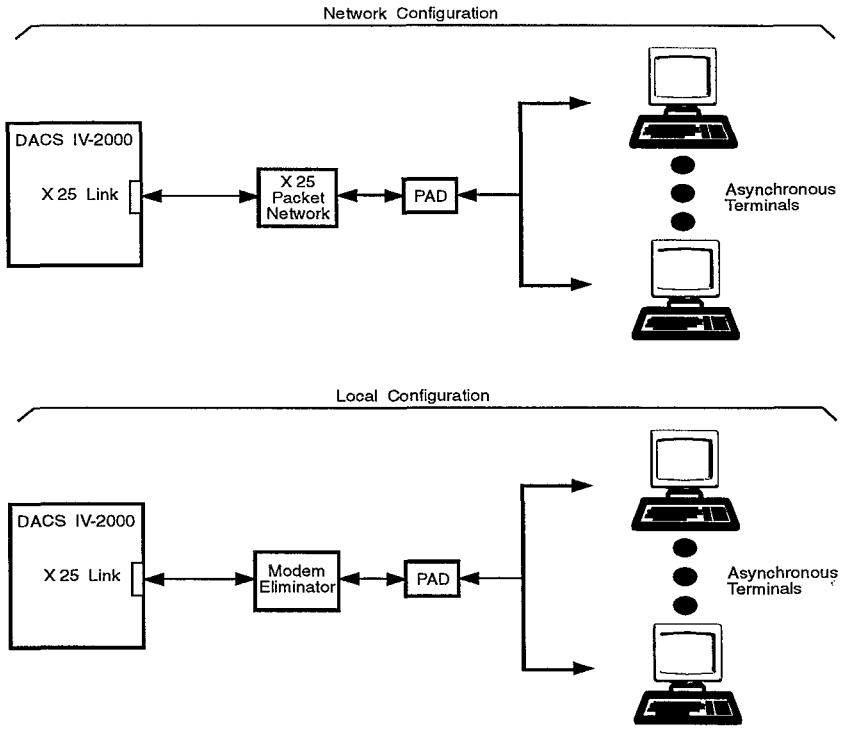
Connecting an X.25 Packet Assembler and Disassembler (PAD)

Administrative links CILINK-1-5, CILINK-1-6, CILINK-2-5, and CILINK-2-6 can be configured for asynchronous operation by using an external X.25 asynchronous packet assembler and disassembler (PAD). The PAD can be configured for either local operation or networking operation as shown in Figure 7-2.

This procedure provides information for preparing CILINK-1-5, CILINK-1-6, CILINK-2-5, and CILINK-2-6 for connecting a MICOM® box Type 2 PAD to the link. For details to connect and configure the PAD, refer to the instructions provided with the PAD.

The following equipment is required for this procedure:

- MICOM Box Type 2 asynchronous PAD
- Terminal(s) to connect to the PAD
- Modem eliminator or X.25 Packet Network and its required equipment



PAD = Packet Assembler and Disassembler

Figure 7-2. CILINK-1-5, CILINK-1-6, CILINK-2-5, or CILINK-2-6 Configured for MICOM Box PAD

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

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

   Where:

   a = Target ID (optional)

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

2. Refer to the user's manual provided with the X.25 PAD, X.25 network, and/or modem eliminator to connect and configure the equipment.

3. Determine the parameters of the link by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:..."
    "l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,aa"
;
```

   Where:

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

   l = Link window size K: 2-7

   m = Counter N2: 2-15

   n = Timer T1: 2-20

   o = Timer T3: 4-120

   p = Network window size W: 1-7

   q = Packet size P: { 128, 256 }

   r = Timer T20: 30-180

   s = Timer T22: 30-180

   t = Timer T23: 30-180

   u = Timer T25: 30-200

   v = Timer T26: 30-180

   w = Counter R20: 1-10

   x = Counter R22: 1-10

y = Counter R23: `1-3`

z = Counter R25: `0-3`

aa = D bit: `{ ON, OFF }`

The link parameters and the X.25 PAD parameters must agree. Refer to the previous section "X.25 link location: CILINK-{1,2}-{5,6} (optional)" (page 7-14) to edit X.25 link parameters.

4. Restore the link by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   This command takes up to 1 minute to complete.

   If this command is denied with the error code `SOSF`, the PAD, X.25 network, and/or modem eliminator are not configured properly (return to Step 2).

5. Determine the state of the X.25 link you are connecting to the PAD by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

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

   Where:

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

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

   If the state of the link is `OOS-PRTCL`, the PAD may not be connected properly. Check the physical connections. If the physical connections are correct the problem can be traced to the PAD configuration. Contact your system administrator or next level of support for further assistance and do not continue with this procedure.

6. Enter the auto baud/auto parity attention sequence of **<RETURN>.<RETURN>** or **<ENTER>.<ENTER>** to access the channel and receive the PAD prompt.

   If the prompt is not displayed, repeat the attention sequence.

   If the prompt still does not appear, check the physical connections. If the physical connections are correct and the link is in service, the problem can be traced to the PAD configuration. Contact your system administrator or next level of support for further assistance.

Adding a Terminal to a Snider Link

This procedure requires both a terminal already connected to a link and an unterminated Snider link (TTY1-1, TTY1-2, TTY1-3, TTY1-4, TTY2-1, TTY2-2, TTY2-3, or TTY2-4).

NOTE:
CILINKs 1-2, 1-3, 1-4, 2-2, 2-3, and 2-4 are interoperable with EIA-232-D via the use of the suggested adaptors. For DACS IV-2000-to-terminal communication, it is suggested the ED-2C646,G2 adapter be used. For DACS IV-2000-to-OS via modem communication, it is suggested the ED-2C646,G1 adapter be used.

CILINKs 1-2 and 2-2 are electrically compatible with the EIA-232-D (with the suggested adaptors) standard up to 9600 baud. Links 1-3 and 2-3 are electrically compatible with the EIA-232-D (with the suggested adaptors) standard up to 9600 baud. These links may operate with the EIA-232-D above these data rates, however, the four per cent rise time specification of EIA-232-D is violated.

1. Plug in the terminal you are adding to an AC power outlet and power up the terminal.
2. Determine the Snider link parameters of the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

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

   Where:

   a = Target ID (optional)

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

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

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

Where:

d = Link location: `CILINK-{1,2}-{1-4}`

g = Baud rate: `{ 300, 1200, 2400, 4800, 9600 }`

h = Message screening: `{ INPUT, AUTO, ALL, DBAUTO, DBALL }`

i = Dialog mode: `{ MENU, COMMAND }`

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

3. Edit the desired Snider link parameters of the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

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

   Where:

   a = Target ID (optional)

   b = Snider link location: **CILINK-{1,2}-{1-4}**

   e = Baud rate: **{ 300, 1200, 2400, 4800, 9600, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **9600** for **CILINK-{1,2}-{1,3,4}** and **2400** for **CILINK-{1,2}-2**
   It is recommended that you use the initial system value for the baud rate.

   f = Message screening: **{ INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **ALL**

   g = Dialog mode: **{ MENU, COMMAND, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **COMMAND**

   i = Flow control: **{ DC3, ACK, CURVAL }** (optional)
   Default: **CURVAL**
   Initial system value: **DC3**

4. Set the options of the terminal you are adding to the following:

   Baud rate: (same value as the baud rate [BAUD] parameter in Step 3)
   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Answerback: ACK (cntrl-F) (only if the flow control parameter in Step 3 is also ACK)

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

5. Connect the terminal connector to the selected Snider TTY port. Figure 7-1 (earlier in this chapter) shows the location of the CILINK TTY connectors on the top panel on the back of the Switch Bays.

NOTE:
CILINKs 1-1 and 2-1 use EIA-232-D connectors, all other CILINKs use EIA-449 connectors. Refer to note at beginning of this procedure for information on adaptors for the EIA-449 connectors.

6. Restore the link to which you are adding a terminal by entering the following command from the terminal already connected to a Snider link:

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

   Where:

   a = Target ID (optional)

   b = Snider link location: **CILINK-{1,2}-{1-4}**

   This command takes up to 1 minute to complete.

   If you do not receive the `login:` prompt on the added terminal, press the **<RETURN>** or **<ENTER>** key on your terminal. If you still do not receive the `login:` prompt, your terminal may not be set to the correct speed.

Adding a Printer

Printers can be connected directly to a Snider link or can be used in tandem with a terminal connected to a Snider link or X.25 PAD network.

Adding a Printer Directly to a Snider Link

A printer that is connected directly to a Snider link is added in the same manner a terminal is added to a Snider link. When adding a printer directly, the following applies:

- The message screening is determined by the setting of the Snider link the printer is connected to.
- The printer does not receive any performance monitoring reports. Refer to the previous section titled "Adding a Terminal to a Snider Link" (page 7-22) 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 7-22)
   - An X.25 PAD network set up as described in the section titled "Connecting an X.25 Packet Assembler and Disassembler (PAD)" (page 7-19).
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.

Using the Input Command Routing Feature (Message Echo)

The input command routing feature is described in the following procedures. The first three procedures show how to activate, to cancel, and to retrieve the configuration of the DACS IV-2000's input command routing capability. The **RTRV-SECU-USER** commands can be used to retrieve the message echo parameter information. The **ED-SECU-USER** command is used to change the message echo parameter for existing UIDs. The **ENT-SECU-USER** command is used to set the message echo parameter for new UIDs.

Activating Input Command Routing

This procedure is used to activate the input command routing capability. After execution of this procedure, the input commands entered and acknowledgment codes generated on the specified link are echoed to all active Snider and X.25 links provisioned to receive them.

NOTE:
Only one link or virtual circuit can be provisioned to echo input commands and acknowledgment codes at a time. Parameters associated with User IDs override parameters associated with links.

1. Activate the input command routing capability by entering the following command:

   ACT-ECHO-LINK:*[a]*:*b*,*c*;

   Where

   a = Target ID (optional)

   b = CILINK location: **CILINK-{1,2}-{1-6}**
   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"
;
```

   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) or link to ON. For additional information on the REPT LOCL IN message, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

1. Set the Message Echo parameter to ON by entering one of the following commands:

   - **New user login/password**:

     ENT-SECU-USER:*[a]*:*b*:::*d*,,*e*:[**SCREEN=***g*, **ECHO=***j*];

     Where:

     a = Target ID (optional)

     b = User ID: < 1 to 10 UID legal characters >

     d = Password: < 6 to 8 password legal characters >

     e = User privilege code (UCFC/UCAL par): { P{1-5}, M{1-5}, T{1-5}, S{1-5}, PM{1-5} }

     g = Message screening: { **INPUT, AUTO, ALL, DBAUTO, DBALL** }
     Default value: **DBALL**
     The value **INPUT** cannot be used if you are to receive echo of input commands and acknowledgment codes.

     j = Message echo: { **ON, OFF** }
     Default value: **OFF**
     To turn on the input command routing capability, you must set this parameter to ON, if not already done so.

- **Existing user login/password**:

  ED-SECU-USER:*[a]*:*b*:::,,,:*[*SCREEN=*h*, ECHO=*k]*;

  Where:

  a = Target ID (optional)

  b = Old user ID: < 1 to 10 UID legal characters >

  h = Message screening: { **INPUT, AUTO, ALL, DBAUTO, DBALL, CURVAL** }
  Default value: **CURVAL**
  The value **INPUT** cannot be used if you are to receive echo of input commands and acknowledgment codes.

  k = Message echo: { **ON, OFF, CURVAL** }
  Default value: **CURVAL**
  To turn on the input command routing capability, you must set this parameter to **ON**, if not already done so.

2. Verify the selected user is allowed to receive REPT LOCL IN messages by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* UID:,UCFC/UCAL:<> */
   "d:...:ECHO=j"
;
```

   Where:

   d = User ID: <1-10 UID legal characters>

   j = Message echo: { ON, OFF }
   ON indicates the associated user receives REPT LOCL IN messages

Cross-Connections

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Cross-Connections

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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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

For detailed information on Cross-Connection Types, refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

Retrieving EC-1/VT1.5/DS1 Port States

This procedure is used to retrieve state information (for example, mapped, performance monitoring, loopbacks, idle) associated with EC-1, VT1.5, or DS1 ports.

1. Determine the state of a EC-1, VT1.5, or DS1 port(s) by entering one of the following commands:

   EC-1 Port: `RTRV-STATE-EC1:`*[a]*`:`*b*`;`
   VT1.5 Port: `RTRV-STATE-VT1:`*[a]*`:`*b*`;`
   DS1 Port: `RTRV-STATE-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port(s) location:
   `{ {1-32}-{1-15}, UNIT-{1-32} }`
   VT1.5 port(s) location:
   `{ {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }`
   DS1 port(s) location:
   `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }`

   A sample output is:

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

   Where:

   e = EC-1 port location: `{1-32}-{1-15}`
   VT1.5 port location: `{1-32}-{1-15}-{1-28}`
   DS1 port location: `{1-32}-{1-31}-{1-28}`

   f = Input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = Output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 signals, Table 8-1 shows the mappings used to identify the signals within the DACS IV-2000 to their associated DS2/VT group and signal number within the group. For more information, refer to the section titled "Cross-Connections" in Chapter 2 of the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

Table 8-1. **DS1 and VT1.5 Mappings**

Asynchronous DACS IV-2000 to DDM-1000		Synchronous			
		DACS IV-2000		DDM-2000	
DS1 Within DS3	DS2,DS1	VT1.5 Within STS-1	VT Group, VT	VT Group, VT	VT1.5 Within STS-1
1	1,1	1	1,1	1,1	1
2	1,2	2	2,1	1,2	8
3	1,3	3	3,1	1,3	15
4	1,4	4	4,1	1,4	22
5	2,1	5	5,1	2,1	2
6	2,2	6	6,1	2,2	9
7	2,3	7	7,1	2,3	16
8	2,4	8	1,2	2,4	23
9	3,1	9	2,2	3,1	3
10	3,2	10	3,2	3,2	10
11	3,3	11	4,2	3,3	17
12	3,4	12	5,2	3,4	24
13	4,1	13	6,2	4,1	4
14	4,2	14	7,2	4,2	11
15	4,3	15	1,3	4,3	18
16	4,4	16	2,3	4,4	25
17	5,1	17	3,3	5,1	5
18	5,2	18	4,3	5,2	12
19	5,3	19	5,3	5,3	19
20	5,4	20	6,3	5,4	26
21	6,1	21	7,3	6,1	6
22	6,2	22	1,4	6,2	13
23	6,3	23	2,4	6,3	20
24	6,4	24	3,4	6,4	27
25	7,1	25	4,4	7,1	7
26	7,2	26	5,4	7,2	14
27	7,3	27	6,4	7,3	21
28	7,4	28	7,4	7,4	28

Establishing One-Way and Two-Way Cross-Connections

Use one of the following procedures to form a one-way or two-way cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and DS1, STS-1, VT1.5 output port (TO):

- "Establishing DS1 One-Way and Two-Way Cross-Connections" (page 8-4)
- "Establishing STS-1 One-Way and Two-Way Cross-Connections" (page 8-6)
- "Establishing VT1.5 One-Way and Two-Way Cross-Connections" (page 8-9)

The FROM and TO ports of a one-way cross-connection can be the same, resulting in a loopback condition.

Establishing DS1 One-Way and Two-Way Cross-Connections

This procedure is used to cross-connect DS1 ports that are in the IDLE-REL state. If either of the selected DS1 ports is within an EC-1 port, the Active Signal Type must be T1 (DS1 signal) or the **ENT-CRS-T1** command is denied. For signal mapping information refer to Table 8-1 in the section titled "Establishing Cross-Connections" (page 8-3).

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the selected DS1 ports are not in the IDLE-REL state (parameters *o* and *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 ports to the IDLE-REL state or selecting DS1 ports in the IDLE-REL state.

If either of the specified DS1 ports is associated with an EC-1 port and the Active Signal Type is not T1, a DS1 cross-connection 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.

3. Establish a one-way or two-way cross-connection by entering the following command:

   `ENT-CRS-T1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`:[FOMODE=`*f*`,TOMODE=`*g*`]:,`*[h]*`;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports:
   DS1 Interface-P Module: `{1-32}-{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` **can not** be specified for DS1 ports within STS1 Interface-16 Modules.

g = TO output mode: { NORM, TERM, AIS, QRSS }
Default: NORM
Specifies what is transmitted from the TO DS1 output port. QRSS **cannot** be specified for DS1 ports within STS1 Interface-16 Modules.

h = Special service type: { RDLD, NOVAL }
Default: NOVAL (not red-lined)
Specifies whether or not the circuit is red-lined.

Wait for the connection completed (COMPLD) message to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 different 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 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.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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. For signal mapping information refer to Table 8-1 in the section titled "Establishing Cross-Connections" (page 8-3).

Table 8-3. **Allowable VT1.5 Cross-Connections**

VT1.5 Signal Formats		TO VT1.5 Port				TO DS1 Port
		UNSPEC	BIT	BYTE	ASYNC	
FROM VT1.5 Port	UNSPEC	Allowed	Allowed	Allowed	Not Allowed	Not Allowed
	BIT	Allowed	Allowed	Allowed w/Warning	Not Allowed	Not Allowed
	BYTE	Allowed	Allowed w/Warning	Allowed	Not Allowed	Not Allowed
	ASYNC	Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed
FROM DS1 Port		Not Allowed	Not Allowed	Not Allowed	Allowed	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}-{1-28}`

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 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.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the selected VT1.5 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 ports to the IDLE-REL state or selecting VT1.5 ports in the IDLE-REL state.

4. Establish a one-way or two-way cross-connection by entering the following command:

ENT-CRS-VT1:*[a]*:*b*,*c*:::*[e]*:*[*FOMODE=*f*,TOMODE=*g]*:,*[h]*;

Where:

a = Target ID (optional)

b = FROM VT1.5 port location:

c = TO VT1.5 port location:

FROM/TO VT1.5 Ports:
STS1 Interface-16 Module: `{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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

Broadcast cross-connections are one-way connections from the designated input port (FROM) to a new output port (ADDTO). The input port can already be cross-connected to one or more output ports. The **ENT-CONF-EC1**, **ENT-CONF-T1**, and **ENT-CONF-VT1** commands can be used to cross-connect at most two output ports to one input port. Figure 8-1 shows an example of two T1 broadcast cross-connections established to an existing cross-connection. If a third broadcast cross-connection is attempted, the command is denied. EC-1 and VT1.5 broadcast cross-connections are made in similar manners.

NOTE:
Broadcast cross-connections are considered secondary cross-connections. Therefore, the 60 ms switching time is not guaranteed in the event of a protection switch. In certain situations restoration of secondary cross-connections could be blocked.

Use one of the following procedures to form a 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" (page 8-13)
- "Establishing STS-1 Broadcast Cross-Connections" (page 8-15)
- "Establishing VT1.5 Broadcast Cross-Connections" (page 8-17)

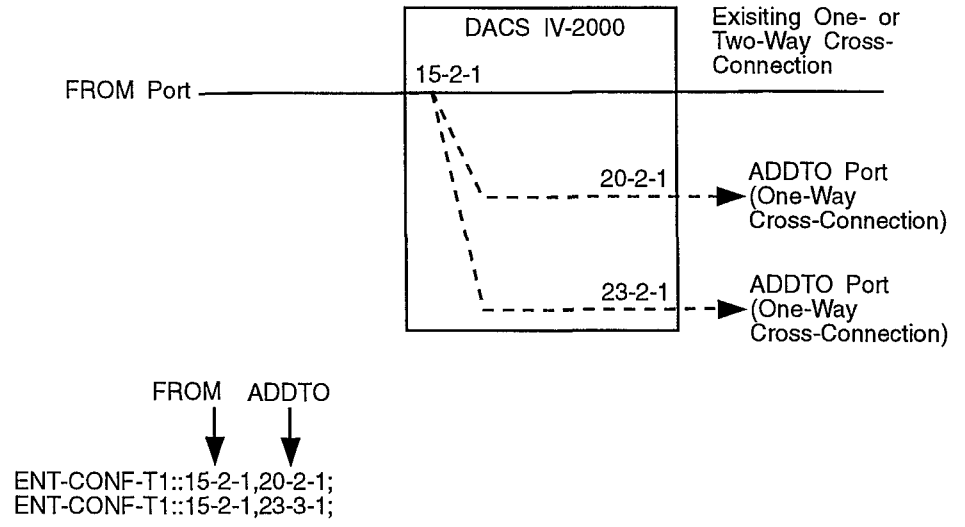


Figure 8-1. **Broadcast Cross-Connection Example**

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 one DS1 input port to more than two DS1 output ports. 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If the selected ADDTO DS1 port is not in the IDLE-REL state (parameters *o* and *p*), contact the system administrator or next level of support for assistance in moving the selected DS1 port to the IDLE-REL state or selecting another DS1 port in the IDLE-REL state.

   If either of the specified DS1 ports is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 cross-connection can not be made. Contact the system administrator or next level of support to deter-

mine 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.

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 **can not** be specified for DS1 ports within 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, this parameter must be RDLD.

   Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 one EC-1 input port to more than two EC-1 output ports. 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 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.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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, this parameter must be **RDLD**.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 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 one VT1.5 input port to more than two VT1.5 output ports. 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}-{1-28}

   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 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.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   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, this parameter must be **RDLD**.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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" (page 8-20)
- "STS-1 Cross-Connection Rollover" (page 8-23)
- "VT1.5 Cross-Connection Rollover" (page 8-26)

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

p = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 8-2 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.

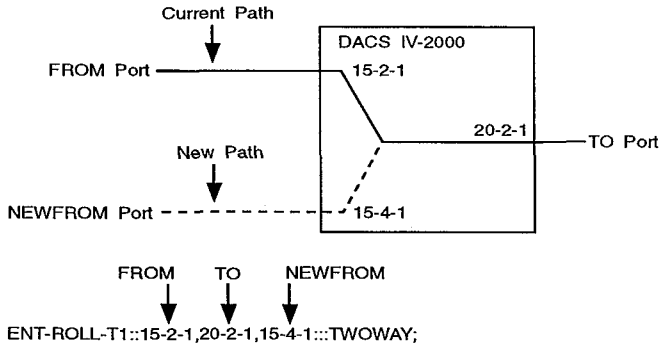


Figure 8-2. **Example of Using the ENT-ROLL-T1 Command**

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" (page 8-30) 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 com-

pleted message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = EC-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   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 8-3 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**.

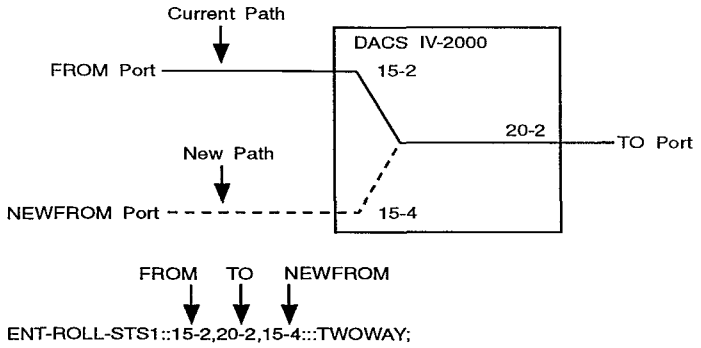


Figure 8-3. **Example of Using the ENT-ROLL-STS1 Command**

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" (page 8-30) 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 document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   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 8-4 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.

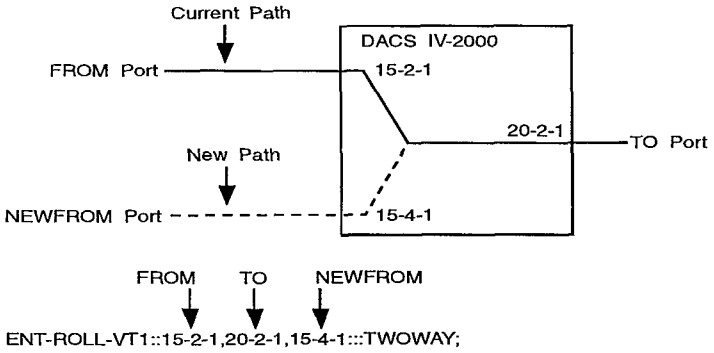


Figure 8-4. Example of Using the ENT-ROLL-VT1 Command

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" (page 8-30) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 to disconnect a one-way or two-way cross-connection between a DS1, STS-1, or VT1.5 input port (FROM) and a DS1, STS-1, or VT1.5 output port (TO):

- "Disconnecting DS1 One-Way and Two-Way Cross-Connections" (page 8-30)
- "Disconnecting STS-1 One-Way and Two-Way Cross-Connections" (page 8-31)
- "Disconnecting VT1.5 One-Way and Two-Way Cross-Connections" (page 8-32)

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 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" (page 8-33)
- "Disconnecting STS-1 Broadcast Cross-Connections" (page 8-34)
- "Disconnecting VT1.5 Broadcast Cross-Connections" (page 8-35)

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.

This procedure is used to disconnect a broadcast DS1 cross-connection.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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) and for setting up, changing, or removing a test connection in the DACS IV-2000. Test access in the DACS IV-2000 is provided through a test access port (TAP or testport) 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. If an IDLE-REL port is used as a testport, the basic state of the port is change to TP (test port), where a TPPV-REL port that is used as a testport retains the basic state TPPV. That is, the basic state TPPV indicates that the testport has been provisioned that way and the basic state TP indicates ports that are used as temporary testports.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

For more information on test access, refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700) or the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

1. Designate which port to be tested is to be the E-End (generally the port providing a *short haul* path access to equipment within the same Central Office) and which port to be tested is to be the F-End (generally the port providing a *long haul* path to another Central Office). This designation is to be carried throughout this procedure. Figure 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.

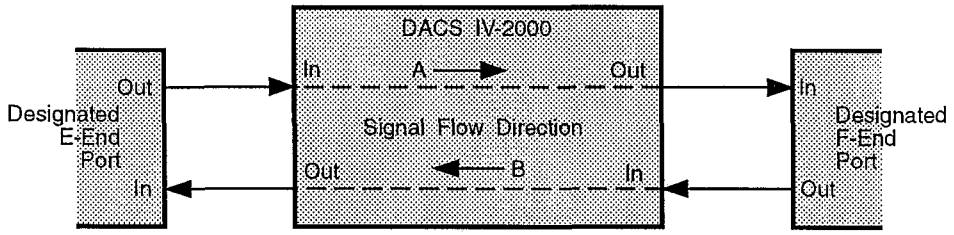


Figure 9-1. Test Access Conventions

2. Check the parameters of the ports (E- and F-End) to be tested for loopbacks (also for DS1 ports, check the line coding [AMI or B8ZS]) by entering one of the following commands:

   T1 ports: `RTRV-T1:[a]:b;`
   STS-1 ports: `RTRV-STATE-EC1:[a]:b;`
   VT1.5 ports: `RTRV-STATE-VT1:[a]:b;`

   Where:

   a = Target ID (optional)

b = E- and F-End ports to be tested location:
DS1: `{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, check the input and output states (parameters *o* and *p*) to make sure there are no loopbacks up, and check the linecode (parameters *u* and *v*) to make sure the parameters 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 10-8). 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 10-23) for STS-1 loopbacks or "Releasing Near-End VT1.5 Loopbacks" (page 10-29) for VT1.5 loopbacks.

3. If you are using test access for DS1 ports, check the parameters of the selected testport for line coding (AMI or B8ZS) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 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 parameters are set to the same option (AMI or B8ZS) as the DS1 ports to be tested (line coding determined in Step 2). If necessary use the **ED-T1** command to set the line coding.

4. If necessary, depending on your office procedures, manually provision the testport (DS1, STS-1, or VT1.5) to be used for this procedure using one of the following procedures: "Provisioning DS1 Testports" (page 9-10) for DS1 test sessions, "Provisioning STS-1 Testports" (page 9-11) for STS-1 test sessions, or "Provisioning VT1.5 Testports" (page 9-12) for VT1.5 test sessions.
5. Connect your test set (according to office procedures) to the port designated for the testport (facility access digroup [FAD]).
6. To test if the signal from the E-End is received by the DACS IV-2000, establish a MONE test access connection by using one of the following procedures: "Establishing DS1 Test Access Connections for DS1 Cross-Connections" (page 9-19) for DS1 test sessions, "Establishing STS-1 Test Access Connections" (page 9-26) for STS-1 test sessions, or "Establishing VT1.5 Test Access Connections" (page 9-28) 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.

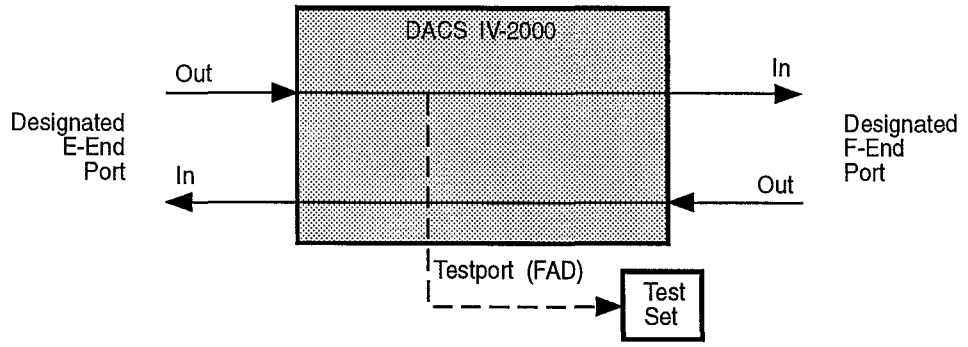


Figure 9-2. **Test Access Configuration After Establishing MONE Connection**

7. Perform the required test (specified by your system administrator) for transmission of the signal from the E-End to the DACS IV-2000.

8. To test both ends of the transmission paths for the E-End, change the MONE test connection to a SPLTE test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 9-31) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-33) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-35) 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 E-End from/to the DACS IV-2000.

   If this is the only test required leave the network interface in the desired state and release the test access connection using the section titled "Removing Test Access Connections" (page 9-45) (after releasing the test connection you are done with this procedure). Otherwise, continue with Step 10.

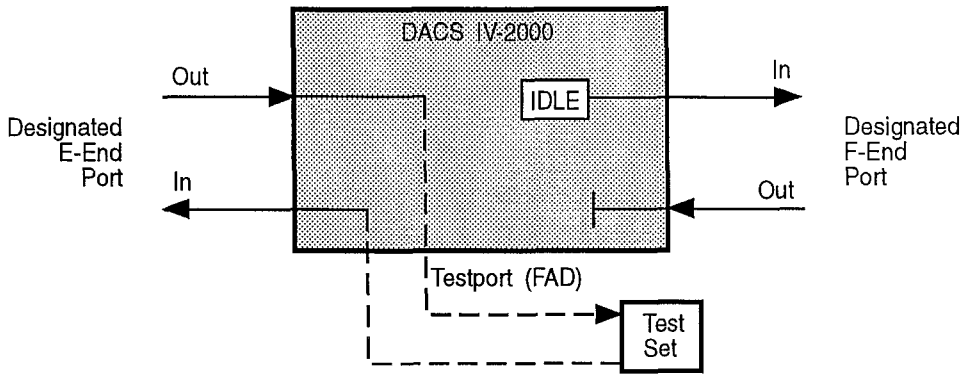


Figure 9-3. **Test Access Configuration After Changing to SPLTE Connection**

10. To test both ends of the transmission paths for the F-End, change the SPLTE test connection to a SPLTF test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 9-31) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-33) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-35) for VT1.5 test sessions.

    Changing the test access connection to a SPLTF allows you to test the transmission between the F-End and the DACS IV-2000.
    Figure 9-4 shows the test access configuration after changing to the SPLTF test access connection.

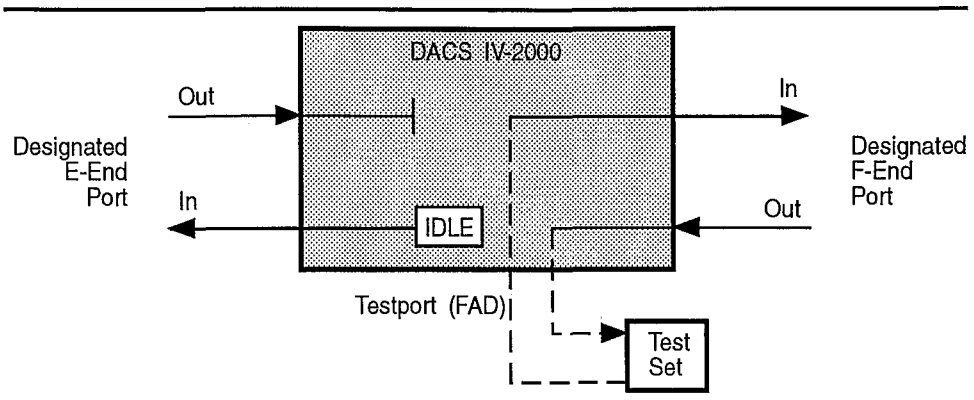


Figure 9-4. **Test Access Configuration After Changing to SPLTF Connection**

11. Perform the required test (specified by your system administrator) for transmission of the signal to/from the F-End from/to the DACS IV-2000.

    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 9-45). After releasing the test connection you are done with this procedure. Otherwise, continue with Step 12.

12. If a round-robin test is required, loop up both ends (E- and F-Ends) of the network interface as shown in Figure 9-5. Exterior/physical loops must be used. A LPBKT loopback cannot be used.

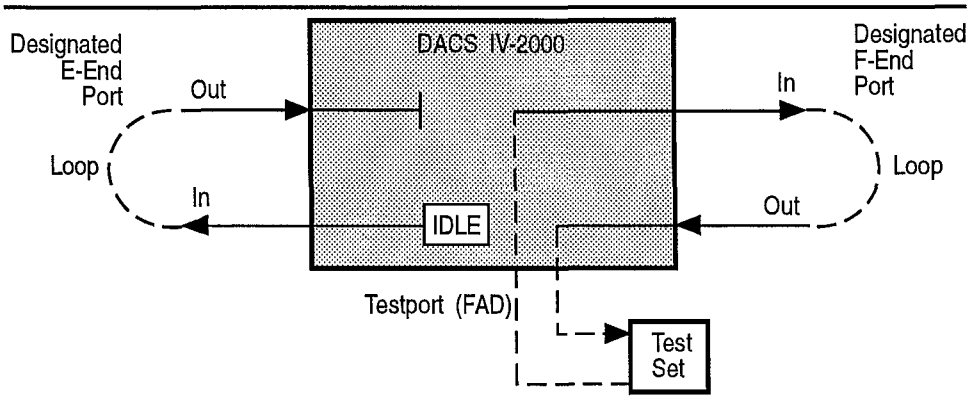


Figure 9-5. **Test Access Configuration After Looping Both Ends of the DACS IV-2000**

13. To do a round-robin test, change the SPLTF test connection to a SPLTA test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 9-31)for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-33) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-35) for VT1.5 test sessions.

    Changing the test access connection to a SPLTA allows you to test the transmission from the E-End to the F-End through the DACS IV-2000. Figure 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 E-End to the F-End through the DACS IV-2000.

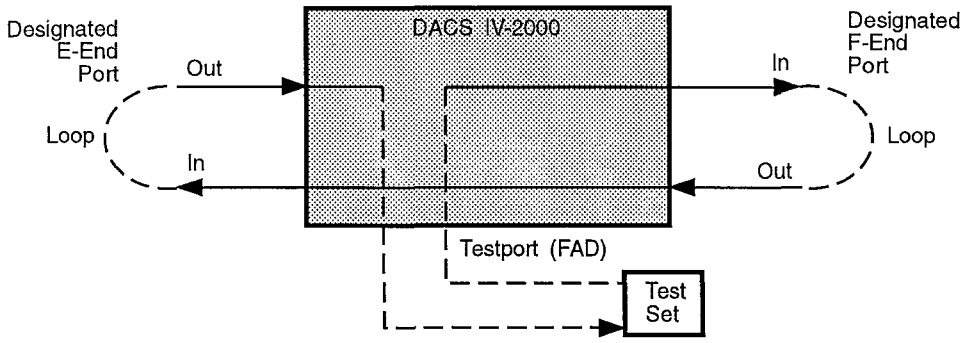


Figure 9-6. **Test Access Configuration After Changing to SPLTA Connection**

15. Change the SPLTA test connection to a SPLTB test connection using one of the following procedures: "Changing DS1 Test Access Mode" (page 9-31) for DS1 test sessions, "Changing STS-1 Test Access Mode" (page 9-33) for STS-1 test sessions, or "Changing VT1.5 Test Access Mode" (page 9-35) for VT1.5 test sessions.

    Changing the test access connection to a SPLTB allows you to test the transmission from the F-End to the E-End through the DACS IV-2000. Figure 9-7 shows the test access configuration after changing to the SPLTB test access connection.

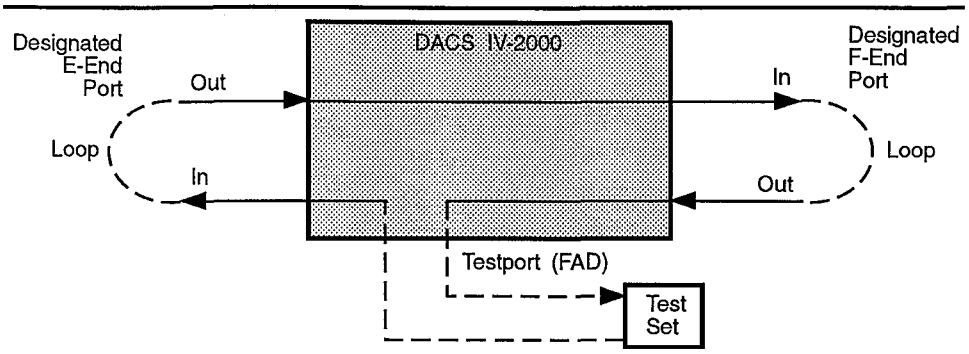


Figure 9-7. **Test Access Configuration After Changing to SPLTB Connection**

16. Perform the required test (specified by your system administrator) for transmission of the signal from the F-End to the E-End through the DACS IV-2000.
17. Disconnect the test access connection using the section titled "Removing Test Access Connections" (page 9-45).
18. To complete the test access session, remove the loops made in Step 12.

Retrieving EC-1/VT1.5/DS1 Test Access Information

This procedure is used to retrieve test access information (for example, provisioned testports, active test access connections) associated with EC-1, VT1.5, or DS1 facilities.

1. Retrieve EC-1, VT1.5, or DS1 test access (`RTRV-TACC-T1` only) information by entering one of the following commands:

   EC-1 Port: `RTRV-TACC-EC1:`*[a]*`;`
   VT1.5 Port: `RTRV-TACC-VT1:`*[a]*`;`
   DS1 Port: `RTRV-TACC-T1:`*[a]*`;`

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT_STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

Where:

c = Test access port (TAP):
EC-1 TAP location: {1-32}-{1-15}
VT1.5 TAP location: {1-32}-{1-15}-{1-28}
DS1 TAP location: {1-32}-{1-31}-{1-28}

d = TAP input and output port state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the port currently used a s the TAP. The second part of the state name indicates the test access mode. The state TPPV-REL identifies provisioned testports that are idle.

e = E-End port:
EC-1 port location: {1-32}-{1-15}
VT1.5 port location: {1-32}-{1-15}-{1-28}
DS1 port location: {1-32}-{1-31}-{1-28}
Specifies the E-End port.

f = Current F-End port:
EC-1 port location: {1-32}-{1-15}
VT1.5 port location: {1-32}-{1-15}-{1-28}
DS1 port location: {1-32}-{1-31}-{1-28}
Specifies the F-End port.

g = Link ID: { CILINK-0-0, CLINK-{1,2}-{1-6} }
Specifies the link the test session was set up. The value CILINK-0-0 is used to designate a test session that is not associated with any link, and is therefore not subject to automatic release.

h = User ID: { <1-10 UID legal characters> }
Specifies the user ID used to set up the test session.

Provisioning Testports

Use one of the following procedures: "Provisioning DS1 Testports" (page 9-10), "Provisioning STS-1 Testports" (page 9-11), or "Provisioning VT1.5 Testports" (page 9-12) 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:

   i = Target ID (optional)

   j = 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.

   A sample output is:

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

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the selected DS1 ports are not in the IDLE-REL state (parameters *f* and *g*), contact the system administrator or next level of support for assistance in moving the selected DS1 ports to the IDLE-REL state or selecting DS1 ports in the IDLE-REL state.

2. Provision a DS1 port(s) as a testport(s) by entering the following command:

   ENT-TSTPT-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be provisioned as the testport(s) location:
   { {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.

   A sample output is:

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

Where:

e = STS-1 port location: `{1-32}-{1-15}`

f = STS-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = STS-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the desired STS-1 port is not in the IDLE-REL state (parameters *f* and *g*) and/or not provisioned, you can provision the STS-1 port by referring to the section titled "Provisioning EC-1 Facilities (STS-1 Signals)" (page 5-63) before performing this procedure.

2. Provision an 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:

   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.

A sample output is:

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

Where:

e = VT1.5 port location: {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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the desired VT1.5 port is not in the IDLE-REL state (parameters *f* and *g*) and/or not provisioned, you can provision the VT1.5 port by referring to the section titled "Provisioning VT1.5 Facilities" (page 5-67) 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 9-14), "Releasing STS-1 Testports" (page 9-15), or "Releasing VT1.5 Testports" (page 9-16)] 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.

   A sample output is:

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

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = DS1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = DS1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If the selected DS1 ports are not in the TPPV-REL state (parameters *f* and *g*), the DS1 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a DS1 testport(s) by entering the following command:

   RLS-TSTPT-T1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = DS1 testport(s) to be deprovisioned location:
   { {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.

   A sample output is:

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

   Where:

   e = STS-1 port location: {1-32}-{1-15}

   f = STS-1 input port state: valid states are listed in Table C-9 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   g = STS-1 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the selected STS-1 ports are not in the TPPV-REL state (parameters *f* and *g*), the STS-1 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a STS-1 testport(s) by entering the following command:

   RLS-TSTPT-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = STS-1 testport(s) to be deprovisioned location:
   { {1-32}-{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.

   A sample output is:

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

   Where:

   e = VT1.5 port location: {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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

g = VT1.5 output port state: valid states are listed in Table C-10 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the selected VT1.5 ports are not in the TPPV-REL state (parameters *f* and *g*), the VT1.5 ports are not testports and you are done with this procedure for those selected ports.

2. Deprovision a VT1.5 testport(s) by entering the following command:

   RLS-TSTPT-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 testport(s) to be deprovisioned location:
   { {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 for DS1 Cross-Connections" (page 9-19), "Establishing DS1 Test Access Connections for VT1.5 Cross-Connections" (page 9-22), "Establishing STS-1 Test Access Connections" (page 9-26), or "Establishing VT1.5 Test Access Connections" (page 9-28)] 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 facility access digroup (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).
- SPLTA — splits the E-End to F-End connection of a one-way or two-way cross-connection to provide test access in the A direction.
- SPLTB — splits the F-End to E-End connection of a two-way cross-connection to provide test access in the B direction.
- SPLTE — splits the E-End to F-End connection of a one-way or a two-way cross-connection to provide test access at the E-End.
- SPLTF — splits the F-End to E-End connection of a two-way cross-connection to provide test access at the F-End.
- SPLTEF — splits both directions of a two-way cross-connection to provide test access at both the E-End and the F-End. The SPLTEF mode requires a pair of 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:
Test access connections are considered secondary cross-connections. Therefore, the 60 ms switching time is not guaranteed in the event of a protection switch. In certain situations restoration of secondary cross-connections could be blocked.

NOTE:
The CONN-TACC command does not allow split or loopback test access on red-lined (RDLD) circuits. You must use the CHG-ACCMD command in conjunction with the CONN-TACC command to accomplish this (that is, establish a monitor test access connection and change it to a split or loop test access connection.

The port(s) used as the testport(s) for test access must be in the IDLE-REL (idle-released) or TPPV-REL (testport-provisioned-released) state.

Establishing DS1 Test Access Connections for DS1 Cross-Connections

This procedure is used to establish a DS1 test access connection for a DS1 cross-connection. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 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-ACCMD-T1 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 or RTRV-T1 command for the ports to be test accessed) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port(s) to be used as the testport(s) location:
   { {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 8-4), if necessary.

4. Establish a test access connection by entering the following command:

   `CONN-TACC-T1:`*[a]*`:`*b*`,`*c*`,:::`*[f]*`:`*[g]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port (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 or DS3 Interface Module.

NOTE:
If the E-End DS1 input port is mapped to exactly one DS1 output port, the output DS1 port becomes the current F-End DS1 output port for the test session. If the E-End DS1 input port is mapped to more than one DS1 output port (broadcast connection), the current F-End DS1 port defaults to the DS1 port that forms a two-way connection with the E-End DS1 input port.

f = Test mode: `{ MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF }`
Default: `MONE`
Specifies the test access mode.

g = Link association: **{ Y, N }**
Default: **Y** (yes, the test session is associated with the link)
Specifies whether the test session is to be associated with the link on which the **CONN-TACC-T1** command is given. When a test session is associated with a link, the test session is automatically released (if permitted by the current system state) on manual or autonomous logout. Manual logout is achieved through the **CANC-USER** command. Autonomous logout occurs on link failure, system reset, or expiration of the link's inactivity timer.

The following output response appears indicating completion of the **CONN-TACC-T1** command:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP;E-PORT,F-PORT,E-SIG,F-SIG,E-OMODE,F-OMODE,EF-STAT,FE-STAT */
   "m:n,o,..."
;
```

Where:

m = Test access port (TAP) location: {1-32}-{1-31}-{1-28}

n = E-END port location: {1-32}-{1-31}-{1-28}

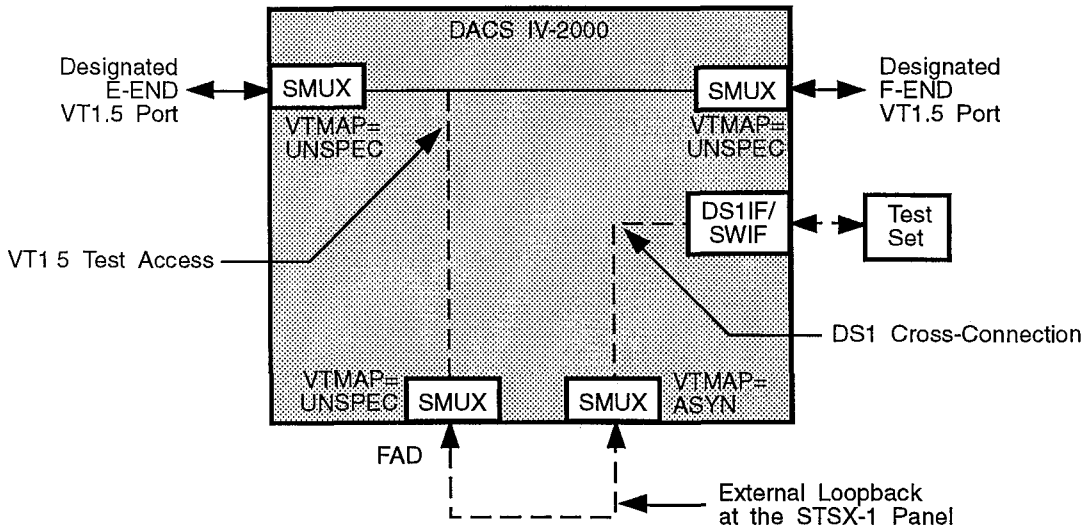
o = F-END port location: {1-32}-{1-31}-{1-28}

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 DS1 Test Access Connections for VT1.5 Cross-Connections

This procedure is used to establish a DS1 test access connection for a VT1.5 cross-connection. To establish the test access connection, an external loopback between two SMUX circuit packs, a DS1 cross-connection, and a VT1.5 test access session are required. Figure 9-8 shows the configuration necessary for testing the DS1 within the VT1.5 cross-connection between two SMUX circuit packs. For information on a typical test access session refer to the section titled "Performing a Typical Test Access Session" (page 9-2).



Note: For MONEF and SPLTEF test modes, two DS1 cross-connections are required (one for each FAD port).

Figure 9-8. **DS1 Test Access Connection for VT1.5 Cross-Connection**

1. Determine type of test access connection to make, FAD port to be used, assign E-End port to be used in the test access connection, SMUX circuit pack for external loopback to be used, and DS1 ports for test set connections.

   Normally a MONE connection is originally established for a test session, and other test access connections are entered by using the **CHG-ACCMD-VT1** command during the test access session [refer to the section titled "Performing a Typical Test Access Session" (page 9-2) for more information].

2. Determine if the VT1.5 ports (E-End, F-End, FADs, and gateway DS1 cross-connection) to be used are in the IDLE-REL state by entering the following command (one for each port, if necessary):

   RTRV-STATE-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port(s) to be used as the testport(s) location:
   { {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 state.

3. Provision the E-End, F-End, and FAD ports for a VT map of UNSPEC and provision the gateway VT1.5 port for a VT map of ASYN by referring to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-70) in Chapter 5.
4. Externally loop the SMUX circuit pack used for the FAD ports to the SMUX circuit pack used for the gateway VT1.5 ports at the STSX-1 panel.
5. Connect the test set(s) to the gateway DS1 ports (connection from DS1IF circuit packs).
6. Establish two-way DS1 cross-connections (one for each FAD port) from DS1 ports connected to the test sets to the gateway VT1.5 ports (SMUX looped to the SMUX containing the FAD ports) by referring to the section titled "Establishing DS1 One-Way and Two-Way Cross-Connections" (page 8-4) in Chapter 8.
7. Establish a two-way VT1.5 cross-connection between the designated E-End VT1.5 port and the designated F-End VT1.5 port using the section titled "Establishing VT1.5 One-Way and Two-Way Cross-Connections" (page 8-9), if necessary.

8. Establish a test access connection by entering the following command:

   CONN-TACC-VT1:*[a]*:*b*,*c*,*[d]*:::*[f]*:*[g]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port (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 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}-{1-15}-{1-28}

n = E-END port location: {1-32}-{1-15}-{1-28}

o = F-END port location: {1-32}-{1-15}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

9. Notify the appropriate personnel, according to office procedures, when the SMUX circuit packs are looped, the DS1 gateway cross-connection is established, and the VT1.5 test access connection is established. In addition, update your office records.

Establishing 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-ACCMD-EC1** 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 9-11).

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 8-6), 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}-{1-15}`
Specifies the E-End, which is the From port (input and output) of a cross-connection or an idle port for a test session. The STS-1 port is associated with an STS1 Interface Module.

NOTE:
If the E-End STS-1 input port is mapped to exactly one STS-1 output port, the output STS-1 port becomes the current F-End STS-1 output port for the test session. If the E-End STS-1 input port is mapped to more than one STS-1 output port (broadcast connection), the current F-End STS-1 port defaults to the STS-1 port that forms a two-way connection with the E-End STS-1 input port.

f = Test mode: `{ MONE, MONF, MONEF, SPLTA, SPLTB, SPLTE, SPLTF, SPLTEF, LOOPE, LOOPF }`
Default: `MONE`
Specifies the test access mode.

g = Link association: `{ Y, N }`
Default: `Y` (yes, the test session is associated with the link)
Specifies whether the test session is to be associated with the link on which the `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}-{1-15}

n = E-END port location: {1-32}-{1-15}

o = F-END port location: {1-32}-{1-15}

If the above response does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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-ACCMD-VT1** 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 9-12).

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 8-9), 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}-{1-15}-{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 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}-{1-15}-{1-28}

n = E-END port location: {1-32}-{1-15}-{1-28}

o = F-END port location: {1-32}-{1-15}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 9-31), "Changing STS-1 Test Access Mode" (page 9-33), or "Changing VT1.5 Test Access Mode" (page 9-35)] 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)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP DS1 port location: `{1-32}-{1-31}-{1-28}`
   Specifies the DS1 port used as the FAD.

   d = FAD DS1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the DS1 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END DS1 port location: {1-32}-{1-31}-{1-28}
Specifies the E-End DS1 port.

f = F-END DS1 port location: {1-32}-{1-31}-{1-28}
Specifies the F-End DS1 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

The test modes are divided into two groups: one-way test modes that use one 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 can not be changed with the **CHG-ACCMD-T1** command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the **DISC-TACC** command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

CHG-ACCMD-T1:*[a]*:*b*::*[d]*;

Where:

a = Target ID (optional)

b = DS1 port (TAP) location: **{1-32}-{1-31}-{1-28}**
Specifies the test access port (TAP), which is represented by the DS1 port being used as the FAD 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d, e, f, g, h"
;
```

   Where:

   c = TAP STS-1 port location: {1-32}-{1-15}
   Specifies the STS-1 port used as the FAD.

d = FAD STS-1 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
Specifies the STS-1 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END STS-1 port location: {1-32}-{1-15}
Specifies the E-End STS-1 port.

f = F-END STS-1 port location: {1-32}-{1-15}
Specifies the F-End STS-1 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

The test modes are divided into two groups: one-way test modes that use one 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 can not be changed with the **CHG-ACCMD-EC1** command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the **DISC-TACC** command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

CHG-ACCMD-EC1:*[a]*:*b*::*[d]*;

Where:

a = Target ID (optional)

b = STS-1 port (TAP) location: **{1-32}-{1-15}**
Specifies the test access port (TAP), which is represented by the STS-1 port being used as the FAD 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

Where:

c = TAP VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the STS-1 port used as the FAD.

d = FAD VT1.5 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
Specifies the VT1.5 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the E-End VT1.5 port.

f = F-END VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the F-End VT1.5 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-6} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

The test modes are divided into two groups: one-way test modes that use one 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 can not be changed with the **CHG-ACCMD-VT1** command from a one-way mode to a two-way mode or from a two-way mode to a one-way mode. To change from a one-way test mode to a two-way test mode, the test session must be released with the **DISC-TACC** command and reestablished with a two-way mode.

3. Change the test access mode for the test access connection by entering the following command:

CHG-ACCMD-VT1:*[a]*:*b*::*[d]*;

Where:

a = Target ID (optional)

b = VT1.5 port (TAP) location: **{1-32}-{1-15}-{1-28}**
Specifies the test access port (TAP), which is represented by the VT1.5 port being used as the FAD 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 9-37), "Changing STS-1 Test Access Parameters" (page 9-40), or "Changing VT1.5 Test Access Parameters" (page 9-42) to change the test access parameters.

Changing DS1 Test Access Parameters

This procedure is used to change parameters associated with a DS1 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   RTRV-TACC-T1:*[a]*;

   Where:

   a = Target ID (optional)

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

Where:

c = TAP DS1 port location: `{1-32}-{1-31}-{1-28}`
Specifies the DS1 port used as the FAD.

d = FAD DS1 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
Specifies the DS1 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END DS1 port location: `{1-32}-{1-31}-{1-28}`
Specifies the E-End DS1 port.

f = F-END DS1 port location: `{1-32}-{1-31}-{1-28}`
Specifies the F-End DS1 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-6} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

CHG-TACC-T1:*[a]*:*b*,*[c]*,*[d]*:::*[f]*:*[g]*:*[h]*;

Where:

a = Target ID (optional)

b = DS1 port (TAP) location: **{1-32}-{1-31}-{1-28}**
Specifies the test access port (TAP), which is represented by the DS1 port being used as the FAD for this test session. The DS1 port can be associated with a DS1 or DS3 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 or DS3 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 or DS3 Interface Module.

f = E-END output mode: { NORM, TERM, AIS, QRSS }
Specifies the new output mode of the E-End. If the E-End DS1 output port is idle, the value TERM cannot be given. If there is no QRSS (quasi-random signal source) provisioned, QRSS cannot be specified. If the test mode is SPLTF, SPLTEF, or LOOPF, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

- NORM — Normal (cross-connected data)
- TERM — Terminated (idle signal)
- AIS — Alarm indication signal (blue code)
- QRSS — Quasi-random signal

g = F-END output mode: { NORM, TERM, AIS, QRSS }
Specifies the new output mode of the F-End (if any). If the F-End DS1 output port is idle, the value TERM cannot be given. If there is no QRSS (quasi-random signal source) provisioned, QRSS cannot be specified. If the test mode is SPLTE, SPLTEF, or LOOPE, the output mode cannot be changed. If the parameter is omitted, it retains its current value.

h = Link association: { Y, N, CURVAL }
Default: CURVAL
Specifies whether the test session is to be associated with the link on which the CONN-TACC-T1 command is given. When 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP STS-1 port location: {1-32}-{1-15}
   Specifies the STS-1 port used as the FAD.

   d = FAD STS-1 port input and output state: { TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }
   Specifies the STS-1 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

   e = E-END STS-1 port location: {1-32}-{1-15}
   Specifies the E-End STS-1 port.

   f = F-END STS-1 port location: {1-32}-{1-15}
   Specifies the F-End STS-1 port.

g = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
Specifies the link the test session is associated with. CILINK-0-0 is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

CHG-TACC-EC1:*[a]*:*b*,*[c]*,*[d]*::*[f]*:*[g]*:*[h]*;

Where:

a = Target ID (optional)

b = STS-1 port (TAP) location: {1-32}-{1-15}
Specifies the test access port (TAP), which is represented by the STS-1 port being used as the FAD 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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause for the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, when the STS-1 test access parameters have been changed and update your office records.

Changing VT1.5 Test Access Parameters

This procedure is used to change parameters associated with a VT1.5 test access connection.

1. Obtain testport and parameter information from office records.
2. Before changing the parameters of a test access connection, determine test activity in the system by entering the following command:

   RTRV-TACC-VT1:*[a]*;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

Where:

c = TAP VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the STS-1 port used as the FAD.

d = FAD VT1.5 port input and output state: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
Specifies the VT1.5 port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the E-End VT1.5 port.

f = F-END VT1.5 port location: `{1-32}-{1-15}-{1-28}`
Specifies the F-End VT1.5 port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-6} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Change the parameters of the test access connection by entering the following command:

CHG-TACC-VT1:*[a]*:*b*,*[c]*,*[d]*:::*[f]*:*[g]*:*[h]*;

Where:

a = Target ID (optional)

b = VT1.5 port (TAP) location: **`{1-32}-{1-15}-{1-28}`**
Specifies the test access port (TAP), which is represented by the VT1.5 port being used as the FAD 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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 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)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* TAP:PORT-STATE,E-END,CURR-F-END,LINK,UID */
   "c:d,e,f,g,h"
;
```

   Where:

   c = TAP port location:
   DS1 port: `{1-32}-{1-31}-{1-28}`
   STS-1 port: `{1-32}-{1-15}`
   VT1.5 port: `{1-32}-{1-15}-{1-28}`
   Specifies the port used as the FAD.

   d = FAD port input and output state:
   DS1 port: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   STS-1 or VT1.5 port: `{ TP-MONE, TP-MONF, TP-SPLTA, TP-SPLTB, TP-SPLTE, TP-SPLTF, TP-LOOPE, TP-LOOPF, TP-MONEF, TP-SPLTEF, TPPV-REL, TPPV-MONE, TPPV-MONF, TPPV-SPLTA, TPPV-SPLTB, TPPV-SPLTE, TPPV-SPLTF, TPPV-LOOPE, TPPV-LOOPF, TPPV-MONEF, TPPV-SPLTEF }`
   Specifies the port currently used as the FAD. The second part of the state name indicates the test access mode or release state.

e = E-END port location:
DS1 port: `{1-32}-{1-31}-{1-28}`
STS-1 port: `{1-32}-{1-15}`
VT1.5 port: `{1-32}-{1-15}-{1-28}`
Specifies the E-End port.

f = F-END port location:
DS1 port: `{1-32}-{1-31}-{1-28}`
STS-1 port: `{1-32}-{1-15}`
VT1.5 port: `{1-32}-{1-15}-{1-28}`
Specifies the F-End port.

g = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-6} }`
Specifies the link the test session is associated with. `CILINK-0-0` is used to designate a test session that is not associated with any link, and is not subject to automatic release.

h = User ID: <1-10 UID legal characters>
Specifies the User ID the test session is associated with.

3. Remove a test access connection by entering the following command:

DISC-TACC:*[a]*:*b*;

Where:

a = Target ID (optional)

b = Port (TAP) location:

All DS1, 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 port, which is represented by the port that is being used as the FAD 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** command must be given to determine which test sessions were not released. Individual **DISC-TACC** commands can be given for each test session that was not released to determine the reason for the test session not being released.

Wait for connection completed message (COMPLD) to appear. If it does not appear, check to see that the command was entered correctly and re-enter the command. If the completed message is still not received, refer to the document titled *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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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Contents

Loopbacks

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This chapter consists of procedures required for establishing, disconnecting, inhibiting and allowing near-end and far-end DS1 and DS3 loopbacks and near-end STS-1 and VT1.5 loopbacks.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

For more information on loopbacks, refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700) or the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

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 and are not inhibited from loopbacks can be looped back. In addition to create a terminal loopback associated with an EC-1 port, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. Retrieve active signal type (DS1 ports within EC-1 ports) and port state information of the DS1 port to be looped back by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{1-32}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   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 5-70) or if another DS1 port is to be selected.

3. Determine if near-end loopbacks are inhibited by entering the following command:

   RTRV-COND-T1:*[a]*:*b*:::**INHDS1LPBK;**

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{1-32}-{1-31}-{1-28}**

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the DS1 port can be allowed to be looped back or if another DS1 port is to be selected. The DS1 port can be allowed to be looped back by using the section titled "Allowing DS1 Loopbacks" (page 10-11).

4. Create a near-end DS1 loopback by entering the following command:

   OPR-LPBK-T1:*[a]*:*b*:::**NEND:***e*:*[f]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

   f = Link association: **{ Y, N }**
   Default: **Y** (yes, the DS1 loopback is associated with the link).
   Specifies whether the DS1 loopback is associated with the link on which the **OPR-LPBK-T1** command is given. When a loopback is associated with a link the loopback is autonomously released (if permitted by the current state) on manual or autonomous logout. Man-

ual 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, that the DS1 loopback has been established and update your office records.

Releasing Near-End DS1 Loopbacks

This procedure is used to release near-end DS1 loopbacks.

1. Retrieve DS1 loopbacks by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

   A sample output i:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS1 port location: {1-32}-{1-31}-{1-28}

   e = Loopback state: { LPBKL, LPBKT, LPBKI, LPBKM, FLPBKM, LPBKF, NONE }
   The value NONE indicates no loopback is present on the specified DS1 port.

   f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
   Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

h = Inhibit state: { NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }
Specifies whether the loopback is inhibited.

2. Release the desired near-end DS1 loopback by entering the following command:

   RLS-LPBK-T1:*[a]*:*b*:::**NEND;**

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 is a DS1 tributary loopback (LPBKM). Far-end DS1 loopbacks are allowed for any of the remote multiplexer communication protocols (FEAC, TR9, and SBIT). Both MUX2 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 "Provisioning DS3 Facilities" (page 5-54) to provision the DS3 interface port(s). If the DS3 loopback state (parameter *y*) is not set to `NONE`, a loopback is already active. If there are no loopbacks active, continue with this procedure.

3. Determine if far-end loopbacks are inhibited by entering the following command:

   `RTRV-COND-T1:`*`[a]`*`:`***`b`**`:::INHDS1FLPBK;`**

   Where:

   a = Target ID (optional)

   b = DS1 port location: **`{1-32}-{1-31}-{1-28}`**

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from far-end loopbacks. Contact the system administrator or next level of support to determine if the DS1 port can be allowed to be looped back or if another DS1 port is to be selected. The DS1 port can be allowed to be looped back by using the section titled "Allowing DS1 Loopbacks" (page 10-11).

4. Create a far-end DS1 loopback by entering the following command:

   OPR-LPBK-T1:*[a]*:*b*:::**FEND:LPBKM:***[f]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

   f = Link association: **{ Y, N }** (for FEAC and TR9 remote multiplexers)
   Default: **Y** (yes, the DS1 loopback is associated with the link)
   Specifies whether the DS1 loopback is associated with the link on which the **OPR-LPBK-T1** command is given. When 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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

The COMPLD response signifies that the loopback request itself (not the action requested at the far-end) has completed.

When establishing a far-end loopback on a DS3 interface port provisioned for SBIT communications, there is a one to two minute delay between the **OPR-LPBK-T1** command completing (for a single loopback) and the actual loopback taking place at the remote end. During this time delay, the DACS IV-2000 denies any other remote request with the SABT error code. However, if the DS1 group is requested, the loopback is completed immediately.

Under TR-TSY-000009 protocol, confirmation of the loopback operation requested is not sent back to the near-end; verification is done through test equipment.

5. Notify far-end personnel that the DS1 loopback has been established and update your office records.

Releasing Far-End DS1 Loopbacks

This procedure is used to release far-end DS1 loopback(s).

1. Retrieve DS1 loopbacks by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }**

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS1 port location: {1-32}-{1-31}-{1-28}

   e = Loopback state: { LPBKL, LPBKT, LPBKI, LPBKM, FLPBKM, LPBKF, NONE }
   The value NONE indicates no loopback is present on the specified DS1 port.

   f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
   Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: { NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }
   Specifies whether the loopback is inhibited.

   The state LPBKF indicates that a far-end loopback was established by the DACS IV-2000. the state FLPBKM indicates a loopback was established in response to a far-end (remote multiplexer) command. Loopbacks established by the remote multiplexer using TR9 protocol can only be release by

the remote multiplexer. If you need to release a loopback established by the remote multiplexer (FLPBKM state) using TR9 protocol, go to Step 4. Otherwise, continue with Step 2.

2. Release the desired far-end DS1 loopback (LPBKF loopback state) by entering the following command:

   RLS-LPBK-T1:*[a]*:*b*:::FEND;**

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31}, UNIT-{1-32} }

NOTE:
This command is denied with the error code SARL if the loopback being release is in the FLPBKM state for remote multiplexers using TR9 protocol.

Wait for the connection completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify far-end personnel that the DS1 loopback has been released and update your office records. After updating your office records you are done with this procedure.

4. From office records, determine if the port indicating a FLPBKM loopback state is connected to a remote multiplexer using TR9 protocol.

   If the port is connected to a remote multiplexer using TR9 protocol, contact the far-end personnel and have them release the loopback.

   If the port is not connected to a remote multiplexer using TR9 protocol, connect a remote multiplexer using TR9 protocol to the port and have a loopback established by the remote multiplexer and released by the remote multiplexer.

5. After the DS1 loopback has been released update your office records.

Inhibiting DS1 Loopbacks

This procedure is used to inhibit DS1 ports from being looped back (near- and far-end). In addition, to inhibit a DS1 signal associated with a EC-1 port to be looped back, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. If the DS1 port is associated with a EC-1 port, retrieve the active signal type of the DS1 port by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{1-32}-{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:..."
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = Active signal type: { EC1, T1, VT1 }

   If the specified DS1 port is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 loopback can not be created. Therefore, the selected port cannot be used for DS1 operations and you are done with this procedure for the selected port.

3. Inhibit DS1 loopback by entering the following command:

   INH-LPBK-T1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {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].

   d = Loopback control: **{ NEND, FEND, BOTH }**
   Specifies what type of loopbacks are inhibited. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the DS1 port has been inhibited from loopbacks and update your office records.

Allowing DS1 Loopbacks

This procedure is used to allow DS1 ports to be looped back (near- and far-end). In addition, to allow a DS1 signal associated with a EC-1 port to be looped back, the Active Signal Type must be T1 (DS1 signal).

1. Obtain circuit provisioning information from office records.
2. If the DS1 port is associated with a EC-1 port, retrieve the active signal type of the DS1 port by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{1-32}-{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:..."
;
```

   Where:

   e = DS1 port location: {1-32}-{1-31}-{1-28}

   f = Active signal type: { EC1, T1, VT1 }

   If the specified DS1 port is associated with an SMUX circuit pack and the Active Signal Type is not T1, a DS1 loopback can not be created. Therefore, the selected port cannot be used for DS1 operations and you are done with this procedure for the selected port.

3. Allow DS1 loopback by entering the following command:

   ALW-LPBK-T1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: **{ {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].

   d = Loopback control: **{ NEND, FEND, BOTH }**
   Specifies what type of loopbacks are allowed. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the DS1 port has been allowed for loopbacks and update your office records.

DS3 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing DS3 loopbacks at the near-end or far-end.

Operating Near-End DS3 Loopbacks

This procedure is used to operate a DS3 line loopback on a specified DS3 interface port or a range of DS3 interface ports at the facility level on a DS3 interface circuit pack within the system. The following procedures can only be done using a MUX2 (AKM68 or AKM68B) 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. Determine if near-end loopbacks are inhibited by entering the following command:

   RTRV-COND-T3:*[a]*:*b*:::**INHDS3LPBK;**

   Where:

   a = Target ID (optional)

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

The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the DS3 port can be allowed to be looped back or if another DS3 port is to be selected. The DS3 port can be allowed to be looped back by using the section titled "Allowing DS3 Loopbacks" (page 10-20).

4. Create a near-end DS3 loopback by entering the following command:

   OPR-LPBK-T3:*[a]*:*b*:::**NEND**:*[e]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

5. Notify the appropriate personnel, according to office procedures, that the DS3 loopback has been established and update your office records.

Releasing Near-End DS3 Loopbacks

This procedure is used to release near-end DS3 loopback(s).

1. Retrieve DS3 loopbacks by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{1-31}, UNIT-{1-32} }**
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS3 port location: {1-32}-{1-31}

   e = Loopback state: { LPBKL, FLPBKL, LPBKF, NONE }
   The value NONE indicates no loopback is present on the specified DS3 port.

   f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
   Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: { NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }
   Specifies whether the loopback is inhibited.

2. Disconnect the desired near-end DS3 loopback by entering the following command:

   RLS-LPBK-T3:*[a]*:*b;*

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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=f,LSTATE=y,RMTMUXC=z>"
;
```

   Where:

   e = DS3 port location: {1-32}-{1-31}

   f = 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 5-54) to provision the

DS3 interface port(s). If the DS3 loopback state (parameter y) is not set to NONE, a loopback is already active. If there are no loopbacks (DS3 and its corresponding DS1s) active, continue with this procedure.

3. Determine if far-end loopbacks are inhibited by entering the following command:

   RTRV-COND-T3:*[a]*:*b*:::**INHDS3FLPBK;**

   Where:

   a = Target ID (optional)

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

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from far-end loopbacks. Contact the system administrator or next level of support to determine if the DS3 port can be allowed to be looped back or if another DS3 port is to be selected. The DS3 port can be allowed to be looped back by using the section titled "Allowing DS3 Loopbacks" (page 10-20).

4. Create a far-end DS3 loopback by entering the following command:

   OPR-LPBK-T3:*[a]*:*b*:::**FEND:***[e]***;**

   Where:

   a = Target ID (optional)

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

   e = Link association: **{ Y, N }**
   Default: **Y** (yes, the DS3 loopback is associated with the link)
   Specifies whether 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

   The COMPLD response signifies that the loopback request itself (not the action requested at the far-end) has completed. Under TR-TSY-000009 protocol, confirmation of the loopback operation requested is not sent back to the near-end; verification is done through test equipment.

5. Notify far-end personnel that the DS3 loopback has been established and update your office records.

Releasing Far-End DS3 Loopbacks

This procedure is used to release far-end DS3 loopback(s).

1. Retrieve DS3 loopbacks by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-32}-{1-31}, UNIT-{1-32} }`
   Specifies the DS3 interface port or all of the DS3 interface ports associated with the given interface module.

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

   Where:

   d = DS3 port location: `{1-32}-{1-31}`

   e = Loopback state: `{ LPBKL, FLPBKL, LPBKF, NONE }`
   The value `NONE` indicates no loopback is present on the specified DS3 port.

   f = Link ID location: `{ CILINK-0-0, CILINK-{1,2}-{1-6} }`
   Specifies the link the loopback is associated with. `CILINK-0-0` is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

   g = User ID: <1-10 UID legal characters>
   Specifies the User ID the loopback is associated with.

   h = Inhibit state: `{ NONE, BOTH, INHDS1LPBK, INHDS3FLPBK }`
   Specifies whether the loopback is inhibited.

   The state `LPBKF` indicates that a far-end loopback was established by the DACS IV-2000. the state `FLPBKL` indicates a loopback was established in response to a far-end (remote multiplexer) command.

2. Release the desired far-end DS3 loopback (LPBKF loopback state) by entering the following command:

   RLS-LPBK-T3:*[a]*:*b*:::**FEND**;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify far-end personnel that the DS3 loopback has been released and update your office records.

Inhibiting DS3 Loopbacks

This procedure is used to inhibit DS3 ports from being looped back (near- and far-end).

1. Obtain circuit provisioning information from office records.
2. Inhibit DS3 loopback by entering the following command:

   INH-LPBK-T3:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

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

   d = Loopback control: **{ NEND, FEND, BOTH }**
   Specifies what type of loopbacks are inhibited. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the DS3 port has been inhibited from loopbacks and update your office records.

Allowing DS3 Loopbacks

This procedure is used to allow DS3 ports to be looped back (near- and far-end).

1. Obtain circuit provisioning information from office records.
2. Allow DS3 loopback by entering the following command:

   ALW-LPBK-T3:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

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

   d = Loopback control: **{ NEND, FEND, BOTH }**
   Specifies what type of loopbacks are allowed. **NEND** specifies near-end loopbacks, **FEND** specifies far-end loopbacks, and **BOTH** specifies near- and far-end loopbacks.

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.
3. Notify the appropriate personnel, according to office procedures, that the DS3 port has been allowed for loopbacks and update your office records.

STS-1 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing STS-1 loopbacks at the near-end. For EC-1 ports configured in the VTFLOAT mode, only STS-1 line loopbacks (LPBKL) are allowed.

Operating Near-End STS-1 Loopbacks

This procedure is used to create a near-end STS-1 loopback. Only EC-1 ports in the IDLE-REL or MAP-REL state can be looped back. In addition, to create an STS-1 loopback the Active Signal Type must be EC1 (STS-1 signal) for the specified port.

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) to be looped back by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{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 5-70) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If the selected EC-1 port is not in the IDLE-REL or MAP-REL state (parameter *g*), contact the system administrator or next level of support for assistance in moving the selected EC-1 ports to the IDLE-REL or MAP-REL state or selecting an EC-1 port in the IDLE-REL or MAP-REL state.

4. Determine if near-end loopbacks are inhibited by entering the following command:

   RTRV-COND-EC1:*[a]*:*b*:::**INHEC1LPBK**;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{1-15}**

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the EC-1 port can be allowed to be looped back or if another EC-1 port is to be selected. The EC-1 port can be allowed to be looped back by using the section titled "Allowing STS-1 Loopbacks" (page 10-26).

5. Create a near-end STS-1 loopback by entering the following command:

   OPR-LPBK-EC1:*[a]*:*b*:::*e*:*[f]*;

   Where:

   a = Target ID (optional)

   b = STS-1 port location: { {1-32}-{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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

   f = Link association: { **Y**, **N** }
   Default: **Y** (yes, the STS-1 loopback is associated with the link)
   Specifies whether 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, that the STS-1 loopback has been established and update your office records.

Releasing Near-End STS-1 Loopbacks

This procedure is used to release near-end STS-1 loopback(s).

1. Retrieve STS-1 loopbacks by entering the following command:

   RTRV-LPBK-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = STS-1 port location: { {1-32}-{1-15}, UNIT-{1-32} }

A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

Where:

d = STS-1 port location: {1-32}-{1-15}

e = Loopback state: { LPBKL, LPBKT, NONE }
The value NONE indicates no loopback is present on the specified STS-1 port.

f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

g = User ID: <1-10 UID legal characters>
Specifies the User ID the loopback is associated with.

h = Inhibit state: { NONE, INHEC1LPBK }
Specifies whether the loopback is inhibited.

2. Release the desired near-end STS-1 loopback by entering the following command:

RLS-LPBK-EC1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = STS-1 port location: **{ {1-32}-{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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the STS-1 loopback has been released and update your office records.

Inhibiting STS-1 Loopbacks

This procedure is used to inhibit EC-1 ports from being looped back (near--end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{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:< ... >:i"
   ;
   ```

   Where:

   d = EC-1 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 EC1, an STS-1 loopback can not be created. Therefore, the selected port cannot be used for STS-1 operations and you are done with this procedure for the selected port.

3. Inhibit STS-1 loopback by entering the following command:

   INH-LPBK-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{ {1-32}-{1-15}, UNIT-{1-32} }**

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the EC-1 port has been inhibited from loopbacks and update your office records.

Allowing STS-1 Loopbacks

This procedure is used to allow EC-1 ports to be looped back (near-end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the EC-1 port (STS-1 signals) by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{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:< ... >:i"
   ;
   ```

   Where:

   d = EC-1 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 EC1, an STS-1 loopback can not be created. Therefore, the selected port cannot be used for STS-1 operations and you are done with this procedure for the selected port.

3. Allow STS-1 loopback by entering the following command:

   ALW-LPBK-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{ {1-32}-{1-15}, UNIT-{1-32} }**

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the EC-1 port has been allowed for loopbacks and update your office records.

VT1.5 Loopback Operations

The procedures in this section are used for creating, releasing, inhibiting, and allowing VT1.5 terminal (LPBKT) loopbacks at the near-end. Only VT1.5 tributaries of EC-1 ports that have an Active Signal Type of VT1 (VT1.5 signal) are allowed to 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}-{1-28}`

   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 5-70) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If the selected VT1.5 port is not in the IDLE-REL or MAP-REL state (parameter *g*), contact the system administrator or next level of support for assistance in moving the selected VT1.5 port to the IDLE-REL or MAP-REL state or selecting another VT1.5 port in the IDLE-REL or MAP-REL state.

4. Determine if near-end loopbacks are inhibited by entering the following command:

   RTRV-COND-VT1:*[a]*:*b*:::**INHVT1LPBK**;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{1-32}-{1-15}-{1-28}**

   The following output response occurs if the specified port is not inhibited:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
```

   If the above response is not output, the selected port is inhibited from near-end loopbacks. Contact the system administrator or next level of support to determine if the VT1.5 port can be allowed to be looped back or if another VT1.5 port is to be selected. The VT1.5 port can be allowed to be looped back by using the section titled "Allowing VT1.5 Loopbacks" (page 10-32).

5. Create a near-end VT1.5 loopback by entering the following command:

   OPR-LPBK-VT1:*[a]*:*b*:::*e*:*[f]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{ {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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703).

   Link association: **{ Y, N }**
   Default: **Y** (yes, the VT1.5 loopback is associated with the link)
   Specifies whether 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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

6. Notify the appropriate personnel, according to office procedures, that the VT1.5 loopback has been established and update your office records.

Releasing Near-End VT1.5 Loopbacks

This procedure is used to release near-end VT1.5 loopback(s).

1. Retrieve VT1.5 loopbacks by entering the following command:

   RTRV-LPBK-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{ {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
   /* PORT:LPBK-STATE,LINK,UID,INH-STATE */
   "d:e,f,g,h"
;
```

Where:

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

e = Loopback state: { LPBKT, NONE }
The value NONE indicates no loopback is present on the specified VT1.5 port.

f = Link ID location: { CILINK-0-0, CILINK-{1,2}-{1-6} }
Specifies the link the loopback is associated with. CILINK-0-0 is used to designate a loopback that is not associated with any link, and is not subject to automatic release.

g = User ID: <1-10 UID legal characters>
Specifies the User ID the loopback is associated with.

h = Inhibit state: { NONE, INHVT1LPBK }
Specifies whether the loopback is inhibited.

2. Release the desired near-end VT1.5 loopback by entering the following command:

RLS-LPBK-VT1:*[a]*:*b*;

Where:

a = Target ID (optional)

b = VT1.5 port location: **{ {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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

3. Notify the appropriate personnel, according to office procedures, that the VT1.5 loopback has been released and update your office records.

Inhibiting VT1.5 Loopbacks

This procedure is used to inhibit VT1.5 ports from being looped back (near-end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the VT1.5 port by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{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}-{1-28}

   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. Therefore, the selected port cannot be used for VT1.5 operations and you are done with this procedure for the selected port.

3. Inhibit VT1.5 loopback by entering the following command:

   INH-LPBK-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

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

   Wait for the completed message (COMPLD) to appear. If it does not appear, check that the command was entered correctly and re-enter the command. If the message is still not received, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the VT1.5 port has been inhibited from loopbacks and update your office records.

Allowing VT1.5 Loopbacks

This procedure is used to allow VT1.5 ports to be looped back (near-end).

1. Obtain circuit provisioning information from office records.
2. Retrieve the port configuration of the VT1.5 port by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **{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}-{1-28}

   i = Active signal type: { EC1, T1, VT1 }

   If the Active Signal Type (parameter *i*) for the port is not VT1, a VT1.5 loopback can not be created. Therefore, the selected port cannot be used for VT1.5 operations and you are done with this procedure for the selected port.

3. Allow VT1.5 loopback by entering the following command:

   ALW-LPBK-EC1:*[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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the cause of the denial, and re-enter the command or repeat the procedure as required.

4. Notify the appropriate personnel, according to office procedures, that the VT1.5 port has been allowed for loopbacks and update your office records.

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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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

For detailed information on performance monitoring, refer to the *DACS IV-2000 (256) Release 4.0 Reference Manual* (AT&T 365-340-700).

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 for DS1 PM" (page 5-45).

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 in Table 11-1 to set up your DS1 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings). For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 UC4 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 both PRI disk drives causes loss of the 7-day history of daily total DS1 performance monitoring data for all monitored DS1 facilities on the DACS IV-2000.

Any unused ports being monitored, either full-time or scanned, should be provisioned as unframed (UNF). Since whole DS1 interface groups or DS1 ports associated with MUXs can be monitored or scanned, there is the possibility of including unused ports. By not provisioning unused ports as UNF, the 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 11-7) "Setting DS1 Performance Monitoring Threshold Values" (page 11-10) and/or "Copying DS1 Performance Monitoring Threshold Values" (page 11-12) "Setting DS1 Facility Parameters" (page 11-15)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-6) [Short Accumulation Time and CRC-6 Errors] "Initializing Accumulated DS1 Performance Monitoring Data" (page 11-21)
Bridged-access full-time or manual camp-on — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-7) "Setting DS1 Facility Parameters" (page 11-15) "Establishing DS1 Manual Camp-on Performance Monitoring" (page 11-17) "Setting DS1 Performance Monitoring Threshold Values" (page 11-10) and/or "Copying DS1 Performance Monitoring Threshold Values" (page 11-12)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-6) [Short Accumulation Time and CRC-6 Errors] "Initializing Accumulated DS1 Performance Monitoring Data" (page 11-21) "Scheduling DS1 Performance Monitoring Reports" (page 11-22) "Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 11-24) "Allowing Scheduled DS1 Performance Monitoring Reports" (page 11-24) "Retrieving DS1 Performance Monitoring Report Schedule" (page 11-25)

Table continue on next page.

Table 11-1. DS1 Performance Monitoring Procedures (Continued)

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Bridged-access full-time or manual camp-on — using PMGR1 (AKM66) circuit packs [continued]		"Retrieving DS1 Performance Monitoring Data" (page 11-26) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-28)
Scan — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-7) "Setting DS1 Facility Parameters" (page 11-15) "Setting DS1 Scan Monitoring Threshold Values" (page 11-18) "Starting DS1 Scan Performance Monitoring" (page 11-19)	"Setting Network Element DS1 Performance Monitoring Parameters" (page 11-6) [Short Accumulation Time and CRC-6 Errors] "Initializing Accumulated DS1 Performance Monitoring Data" (page 11-21) "Scheduling DS1 Performance Monitoring Reports" (page 11-22) "Inhibiting Scheduled DS1 Performance Monitoring Reports" (page 11-24) "Allowing Scheduled DS3 Performance Monitoring Reports" (page 11-38) "Retrieving DS1 Performance Monitoring Report Schedule" (page 11-25) "Retrieving DS1 Performance Monitoring Data" (page 11-26) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-28)

Table continue on next page.

Table 11-1. **DS1 Performance Monitoring Procedures (Continued)**

Type of DS1 Performance Monitoring	Required Procedures	Optional Procedures
Automatic Camp-on — using PMGR1 (AKM66) circuit packs	"Verifying DS1 Equipment Parameters" (page 11-7) "Provisioning Automatic Camp-on Performance Monitoring DS1 Ports" (page 11-17)	"Retrieving DS1 Performance Monitoring Data" (page 11-26) "Copying DS1 Performance Monitoring Threshold Values" (page 11-12) "Retrieving Provisioned DS1 Performance Monitoring Configuration" (page 11-28)

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 (CRCERR) and short accumulation period (SHACCUM) parameters are the desired values by entering the following command:

   RTRV-NE:*[a]*;

   Where:

   a = Target ID (optional)

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "... ,CRCERR=t,SHACCUM=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]*:::::*[***CRCERR=***r*,**SHACCUM=***s]*;

   Where:

   a = Target ID (optional)

   r = Number of CRC-6 errors: **{0-19200}** (optional)

   s = Short accumulation period: **{ 15-MIN, 1-HR }** (optional)

3. If the value of SHACCUM was changed in Step 2, a system reset needs to be performed by entering the following command:

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

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

Where:

a = Target ID (optional)

The system takes about 30 minutes to reset. Refer to the section titled "Reset and Boot" (page 6-7) 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 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>::aa"
;
```

Where:

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

f = Provisioned circuit pack code name: `{ AKM50, AKM49, AKM66, INIT }`

g = Circuit pack code name: `{ AKM50, AKM49, AKM66, INVALID }`

aa = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If either the provisioned circuit pack code (parameter *f*) or the circuit pack code (parameter *g*) is `AKM49`, `AKM66`, or `INVALID`, refer to the section titled "Provisioning SWIF and DS1IF Circuit Packs" (page 5-31) to provision a SWIF2 (AKM50) circuit pack.

If the basic state (parameter *aa*) is `EQPD`, `PNDG`, or `AVAIL`, refer to the "Switch Interface (SWIF)" state diagram in the appendix on "State Diagrams" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the appropriate actions to provision the SWIF2 to the POS state.

Verifying PMGR1 Parameters

This procedure is used to set the DS1 performance monitoring parameters that 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>::aa"
;
```

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, INIT }

g = Circuit pack code name: { AKM66, AKM49, AKM50, AKM52, AKM68, INVALID }

q = Performance monitoring function: { PM, PM-SCAN }

aa = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 for DS1 PM" (page 5-45) to provision a PMGR1 (AKM66) circuit pack.

The performance monitoring function (parameter *q*) must be set to PM to be used for full-time, camp-on, and automatic camp-on performance monitoring or PM-SCAN for scan performance monitoring.

If the basic state (parameter *aa*) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 11-18). System-wide DS1 performance monitoring default thresholds can be changed using the values **SFPATH**, **ESFPATH**, and **LINE** for path parameters for super frame (SF) signals, path parameters for extended super frame (ESF) signals, and line parameters for SF, ESF, and unframed (UNFR) signals, respectively. Using the above values eliminates using individual DS1 ports to change all ports set to the default thresholds.

1. 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}, SFPATH, ESFPATH, LINE }
The values **SFPATH**, **ESFPATH**, and **LINE** are used to retrieve system-wide default thresholds for path parameters for SF signals, path parameters for ESF signals, and line parameters for SF, ESF, and UNFR signals, respectively. When using the above values, parameter d must be set to **ALL**.

d = Monitored parameter: refer to the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) 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}, SFPATH, ESFPATH, LINE }`

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 (256) Release 4.0 Quick Reference Job Aids* [AT&T 365-340-703] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual [AT&T 365-340-702] 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}, SFPATH, ESFPATH, LINE }**
   The DS1 port can be located in any interface module, including STS1 Interface-16 Modules. A DS1 port can be associated with an VT1.5 port as long as the VT1.5 port is configured for ASYNC (refer to the section titled "Configuring EC-1 Ports for STS-1/VT1.5/DS1 Operation" (page 5-70) for configuring EC-1/VT1.5 ports). The values **SFPATH**, **ESFPATH**, and **LINE** are used to set system-wide default thresholds for path parameters for SF signals, path parameters for ESF signals, and line parameters for SF, ESF, and UNFR signals, respectively.

   d = Monitored parameter: **{ CVL, ESL, SESL, CVP, ESP, BESP, SESP, OOFS, DM, UAS, SEFS, CSS }**

e = Threshold Level: `{0-134217728}`
Refer to the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for the default threshold levels.

f = Location: `{ NEND, FEND, ALL }` (optional)

g = Time Period: `{ 15-MIN, 1-HR, 1-DAY }`
The accumulation time period must match the short accumulation time set for the network element.

Copying DS1 Performance Monitoring Threshold Values

This procedure is used to copy DS1 performance monitoring parameter threshold values for dedicated full-time, bridged-access full-time, and camp-on performance monitoring from one DS1 port to another DS1 port or to a range of up to 28 DS1 ports. The following restrictions apply when copying threshold values:

- When copying far-end values, the far-end NTE of the destination ports must be the same as the far-end NTE of the source port.
- The framing format of the source DS1 port and the destination DS1 ports must be identical.
- Threshold settings on a DS1 port on a DS1IF circuit pack can only be copied to another DS1 port or range of DS1 ports that are on DS1IF circuit packs.
- Threshold settings on a DS1 port within a MUX or SMUX circuit pack can only be copied to another DS1 port or range of DS1 ports within MUX or SMUX circuit packs.
- A PMGR circuit pack cannot reside in any of the destination locations.
- The destination DS1 ports of SMUX circuit packs must have a active signal type of T1.

1. Retrieve the threshold values of the source DS1 port to obtain a record of the values being copied by entering the following command:

   `RTRV-TH-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{1-32}-{1-31}-{1-28}`

   d = Monitored parameter: refer to the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) 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 the settings of the source DS1 port and destination DS1 ports to be used by entering the following command:

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

Where:

a = Target ID (optional)

b = DS1 port location: **{ {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*) for the destination ports match those of the source port. If the values match, you do not need to perform Step 3.

If the active signal type (parameter *f*) for a given destination port is not T1, DS1 performance monitoring thresholds can not be copied for that destination port.

3. Edit the destination DS1 ports to match the parameters of the source DS1 port by entering the following command:

   `ED-T1:`*[a]*`:`*b*`::::[BERL=`*d*`,FMT=`*h*`,FENDNTE=`*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-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 5-70) in Chapter 5 for configuring EC-1/VT1.5 ports).

   d = BER threshold: `{ 3-9, CURVAL }`
   Initial system value: `3`

   h = DS1 signal format: `{ ESF, SF, UNF, CURVAL }`
   Initial system value: `UNF`

   i = Far-end notification: `{ ANSI, NOT-ANSI, CURVAL }`
   Initial system value: `NOT-ANSI`
   Set to `ANSI` if parameter *h* is set to `ESF`. Otherwise, set to `NOT-ANSI`.

   If a range of DS1GRPs or a UNIT is specified, this command can take up to 10 minutes to complete.

   When the DS1 signal format is changed on a SWIF2 circuit pack from UNF to ESF or SF, full-time performance monitoring is enabled on those DS1 signals.

4. Copy threshold values for the desired performance monitoring parameters by entering the following command:

   `CPY-TH-T1:`*[a]*`:`*b*`,`*c*`:::`*[e]*`,`*[f]*`;`

   Where:

   a = Target ID (optional)

   b = Source DS1 port location: `{1-32}-{1-31}-{1-28}`
   The source DS1 port can be located in any interface module, including STS1 Interface-16 Modules.

c = Destination DS1 port location(s): `{ {1-32}-{1-31}-{1-28}, DS1GRP-{1-32}-{1-31} }`
The destination DS1 port(s) 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 5-70) in Chapter 5 for configuring EC-1/VT1.5 ports).

e = Location: `{ NEND, FEND, ALL }` (optional)

f = Time period: `{ 15-MIN, 1-HR, 1-DAY, ALL }`
The accumulation time period must match the short accumulation time set for the network element.

Depending upon the number of ports to which threshold settings are being copied and the number of monitored parameters involved, the time required for this command to complete varies.

Setting DS1 Facility Parameters

This procedure is used to set the signal format, bit error rate threshold, and far-end network equipment type parameters needed for DS1 ports to be monitored.

1. Determine the settings of the DS1 port(s) to be monitored by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {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`

f = 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 *f*), 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=***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-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 5-70) in Chapter 5 for configuring EC-1/VT1.5 ports).

d = BER threshold: { 3-9, CURVAL }
Initial system value: 3

h = DS1 signal format: { **ESF, SF, UNF, CURVAL** }
Initial system value: **UNF**

i = Far-end notification: { **ANSI, NOT-ANSI, CURVAL** }
Initial system value: **NOT-ANSI**
Set to **ANSI** if parameter *h* is set to **ESF**. Otherwise, set to **NOT-ANSI**.

If a range of DS1GRPs or a UNIT is specified, this command can take up to 10 minutes to complete.

When the DS1 signal format is changed on a SWIF2 circuit pack from UNF to ESF or SF, full-time performance monitoring is enabled on those DS1 signals.

Establishing DS1 Manual Camp-on Performance Monitoring

This procedure establishes a bridged-access full-time or manual camp-on performance monitoring connection.

1. 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}`
   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 5-70) in Chapter 5 for configuring EC-1/VT1.5 ports).

   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 an automatic camp-on performance monitoring connection. Camp-on performance monitoring begins when BER or OOFS threshold values are exceeded.

1. Provision a DS1 port(s) on a PMGR1 circuit pack for an automatic camp-on monitoring port when a DS1 facility being scanned shows degraded service by entering the following command:

   `ENT-AUTOCMPN-T1:`*[a]*`:`*b*`::Y;`

   Where:

   a = Target ID (optional)

   b = Monitoring DS1 port (PMGR1 signal) location:
   `{1-32}-{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 11-10).

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 { CVP, ESP, SESP, OOFS, SEFS }

   g = Location: { NEND, FEND }

   h = DS1 signal format: { ESF, SF }

   i = Threshold value: 0-134217728

   j = Time period: { 15-MIN, 1-HR, 1-DAY }

   From the above output response, determine if the values are set to the desired levels for the various monitored parameters. If the values are set to the desired level, you do not need to perform Step 2.

2. Set the threshold values for the desired scan performance monitoring parameters by entering the following command:

   SET-SCANTH-NE:*[a]*:::*c*,*d*,*[e]*,*[f]*,*[g]*;

   Where:

   a = Target ID (optional)

   c = Monitored parameter: **{ CVP, ESP, SESP, OOFS, SESF }**

d = Threshold Level: `{0-134217728}`
Refer to the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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, NOVAL }`
   Default value: **NOVAL** (indicates not red-lined)
   Red-lined connections must be disconnected with red-lined specified.

Initializing Accumulated DS1 Performance Monitoring Data

This procedure is used to initialize DS1 performance monitoring accumulation registers. Under normal conditions it is not necessary to initialize accumulation registers before scheduling performance monitoring reports.

1. 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, CCS, ALL }`

   e = Monitored Value: `{0-134217728}`
   Refer to the *DACS IV-2000 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for the default threshold levels.

   f = Location: `{ NEND, FEND, ALL }`

   g = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
   The value entered must match the short accumulation time set for the network element.

   h = Monitored date: `{ {1-12}-{1-31}, CURVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are initialized.

   i = Monitored time: `{ {0-23}-{0,15,30,45}, CURVAL, ALL }`
   If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are initialized.

   If all the registers in a range are not initialized, instead of receiving a `COMPLD` *or* `DENY` *response, you receive a* `PRTL` *response.*

Scheduling DS1 Performance Monitoring Reports

This procedure is used to schedule DS1 performance monitoring reports. Up to 64 DS1 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports or 3600 report lines per hour) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one DS1 port within the same interface module (`UNIT`) or DS1 interface group (`DS1GRP`), using one schedule is much faster and more effective than scheduling individual DS1 ports. For example if all the DS1 ports associated with DS1GRP-15-5 are to be scheduled, the DS1 interface group DS1GRP-15-5 should be used instead of the 28 individual DS1 ports. Another example, if all 28 ports associated with DS1 interface groups DS1GRP-15-5 and DS1GRP-15-6, the interface module UNIT-15 should be used instead of the 56 individual DS1 ports or the 2 individual DS1 interface groups.

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, CCS, ALL }`

   h = Monitored level: `{0-134217728}-{UP,DN}`
   Specifying `UP` indicates the monitoring parameter with values equal to or greater than the specified level are reported. Specifying `DN` indicates the monitoring parameter with values equal to or less than the specified level are reported.

i = Location: `{ NEND, FEND }`

j = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
The value entered must match the short accumulation time set for the network element.

k = Time offset: `{0-7}-{0-23}-{0,15,30,45}`

No report is generated if there is no data to report, unless the monitored level is set to `0-UP`.

As the total number of reports scheduled approaches 128 or 3600 report lines per hour, this command can take up to 3 minutes to complete.

Canceling DS1 Performance Monitoring Reports

This procedure is used to cancel reporting of scheduled DS1 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-T1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {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. The accumulated data can still be accessed by the `RTRV-PM-T1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-T1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS1 port location: `{ {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 Report Schedule

This procedure is used to retrieve DS1 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {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.

NOTE:
DS1 performance monitoring data is collected by a SWIF2 or PMGR1 circuit pack. If a manual switch to protection is executed the data on the service SWIF2 circuit pack is not available to be retrieved. This data is available when a manual switch to working is executed if the service SWIF2 circuit pack is not bad or has not been removed. After switching back to working the performance monitoring data on the protection SWIF2 circuit pack is not available for retrieval. Performance monitoring data on PMGR1 circuit packs is lost when they fail or are extracted.

1. Retrieve DS1 performance monitoring data for the desired monitored port(s) by entering the following command:

   RTRV-PM-T1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,,*g*,*[h]*,*[i]*;

   Where:

   a = Target ID (optional)

   b = DS1 port location: { {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, CCS, 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 **DS1GRPs** *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 your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various DS3 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all DS3 performance monitoring functions.

The procedures are organized in a manner that allow you to use them as stand-alone (for individual functions) or in the order they appear to set up your DS3 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings).

For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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 (PMTYPE) and DS3 accumulation period (ACCUM) parameters are the desired values by entering the following command:

   RTRV-NE:*[a]*;

   Where:

   a = Target ID (optional)

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

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
   "... ,PMTYPE=v,ACCUM=w, ... "
;
```

Where:

v = DS3 performance monitoring type: { PSET#1, PSET#2, NONE }
PSET#1 indicates CB149 parameters, PSET#2 indicates TR820 parameters.

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

If the values set for DS3 performance monitoring type (parameter *v*) and DS3 accumulation period (parameter *w*) are the desired values, do not perform Steps 2 and 3.

2. Edit the DS3 performance monitoring network element parameters by entering the following command:

   ED-NE:*[a]*::::*[***PMTYPE=***v,*ACCUM=*w]*;**

   Where:

   a = Target ID (optional)

   v = DS3 performance monitoring type: { **PSET#1, PSET#2, NONE** }
   PSET#1 indicates CB149 parameters, **PSET#2** indicates TR820 parameters. Specifying **NONE** turns off DS3 performance monitoring. However, any bit error rate (BER) values are still active.

   w = DS3 accumulation period: { **15-MIN, 1-HR** }
   If **PSET#1** is specified for parameter *t*, **15-MIN** must be specified for this parameter.

3. If the DS3 performance monitoring type (PMTYPE) 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 6-7) 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 (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 = MUX2 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>::aa"
;
```

   Where:

   d = MUX circuit pack location: MUX-{1-32}-{1-31}

   f = Provisioned circuit pack code name: { AKM52, AKM68, INIT }

   g = Circuit pack code name: { AKM52, AKM68, INVALID }

   aa = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If either the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23) to provision a MUX2 (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 (AKM68B)" (page 14-73).

   If the basic state (parameter *aa*) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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: `{ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, 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 `{ BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES }`

   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 (256) Release 4.0 Quick Reference Job Aids* [AT&T 365-340-703] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual [AT&T 365-340-702] for PSET#1 (CB149) and PSET#2 (TR820) parameter monitored values and the default threshold values). If the values are set to the desired level, you do not need to perform Step 3.

3. Set the threshold values for the desired performance monitoring parameters by entering the following command:

   SET-TH-T3:*[a]*:*b*:::*d*,*e*,*[f]*,,*g*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: **{ {1-32}-{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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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=i,FMT=l>"
;
```

   Where:

   e = DS3 port location: {1-32}-{1-31}

   h = BER threshold value: 3-9

i = BER metric: { BPV, PTY, CP-BITS, FMA-BITS, FMN-BITS }

j = Signal format: { ASYNC, CBIT }

From the above response, determine if the values for bit error rate (parameter *f*), bit error rate metric (parameter *g*), and DS3 signal format (parameter *i*) are set to the desired level. If the values are set to the desired levels, you do not need to perform Step 2.

2. Edit the DS3 performance monitoring parameters of the DS3 port(s) to be monitored by entering the following command:

   ED-T3:*[a]*:*b*:::::[**BERL**=*d*,**BERM**=*f*,**DS3FORMAT**=*h*];

   Where:

   a = Target ID (optional)

   b = DS3 port location: { (1-32)-(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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

f = Location: `{ NEND, FEND, ALL }`

g = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
The value entered must match the DS3 accumulation time set for the network element.

h = Monitored date: `{ {1-12}-{1-31}, CURVAL, ALL }`
If `ALL` is specified (parameter *g* must be `1-DAY`), all the daily performance monitoring registers are initialized.

i = Monitored time: `{ {0-23}-{0,15,30,45}, CURVAL, ALL }`
If `ALL` is specified (parameter *g* must be `15-MIN` or `1-HR`), all the short accumulation period registers are initialized.

If all the registers in a range are not initialized, instead of receiving a COMPLD *or* DENY *response, you receive a* PRTL *response.*

Scheduling DS3 Performance Monitoring Reports

This procedure is used to schedule DS3 performance monitoring reports. Up to 64 DS3 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports or 3600 report lines per hour) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one DS3 port within the same interface module (`UNIT`), using one schedule is much faster and more effective than scheduling individual DS3 ports. For example if all the DS3 ports associated with the DS3 Interface Module in unit 31, UNIT-31 should be used instead of the 31 individual DS3 ports.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   `SCHED-PMREPT-T3:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`,`*[g]*`,`*[h]*`,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-32}-{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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

i = Location: `{ NEND, FEND }`

j = Time period: `{ 15-MIN, 1-HR, 1-DAY }`
The value entered must match the DS3 accumulation time set for the network element.

k = Time offset: `{0-7}-{0-23}-{0,15,30,45}`

No report is generated if there is no data to report, unless the monitored level is set to `0-UP`.

As the total number of reports scheduled approaches 128 or 3600 report lines per hour, this command can take up to 3 minutes to complete.

Canceling DS3 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled DS3 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-T3:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-32}-{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. The accumulated data can still be accessed by the `RTRV-PM-T3` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-T3:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-32}-{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 Report Schedule

This procedure is used to retrieve DS3 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3 port location: `{ {1-32}-{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 MUXP 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 MUXP 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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: { BEC, OOFS, TPA, TPB, TPC, UAS, CV, ES, SES, ALL }

l = Monitored value: 0-811987200

m = Validity: { COMPL, NA, PRTL }

n = Location: { NEND, FEND }

o = Time period: { 15-MIN, 1-HR, 1-DAY }

p = Monitored date: {1-12}-{1-31}

q = Monitored time: {0-23}-{0,15,30,45}

STS-1 Performance Monitoring Procedures

This section consists of procedures that allow you to provision and establish STS-1 performance monitoring, schedule STS-1 performance monitoring reports, and retrieve STS-1 performance monitoring information.

In order to use these procedures, your user login must have at least a PM (for performance monitoring) setting for your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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.

Enabling STS-1 Performance Monitoring Mode

This procedure is used to set the STS-1 performance monitoring mode. EC-1 facilities can be monitored for section, line, or path performance on a port by port basis.

1. Determine the STS-1 performance monitoring mode and mode types for the EC-1 facilities to be monitored by entering the following command:

   RTRV-PMMODE-EC1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { `{1-32}-{1-15}`, **UNIT-**`{1-32}` }

d = Location: **{ NEND, FEND, ALL }**

If the performance monitoring mode is turned off for all EC-1 facilities, the above command completes without any output lines. Otherwise, a sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:LOCN,MTYPE */
   "e:f,g"
;
```

Where:

e = EC-1 port location: { {1-32}-{1-15}, UNIT-{1-32} }

f = Location: { NEND, FEND }

g = STS-1 performance monitoring mode type: { S, L, P }
Where S is section, L is line, and P is path. More than one mode type per port can be combined on one output line with a single ampersands (for example, S&L).

If the performance monitoring mode and mode type for the selected ports are the desired mode and types, you are done with this procedure. Otherwise, go to Step 2.

2. Turn on the STS-1 performance mode and set the mode types for the EC-1 facilities to be monitored by entering the following command:

SET-PMMODE-EC1:*[a]*:*b*:::*[d]*,*[e]*,ON;

Where:

a = Target ID (optional)

b = EC-1 port location: **{ {1-32}-{1-15}, UNIT-{1-32} }**

d = Location: **{ NEND, FEND, ALL }**
Specifying **ALL** sets the mode type for the near-end and far-end.

e = STS-1 performance monitoring mode type: **{ S, L, P }**
Where **S** is section, **L** is line, and **P** is path. More than one mode type per port can be assigned with a single ampersands (for example, **S&L**).

Disabling STS-1 Performance Monitoring Mode

This procedure is used to disable the STS-1 performance monitoring mode. EC-1 facility monitoring can be disabled on a port by port basis.

1. Turn off the STS-1 performance mode for the EC-1 facilities that are no longer to be monitored by entering the following command:

   SET-PMMODE-EC1:*[a]*:*b*:::*[d]*,*[e]*,**OFF;**

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ {1-32}-{1-15}, UNIT-{1-32} }`

   d = Location: **{ NEND, FEND, ALL }**
   Specifying **ALL** sets the mode type for the near-end and far-end.

   e = STS-1 performance monitoring mode type: **{ S, L, P }**
   Where **S** is section, **L** is line, and **P** is path. More than one mode type per port can be assigned with a single ampersands (for example, **S&L**).

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>:...:aa"
;
```

   Where:

   d = SMUX circuit pack location: `SMUX-{1-32}-{1-15}`

   f = Provisioned circuit pack code name: `{ AKM84, INIT }`

   g = Circuit pack code name: `{ AKM84, INVALID }`

aa = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If either the circuit pack code (parameter *g*) is `INVALID`, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23) to provision an SMUX (AKM84) circuit pack.

If the basic state (parameter *aa*) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the appropriate actions to provision the SMUX 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 (256) Release 4.0 Quick Reference Job Aids* [AT&T 365-340-703] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual [AT&T 365-340-702] 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

   f = Location: { NEND, FEND, ALL }

   g = Time period: { 15-MIN, 1-DAY }

   h = Monitored date: { {1-12}-{1-31}, CURVAL, NOVAL, ALL }
   If ALL is specified (parameter *g* must be 1-DAY and parameter *i* must not be ALL), all the daily performance monitoring registers are initialized.

i = Monitored time: { {0-23}-{0,15,30,45}, CURVAL, NOVAL, ALL }
If **ALL** is specified (parameter *g* must be **15-MIN** and parameter *h* must be **NOVAL**), all the short accumulation period registers are initialized.

If all the registers in a range are not initialized, instead of receiving a COMPLD *or* DENY *response, you receive a* PRTL *response.*

Scheduling STS-1 Performance Monitoring Reports

This procedure is used to schedule STS-1 performance monitoring reports. Up to 64 STS-1 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports or 3600 report lines per hour) can be scheduled. Scheduling 64 reports can generate a large amount of output.

NOTE:
When scheduling reports for more than one STS-1 port within the same interface module (**UNIT**), using one schedule is much faster and more effective than scheduling individual STS-1 ports. For example if all the STS-1 ports associated with the STS1Interface Module in unit 31, UNIT-31 should be used instead of the 31 individual STS-1 ports.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-EC1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: { {1-32}-{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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

i = Location: `{ NEND, FEND }`

j = Time period: `{ 15-MIN, 1-DAY }`

k = Time offset: `{0-1}-{0-7}-{0,15,30,45}`
If the value of `1` is given for the first component (DAY), the value `0` must be given for the last two components (HR and MIN).

No report is generated if there is no data to report, unless the monitored level is set to `0-UP`.

As the total number of reports scheduled approaches 128 or 3600 report lines per hour, this command can take up to 3 minutes to complete.

Canceling STS-1 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled STS-1 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ {1-32}-{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. The accumulated data can still be accessed by the `RTRV-PM-EC1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-EC1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ {1-32}-{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 Report Schedule

This procedure is used to retrieve STS-1 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   `RTRV-PMSCHED-EC1:`*[a]*`:`*[b]*`;`

   Where:

   a = Target ID (optional)

b = EC-1 port location: **{ {1-32}-{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 SMUXP circuit pack is not available for retrieval.

1. Retrieve STS-1 performance monitoring data for the desired monitored port(s) by entering the following command:

   `RTRV-PM-EC1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,`*[f]*`,,`*g*`,`*[h]*`,`*[i]*`;`

   Where:

   a = Target ID (optional)

   b = EC-1 port location: `{ {1-32}-{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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 your user community functional category (UCFC). Depending on your user community authorization level (UCAL), you can perform various DS3 performance monitoring functions. For example, a UCFC/UCAL value of PM1 allows you to retrieve reports and parameter values only. A UCFC/UCAL value of PM5 allows you to perform all VT1.5 performance monitoring functions.

The procedures are organized in a manner that allow you to use them as stand-alone (for individual functions) or in the order they appear to set up your VT1.5 performance monitoring configuration (provided you have the necessary UCFC/UCAL settings).

For more information on the commands and their parameters, UCFC, and UCAL, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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**

Enabling VT1.5 Performance Monitoring Mode

This procedure is used to set the VT1.5 performance monitoring mode. VT1.5 facilities can be monitored for path performance on a port by port basis.

1. Determine the VT1.5 performance monitoring mode and mode types for the VT1.5 facilities to be monitored by entering the following command:

   RTRV-PMMODE-VT1:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

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

   d = Location: **NEND**

If the performance monitoring mode is turned off for all VT1.5 facilities, the above command completes without any output lines. Otherwise, a sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:LOCN,MTYPE */
   "e:NEND,P"
;
```

Where:

e = VT1.5 port location: { {1-32}-{1-15}-{1-28}, VT1GRP-{1-32}-{1-15}, UNIT-{1-32} }

If the performance monitoring mode and mode type for the selected ports are the desired mode and types, you are done with this procedure. Otherwise, go to Step 2.

2. Turn on the VT1.5 performance mode and set the mode types for the EC-1 facilities to be monitored by entering the following command:

   SET-PMMODE-VT1:*[a]*:*b*:::,,ON;**

   Where:

   a = Target ID (optional)

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

   Only near-end path performance can be monitored for VT1.5 facilities.

Disabling VT1.5 Performance Monitoring Mode

This procedure is used to disable the VT1.5 performance monitoring mode. VT1.5 facility monitoring can be disabled on a port by port basis.

1. Turn off the VT1.5 performance mode for the VT1.5 facilities that are no longer to be monitored by entering the following command:

   SET-PMMODE-VT1:*[a]*:*b*:::,,OFF;**

   Where:

   a = Target ID (optional)

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

   Only near-end path performance can be monitored for VT1.5 facilities.

Verifying VT1.5 Equipment State

This procedure is used to set the VT1.5 performance monitoring parameters that are associated with SMUX circuit packs. Any VT1.5 signal associated with an SMUX (AKM84) circuit pack can be monitored.

1. Verify the circuit pack code name is set to AKM84 and the basic state is ACT or POS of the SMUX circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = SMUX circuit pack location: **SMUX-{1-32}-{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>:...:aa"
;
```

   Where:

   d = SMUX circuit pack location: SMUX-{1-32}-{1-15}

   f = Provisioned circuit pack code name: { AKM84, INIT }

   g = Circuit pack code name: { AKM84, INVALID }

   x = Equipment state: valid states are listed in Table C-8 of the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

   If either the circuit pack code (parameter *g*) is INVALID, refer to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23) to provision an SMUX (AKM84) circuit pack.

   If the basic state (parameter *aa*) 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) to determine the appropriate actions to provision the SMUX to the POS state.

Setting VT1.5 Performance Monitoring Threshold Values

This procedure is used to set VT1.5 performance monitoring parameter threshold values. When any of the threshold values are exceeded a `REPT EVT VT1` message is output to the links with users with a UCFC for PM logged in. Performance monitoring data is not sent to a link if a printer is connected to the link.

1. Determine the threshold values for the desired parameters for performance monitoring by entering the following command:

   `RTRV-TH-VT1:`*`[a]:b:::[d],[e],[f];`*

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: **`{ {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 (256) Release 4.0 Quick Reference Job Aids* [AT&T 365-340-703] or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual [AT&T 365-340-702] 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

f = Location: **NEND**

g = Time period: { **15-MIN, 1-DAY** }

h = Monitored date: { {1-12}-{1-31}, **CURVAL, NOVAL, ALL** }
If **ALL** is specified (parameter *g* must be **1-DAY** and parameter *i* must not be **ALL**), all the daily performance monitoring registers are initialized.

i = Monitored time: { {0-23}-{0,15,30,45}, **CURVAL, NOVAL, ALL** }
If **ALL** is specified (parameter *g* must be **15-MIN** and parameter *h* must be **NOVAL**), all the short accumulation period registers are initialized.

If all the registers in a range are not initialized, instead of receiving a COMPLD *or* DENY *response, you receive a* PRTL *response.*

Scheduling VT1.5 Performance Monitoring Reports

This procedure is used to schedule VT1.5 performance monitoring reports. Up to 64 VT1.5 reports (or 128 total DS1, DS3, STS-1, and VT1.5 reports or 3600 report lines per hour) can be scheduled. Scheduling 64 reports can generate a large amount of output. Therefore, it is important to carefully plan report schedules.

NOTE:
When scheduling reports for more than one VT1.5 port within the same interface module (**UNIT**) or VT1.5 interface group (**VT1GRP**), using one schedule is much faster and more effective than scheduling individual VT1.5 ports. For example if all the VT1.5 ports associated with VT1GRP-31-5 are to be scheduled, the VT1.5 interface group VT1GRP-31-5 should be used instead of the 28 individual VT1.5 ports. Another example, if all 28 ports associated with VT1.5 interface groups VTS1GRP-31-5 and VT1GRP-31-6, the interface module UNIT-31 should be used instead of the 56 individual VT1.5 ports or the 2 individual VT1.5 interface groups.

1. Schedule or reschedule performance monitoring reports by entering the following command:

   SCHED-PMREPT-VT1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,*[g]*,*[h]*,*[i]*,,*j*,*[k]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: { {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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for default threshold levels.

   i = Location: NEND

   j = Time period: { 15-MIN, 1-DAY }

   k = Time offset: {0-1}-{0-7}-{0,15,30,45}
   If the value of 1 is given for the first component (DAY), the value 0 must be given for the last two components (HR and MIN).

   No report is generated if there is no data to report, unless the monitored level is set to 0-UP.

   As the total number of reports scheduled approaches 128 or 3600 report lines per hour, this command can take up to 3 minutes to complete.

Canceling VT1.5 Performance Monitoring Report Schedule

This procedure is used to cancel reporting of scheduled VT1.5 performance monitoring reports.

1. Cancel performance monitoring reports by entering the following command:

   `SCHED-PMREPT-VT1:`*[a]*`:`*b*`:::`*[d]*`,`*[e]*`,0,ALL,,`*[i]*`,,`*j*`,`*[k]*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: `{ {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. The accumulated data can still be accessed by the `RTRV-PM-VT1` command.

1. Inhibit scheduled performance monitoring reports by entering the following command:

   `INH-PMREPT-VT1:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: `{ {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 VT1.5 performance monitoring report schedule information.

1. Retrieve the performance monitoring report schedule by entering the following command:

   RTRV-PMSCHED-VT1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: { {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 SMUXP circuit pack is not available for retrieval.

1. Retrieve VT1.5 performance monitoring data for the desired monitored port(s) by entering the following command:

   RTRV-PM-VT1:*[a]*:*b*:::*[d]*,*[e]*,*[f]*,,*g*,*[h]*,*[i]*;

   Where:

   a = Target ID (optional)

   b = VT1.5 port location: { {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 (256) Release 4.0 Quick Reference Job Aids* (AT&T 365-340-703) or the appendix on "Monitored Parameters" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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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Contents

Alarms

12

This chapter consists of procedures required to clear critical, major, and minor alarms that occur in the DACS IV-2000.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

CAUTION:
When clearing alarms, only clear one alarm at a time and never extract more than one circuit pack at a time.

Alarm Types

There are three levels of alarms:

- Critical — Indicates a severe, service-affecting condition. You can set the threshold that activates this alarm (that is, a specific number of DS1/VT1.5 facility failures). You can also set the type of failure to monitor (that is, facility, equipment, or both).
- Major — Provided for all service-affecting failures, main or unit controller failures, and power supply failures. A main controller failure (one that causes loss of communications with the DACS IV-2000) initiates a main controller failure alarm indication in addition to the major alarm.
- Minor — Caused by failures, manual actions, and certain other abnormal conditions that are non-service-affecting.

The DACS IV-2000 provides for alarm indications and audible alarm cutoffs in several ways as shown in Table 12-1. Using the ACO switch (on the status panel or remotely) turns off the audible alarms. Contact closures for visual alarms remain on until the condition causing the alarm is corrected.

Detailed alarm information is provided in messages on the administrative links. In these messages there are two parameters that carry alarm information. These parameters are the alarm code and the alarm notification code. Table 12-2 lists the parameters for the various alarm levels.

Table 12-1. **DACS IV-2000 Alarm Indications/Switches**

Indicators/Switches	Frame	Office		
	Status Panel	Audible	Visual	Remote
CRITICAL indicator	X	X	X	X
MAJOR indicator	X	X	X	X
MINOR indicator	X	X	X	X
FAILURE (main controller failure) indicator	X		X	X
ACO indicator	X			
ACO switch	X			X
Remote ID (active whenever CRITICAL, MAJOR, MINOR, and FAILURE alarm indicators are active) indicator				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 status panel switch or remote 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 version 1 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 version 2 Synchronizer Module circuit packs and 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 provides autonomous messages (`REPT ALM`) that indicate a failure condition has occurred as well as when the failure condition clears for all equipment and facilities within the DACS IV-2000. In addition to the autonomous messages several commands exist that allow you to retrieve alarm, condition, and

state information. These commands and messages along with the remote alarm indicators provide for isolating failures from a remote maintenance center.

The section titled "Isolating Failures" (page 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 the Network Element" (page 5-5).

The following sections describe how critical alarms are activated and cleared based on the failure type setting in the **ED-NE** command.

Transmission Equipment (EQPT)

The failure type setting of EQPT (equipment) in the **ED-NE** command activates critical alarms (CR) associated with transmission equipment failure reported as a major alarm (MJ), service affecting (SA) condition. There is *no failure threshold* associated with equipment failures. In the event of a major, service affecting equipment failure, the DACS IV-2000 outputs a `REPT ALM COM` message and activates the critical alarm LED, audible alarm, and remote critical alarm indicators. Transmission equipment includes DS1, DS3, and STS1 interface circuit packs (DS1IFs, MUXs, and SMUXs), switch interface circuit packs (SWIFs), switch input/output circuit packs (SWIOs), switch center stage circuit packs (SWCSs), Synchronizer Module circuit packs (DPLLs, TBS3s, and DS1TXs), clock generator circuit packs (CLKGNs), and clock distributor circuit packs (CLKDRs).

Facility (FAC)

The failure type setting of FAC (facility) in the **ED-NE** command activates and clears critical alarms 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 alarm clears
  - — The DS1 port is changed to the NDRVN (non-driven) or INIT (initialized) state

- DS3 interface ports configured in the DS1 mode — only DS1 tributaries which are in the DRVN state contribute toward the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - — The DS3 facility alarm clears
  - — The DS3 port is changed to the NDRVN or INIT state
  - — The DS1 tributaries are disconnected
- DS3 interface ports (MUX3 circuit packs) configured in the CC mode with an DS3 cross-connection present — incoming facility failures result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - — The DS3 facility alarm clears
  - — The DS3 port is changed to the NDRVN or INIT state
  - — The DS3 cross-connection is disconnected
- VT1.5 interface ports — all major facility alarms result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - — The VT1.5 facility alarm clears
  - — The VT1.5 port is changed to the NDRVN (not-driven) or INIT (initialized) state
- STS1 interface ports not configured for STS1 Clear Channel (STS1cc) — only the VT1/DS1 tributaries that are cross-connected result in the critical alarm counter being incremented. The critical alarm counter is decremented when the following events occur:
  - — The STS1 facility alarm clears
  - — The STS1 port is changed to the NDRVN (not driven) or INIT (initialized state)
  - — The VT1/DS1 tributaries are disconnected
- STS1 interface ports configured for STS1 Clear Channel (STS1cc) with an STS1cc cross-connection present — incoming facility failures result in the critical alarm counter being incremented by 30. The critical alarm counter is decremented by 30 when the following events occur:
  - — The STS1 facility alarm clears
  - — The STS1 port is changed to the NDRVN or INIT state
  - — The STS1cc cross-connection is disconnected

When facility failures have reached the provisioned DS1 failure threshold, the system outputs a `REPT ALM COM` message and activates the critical alarm LED, audible alarm, and remote critical alarm indicators. Facility alarms that occur after

the system has entered the critical alarm state are reported by the REPT ALM T1, REPT ALM T2, or REPT ALM T3 messages. The system generates a critical alarm message or REPT ALM COM one time for facility related failures.

In the event that a facility has more than one type of alarm active at any given time, the critical alarm facility counter is incremented for each type of event. Likewise, if another event occurs which overrides all currently existing events, the counter is decreased by the number of events which were eliminated, and then increased by one. For example:

Initial Facility State: YELLOW alarm
Critical Alarm Counter: 1

Next Failure Encountered: T+BER detected on same facility
Critical Alarm Counter: 2

Next Failure Encountered: LOS detected on same facility
Critical Alarm Counter: 1 LOS overrides YELLOW and T+BER; therefore, the critical alarm counter is decremented 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 (CRITICAL LED lit and remote critical alarm indicator active) due to transmission equipment failures and the critical alarm facility threshold is reached, the system outputs a REPT ALM COM message with a CTYPE code of FAC and re-activates the audible alarm.
- If the system is currently in the critical alarm state (CRITICAL LED lit and remote critical alarm indicator active) due to facility failures and a major alarm, service affecting transmission equipment failure occurs. The system outputs a REPT ALM COM message with a CTYPE code of INT and re-activates the audible alarm.
- When critical alarms are eliminated, the last event that caused the system to come out of the critical alarm state is reported. For example, if the system had a critical alarm active due to transmission equipment and facility failures, and facility failures were eliminated so that the number of remaining facility failures is below the facility threshold, the system does not generate a critical alarm clear message. The system does not turn off the critical alarm LED and remote critical alarm indicators until the transmission equipment failures are eliminated. The audible alarm can be de-activated by pushing the ACO button or entering the OPR-ACO-ALL command. The REPT ALM COM message contains a CTYPE field that tells you what type of event caused the system to exit the critical alarm state (INT if transmission equipment related, and FAC if facility related).

Link Communication Availability

The following sections contain information of CILINK availability for specific frame and ECI circuit pack states.

Main Controller Failure Alarm (FAILURE) Active

When the main controller failure alarm becomes active (the FAILURE LED is lit and the remote main controller failure alarm is active), one of the following has occurred:

- The main controller failed (due to multiple failures) and cannot recover autonomously. Link communications is lost until failure is resolved.
- 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 or both of the following events:
  - — Both ECI circuit packs extracted or failed
  - — Both controller complexes (CPU/SSC/MTC) failed.

  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.
- 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. No commands are accepted until the side switch is completed.

  After the side switch is completed, all links are taken down (ending all login sessions) and immediately brought back into service (provided the associated ECI circuit pack is working), the main controller failure alarm indicators clear, and a minor alarm becomes active (if there are no critical or major alarms pending) for the failed control complex.

Single ECI Failure

When a single ECI circuit pack fails, a ECI circuit pack *restart* is initiated. Link communications is temporarily lost (approximately 2 minutes) during the *restart.* Depending on which ECI circuit pack fails, one of the following system response takes place:

- When the ECI circuit pack your terminal or X.25 network is connected to fails, communications with the frame is lost, the minor alarm indicators become active, an autonomous *call redirect* (X.25 networks supporting call

redirect only) to the working ECI circuit pack is started, and an autonomous restart of the working ECI circuit pack is performed. The restart of the working ECI circuit pack takes up to 2 minutes to complete.

When the restart is completed, the TTY1 link of the working ECI circuit pack is put into service and all login sessions are disconnected.

- When the ECI circuit pack your terminal or X.25 network is **not** connected to fails, the minor alarm indicators become active and the ECI circuit pack you are connected to is restarted. During the restart (up to 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 then brought back into service. That is, you must login again to access the system.

Major Alarms

Major alarms are caused by the following events:

- Blown primary fuse(s)
- Blown secondary fuses in Switch Power Module for fuses associated with SWIO or SWCS circuit packs
- Blown secondary fuses in Switch Power Module for fuses associated with CLKGN or SYNC circuit packs
- Power circuit pack failures
- Loss of -48 Vdc feeder (causes power circuit pack to alarm)
- Blown fuse(s) in the Redundant Controller Power Module (both PRI disk drive or active CC circuit packs affected)
- Main Controller (MC) failures (active or both CCs fails) or manual removal
- ECI circuit pack failure
- Both synchronizer sides fail
- DPLL, TBS3, DS1TX, and CLKGN circuit pack failures
- Both PRI disk drives fail
- Unit controller (UC) failures
- Interface circuit pack failures when active and not protected
- Protection switch failures
- Internal clock and signal failures associated with interface (MUX, SMUX, DS1IF, or SWIF), switch (SWIO or SWCS), and clock generator (CLKGN) circuit packs when active and not protected
- Fan assembly failure

- Fan filter replacement indicator (fan assemblies ED-9C130-30,G1 or ED-9C130-30,G2)
- Incoming DS1, DS3, STS-1, or VT1.5 signal failures when attributes are set to MJ

Minor Alarms

Minor alarms are caused by the following events:

- Internal clock and signal failures associated with interface (MUX, SMUX, DS1IF, or SWIF), switch (SWIO or SWCS), and clock generator (CLKGN) circuit packs when protected
- Blown secondary fuses in Switch Power Module for fuses associated with protected SWIO and SWCS circuit packs
- Interface circuit pack failures in an interface module when protected
- Blown fuse(s) in the Redundant Controller Power Module (one PRI disk drive, SEC disk drive, or stand-by CC circuit packs affected)
- Main Controller (MC) failures when only the stand-by CC fails
- BITS timing reference failures
- Single PRI or SEC disk drive failure
- CILINK failure (including OOS-PRTCL state)
- PMGR1 circuit pack failures
- Time of day clock failure (ECI alarm)
- Autonomous switch to protection is in progress
- Manual switch to protection is active
- Incoming DS1, DS3, STS-1, or VT1.5 signal failures when attributes are set to MN

Turning Off Audible Alarm

This procedure is used to turn off the audible alarm associated with a DACS IV-2000. This procedure does not clear other alarm indicators, and does not disable future alarms from sounding audibles. To clear failures, refer to the section titled "Isolating Failures."

1. Turn off the audible alarm by pushing the ACO button on the status panel or by entering the following command:

   `OPR-ACO-ALL:`*[a]*`;`

   Where:

   a = Target ID of frame with alarm(s)

   The green ACO LED on the status panel lights and the audible alarm is silenced.

Isolating Failures

The DACS IV-2000 provides compatible with Bell Communications Research's (Bellcore) Operations Systems/Intelligent Network Elements (OPS/INE), and Network Monitoring and Analysis (NMA) operations systems. Isolating failures can be done at a remote maintenance center by communicating with the DACS IV-2000, normally through an X.25 PAD network.

These procedures can be used by personnel at a remote maintenance center (through an X.25 PAD network) to clear and/or direct personnel at the frame to clear alarms or by personnel (using a 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 7-25), if necessary.)

NOTE:
When the active DPLL or TBS3 circuit pack fails or associated fuse fails, the DACS IV-2000 initiates a autonomous synchronizer switch. During this switch several REPT ALM, REPT SW, and REPT DBCHG messages are output indicating temporary alarm states of facilities and equipment and protection switches during the synchronizer switch. These alarms and protection switches clear once the standby synchronizer becomes active. After the series of messages you can enter the **RTRV-ALM-ALL** or **RTRV-ALM-EQPT** command to determine which synchronizer circuit pack has failed.

1. Check to see if the FAILURE alarm indicator (FAILURE LED on the status panel or remote main controller alarm indicator) is active.

   If the FAILURE alarm indicator is active and remains active for ten minutes, a hard failure has occurred and 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 and for ED-9C114-30 Fuse and Alarm Panel, check for and/or replace blown A1 and C1 fuses. Use the sections titled "Fuses in Redundant Controller Power Module" (page 12-94) and for ED-9C114-30 Fuse and Alarm Panel, "Primary Fuses" (page 12-71). Replacement fuses may be necessary (see fuse chart in the referenced procedure information).

   b. Check for and/or replace failed Redundant Controller PWRF and PWRG circuit pack(s) located in Redundant Controller Power Module. Use the section titled "Multiple Power Circuit Pack Failures in Redundant Controller Power Module" (page 12-91). 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 12-105). Replacement Redundant Controller circuit packs may be necessary (two CPU, two SSC, two MTC, two ECI, two SCI, and one UI circuit packs, refer to the *DACS IV-2000 Release 4.0 Quick Reference Job Aids* [AT&T 365-340-703] for circuit pack codes).

2. If you are logged in already, continue with Step 3; otherwise, log into the DACS IV-2000. Refer to the logging in procedures in Chapter 4, if necessary.

   If you can not log into the DACS IV-2000, refer to the section titled "Link Communication Failures" (page 12-29).

3. Verify that the alarm is on the DACS IV-2000 by entering the following command:

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

   Where:

   a = Target ID of frame with alarm(s)

   The following output response appears (any pertinent parameter shown):

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

   Where:

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

   d = Condition type: { FAC, INT, GP }
   The value GP is specified for major or minor alarms.

   e = Service affecting: { NSA, SA }

   The message returned from the above command indicates the highest alarm level on the frame (critical, major, or minor). In addition, the **RTRV-ALM-COM** command indicates if an equipment (INT) or facility (FAC) failure caused a critical alarm and if the highest alarm level is service affecting.

   If there is an alarm present on the frame, continue with Step 5. If the **RTRV-ALM-COM** command is denied with the SNVS error code, continue with Step 4.

   If the message does not contain a notification code (CR, MJ, or MN), there are no pending alarms for the specified DACS IV-2000. If this is the case, do not continue with this procedure for the specified system (Target ID).

4. Reset the system by entering the following command:

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

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

Where:

a = Target ID (optional)

The system takes up to 30 minutes to reset. For more information on booting the system refer to the section titled "Reset and Boot" (page 6-7).

After the main controller is in-service, return to Step 2.

5. Check for the number of active alarms and note the reported alarm levels for each alarm (on the output from the printer) by entering the following `RTRV` commands:

   - To determine all near-end alarms associated with the DACS IV-2000 frame:

     Near-end alarms:
     `RTRV-ALM-ALL:`*[a]*`;`

     Where:

     a = Target ID (optional)

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the `RTRV-ALM-ALL` response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

   - To determine all far-end alarms associated with remote multiplexers connected to MUX2 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;`
   `RTRV-COND-EQPT:`*[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, T3, and EQPT 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` or `RTRV-COND-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), or 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 Step 8.
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
ALLREFFAIL (all timing references failed)	SYNCN	"External Timing Reference (BITS) Failure" (page 12-133)	X	
BKUPMEMS (secondary non-volatile backup failure)	SEC	"CPY-MEM Command or Database Backup Failure" (page 13-8)	X	
CONTBUS (control bus failure)	SWCS SWIO	"Clearing CONTBUS Conditions" (page 12-124)	X	
DTLCH (data latch error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
EOR (end-of-range error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
EXJIT (excessive jitter)	SYNCPRI-{0,1} SYNCSEC-{0,1}} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
EXPHR (excessive phase error)	DPLL	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
EXTERR (error detected external to system)	CILINK-{1,2}-{1-6}	"Link Communication Protocol Failures (OOS-PRTCL)" (page 12-31)	X	X
FRD (security violation has occurred)	CILINK-{1,2}-{1-6}	"Link Communication Failures" (page 12-29)	X	X
FRQOF (frequency offset error)	SYNCPRI-{0,1} SYNCSEC-{0,1} TB (TBS3) TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	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
FSNLN (frequency synthesizer loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
FSTO (phase lock loop fast start time-out)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
ICTLR (interrupt controller error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
IHRER (interrupt holding register error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
IMPROPBLK (blank BXA circuit pack in wrong slot)	DS1IF DS1IP SWIF SWIF-P (protection) MUX MUXP SMUX SMUXP	"Clearing IMPROPBLK Conditions" (page 12-55)	X	X
IMPROPRMVL (circuit pack improperly extracted)	CLKDR CLKGN DS1IF DS1IP DS1RY MUX MUXP MUXPS MC circuit packs PWRA PWRE PWRF PWRG SMUX SMUXP	"Clearing IMPROPRMVL Conditions" (page 12-56)	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
IMPROPRMVL (circuit pack improperly extracted) [continued]	SWCS SWIF SWIF-P (protection) SWIO	"Clearing IMPROPRMVL Conditions" (page 12-56)	X	
INHSWPR (switch to protection equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWPR Conditions" (page 12-58)	X	X
INHSWWKG (switch to working equipment inhibited)	DS1IF MUX SMUX SWCS SWIF SWIO	"Clearing INHSWWKG Conditions" (page 12-58)	X	X
INT (internal hardware failure)	PWRA PWRE	"Primary Fuses" (page 12-71) for blown primary fuses and/or "Power Circuit Pack Failure" (page 12-81) for failed power circuit packs	X	
	PWRF PWRG	"Primary Fuses" (page 12-71) [ED-9C114-30 Fuse and Alarm Panel, fuses A1 and C1] and/or "Fuses in Redundant Controller Power Module" (page 12-94) for blown fuses and/or "Power Circuit Pack Failure" (page 12-81) for failed power circuit packs	X	
	CILINK-{1,2}-{1-6}	"Link Communication Protocol Failures (OOS-PRTCL)" (page 12-31)	X	X

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
Table continued on next page.				
INT (internal hardware failure) [continued]	SEC	"Minor Alarms Due to Redundant Controller Failure" (page 12-134) for blown fuses and/or "CPY-MEM Command or Database Backup Failure" (page 13-8) in Chapter 13 for other alarm conditions	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 12-94) for blown fuses, "Power Circuit Pack Failure" (page 12-81) for failed Redundant Controller power circuit packs, and/or "Redundant Controller Failure" (page 12-105) for circuit pack failure	X	
		Minor Alarms: "Minor Alarms Due to Redundant Controller Failure" (page 12-134)	X	
	CLKDR DS1IF MUX SMUX SWIF	"Primary Fuses" (page 12-71) for blown fuses in the alarm and Fuse and Alarm Panel, "Power Circuit Pack Failure" (page 12-81) for failed power circuit packs, and/or "Interface, Switch Module Circuit Pack Failures" (page 12-114) for failed interface module circuit packs	X	

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
Table continued on next page.				
INT (internal hardware failure) [continued]	CLKGN SWCS SWIO	"Primary Fuses" (page 12-71) for blown fuses in the alarm and Fuse and Alarm Panel, "Power Circuit Pack Failure" (page 12-81) for failed power circuit packs, "Secondary Fuses in Switch Power Module" (page 12-77) for blown Switch Module circuit pack fuses, and/or "Interface, Switch Module Circuit Pack Failures" (page 12-114) for failed SWIO and SWCS Module circuit packs	X	
	DS1IP DS1RY MUXP MUXPS SMUXP SWIF-P (protection)	"Primary Fuses" (page 12-71) for blown fuses in the alarm and Fuse and Alarm Panel, "Power Circuit Pack Failure" (page 12-81) for failed power circuit packs, and/or "Protection Circuit Pack Failures" (page 12-127) for failed protection switch circuit packs	X	
	UC	"Primary Fuses" (page 12-71) for blown fuses in the alarm and Fuse and Alarm Panel, "Power Circuit Pack Failure" (page 12-81) for power circuit packs, and/or "Unit Controller Failure" (page 12-113) for unit controller circuit pack failure	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
INT (internal hardware failure) [continued]	DPLL TB (TBS3) TX (DS1TX)	Critical alarm: "Critical Alarm Caused by Synchronizer Module Failure" (page 12-37) Major or Minor alarms: "Primary Fuses" (page 12-71) [ED-9C114-30 Fuse and Alarm Panel, fuses A1 and C1], "Fuses in Redundant Controller Power Module" (page 12-94), and/or "Secondary Fuses in Switch Power Module" (page 12-77) for blown synchronizer fuses or "Synchronizer Module Failure" (page 12-36)	X	
	DS3PM MUX (PMGR) SWIF (PMGR)	"PMGR1 and DS3PM Circuit Pack Failures" (page 12-138)	X	
	FAN	"Fan Assembly Failure" (page 12-129)	X	
LERDF (line error detector failure)	TX (DS1TX)	"DS1TX Circuit Pack Failure" (page 12-49)	X	X
LOS (loss of signal)	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
MAN (manual removal of equipment)	CC-0/CC-1 DS3PM MC PRI-1/PRI-2 SEC SYNC-0/SYNC-1 TX (DS1TX) UC	"Clearing MAN Conditions" (page 12-54)	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
OOF (out of frame)	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
PFLCH (phase/ frequency readable output latch error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
PHSTP (phase step error)	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
PSHLN (phase shifter output loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
RAMER (RAM error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
ROMER (ROM error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
RTV (real-time violation)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
SYNCCLK0 (Clock side 0 hardware failure)	SWCS SWIO CLKGN-0	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 12-125)	X	
SYNCCLK1 (Clock side 1 hardware failure)	SWCS SWIO CLKGN-1	"Clearing SYNCCLK0 and SYNCCLK1 Conditions" (page 12-125)	X	
SYNCFRNG (synchronizer has made a transition into free-running mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 12-49)	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
SYNCFST (synchronizer has made a transition into fast-start mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 12-49)	X	X
SYNCHLDOVR (synchronizer has made a transition into holdover mode)	SYNCN	"DS1TX Circuit Pack Failure" (page 12-49)	X	X
SYPLN (sync pulse generator loss of energy)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
TBCOLD (time base oven cold)	TB (TBS3)	"TBS3 Circuit Pack Failure" (page 12-46)	X	X
TBIOER (time base communication error)	TB (TBS3)	"TBS3 Circuit Pack Failure" (page 12-46)	X	
TBLEN (time base strobe loss of energy)	DPLL TB (TBS3) TX (DS1TX)	"Synchronizer Module Failure" (page 12-36)	X	
TBNDF (time base strobe energy detector failure)	TX (DS1TX)	"DS1TX Circuit Pack Failure" (page 12-49)	X	
TODC (time-of-day clock failure)	ECI-1/ECI-2	"Time of Day Clock Failure" (page 12-142)	X	X
TRBER (high bit error rate > 10^{-3})	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	X	X
TRMNBER (minor bit error rate > 10^{-6})	SYNCPRI-{0,1} SYNCSEC-{0,1} TX (DS1TX)	"External Timing Reference (BITS) Failure" (page 12-133)	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
URTER (UART error)	DPLL	"DPLL Circuit Pack Failure" (page 12-40)	X	
X1LEN (loss of energy on 1 ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
X3LEN (loss of energy on 30 ms synchronizer cross-couple)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XCOOL (synchronizer cross-couple out-of-lock error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XCRTV (synchronizer cross-couple real-time violation error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XCSUM (synchronizer cross-couple summary error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XFLRG (synchronizer cross-couple fast lock range error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XFQOF (synchronizer cross-couple frequency offset error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	
XLKDN (synchronizer cross-couple communication link error)	DPLL	"DPLL Timing Cross-Coupling Failure" (page 12-42)	X	

Table 12-5. Procedures for Far-End Equipment Condition (RTRV-ALM-EQPT or RTRV-COND-EQPT)

Condition Type	Equipment Location	Procedure to Use	Clear Alarm From	
			Frame	Remote
ACPWR (AC power failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-68)	X	X
COM (common equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-68)	X	X
DS1IF (DS1 interface equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-68)	X	X
MUX (multiplex equipment failure)	MUX (FEND)	"Remote Multiplexer Signal Failure" (page 12-68)	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 DS3FRMTMISMATCH, LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-60)	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 12-60)	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 12-68)	X	X
T+BER (bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-59)	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 12-68)	X	X
OOF (out of frame)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-60)	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
DS3FRMTMISMATCH (DS3 format mismatch) LSSIG (loss of signal) OOF (out of frame)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-60)	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 — MUX1) AISFRAMED (framed alarm indication signal detected — MUX2) AISUNFRAMED (unframed alarm indication signal detected — MUX2) ALLDS2SOOF (all DS2s in a DS3 signal are out of frame — MUX2) IDLE (idle signal detected — MUX2)	NEND	"Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions" (page 12-60)	X	X
T+BER (bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-59)	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 12-68)	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 12-60)	X	X
LOF (loss of frame) LOP (loss of pointer LOS (loss of signal) SLMF (signal label match failure)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-60)	X	X
T+BERL (line bit error rate threshold exceeded)	NEND	"Clearing T+BER and T+BERL Conditions" (page 12-59)	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 12-60)	X	X
LOP (loss of pointer)	NEND	"Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, LSSIG, OOF, or SLMF Conditions" (page 12-60)	X	X

Alarm Clearing Procedures

This section contains alarm clearing procedures referenced 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 can be lost due to:

- invalid login session setup attempts (FRD alarm condition, link lock-out)
- equipment failure (fuses [including those associated with CILINKs], power supplies, and Redundant Controller circuit packs)
- X.25 PAD network failures
- terminal/CILINK parameter mismatch
- 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 **ACT-USER** command is not accepted) and the 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. See the following note for alarms associated with the FRD condition.

NOTE:
Links can appear locked if the number of unsuccessful login attempts exceeds the provisioned number for the provisioned interval (FRD alarm condition). The link lockout is released when the provisioned lockout interval has elapsed. Information regarding security link parameters (including the UID causing the lock-out) can be retrieved using the **RTRV-SECU-LINK** command on a link that is not locked-out. Security link parameters can only be changed by superusers with the **ED-SECU-LINK** command. The FRD condition clears autonomously after the lock-out time (set by the **ED-SECU-LINK** command) has expired (that is, there is no alarm clearing procedure required for this condition). Refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for more information on security link parameters and superusers.

If the 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 1A fuses associated with the links. Two are located on FBF for ECI-1 and two on FBG for ECI-2. The fuse boards FBF and FBG are located in the Redundant Controller Power Module. If any one of these four fuses is blown, you can lose communications with the system. Perform the following procedure to replace blown fuses associated with CILINKs.

NOTE:
Failure of the +12V fuses for an ECI circuit pack can cause the output associated with the CILINKs to be garbled until the DACS IV-2000 starts the ECI restart process.

If there are alarms associated with ECI circuit packs (for example, blown 5A ECI fuses in FBF or FBG), 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 (1A ECI circuit pack fuses in fuse boards FBF and FBG. Use fuse tool (Part Number 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 as described in the section titled "Adding a Printer" (page 7-25). 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 7-25), if necessary.

Link Communication Protocol Failures (OOS-PRTCL)

Administration links (CILINKs) can go out of service due to protocol failures. These types of failures are caused by:

- Snider links — terminal and CILINK parameter mismatch, usually mismatches with flow control settings of the interface terminal.
- X.25 PAD links — external equipment to the DACS IV-2000 is improperly connected or the X.25 PAD network has failed.

Restoring proper protocol to the affected CILINK, in most cases, allows the CILINK to autonomously switch back to service allowing you to log in properly If you are still unable to log in, perform the following procedure:

1. Check to make sure all cables connected to the failed links are secure and have the correct adaptors (refer to office records and Table 1-5, if necessary).
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 12-35).
4. If all cables are connected properly, the link that is OOS-PRTCL may need to be removed and restored to service by performing the following procedure:

   a. Determine which CILINKs are OOS-PRTCL by entering the following command:

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

      Where:

      a = Target ID (optional)

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

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

Where:

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

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

From the above message, note the values of the link location (*d*) and state (*e*) parameters for each link.

b. Remove the failed link from service by entering the following command:

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

Where:

a = Target ID (optional)

b = Administrative link location: **`CILINK-{1,2}-{1-6}`**

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:

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

      Where:

      a = Target ID (optional)

      b = User ID: <1 to10 UID legal characters>

   b. Remove the failed link from service by entering the following command:

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

      Where:

      a = Target ID (optional)

      b = Administrative link location: `CILINK-{1,2}-{1-6}`

   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}**

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

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

   Where:

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

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

   If the link state (*e*) is IS, you are done with this procedure. If the link state is OOS-PRTCL, refer the problem to your system administrator or next level of support for assistance.

Recover From Loss of All CILINKs

CAUTION:
Only perform this procedure if directed 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 7-22), 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 6-7).

Synchronizer Module Failure

The procedures contained in this section are used to clear equipment failures associated with the Synchronizer Module circuit packs. For any failures due to external timing reference (BITS) failure (includes the alarm conditions, EXJIT, EXPHR, FRQOF, LOS, OOF, PHSTP, TRBER, and TRMNBER), go to the section titled "External Timing Reference (BITS) Failure" (page 12-134).

1. If a critical alarm (CR alarm notification in REPT ALM message or RTRV ALM response) is active due to Synchronizer (SYNC) Module failure, go to the next section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 12-37).
2. Check for blown fuses (perform the associated procedure to clear the blown fuse):
   - Fuses A1 and C1 in Fuse and Alarm Panel (ED-9C114-30), refer to the section titled "Primary Fuses" (page 12-71) to replace fuses.
   - +5.0V fuses in fuse board FBB-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - -5.0V fuses in fuse board FBD-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - SYNCF and SYNCG fuses in fuse board FBI, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94 to replace fuses.
3. If you replaced a fuse in Step 2, restore the SYNC 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 3 minutes 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 in the REPT ALM message or RTRV ALM response:
   - "DPLL Circuit Pack Failure" (page 12-41) — 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 12-44) — for alarm conditions, X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, and XLKDN.
- "TBS3 Circuit Pack Failure" (page 12-48) — for alarm conditions, INT (with equipment location of TB) and TBIOER.
- "DS1TX Circuit Pack Failure" (page 12-51) — for alarm conditions (associated with the equipment location TX), INT, LERDF, and TBNDF.
- "DS1TX Circuit Pack Failure" (page 12-51) — 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 12-36).

NOTE:
If the critical alarm associated with the synchronizer is caused by a power failure, the synchronizer will be autonomously restored when power is restored.

1. Notify the system administrator or next level of support that an unprotected failure of the Synchronizer Module has occurred (that is, both synchronizer sides have failed).

CAUTION:
Failure of both synchronizer sides can cause loss of system timing and synchronization. This can impact all cross-connections on the frame.

2. Check for blown fuses (perform the associated procedure to clear the blown fuse):
   - Fuses A1 and C1 in Fuse and Alarm Panel (ED-9C114-30), refer to the section titled "Primary Fuses" (page 12-71) to replace fuses.
   - +5.0V fuses in fuse board FBB-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.

- -5.0V fuses in fuse board FBD-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
- SYNCF and SYNCG fuses in fuse board FBI, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94 to replace fuses.

Wait a minimum of 5 minutes for the system to autonomously restore both synchronizer sides. If both synchronizer sides are restored, you are done with this procedure. If only one synchronizer side is autonomously restored, perform Steps 3 through 5 and Step 9. Otherwise, continue with Step 3.

3. Determine which Synchronizer Module circuit packs are in the OOS-FLT state by entering the following command for each type of equipment:

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

   Where:

   a = Target ID (optional)

   b = Equipment location: `[ DPLL-0&-1, TB-0&-1, TX-0&-1 ]`

   From the output responses, determine which circuit packs are in the OOS-FLT state. A sample output response is:

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

   Where:

   e = Equipment location: `{ DPLL-{0,1}, TB-{0,1}, TX-{0,1} }`

   f = State: `{ OOS-FLT, OOS-FEF, IS }`

4. Obtain necessary Synchronizer Module circuit packs of the same version for all circuit packs indicating an OOS-FLT state.
5. Replace all failed circuit packs with new circuit packs, one at a time. Refer to Chapter 2 for replacing circuit packs if necessary.

NOTE:
If two failed circuit packs are on the same synchronizer side and one is a DPLL circuit pack, replace the DPLL circuit pack first.

After extracting a circuit pack, attach alarm report.

6. Wait a minimum of 5 minutes for the system to autonomously restore both synchronizer sides. If both synchronizer sides are restored, you are done with this procedure. If only one synchronizer side is autonomously restored, go to Step 9. If neither synchronizer side is autonomously restored, continue with the next step.
7. Restore one synchronizer side by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to 3 minutes to complete. If you replaced a TBS3 circuit pack in Step 5, bit errors can occur for 30 minutes while the oscillator is warming up.

   If the restore fails, go to Step 9. Otherwise, continue with the next step.
8. If the DS1TX circuit pack associated with the synchronizer side just restored is still in the OOS-FLT state, restore the DS1TX circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: `TX-[0,1]`

   This command takes up to 1 minute to complete.

   Continue with the next step even if the restore fails.

   If the TBS3 circuit pack on this synchronizer side was replaced in Step 5, wait 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides can not be switched by software) before continuing this procedure.

9. Restore the other synchronizer side by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-{0,1}`

   This command takes up to 3 minutes to complete. If you replaced a TBS3 circuit pack in Step 5, bit errors can occur for 30 minutes while the oscillator is warming up.

   If the restore fails, contact your system administrator or next level of support for assistance in clearing the trouble. Otherwise, continue with the next step.

10. If the DS1TX circuit pack associated with the synchronizer side just restored is still in the OOS-FLT state, restore the DS1TX circuit pack by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-{0,1}`

    This command takes up to 1 minute to complete.

    If the TBS3 circuit pack on this synchronizer side was replaced in Step 5, wait 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides can not be switched by software) before continuing this procedure.

    If the restore fails, contact your system administrator or next level of support for assistance in clearing the trouble. Otherwise, continue with the next step.

11. If any alarm is present at this time, contact your system administrator or next level of support for assistance in clearing the trouble.

DPLL Circuit Pack Failure

This procedure is used to clear major alarms associated with DPLL circuit packs that are caused by the alarm conditions: DTLCH, FSNLN, FSTO, ICTLR, IHRER, INT, PFLCH, PSHLN, RAMER, ROMER, RTV, SYPLN, and URTER. If a critical alarm is active due to Synchronizer Module failure, go to the previous section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 12-37). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-36).

1. Determine which DPLL circuit packs is in the OOS-FLT or OOS-FEF state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:DPLL-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response, determine which DPLL circuit pack is in the OOS-FLT state:

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:STATE */
      "DPLL-0:f"
      "DPLL-1:f"
   ;
   ```

   Where:

   f = State: `{ OOS-FLT, OOS-FEF, ACT }`

   If the DPLL circuit pack is in the OOS-FEF state, the associated TBS3 circuit pack has failed [refer to the section titled "TBS3 Circuit Pack Failure" (page 12-48) to clear TBS3 circuit pack failures]. Otherwise, if the DPLL circuit pack is in the OOS-FLT state continue with Step 2.

2. Check for blown fuses (perform the associated procedure to clear the blown fuse):

   - Fuses A1 and C1 in Fuse and Alarm Panel (ED-9C114-30), refer to the section titled "Primary Fuses" (page 12-71) to replace fuses.
   - +5.0V fuses in fuse board FBB-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - -5.0V fuses in fuse board FBD-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - SYNCF and SYNCG fuses in fuse board FBI, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94 to replace fuses.

3. Restore the synchronizer side associated with the blown fuse to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to 3 minutes to complete.

   If the restore was successful you are done with this procedure, otherwise continue with Step 4.

4. Remove the synchronizer side associated with the failed DPLL circuit pack (OOS-FLT state) from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   The original alarm condition clears and a new alarm occurs with the condition set to `MAN`*.*

5. Obtain a diagnostic report for the DPLL circuit pack that failed by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

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

   Diagnostics take up to 15 minutes to complete. This report is used for further reference and/or trouble report generation.

6. Obtain a new DPLL circuit pack of the same version as the failed one.
7. Extract the failed DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
8. Install the new DPLL circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

9. Restore the synchronizer side removed in Step 4 by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to 3 minutes to complete.

10. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 9 (standby side) by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-[0,1]`

    This command takes up to 1 minute to complete. The DS1TX circuit pack is restored to the IS state.

11. Retrieve the state of the DPLL circuit pack associated with the synchronizer side restored in Step 9 by entering the following command:

    `RTRV-STATE-EQPT:`*[a]*`:DPLL-0&&-1;`

    Where:

    a = Target ID (optional)

    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, attach the alarm report to the DPLL circuit pack extracted in Step 7.

    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 following alarm conditions: X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, and XLKDN. If a critical alarm is active due to Synchronizer Module failure, go to the previous section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 12-37). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-36).

1. Determine which DPLL circuit pack 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: `{ STBY, OOS-FLT, ACT }`

2. Check for blown fuses (perform the associated procedure to clear the blown fuse):

   - Fuses A1 and C1 in Fuse and Alarm Panel (ED-9C114-30), refer to the section titled "Primary Fuses" (page 12-71) to replace fuses.
   - +5.0V fuses in fuse board FBB-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - -5.0V fuses in fuse board FBD-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - SYNCF and SYNCG fuses in fuse board FBI, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94 to replace fuses.

3. Restore the synchronizer side associated with the blown fuse to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer location: `SYNC-[0,1]`

   This command takes up to 3 minutes to complete. The synchronizer side is restored to the STBY state.

   If the restore was successful you are finished with this procedure. Otherwise, continue with Step 4.

4. Obtain a new DPLL circuit pack of the same version as the failed one.

5. Extract the failed DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and mark for later reference.

6. Install the new DPLL circuit pack obtained in Step 4 (referring to Chapter 2 for installing circuit packs, if necessary).

7. Restore the failed synchronizer side by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to 3 minute to complete.

   If the restore is successful, the alarm condition clears, the synchronizer side is restored to the STBY state, and the DS1TX circuit pack is autonolf the restore fails and there is no autonomous `REPT DGNDET EQPT` message indicating a diagnostic phase of 800, 1000, or 2000, there is a failure of another type. Go to the section "DPLL Circuit Pack Failure" (page 12-41).

   If the restore fails displaying an autonomous `REPT DGNDET EQPT` message indicating a diagnostic phase of 800, 1000, or 2000, or the restore succeeds but the DPLL circuit pack fails again, continue with the next step.

8. Restore the synchronizer side failed in Step 7 using the FRCD option by entering the following command to determine if the active DPLL circuit pack is causing the cross-couple failure:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to 3 minute to complete. The `OOS-FLT` *alarm condition clears.*

   The synchronizer sides switch and the original active side is autonomously removed to OOS-FLT with MJ, INT alarm messages. The DPLL2 and TBS32 circuit packs green ACT LEDs extinguish and the red ACT LEDs light.

   The restored side is now the active side and the DPLL2 and TBS32 circuit packs red ACT LEDs go out and the green ACT LEDs light.

   The SYNCN mode transitions from FRNG to FST to NORM.

   If the synchronizer does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with the next step.

9. If the DPLL circuit pack extracted in Step 5 is the same version as the DPLL circuit pack that is now the OOS-FLT DPLL circuit pack, it can be used as the replacement circuit pack in this procedure. Otherwise, obtain a DPLL circuit pack of the same version as the active DPLL circuit pack.

10. Extract the OOS-FLT DPLL circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and mark for later reference.

11. Install the DPLL circuit pack obtained in Step 9 (referring to Chapter 2 for installing circuit packs, if necessary).

12. Restore the synchronizer side that was autonomously removed in Step 8 by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Synchronizer side location: `SYNC-[0,1]`

    This command takes up to 3 minute to complete. The `INT` *alarm condition clears.*

    If the restore is successful, the alarm condition clears, the synchronizer side is restored to the STBY state, and the DS1TX circuit pack is autonomously restored to the IS state.

If the restore fails displaying an autonomous REPT DGNDET EQPT message indicating a diagnostic phase 800, 1000, or 2000, contact your system administrator or next level of support for assistance before continuing this procedure.

If the restore fails and there is no autonomous REPT DGNET EQPT message indicating a diagnostic phase 800, 1000, or 2000, this indicates an other type failure. Go to the section "DPLL Circuit Pack Failure" (page 12-41). Otherwise, continue with the next step.

13. Retrieve the alarm state of the DPLL circuit pack installed in Step 11 by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = DPLL circuit pack location: DPLL-{0,1}

    If the INT alarm has cleared, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

    Attach the alarm report to the DPLL circuit pack extracted in Step 10 and you are done with this procedure, otherwise continue with this step.

    If the restore is successful and the DPLL circuit pack fails again, the following output response appears (only pertinent parameters are shown):

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

    Where:

    h = DPLL circuit pack location: DPLL-{0,1}

    j = Alarm condition type: { X1LEN, X3LEN, XCOOL, XCRTV, XCSUM, XFLRG, XFQOF, XLKDN, DTLCH, EOR, EXPHR, FSNLN, FSTO, ICTLR, IHRER, INT, PFLCH, PSHLN, RAMER, ROMER, RTV, SYPLN, TBLEN, URTER }

    If any of the alarm conditions that start with the letter X appear, contact your system administrator or next level of support for assistance in clearing the failure. Otherwise, go to the section titled "DPLL Circuit Pack Failure" (page 12-41).

TBS3 Circuit Pack Failure

This procedure is used to clear major alarms associated with TBS3 circuit packs that are caused by the alarm conditions: INT, TBIOER, and TBLEN. 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 12-37). If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-36).

1. Check for blown fuses (perform the associated procedure to clear the blown fuse):
   - Fuses A1 and C1 in Fuse and Alarm Panel (ED-9C114-30), refer to the section titled "Primary Fuses" (page 12-71) to replace fuses.
   - +5.0V fuses in fuse board FBB-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - -5.0V fuses in fuse board FBD-4 (locations P and N), refer to the section titled "Secondary Fuses in Switch Power Module" (page 12-77) to replace fuses.
   - SYNCF and SYNCG fuses in fuse board FBI, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94 to replace fuses.
2. Determine which TBS3 circuit packs is in the OOS-FLT or OOS-FEF state by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:TB-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response, determine which TBS3 circuit pack is in the OOS-FLT state:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "TB-0:f"
   "TB-1:f"
;
```

   Where:

   f = State: `[ OOS-FLT, OOS-FEF, ACT ]`

   If the TBS3 circuit pack is in the OOS-FEF state, the associated DPLL circuit pack has failed [refer to the section titled "DPLL Circuit Pack Failure" (page 12-41) to clear DPLL circuit pack failures]. Otherwise, if the TBS3 circuit pack is in the OOS-FLT state continue with Step 3.

3. Remove the synchronizer side associated with the failed TBS3 circuit pack (OOS-FLT state) from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

4. Obtain a new TBS3 circuit pack of the same version as the failed one.
5. Extract the failed TBS3 circuit pack (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.
6. Install the new TBS3 circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).
7. If version 2 synchronizer circuit packs are installed, go to Step 8. Otherwise (for version 1 synchronizer circuit packs), perform the following procedure:
   a. Extract the DPLL1 circuit pack associated with the TBS31 circuit pack installed in Step 6. Refer to Chapter 2 for extracting circuit packs, if necessary.
   b. Reinstall the DPLL1 circuit pack extracted in Step 7a (refer to Chapter 2 for installing circuit packs, if necessary). The extraction and reinstallation of the DPLL1 circuit pack after replacing the TBS31 circuit pack allows the DPLL1 circuit pack to re-establish the linkage between the DPLL1 and the TBS31 circuit packs.
8. Restore the synchronizer side removed in Step 3 by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Synchronizer side location: `SYNC-[0,1]`

   This command takes up to 3 minutes to complete. It takes 30 minutes for the TBS3 circuit pack to temperature stabilize (the synchronizer remains in fast mode for 30 minutes and synchronizer sides can not be switched by software).

9. Retrieve the state of the TBS3 circuit pack of the synchronizer side restored in Step 9 by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = TBS3 circuit pack location: `TB-[0,1]`

   From the following output response, determine the state of the new TBS3 circuit pack:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "TB-0:f"
    "TB-1:f"
;
```

   Where:

   f = State: `[ OOS-FLT, STBY ]`

   The state of the new TBS3 circuit pack is `STBY`. If the state of the new TBS3 circuit packs is `OOS-FLT`, contact your system administrator or next level of support for assistance in clearing the trouble.

10. Restore the DS1TX circuit pack associated with the synchronizer side restored in Step 9 by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-[0,1]`

    This command takes up to 1 minute to complete.

DS1TX Circuit Pack Failure

This procedure is used to clear minor alarms associated with DS1TX circuit packs (indicated by TX as the equipment location) or alarms associated with synchronizer mode switches (indicated by SYNCN as the equipment location) that are caused by the alarm conditions INT, LERDF, TBLEN, TBNDF, SYNCFRNG, SYNCFST, or SYNCHLDOVR. If a critical alarm is active due to Synchronizer Module failure, go to the section titled "Critical Alarm Caused by Synchronizer Module Failure" (page 12-37) earlier in this chapter. If the alarm is caused by any other alarm condition, go to the section titled "Synchronizer Module Failure" (page 12-36).

1. If the alarm condition causing the alarm is SYNCFRNG, SYNCFST, or SYNCHLDOVR, retrieve the alarm state of SYNCN to determine if all timing references have failed by entering the following command:

   `RTRV-ALM-EQPT:`*[a]*`:SYNCN:::,ALL;`

   Where:

   a = Target ID (optional)

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

   ```
      TID YY-MM-DD HH:MM:SS
   M  CTAG COMPLD
      /* LOC:NTFCNCDE,CTYPE,SRVERR,,,LOCN */
      "SYNCN:...,j,..."
   ;
   ```

   Where:

   j = Alarm condition type: { ALLREFFAIL, SYNCFRNG, SYNCFST, SYNCHLDOVR }

   If the alarm condition ALLREFFAIL appears, do not continue with this procedure, but instead refer to the section titled "External Timing Reference (BITS) Failure" (page 12-134).

2. If the alarm condition causing the alarm is INT, TBLEN, or TBNDF, continue with Step 3. Otherwise, refer to the section titled "External Timing Reference (BITS) Failure" (page 12-134). If after ensuring the BITS references are good and the alarm did not clear, continue with Step 3. If the LERDF alarm cleared, you are done with this procedure.

3. Determine which DS1TX circuit pack (TX) is in the OOS-FLT state by entering the following command for each DS1TX circuit pack:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: `TX-{0,1}`

   From the following output response, determine which TX is in the OOS-FLT state:

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

   Where:

   e = Timing extractor port location: `TX-{0,1}`

   f = State: `{ OOS-FLT, ACT }`

4. Determine which synchronizer side is active (ACT state) and which is standby (STBY state) by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:SYNC-0&-1;`

   Where:

   a = Target ID (optional)

   From the following output response (for this procedure only pertinent parameters are shown), determine which synchronizer side is in the ACT state and in the STBY state:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "SYNC-1:f"
;
```

   Where:

   f = State: `{ ACT, STBY }`

5. If both DS1TX circuit packs indicate an OOS-FLT state remove the DS1TX circuit pack associated with the active synchronizer side, or if only the DS1TX circuit pack that is in the OOS-FLT state is associated with the standby synchronizer side, remove the DS1TX circuit pack by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port locations: `TX-[0,1]`

   The original alarm condition clears and a new alarm occurs with the condition set to `MAN`.

6. Obtain a new DS1TX circuit pack of the same version as the failed one.

7. Extract the DS1TX circuit pack removed in Step 5 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

8. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

9. Restore the DS1TX circuit pack removed in Step 5 by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = Timing extractor port location: `TX-[0,1]`

   This command takes up to 1 minute to complete.

   If an alarm remains that is associated with the DS1TX circuit pack installed in Step 8, and it is the only DS1TX circuit pack that is in the OOS-FLT state, contact your system administrator or next level of support for assistance in clearing the trouble.

   If the DS1TX circuit pack associated with the standby synchronizer side was in the OOS-FLT state, you are done with this procedure. Otherwise continue with Step 10..

10. Remove the DS1TX circuit pack associated with the standby synchronizer side:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-[0,1]`

    The original alarm condition clears and a new alarm occurs with the condition set to MAN.

11. Obtain a new DS1TX circuit pack of the same version as the failed one.

12. Extract the DS1TX circuit pack removed in Step 10 (referring to Chapter 2 for extracting circuit packs, if necessary) and attach the alarm report to it.

13. Install the new DS1TX circuit pack (referring to Chapter 2 for installing circuit packs, if necessary).

14. Restore the DS1TX circuit pack removed in Step 10 by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Timing extractor port location: `TX-[0,1]`

    This command takes up to 1 minute to complete.

    If alarm remains that is associated with the DS1TX circuit packs installed in Step 8 or Step 13, 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 6-17) 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]*:SYNCN;**

   Where:

   a = Target ID (optional)

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

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

   Where:

   j = Alarm condition type: { SYNCFRNG, SYNCFST, SYNCHLDOVR }

   The above alarm condition types indicate the following states:

   - SYNCFRNG — Synchronizer Module is not provisioned
   - SYNCFST — Synchronizer Module is in the process of phase-locking the timing reference
   - SYNCHLDOVR — Synchronizer Module is operating in the holdover mode due to failure of external timing reference (BITS) failure or manual switch for maintenance of BITS timing source.

2. Contact your system administrator or next level of support to determine why the above condition 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 5-20)], wait for the Synchronizer Module to phase-lock onto the BITS timing source, or clear BITS failures ["External Timing Reference (BITS) Failure" (page 12-133)].

Clearing MAN Conditions

The condition type MAN occurs when the **RMV-EQPT** command is used to remove equipment from service. To clear this condition, use the following procedure.

1. If necessary, retrieve the locations of the equipment in alarm by entering the following command:

   RTRV-ALM-EQPT:*[a]*:ALL:::,MAN;**

   Where:

   a = Target ID (optional)

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

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

   Where:

   h = Equipment location: { MC, CC-{0,1}, PRI-{1,2}, SEC, UC-{1-32}, SYNC-{0,1}, TX-{0,1}, DS3PM-{1-32} }

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, UC-{1-32}, SYNC-{0,1}, TX-{0,1}, 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 5-89) for DS1IF, "Deprovisioning SWIF Circuit Packs" (page 5-91) for SWIF, or "Deprovisioning MUX or SMUX Circuit Packs" (page 5-93) for MUX and SMUX).

Clearing IMPROPRMVL Conditions

The condition type IMPROPRMVL indicates that a circuit pack has been physically extracted from its slot. To clear this condition, perform the following procedure.

1. If necessary, retrieve the location of the equipment in alarm by entering the following command:

   RTRV-ALM-EQPT:*[a]*:ALL:::,IMPROPRMVL;**

   Where:

   a = Target ID (optional)

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

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

   Where:

   h = Equipment location: { 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}
   PWRA-{1-4}, PWRE2-SW-{1,2}, PWRE-{1-32}-{1,2},
   PWRF-{1,2}, PWRG-{1,2} }

2. If the circuit pack location that is identified by the **RTRV-ALM-EQPT** command is occupied, extract the circuit pack from the slot (refer to Chapter 2 for extracting circuit packs, if necessary).

3. If the circuit pack identified in Step 1 is a PWRA, PWRE, PWRF, or PWRG, go to Step 4. Otherwise, retrieve the provisioning and circuit pack type/code information for the circuit pack slot indicating the IMPROPRMVL condition by entering the following command:

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

   Where:

   a = Target ID (optional)

b = Circuit pack location: { **CLKGN-{0,1}, SWCS-{1-32}, 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 following output response appears (only the pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAGCOMPLD
    /*LOC:UTYPE:<>:CLEI:STATE */
    "d:...:<PCODE=f, CCODE=INVALID,PLBO=h,PEQL=j,CEQL=INVALID ...
;
```

Where:

d = Circuit pack location (circuit pack type): { CLKGN-{0,1}, SWCS-{1-32}, 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): { AWR11, AWS1, AWS1B, AWR6, AKM56, AKM52, AKM68, AKM55, AKM70, AKM84, AKM85, AKM53, AKM49, AKM50, AKM46, AKM47, AKM48 }

h = Provisioned line build-out (MUX circuit packs only): { OUT, IN }

j = Provisioned equalizer (DS1IF circuit packs only): { 20, 40, 60, 80, 100 }

4. If the circuit pack identified in Step 1 is a PWRA, PWRE, PWRF, or PWRG, obtain the same type of circuit pack. Otherwise, obtain the correct circuit pack type with the proper code identified by the **RTRV-EQPT** command.
5. If the circuit pack to be installed is a DS1IF circuit pack, refer to the section titled "Setting Equalizer (EQL) and DS1 Code Type" (page 5-35) 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 pack, refer to the section titled "Setting Line Build Out (LBO)" (page 5-26) 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-{1-32}, 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 autolock value)
- The interface or switch circuit pack is switched to protection by the `SW-TOPROTN-EQPT` command
- The interface or switch circuit pack is inhibited from switching to 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-{1-32}, 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, Switch Module Circuit Pack Failures" (page 12-114) to replace the failed circuit pack associated with the INHSWWKG condition.

Clearing T+BER and T+BERL Conditions

For T1 and T3 facilities, the condition type T+BER occurs when degradation of the incoming signal has been detected. For EC-1 facilities the condition type T+BERL occurs when degradation of the incoming signal has been detected. When the DACS IV-2000 is indicating one of these conditions perform the following procedure.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of signal degradation, so that the trouble can be isolated and cleared.

Clearing AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, IDLE, or YEL Conditions

The condition types AIS, AISL, AISP, AISFRAMED, AISUNFRAMED, ALLDS2SOOF, DS1-AIS, FERF, and IDLE occur when the DACS IV-2000 is receiving an abnormal signal from far-end equipment. These conditions usually indicate that the far-end equipment has detected an abnormal signal and is transmitting a signal that indicates the type of condition detected to the DACS IV-2000 Once the problems at the far-end have been cleared, a normal signal is restored. The condition YEL is transmitted to the DACS IV-2000 from other equipment to indicate an error condition that occurred at the far-end equipment or facility (that is, the incoming signal is good but, somewhere a failure occurred). When the DACS IV-2000 is indicating one of these conditions perform the following procedure.

1. From office records, determine the source of the signal.
2. Contact the far-end office or your internal support people to inform them of the condition that you are detecting or transmitting, so that the trouble can be isolated and cleared.

Clearing DS3FRMTMISMATCH, LOF, LOP, LOS, 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 DS3FRMTMISMATCH, 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 (that is, the provisioned signal label [VTMAP and/or EC1MAP value of the `ED-PORT` command] does not match the received signal label).
- VT1.5 facilities — the condition type LOP occurs when there is a problem with the port provisioning, the incoming signal, or with the cable connected to the frame.

A flashing red alarm LED on interface circuit packs indicate an incoming signal failure. When the DACS IV-2000 is indicating one of the above conditions, perform the following procedure.

CAUTION:
The 120V AC and the DC meter Buzzers must ***not*** *be used for continuity checking of the ring and tip leads because of the 100 ohms impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-1), 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}, 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 }

T3 Facilities:

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.

d = 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}, 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

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}, 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.

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}, 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

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}, 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)

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**, **RTRV-ALM-T3**, and **RTRV-ALM-EQPT** commands issued with the **FEND** value for the location parameter), indicate failure with the far end multiplexers or mismatches in the provisioning for far end multiplexers. When the DACS IV-2000 is indicating one of these conditions perform the following procedure:

1. From office records, determine the remote multiplexer connected to the MUX circuit pack indicating the alarm condition.
2. Retrieve the provisioning information associated with the DS3 port indicating the alarm condition by entering the following command:

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

   Where:

   a = Target ID (optional)

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

```
   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:

   d = 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. If the provisioning information does not match the far end multiplexer associated with the failed port, set the necessary parameters to match the far end multiplexer by entering the following command:

   ED-T3:*[a]*:*b*::::*[*BER=*d*,BERM=*f*,ISTAT=*g*,DS3FORMAT=*h*,
   IDLE=*m*,RMTMUXC=*n*,XPOL=*o*,XBITRCV=*p*,DS2XTR=*q*,
   DS2XRCV=*r]*;

   Where:

   a = Target ID (optional)

   b = DS3 port location: { {1-32}-{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

   n = Remote multiplexer type: { SBIT, FEAC, TR9, NONE, CURVAL }
   Initial system value: NONE

   o = DS3 X-bit transmit: { 0, 1, ALM0, ALM1 } (optional)
   Default value: ALM0

   p = DS3 X-bit receive: { ALM0, ALM1, IGNORE } (optional)
   Default value: IGNORE

   q = DS2 X-bit transmit: { 0, 1, ALM0, ALM1 } (optional)
   Default value: ALM0

   r = DS2 X-bit receive: { ALM0, ALM1, IGNORE } (optional)
   Default value: IGNORE

   If the alarm condition clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Contact the system administrator of the remote multiplexer of the condition encountered, so that trouble can be resolved. Table 12-11 can be used to associate the alarm condition with possible equipment or facility failures.

Table 12-11. **Remote Multiplexer Alarm Conditions**

Alarm Condition	Remote Multiplexer Type		
	TR9	FEAC	SBIT
ACPWR (EQPT)	NA	NA	AC power feed failure
COM (EQPT)	NA	Equipment failure common to DS3 hardware	Equipment failure common to DS3 hardware
DS1IF (EQPT)	NA	DS1 interface equipment failure	DS1 interface equipment failure
MUX (EQPT)	NA	DS3 hardware failure	DS3 hardware failure
INC (T1)	NA	Single DS1 LOS or high BER at the far-end	Single DS1 LOS or high BER at the far-end
MINC (T1)	NA	Multiple DS1 LOS and/or high BER at the far-end	Multiple DS1 LOS and/or high BER at the far-end
OOF (T2)	DS2 OOF (DS2 X-bits)	DS2 OOF (DS2 X-bits)	DS2 OOF (DS2 X-bits)
AIS (T3)	NA	DS3 AIS received by far-end	DS3 AIS received by far-end (all 7 DS2 OOF)
IDLE (T3)	NA	DS3 Idle received by far-end	DS3 Idle received by far-end
INC (T3)	NA	Incoming DS3 LOS or high BER at the far-end	Incoming DS3 LOS or high BER at the far-end
OOF (T3)	NA	DS3 or DS2 OOF received at the far-end	DS3 or DS2 OOF received at the far-end
SBITFAIL (T3)	NA	NA	Far-end not responding to SBIT protocol
YEL (T3)	DS3 LOF or AIS (DS3 X-bits)	DS3 LOF or AIS (DS3 X-bits)	DS3 LOF or AIS (DS3 X-bits)

NA - Not applicable

Primary Fuses

Primary fuses are located at the top of Switch Bay. The fuses are arranged as shown in Figure 12-1 (ED-2C940-30 Fuse and Alarm Panel) or Figure 12-2 (ED-9C114-30 Fuse and Alarm Panel). Use this procedure only if any of the red bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or red fuse alarm lamps (ED-9C114-30 Fuse and Alarm Panel) are lit. The bus alarm lamps in the ED-2C940-30 Fuse and Alarm Panel are shaded in Figure 12-1.

⚠ CAUTION:
Only blown fuses (identified by extended stems of indicator fuses [ED-2C940-30 Fuse and Alarm Panel] or lit alarm lamp [ED-9C114-30 Fuse and Alarm Panel]) should be extracted. Extracting good fuses may cause loss of service.

1. Check to see if there are any bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or red alarm lamps (ED-9C114-30 Fuse and Alarm Panel) lit.

   If there are any Fuse and Alarm Panel alarm lamps lit, continue with Step 2.

   If there are any power circuit pack alarm LEDs lit, go to the section titled "Power Circuit Pack Failure" (page 12-81). Otherwise, go to the section titled "Isolating Failures" (page 12-10) to clear any other alarm.

2. Open the door to the Fuse and Alarm Panel by pushing where indicated.

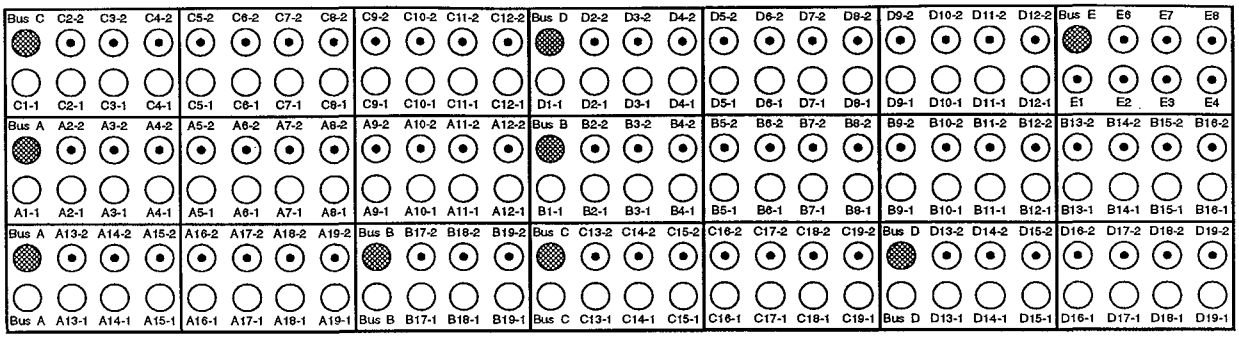
3. Locate the blown fuses (for ED-2C940-30 Fuse and Alarm Panel, the stem of indicator fuse is extended from its base; for ED-9C114-30 Fuse and Alarm Panel, lit alarm lamp). If more than one, select one at a time.

4. For the fuse selected in Step 3, replace the fuse (for ED-2C940-30 Fuse and Alarm Panel, replace the load fuse identified by the *-1* after the location number first, then the indicator fuse identified by the *-2*). For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for replacing fuses, if necessary.

5. If the replaced fuse:

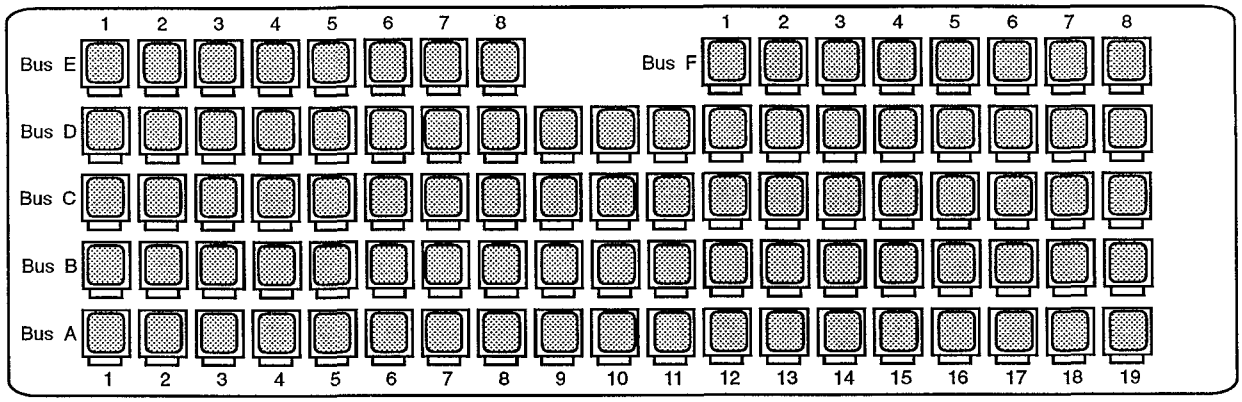
   - Blows again, continue with Step 6.
   - Does not blow again and there are other Fuse and Alarm Panel alarm lamps lit, go to Step 3; otherwise go to Step 9.

6. Obtain a new power circuit pack associated with the blown fuse in Step 5, and replace the failed one (refer to Chapter 2 for extracting and installing circuit packs, if necessary). Refer to Figure 12-1 and 12-2 and Tables 12-12 and 12-13 to associate the power circuit pack with the blown fuse.



Note: Fuses for power buses A, B, C, and D come in pairs with the load fuse labeled with *-1* and the indicator fuse labeled with *-2*. Fuses for power bus E do not have dual fuses (one load and one indicator), they are all indicator fuses.

Figure 12-1. **ED-2C940-30 Fuse and Alarm Panel**



Note: Fuse location B1 is not connected. Fuses A1, A2, B2, C1, C2, and D2 are 12A, fuse D1 is 2A, all other fuses are 10A. All fuses have a red alarm lamp to indicate failure.

Figure 12-2. **ED-9C114-30 Fuse and Alarm Panel**

Table 12-12. **Fuse Chart for Switch Bay (Bay 5 Excluding Fan Assemblies)**

Standard Power (ED-2C940-30 Fuse and Alarm Panel)

Auxiliary Power PWRE		Switch Power PWRA			
1	2	1	2	3	4
B14	D8	A2	B2	C2	D2

Note: Fuses A2-1, B2-1, C2-1, and D2-1 are 12 A and fuses B14-1 and D8-1 are 10 A. Fuses A2-2, B2-2, B14-2, C2-2, D2-2, and D8-2 (indicator fuses) are 0.5 A.

Duplex Power (ED-9C114-30 Fuse and Alarm Panel)

Auxiliary Power PWRE		Switch Power PWRA			
1	2	1	2	3	4
B14	D8	A2	B2	C2	D2
PWRF-1, PWRG-1, TBS3-0 (SYNC-0)		PWRF-2, PWRG-2, TBS3-1 (SYNC-1)		Header Designation Assembly (Top of Bay)	
A1		C1		D1	

Note: Fuses A1, A2, B2, C1, C2, and D2 are 12A, fuses B14 and D8 are 10A, and fuse D1 is 2A. All fuses have a red alarm lamp to indicate failure.

Table 12-13. Fuse Chart for Interface Bays (Bays 1-4 and 6-9)

Shelf	PWR Circuit Pack	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse and Alarm Panel)									
4	PWRE-2	C17	D14	D4	D10	C12	D6	B15	C19
	PWRE-1	A17	C15	B4	C10	B12	B6	C8	A19
3	PWRE-2	D16	D13	C4	B10	D12	C6	B8	D18
	PWRE-1	A16	A14	A4	A10	A12	A6	A8	C18
2	PWRE-2	B18	C14	D3	C9	D11	D5	C7	D19
	PWRE-1	A15	B17	C3	B9	B11	C5	B7	A18
1	PWRE-2	D15	C13	B3	D9	C11	B5	D7	D17
	PWRE-1	C16	A13	A3	A9	A11	A5	A7	B19
Note: All load fuses are 10A and all indicator fuses are 0.5A.									
Duplex Power (ED-9C114-30 Fuse and Alarm Panel)									
4	PWRE-2	F4	D14	D4	D10	D12	D6	D8	F8
	PWRE-1	E4	B14	B4	B10	B12	B6	B8	E8
3	PWRE-2	F3	C14	C4	C10	C12	C6	C8	F7
	PWRE-1	E3	A14	A4	A10	A12	A6	A8	E7
2	PWRE-2	D15	D13	D3	D9	D11	D5	D7	D18
	PWRE-1	B15	B13	B3	B9	B11	B5	B7	B18
1	PWRE-2	F2	C13	C3	C9	C11	C5	C7	F6
	PWRE-1	E2	A13	A3	A9	A11	A5	A7	E6
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

7. Replace blown fuses (for ED-2C940-30 Fuse and Alarm Panel, load fuse first, then indicator fuse). For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for replacing fuses, if necessary.
8. If fuses:
   - Blow again, return the original power circuit pack to the frame.

     Failure cannot be cleared by replacing a circuit pack or fuse. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem. If there are Fuse and Alarm Panel alarm lamps lit, go to Step 3; otherwise do not continue with this procedure.
   - Do not blow, attach the alarm report to the failed circuit pack.

     If there are other Fuse and Alarm Panel alarm lamps lit, go to Step 3. Otherwise continue with Step 9.
9. Close all Fuse and Alarm Panel doors, if not already done.
10. For ED-9C114-30 Fuse and Alarm Panel, if you replaced fuse A1 (SYNC side 0) or C1 (SYNC side 1), restore the SYNC side associated with the A1 or C1 fuse to service by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Synchronizer side location: `SYNC-{0,1}`

    This command takes up to 1 minute to complete.
11. If the FAILURE LED on the Status Panel is lit, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

12. After Fuse and Alarm Panel alarm lamps are off, verify that the alarm(s) have cleared by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Power circuit pack location: **{ PWRA-{1-4}, PWRE-{1-32}-{1,2}, PWRE2-SW-{1,2}, PWRF-{1,2}, PWRG-{1,2} }**

    The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

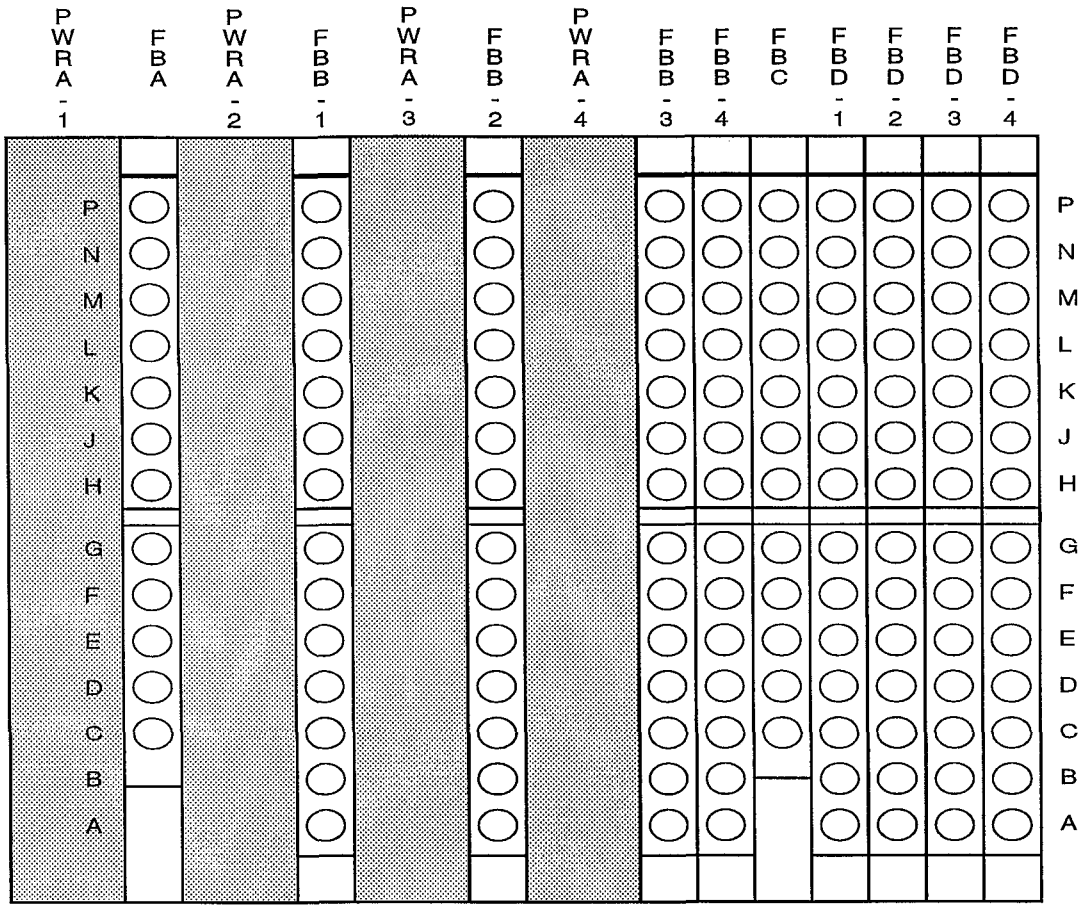
    If you get the above response, you are done with this procedure. If you do not get the above response; refer the problem to your system administrator or your next level of support for assistance.

Secondary Fuses in Switch Power Module

This procedure is applicable for major and minor alarms associated with secondary fuses in the Switch Power Modules. Major alarms occur if more than one fuse blows or the associated circuit pack is inhibited from switching to protection. Minor alarms occur when only one fuse blows and the associated circuit pack switches to protection.

⚠ CAUTION:
Only blown fuses (identified by a lit red LED) should be extracted. Extracting good fuses may cause loss of service.

1. Check to see if there are any blown fuse indicators (a lit red LED) in any of the fuse boards in the Switch Power Module (FBA, FBB, FBC, and FBD).
2. Locate the blown secondary fuses (refer to Table 12-14 for fuse locations). If both fuses associated with the same circuit pack (SYNC refers to all circuit packs associated with a synchronizer side) are blown locate both of them together. If more than one circuit pack's fuse(s) have blown, select one circuit pack's fuse(s) at a time.
3. Locate the circuit pack associated with the blown fuse selected in Step 2 by referring to Figure 12-3 and Table 12-14, and partially extract the circuit pack from its slot (for SYNC fuses, partially extract the associated DPLL circuit pack).
4. Replace the blown fuse selected in Step 2 with a new one of the same type. If both fuses associated with the same circuit pack are blown, replace both fuses with the appropriate fuse types. Use fuse tool (Part Number WP90247,List 201) to extract fuses.
5. If a fuse:
   - Does not blow again, continue with Step 6.
   - Blows again, the failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems not associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be refer to your system administrator or your next level of support) and return to Step 2.
6. Insert the circuit pack that you partially extracted in Step 3.



Note: A blown fuse is indicated by a lit red LED.

Figure 12-3. **Secondary Fuses (FBA, FBB, FBC, and FBD)**

7. If the fuse:

   - Does not blow again and there are more blown secondary fuse indicators, return to Step 2; otherwise, continue with Step 8.
   - Blows again, obtain a new circuit pack for the circuit pack associated with the blown fuse, and replace the failed circuit pack marking the circuit pack replaced for later reference. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

Table 12-14. Secondary Fuse Chart for System

Location	Type 77D (10 A) Fuse for +5V Supply				
	FBA	FBB-1	FBB-2	FBB-3	FBB-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	SYNC-1*
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	SYNC-0*
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 -5V Supply				
	FBC	FBD-1	FBD-2	FBD-3	FBD-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	SYNC-1*
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	SYNC-0*
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

* SYNC fuses provide fuse protection for all three circuit packs (DPLL, TBS3, and DS1TX) associated with a synchronizer side.

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.

8. If you replaced a SYNC fuse, restore the associated synchronizer side 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.

   If the **RST-EQPT** fails to restore the specified equipment, refer to the section titled "Synchronizer Module Failure" (page 12-36) for further instructions in clearing a synchronizer failure.

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}, SYNCN }**

   The following output response appears if the alarm has cleared:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If you get the above response, you are done with this procedure. If you do not get the above response; refer the problem to your system administrator or your next level of support for assistance.

Power Circuit Pack Failure

This procedure is used if there is a power circuit pack failure indicator active (lit red LEDs, response from **RTRV-ALM** command, or REPT ALM message).

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or REPT ALM EQPT message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

1. If all the alarm LEDs for the power circuit packs are lit and there is no loss-of-service, go to the section titled "All Power Circuit Pack Alarm LEDs Lit" (page 12-83).
2. For PWRA, PWRE, PWRF, and PWRG circuit packs, check to see if any bus alarm lamp (ED-2C940-30 Fuse and Alarm Panel) or fuse alarm lamp (ED-9C114-30 Fuse and Alarm Panel) is lit on the Fuse and Alarm Panel. If there are alarm lamps lit, refer to the section titled "Primary Fuses" (page 12-71) before performing this procedure.
3. For PWRF or PWRG circuit packs, check fuse board FBI (Redundant Controller Power Module) for any blown fuse indicators. If there are blown fuse indicators active, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94) before performing this procedure.
4. If there are no bus alarm lamps (ED-2C940-30 Fuse and Alarm Panel) or no fuse alarm lamps (ED-9C114-30 Fuse and Alarm Panel) lit or the FBI fuse board ALM LED is not lit, check to see if there are any power circuit packs without their green ON LED lit. If there are any power circuit pack green ON LEDs not lit, refer to the section titled "BDFB Power Feeder Failure" (page 12-84) before continuing this procedure.

5. If there are no power bus ALM LEDs lit and all green ON LEDs on the power circuit packs are lit, check for lit red ALM LEDs on the power circuit packs in the module that contains the circuit pack indicating the alarm condition (from **RTRV-ALM** command or REPT ALM message). If there are no ALM LEDs lit perform the following procedure. Otherwise go to Step 6.

   a. Initiate the LED lamp test by pressing the LED/Lamp Test button on the status panel or entering the following command:

      EX-EQPT:*[a]*;

      Where:

      a = Target ID (optional)

      This command takes up to 1 minute to complete.

   b. Identify the power circuit pack(s) that the alarm LED does not illuminate and continue with Step 6.

6. If a red ALM LED is lit on only one power circuit pack or only one power circuit pack is identified in Step 5b within the module, use the next section titled "Single Power Circuit Pack Failure" (page 12-87). If there is more than one red ALM LED lit on power circuit packs or more than one power circuit pack is identified in Step 5b within the module, use the section titled "Multiple Power Circuit Pack Failures" (page 12-89).

   If the red ALM LEDs are not lit on the power circuit packs or no power circuit packs are identified in Step 5b go to the section indicated below:

   - "Redundant Controller Failure" (page 12-105) for Redundant Controller Module circuit packs (CPU, MTC, SSC, ECI, SCI, UI, and PRI)
   - "Unit Controller Failure" (page 12-113) for UC circuit packs
   - "Interface, Switch Module Circuit Pack Failures" (page 12-114) for interface module and SWIO and SWCS Module circuit packs (CLKGN, CLKDR, DS1IF, DS1IP, SWIF, MUX, SMUX, SWCS, and SWIO)
   - "Protection Circuit Pack Failures" (page 12-127) for protection and protection switch circuit packs (DS1IP, SWIF-P [protection], DS1RY, MUXP, SMUXP, and MUXPS)

All Power Circuit Pack Alarm LEDs Lit

Used this procedure when all alarm LEDs associated with the power circuit packs are lit and there is no loss-of-service. If there is any loss-of-service (SA type of alarms) go to the section titled "Prioritizing Alarms" (page 12-10) to identify alarms and clear them.

1. Clear the Main Controller's LED exercise bit by entering the following command:

   EX-EQPT:*[a]*:MC;**

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise, continue with Step 2.

2. Remove the Main Controller from service by entering the following command:

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

   Where:

   a = Target ID (optional)

3. Extract the CPU circuit pack associated with the active control complex. Refer to Chapter 2 for extracting circuit packs, if necessary.

   An alarm is generated when you extract the CPU circuit pack.

4. Re-install the CPU circuit pack extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.

   The alarm generated in Step 2 clears when you re-install the CPU circuit pack.

5. Restore the Main Controller to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete.

6. If the alarm LEDs are extinguished, you are done with this procedure. Otherwise; refer the problem to your system administrator or your next level of support for assistance.

BDFB Power Feeder Failure

This procedure is used if Battery Distribution Feeder Board (BDFB) power feeder failure is suspected. Possible BDFB power feeder failure is indicated by power circuit packs not having their green ON LED lit and Fuse and Alarm Panel alarm lamps (bus or fuse alarm lamps) not being lit.

1. Using the information in Table 12-15, attempt to identify a power feeder that all the power circuit packs without their green ON LED lit have in common.

NOTE:
Table 12-15 shows the power buses distribution to the different power circuit packs. For frames wired for duplex power (power buses A, B, C, D, E, and F), the second and third columns of Table 12-15 show that BDFB-A supplies power buses A, B, and E; and BDFB-B supplies power buses C, D, and F. For frames using standard power, the fourth (rightmost) column of Table 12-15 show that the same BDFB supplies all power buses (A, B, C, D, E, F, and G).

2. If a power feeder is identified, refer to your local -48V power troubleclearing procedures to correct the problem. If a single power feeder cannot be identified, refer the problem to your system administrator or next level of support for assistance.
3. If there is a fan assembly alarm associated with the power feeder identified in this procedure, refer to the procedure in the section titled "Fan Assembly Failure" (page 12-129) to clear it.

Table 12-15. **Power Circuit Pack and BDFB Power Feeder Associations**

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
A	PWRA-1 PWRE-5-1 PWRE-7-1 PWRE-9-1 PWRE-11-1 PWRE-13-1 PWRE-15-1 PWRE-17-1 PWRE-19-1 PWRE-21-1 PWRE-23-1 PWRE-25-1 PWRE-27-1 PWRF-1 PWRG-1		PWRA-1 PWRE-2-1 PWRE-3-1 PWRE-4-1 PWRE-5-1 PWRE-7-1 PWRE-9-1 PWRE-11-1 PWRE-13-1 PWRE-15-1 PWRE-17-1 PWRE-19-1 PWRE-21-1 PWRE-23-1 PWRE-25-1 PWRE-27-1 PWRE-30-1 PWRE-32-1
B	PWRA-2 PWRE-2-1 PWRE-6-1 PWRE-8-1 PWRE-10-1 PWRE-12-1 PWRE-14-1 PWRE-16-1 PWRE-18-1 PWRE-20-1 PWRE-22-1 PWRE-24-1 PWRE-26-1 PWRE-28-1 PWRE-30-1 PWRE-SW-1		PWRA-2 PWRE-2-2 PWRE-6-1 PWRE-9-2 PWRE-12-1 PWRE-14-1 PWRE-15-2 PWRE-18-1 PWRE-20-1 PWRE-21-2 PWRE-24-1 PWRE-26-1 PWRE-27-2 PWRE-28-2 PWRE-29-1 PWRE-SW-1

Table continued on next page.

Table 12-15. **Power Circuit Pack and BDFB Power Feeder Associations (Continued)**

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
C		PWRA-3 PWRE-5-2 PWRE-7-2 PWRE-9-2 PWRE-11-2 PWRE-13-2 PWRE-15-2 PWRE-17-2 PWRE-19-2 PWRE-21-2 PWRE-23-2 PWRE-25-2 PWRE-27-2 PWRF-2 PWRG-2	PWRA-3 PWRE-1-1 PWRE-4-2 PWRE-5-2 PWRE-6-2 PWRE-8-1 PWRE-10-1 PWRE-11-2 PWRE-14-2 PWRE-16-1 PWRE-17-2 PWRE-20-2 PWRE-22-1 PWRE-23-2 PWRE-26-2 PWRE-28-1 PWRE-31-1 PWRE-32-2
D		PWRA-4 PWRE-2-2 PWRE-6-2 PWRE-8-2 PWRE-10-2 PWRE-12-2 PWRE-14-2 PWRE-16-2 PWRE-18-2 PWRE-20-2 PWRE-22-2 PWRE-24-2 PWRE-26-2 PWRE-28-2 PWRE-30-2 PWRE-SW-2	PWRA-4 PWRE-1-2 PWRE-3-2 PWRE-7-2 PWRE-8-2 PWRE-10-2 PWRE-12-2 PWRE-13-2 PWRE-16-2 PWRE-18-2 PWRE-19-2 PWRE-22-2 PWRE-24-2 PWRE-25-2 PWRE-29-2 PWRE-30-2 PWRE-31-2 PWRE-SW-2

Table continued on next page.

Table 12-15. Power Circuit Pack and BDFB Power Feeder Associations (Continued)

Power Feeder	Duplex Power		Standard Power BDFB
	BDFB-A	BDFB-B	
E	PWRE-1-1 PWRE-3-1 PWRE-4-1 PWRE-29-1 PWRE-31-1 PWRE-32-1		
F		PWRE-1-2 PWRE-3-2 PWRE-4-2 PWRE-29-2 PWRE-31-2 PWRE-32-2	PWRF-1 PWRG-1
G			PWRF-2 PWRG-2

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 12-89).

NOTE:
When a power circuit pack fails, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

1. Locate the power circuit pack indicating the alarm (lit alarm LED).

2. Check to make sure that the latch on the power circuit pack is fully secured. If not, it can be causing intermittent power circuit pack failures.

   If securing the latch causes the alarm to clear, you are done with this procedure.

3. Obtain a power circuit pack of the same type and series as the circuit pack located in Step 1.

4. Replace the power circuit pack located in Step 1 and mark the replaced circuit pack for later reference. Refer to Chapter 2 for extracting and installing circuit packs.

   After replacing the power circuit pack, the ALM LED should go off. If the ALM LED stays off, attach the alarm report to the failed circuit pack and you are done with this procedure.

   If the ALM LED stays on, continue with Step 5.

5. 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 and 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 12-77). 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 failures 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 12-87) 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 12-87).

For the module containing the multiple power circuit pack failure refer to the section indicated:

- "Multiple Power Circuit Pack Failures in Switch Power or Auxiliary Power Module" (page 12-90) for Switch and Auxiliary Power Module power circuit packs.
- "Multiple Power Circuit Pack Failures in Redundant Controller Power Module" (page 12-91) for Redundant Controller Power Module power circuit packs.
- "Multiple Circuit Pack Failures in Interface Module" (page 12-92) for interface module power circuit packs.

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one power circuit pack at a time. Extracting more than one power circuit pack may cause loss of service.

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 12-87).

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or REPT ALM EQPT message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one PWRA or PWRE (POWERE-SW) circuit pack at a time. Extracting more than one PWRA or PWRE circuit pack may cause loss of service.

1. Locate the PWRA or POWERE-SW circuit packs indicating the alarm (lit alarm LED).
2. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of possible service outages due to multiple power circuit pack failures within Switch and Auxiliary Power Modules.
3. Check to make sure that the latch on the power circuit packs identified in Step 1 are fully secured. If not, it can be causing intermittent power circuit pack failures.

   If securing all the latches causes the alarms to clear for the power circuit packs, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 12-87). Otherwise, continue with this procedure.
4. Obtain new power circuit packs of the same series for the circuit packs identified in Step 1.
5. Choose one of the power circuit packs identified in Step 1 and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
6. Check to see if the red ALM LED on the replacement power circuit pack is off.

   If the ALM LED does not turn off, refer the problem to your system administrator or your next level of support for assistance.

   If the ALM LED is off, attach the alarm report to the failed circuit pack.

7. Check to see if there are any other red ALM LEDs lit on any of the Switch Power or Auxiliary Power Modules. If so, repeat this procedure from Step 5.
8. Wait to see if all alarms and trouble indicators go off (about 30 seconds).

   If any ALM LEDs remain lit, refer the trouble to your system administrator or next level of support.

NOTE:
If multiple 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 12-87) for each failed PWRG circuit pack(s).

NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

CAUTION:
Never disengage or extract more than one PWRG circuit pack at a time. Extracting more than one PWRG circuit pack may cause loss of service.

1. Locate the PWRF or PWRG circuit packs indicating the alarm (lit alarm LED).
2. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of service outages due to multiple power circuit pack failures within the Redundant Controller Power Module.
3. 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 12-87). Otherwise, continue with this procedure.
4. Obtain new PWRF and/or PWRG circuit packs (two of each if necessary).

5. Choose one of the power circuit packs identified in Step 1 and replace it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
6. Check to see if there are any other red ALM LEDs lit on any of the redundant controller power circuit packs you haven't replaced. If there are, repeat this procedure from Step 5.
7. 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.
8. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

Multiple Circuit Pack Failures in Interface Module

Perform this procedure to clear multiple PWRE circuit pack failures within an interface module. If only one of the PWRE circuit packs has a lit red ALM LED, go to the section titled "Single Power Circuit Pack Failure" (page 12-87).

⇒ NOTE:
When power circuit packs fail, more than one power circuit pack location may be indicated in the **RTRV-ALM-ALL** response or `REPT ALM EQPT` message. The alarm LEDs on the power circuit packs must be used to isolate the failure.

⚠ CAUTION:
Never disengage or extract more than one PWRE circuit pack at a time. Extracting more than one PWRE circuit pack may cause loss of service.

1. Call your system administrator or next level of support for assistance in performing this procedure and to notify them of service outages due to multiple PWRE circuit pack failures within an interface module.

2. Check to make sure that the latch on the PWRE circuit packs within the single interface module are fully secured. If not, it can be causing intermittent PWRE circuit pack failures.

   If securing all the latches causes the alarms to clear for all PWRE circuit packs within an interface module, you are done with this procedure. If only one red ALM LED remains lit, go to the section titled "Single Power Circuit Pack Failure" (page 12-87). Otherwise, continue with this procedure.

3. Obtain new PWRE circuit packs.

4. For each failed PWRE circuit pack within an interface module do:

   a. Replace a PWRE circuit pack with its red ALM LED lit. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   b. Check to see if the red ALM LED on the replacement PWRE circuit pack is off.

      If the ALM LED does not turn off, refer the problem to your system administrator or your next level of support before continuing.

      If the ALM LED is off, attach the alarm report to the failed PWRE circuit pack.

5. Restore the interface module's associated unit controller and DS3PM (if installed) circuit pack by entering the following command for each circuit pack:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: **UC-{1-32}**
   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 modules PWRE circuit packs.

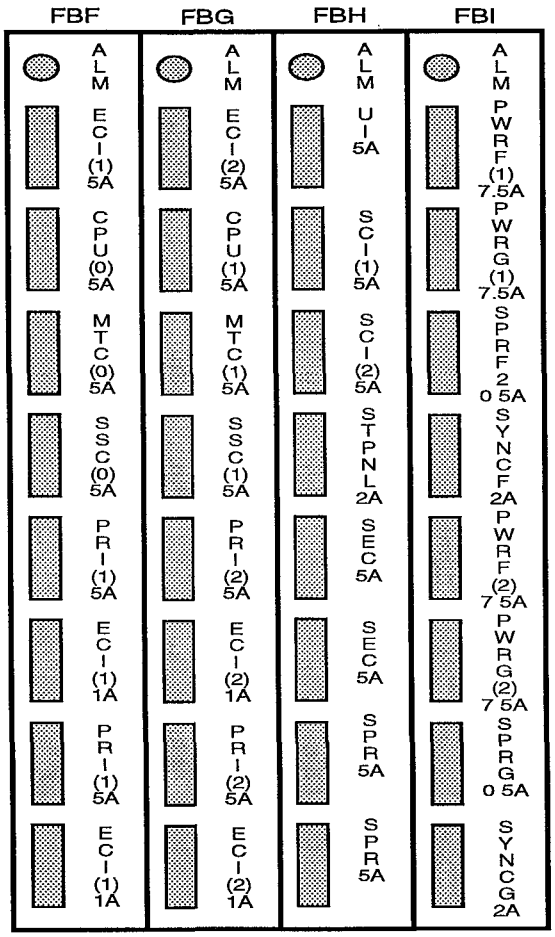
   If any ALM LEDs are still lit, repeat this procedure from Step 3.

7. If the red ALM LED on any unit controller remains lit, go to the section titled "Unit Controller Failure" (page 12-113).

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 12-134). Figure 12-4 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 (FBF, FBG, FBH, and FBI).
2. For the circuit pack indicating the alarm, perform the appropriate procedure:
   - "Fuses in Redundant Controller Power Module" (page 12-94) for Redundant Controller Power Module power circuit packs (PWRF and PWRG)
   - "ECI Fuses" (page 12-97) for either ECI circuit pack
   - "Control Complex (CPU/MTC/SSC), SCI, UI, and Status Panel Fuses" (page 12-100) for Redundant Controller Module circuit packs (excluding ECI, PRI, and SEC)
   - "Disk Drive Fuses" (page 12-101) for either PRI disk drive
   - "Minor Alarms Due to Redundant Controller Failure" (page 12-134) for the SEC disk 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 7.5A fuses are the load fuses to the PWRF and PWRG power circuit packs.
- The 5A (2A for the Status Panel) fuses are the secondary fuses (or the +5V supply) to the circuit packs contained in the Redundant Controller Module.
- The 1A fuses associated with the ECI circuit packs are for +12V and -12V supplied to the CILINKs. When these fuses blow, communication with the CILINKs can be interrupted.
- The 5A fuses for the optical disk drive (SEC) is for the +5V and +12V supply.
- The 5A fuses for the hard disk drives (PRI) are for the+5V and +12V supply.
- The 2A fuses for SYNCF (TBS-0) and SYNCG (TBS3-1) are for the -48V supply to the TBS3 circuit packs.
- The labels SPR, SPRF, and SPRG denote spare fuses that are not connected to any circuit pack.

Figure 12-4. **Redundant Controller Power Module Fuses (FBF, 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 12-94).

1. If the frame has a ED-9C114-30 Fuse and Alarm Panel, check fuse locations A1 and C1 for a lit alarm lamp. If either alarm lamp is lit, refer to the section "Primary Fuses" (page 12-71) before continuing with this procedure.
2. Check for blown fuses in fuse board FBI. If there are blown fuses, continue with this procedure; otherwise, go to the section titled "Power Circuit Pack Failure" (page 12-81).
3. Locate the blown fuses in fuse board FBI. If more than one, select one.
4. Extract the circuit pack associated with the fuse chosen in Step 3.
5. Replace the fuse chosen in Step 3. Use fuse tool (Part Number WP90247,List 201) to extract fuses.
6. Reinsert the circuit pack pulled in Step 4.
7. If the fuse:
   - Does not blow, repeat Steps 3 through 6 for any additional blown fuses in fuse board FBI, then continue with Step 8.
   - 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 3. Otherwise, continue with the next step.
8. If there are any other blown fuses in fuse boards FBF, FBG, or FBH, refer to the next section titled "ECI Fuses" (page 12-97) 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 12-81).

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 9.

9. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

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 12-134).

1. If there are blown fuses in fuse board FBI, refer to the previous section titled "Fuses in Redundant Controller Power Module" (page 12-94) before performing the rest of this procedure.
2. Locate the blown 5A fuses in fuse boards FBF and FBG associated with the ECI circuit pack(s). If more than one, select one.

NOTE:
The 1A fuses associated with the ECI circuit packs are connected to the CILINKs. When these fuses blow a minor alarm is issued and loss of communications with the CILINKs can occur. The section titled "Link Communication Failures" (page 12-29) provides procedures for reestablishing communications with the CILINKs.

3. Partially extract the ECI circuit pack associated with the fuse chosen in Step 2.
4. Replace the fuse chosen in Step 2. Use fuse tool (Part Number WP90247,List 201) to extract fuses.
5. Reinsert the ECI 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 secondary fuses associated with the Redundant Controller Power Module, continue with the next section titled "Control Complex (CPU/MTC/SSC), SCI, UI, and Status Panel Fuses" (page 12-100) 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 ECI-1 has failed, the frame is connected to a GTP using the TABS link on CILINK-1-4, and your office procedures require you to use CILINK-1-4 for the GTP connection, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel. Otherwise, go to Step 7b.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

If other links were in service before ECI circuit pack failure, go to Step 10; otherwise you are done with this procedure.

   b. If your terminal is connected to the ECI circuit pack that encountered a blown fuse and there is no terminal connected to the other ECI circuit pack, switch your terminal to one of the available Snider links on the active ECI circuit pack [refer to the section titled "Adding a Terminal to a Snider Link" (page 7-22), if necessary].

c. At the terminal on the active ECI circuit pack, log into the DACS IV-2000. If you cannot log in, refer to the section titled "Link Communication Failures" (page 12-29).

d. Restore the out-of-service ECI circuit pack by entering the following command (after restoring the ECI circuit pack, go to Step 10):

`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.

NOTE:
The ECI circuit pack restored with the `RST-EQPT` command becomes the slave for the TABS link. When the system is reset, ECI-1 becomes the master and ECI-2 becomes the slave.

8. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. After a system reset ECI-1 becomes the master and ECI-2 becomes the slave for the associated TABS links.

9. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

When the MC returns to service, only CILINKs 1-1 and 2-1 are restored to service. If other links were in service before ECI circuit pack failure, go to Step 10; otherwise you are done with this procedure.

10. 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}`

    This command takes up to 1 minute to complete.

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 12-134).

1. If there are blown fuses in fuse board FBI, refer to the previous section titled "Fuses in Redundant Controller Power Module" (page 12-94) before performing the rest of this procedure.
2. Locate the blown 5A fuses in fuse boards FBF, FBG, and FBH (exclude PRI and SEC fuses). If more than one, select one.
3. Partially extract the circuit pack associated with the fuse chosen in Step 2.
4. Replace the fuse chosen in Step 2. Use fuse tool (Part Number 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 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, and FBH (exclude ECI, PRI, and SEC fuses), go to Step 2. If there are other blown fuses associated with the Redundant Controller Power Module, continue with the next section titled "Disk Drive Fuses" (page 12-101) to replace additional fuses.

7. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

8. If there are any PRI disk drives blown fuses, refer to the next section titled "Disk Drive Fuses" (page 12-101).

   If the major alarm LED stays lit and there are red ALM LEDs lit on any of the control complex circuit packs, refer to the section titled "Redundant Controller Failure" (page 12-105).

Disk Drive Fuses

Perform this procedure only if both PRI disk drives are OOS-FLT due to fuses blowing. If one PRI disk drive is still in service and the other PRI disk drive's fuse blew, refer to the section titled "Minor Alarms Due to Redundant Controller Failure" (page 12-136). If there are other blown fuses in the Redundant Controller Power Module, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94) to replace blown fuses.

1. Locate the blown 5A PRI fuses in fuse boards FBF and FBG. Select one PRI disk drive for which to replace fuses.
2. Partially extract the PRI disk drive chosen in Step 1.
3. Replace the fuse(s) associated with the disk drive chosen in Step 1. Use fuse tool (Part Number WP90247,List 201) to extract fuses.
4. Reinsert the PRI disk drive pulled in Step 2.

5. If the fuse(s):

   - Does not blow, repeat Steps 1 through 4 for the other PRI disk drive, and continue with Step 6.
   - Blows again, obtain a new PRI disk drive and replace the PRI disk drive chosen in Step 1. After replacing the PRI disk drive, mark the PRI disk drive with the TID of the frame and replace the fuse(s) again.

     If the fuse(s) blow again, return the original PRI disk drive to the Redundant Controller Module. Refer the problem to your system administrator or your next level of support for assistance in clearing the problem before continuing with this procedure.

     If the fuse does not blow again, attach the alarm report to the failed PRI disk drive.

6. Repeat Steps 1 through 5, if necessary until all PRI blown fuse problems are cleared.
7. If you replace one PRI disk drive, go to Step 8. If you replaced both PRI disk drives, go to Step 9. If you did not replace any PRI disk drives, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 20 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

8. If you replaced one PRI disk drive, perform the following procedure to restore the replaced disk drive:

   a. Initialize the replaced PRI disk drive by entering the following command:

      `CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

      Where:

      a = Target ID (optional)

      d = PRI disk drive location: `PRI-[1,2]`

      This command takes up to 15 minutes to complete.

   b. Restore the PRI disk drive that was replaced to service by entering the following command:

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

      Where:

      a = Target ID (optional)

      b = PRI disk drive location: `PRI-[1,2]`

      This command takes up to 5 minutes to complete.

      After completion, the contents of the in-service PRI disk drive are copied to the new PRI disk drive, and you are done with this procedure.

9. If you replaced both PRI disk drives, perform the following procedure to restore the disk drives:

   a. Partially extract PRI-2 from its slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out (halfway).

   b. Go to the section titled "Replacing Both PRI Disk Drives" (page 14-6) and start at Step 4. Skip Step 12 of the referenced procedure.

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 12-134).

1. Check for blown fuses in the Redundant Controller Power Module (red ALM LED lit on the fuse boards FBF, FBG, FBH, and FBI). If there are blown fuse, refer to the section titled "Fuses in Redundant Controller Power Module" (page 12-94) before performing this procedure.

   Check the PWRF and PWRG 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 12-81) before performing this procedure.

2. Check to see if a pre-PRI5 disk drive has been installed. If none exist, continue with Step 3.

   If two pre-PRI5 disk drives are installed, refer to the section titled "Replacing Both PRI Disk Drives" (page 14-6) to install PRI5 disk drives. If after installing the PRI5 disk drives, there are no more alarms associated with the Redundant Controller, you are done with this procedure. Otherwise, continue with Step 3.

   If one pre-PRI5 disk drive is installed, perform the following procedure:

   a. Extract the pre-PRI5 disk drive from the slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out to remove the PRI disk drive from the slot.

   b. Copy working memory to the remaining PRI disk drive 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 procedure titled "Restoring Databases from SEC Disk to PRI Disk" (page 6-35).

c. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

d. Install a PRI5 disk drive by referring to the section titled "Replacing Both PRI Disk Drives" (page 14-6).

If there are no more alarms associated with the Redundant Controller, you are done with this procedure. Otherwise, continue with Step 3.

3. Locate the circuit packs in the Redundant Controller Module with their ALM LED lit.
4. For the circuit pack indicating the error, refer to the appropriate section:
   - "ECI Circuit Pack Failure" (page 12-107) for ECI circuit packs
   - "Control Complex (CPU/MTC/SSC), SCI, and UI Circuit Pack Failure" (page 12-110) for all Redundant Controller Module circuit packs excluding ECI, PRI, and SEC
   - "Replacing Both PRI Disk Drives" (page 14-6) if both PRI disk drives (PRIs) have failed
   - "Replacing One PRI Disk Drive" (page 14-4) if only one PRI disk drive has failed

ECI Circuit Pack Failure

Perform this procedure if there is a major alarm associated with the ECI circuit pack(s).

NOTE:
Failure of an ECI circuit pack causes its associated CILINKs to the OOS-MTCE state. This procedure instructs you to restore the CILINKs that were not in the OOS-MTCE state before the ECI circuit pack failure.

1. Locate the ECI circuit pack(s) indicated by a failure message and/or a lit ALM LED.

NOTE:
The loss of the time and the date due to both ECI circuit packs entering the OOS-FLT state causes two `REPT EXCPTN SYS` messages to be output and a minor alarm to be issued.

2. Obtain a new ECI circuit pack for each failed ECI circuit pack.
3. Extract the failed ECI circuit pack identified in Step 1, and attach the alarm report to it. If both ECI circuit packs failed, pick the one with the 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.
4. Install an ECI circuit pack in place of the one extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
5. Repeat Steps 3 and 4 for the other ECI circuit pack if both ECI circuit packs failed.

   If both control complexes indicate failure (ALM LED lit), go to the next section titled "Control Complex (CPU/MTC/SSC), SCI, and UI Circuit Pack Failure" (page 12-110).

   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 6. If only one ECI circuit pack was replaced, perform Step 8.
6. If the frame is connected to a General Telemetry Processor (GTP) using one of the TABS links (CILINK-{1,2}-4), make sure the GTP is connected to CILINK-1-4. After a system reset ECI-1 becomes the master and ECI-2 becomes the slave for the associated TABS links.

7. If both ECI circuit packs were replaced, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

8. Perform the following procedure only if one ECI circuit pack was replaced:

⇒ NOTE:
When one of the ECI circuit packs fails, an autonomous restart of the other ECI circuit pack is performed, bringing the links associated with the working ECI into service. This restart takes about 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 and the working ECI circuit pack becomes the master side for the TABS link. If your X.25 PAD network does not support call redirect, you must use a terminal connected to the PAD network connected to the working ECI circuit pack to continue this procedure.

   a. If ECI-1 has failed, the frame is connected to a GTP using the TABS link on CILINK-1-4, and your office procedures require you to use CILINK-1-4 for the GTP connection, reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel. Otherwise, go to Step 8b.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

   b. 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.

c. If the frame is connected to a GTP using one of the TABS links (CILINK-{1,2}-4), make sure it is connected to link 4 of the ECI circuit pack that is working. Remove the GTP connection from the failed ECI circuit pack and connect it to the working ECI circuit pack, if necessary.

CAUTION:
Ground yourself by wearing the wrist strap provided with the equipment when working with link connections.

d. 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 7-22)]. 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 7-22), if necessary], and perform the rest of this procedure using the new terminal configuration.

e. At the terminal on the working ECI circuit pack, log into the DACS IV-2000. If you cannot log in, refer to the section titled "Link Communication Failures" (page 12-29).

f. Restore the ECI circuit pack that failed by entering the following command:

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

Where:

a = Target ID (optional)

b = ECI circuit pack location: `ECI-{1,2}`

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

NOTE:
The ECI circuit pack restored with the `RST-EQPT` command becomes the slave for the TABS link. When the system is reset, ECI-1 becomes the master and ECI-2 becomes the slave.

g. Restore all links (one at a time) that are connected to service by entering the following command for each link:

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

Where:

a = Target ID (optional)

b = Administrative link location: `CILINK-{1,2}-{1-6}`

CILINKs take up to 1 minute to be restored.

h. If you disconnected a terminal in Step 8d, disconnect your terminal and reconnect the disconnected terminal. Refer to the section titled "Adding a Terminal to a Snider Link" (page 7-22), if necessary.

i. Reconnect your terminal to the TTY1 of the ECI circuit pack you removed it from in Step 8d. Refer to the section titled "Adding a Terminal to a Snider Link" (page 7-22), if necessary.

j. If necessary, replace the stile strip removed in Step 7b.

⚠ 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 12-134). If either ECI circuit pack's ALM LED is lit refer to the previous section "ECI Circuit Pack Failure" (page 12-107) 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 12-134) 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 7-22), 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:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG 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.

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, MTC, SCI, and UI circuit packs (one at a time) of one of the control complexes and attach the alarm report to the replaced circuit packs. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

4. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

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 to ensure system integrity.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

Unit Controller Failure

This procedure is used to clear UC circuit pack failures.

1. Check to see if any of the bus fuse alarms are lit (ED-2C940-30 Fuse and Alarm Panel) or fuse alarm lamps lit (ED-9C114-30 Fuse and Alarm Panel) on the Fuse and Alarm Panel on the top of the Switch Bay. If there are any alarm lamps lit that are associated with the power circuit packs, refer to the section titled "Primary Fuses" (page 12-71) 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 12-81) before performing the rest of this procedure.
3. Locate the failed unit controller (red LED lit).
4. 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 Step 5.
5. Obtain a new UC circuit pack for the failed one.
6. Replace the failed UC circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary. After extracting the failed UC circuit pack attach the alarm report to it.
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, 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 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Some faults cannot be isolated to a single circuit pack by the system. When data signals are transmitted from one circuit pack to another circuit pack, parity is calculated over a frame of data and a parity bit is inserted to make the parity odd. When this signal is received, parity is checked to be sure it is still odd. A parity error is a failure in transmission from one circuit pack to another. It can be created by a failure on either circuit pack, connector pins, or the wires carrying signals between them. A similar situation exists with the transmission of clock signals from circuit pack to circuit pack.

The system software isolates and removes circuit packs from service in a way that best protects service.

⚠ CAUTION:
Do not remove a circuit pack if it is unprotected (that is, in the ACT-FLT state). It can still be carrying service and removing it disrupts service. A circuit pack must not be active (that is, in the OOS-FLT, POS-FLT, or EQPD-FLT state) before extracting it from the frame.

This procedure is used to clear alarms associated with interface, switch, and clock generator circuit packs. The majority of the alarms indicate a failure on a single

circuit pack and the replacement of the circuit pack clears the alarm. There can also be multiple circuit pack failures which require the replacement of more than one circuit pack to clear the alarm. There can be some instances where replacement of the circuit pack with the alarm indication does not clear the alarm. When this occurs, you are directed to contact your system administrator or your next level of support for assistance. Causes for these types of trouble are:

- No Signal from Standby Clock
- No Signal from Active Clock
- CLKGN not Sending Clock Signals
- N-Rate Parity Failures (SWIO and SWCS Circuit Packs)
- N-Rate Clock Failure (CLKDR to SWIO)
- N-Rate Parity Failure (SWIO to interface Circuit Packs)
- MUX, SMUX, or SWIF 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 12-127).

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 or could cause loss of service.

⚠ CAUTION:
The 120V AC and the DC meter Buzzers must ***not*** *be used for continuity checking of the ring and tip leads because of the 100 ohms impedance. Refer to the section titled "DS1 Facility Continuity Checking" (page 2-1), 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 12-124) 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 12-125) to clear the alarm.

1. Check to see if any bus alarm lit (ED-2C940-30 Fuse and Alarm Panel) or fuse alarm lamps lit (ED-9C114-30 Fuse and Alarm Panel) on the Fuse and Alarm Panel on the top of the Switch Bay. If there is a bus alarm lamp lit, refer to the procedure titled "Primary Fuses" (page 12-71) 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 12-81) 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}** }

   A sample output is:

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

   Where:

   e = Circuit pack location: { MUX-{1-32}-{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} }

   f = Equipment state: failure states are ACT-FRCD-FLT, EQPD-FLT, IS-FLT, OOS-FLT, and POS-FLT

4. Choose any circuit pack that is in the OOS-FLT (clear circuit packs in OOS-FLT state first), EQPD-FLT, IS-FLT or POS-FLT states, and go to Step 6.

   If there are no circuit packs in the OOS-FLT, EQPD-FLT, POS-FLT, or IS-FLT state and the state of any circuit pack is ACT-FLT or ACT-FRCD-FLT, switch the circuit pack h to protection by entering one of the following commands:

   ACT-FLT state:

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

   ACT-FRCD-FLT state:

   ALW-SW-EQPT:*[a]*:*b*::**PROTN**;

   Where:

   a = Target ID (optional)

   b = Circuit pack location: { **MUX-{1-32}-{1-31}, SMUX-{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 CLKGN circuit pack and any UC circuit pack in an STS1 Interface-16 Module has been removed from service with the **RMV-EQPT** command, restore all identified UC circuit packs to service by entering the following command (one for each UC circuit pack):

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

   Where:

   a = Target ID (optional)

   b = Equipment location: { UC-{1-32} }

   This command takes up to 5 minutes to complete.

   If the red ALM LED on the CLKGN circuit pack does not turn off, continue with Step 8.

   If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

6. If the circuit pack chosen in Step 4 is a MUX circuit pack and it is in the EQPD-FLT or POS-FLT state, retrieve the port state by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = DS3 port location: {1-32}-{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 10-13). Otherwise, continue with the Step 8.

   If the red ALM LED on the MUX circuit pack does not turn off (approximately 20 seconds) after establishing the loopback, continue with Step 8.

   If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

7. If the circuit pack chosen in Step 4 is an SMUX circuit pack and it is in the EQPD-FLT or POS-FLT state, retrieve the port state by entering the following command:

   RTRV-STATE-EC1:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = EC-1 port location: **{1-32}-{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 (256) Release 4.0, Commands and Messages* manual (AT&T 365-340-702).

   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 10-21). Otherwise, continue with the next step.

   If the red ALM LED on the SMUX circuit pack does not turn off (approximately 20 seconds) after establishing the loopback, continue with the next step.

   If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs, return to Step 3 for clearing the remaining circuit pack failures.

8. Obtain a diagnostic report for the circuit pack selected in Step 4 by entering the following command:

   DGN-DET-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = Circuit pack location: **{ SWCS-{1-32}, 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for information on diagnostic tests that are performed.

9. Obtain a new circuit pack of the same type as the circuit pack selected in Step 4.
10. If the failed circuit pack selected in Step 4 is not a MUX, DS1IF, or SMUX circuit pack, go to Step 11. For MUX, DS1IF, or SMUX circuit packs, perform the following procedure:
    a. Retrieve the provisioned and circuit pack LBO or EQL setting by entering the following command:

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

       Where:

       a = Target ID (optional)

       b = MUX or DS1IF circuit pack location:
       { MUX-{1-32}-{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 (only pertinent parameters are shown):

       - **MUX or SMUX circuit pack**:

```
    TID YY-MM-DD HH:MM:SS
M   c COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: :...PLBO=h, CLBO=i..."
;
```

       Where:

       d = Circuit pack location: { MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15} }

       h = Provisioned line build-out: { INIT, OUT, IN }

       i = Circuit pack line build-out: { OUT, IN }

       Check the values of parameters *h* and *i*.

       - **DS1IF circuit pack**:

```
    TID YY-MM-DD HH:MM:SS
M   c COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "d: :...PEQL=j, CEQL=k..."
;
```

Where:

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

j = Provisioned Equalizer: `{ INIT, 20, 40, 60, 80, 100, 20*, 40*, 60*, 80*, 100* }`
An asterisk (*) indicates the value was provisioned through circuit pack insertion.

k = Circuit pack line build-out: `{ INIT, 20, 40, 60, 80, 100, INVALID }`

Check the values of parameters *j* and *k*.

If the values match, set the value of the new MUX, DS1IF, or SMUX circuit pack to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-26) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-35) for DS1IF circuit packs] and continue with Step 11.

If the values do not match, continue with Step 10c.

c. Extract the MUX, DS1IF, or SMUX circuit pack selected in Step 4. Refer to Chapter 2 for extracting circuit packs, if necessary.

d. Set the circuit pack LBO or EQL settings by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-26) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-35) for DS1IF circuit packs].

e. Reinstall the MUX, DS1IF, or SMUX circuit pack extracted in Step 10c. Refer to Chapter 2 for installing circuit packs, if necessary.

If the red ALM LED on the MUX, DS1IF, or SMUX circuit pack does not turn off (approximately 20 seconds), set the value of the new MUX, DS1IF, or SMUX circuit pack obtained in Step 9 to match the provisioned value by referring to the appropriate section ["Setting Line Build Out (LBO)" (page 5-26) for MUX or SMUX circuit packs or "Setting Equalizer (EQL) and DS1 Code Type" (page 5-35) for DS1IF circuit packs] and continue with Step 11.

If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

11. Replace the failed circuit pack selected in Step 4 and attach the alarm report to the failed circuit pack. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

12. If the red ALM LED on the circuit pack replaced in Step 11 does not turn off (approximately 20 seconds), continue with Step 13.

    If the red ALM LED turns off on the circuit pack replaced in Step 11 and you switch the circuit pack to protection with the **SW-TOPROTN-EQPT** command in Step 4, allow the circuit pack to switch to working by entering the following command:

    ALW-SW-EQPT:*[a]*:*b*::**WKG;**

    Where:

    a = Target ID (optional)

    b = Circuit pack location: **{ MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-15}, SWIF-{1-32}-{1-8}, SWCS-{1-32}, SWIO-{1-32} }**

    If there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

13. If the circuit pack you replaced in Step 11 is a SWIO circuit pack, continue with Step 14. Otherwise, go to Step 18.

NOTE:
The CLKDR circuit pack is an extension of the SWIO circuit pack and can be contributing to the SWIO circuit pack failure.

14. Obtain a new CLKDR circuit pack

15. Replace the failed CLKDR circuit pack. After extracting the failed CLKDR circuit pack attach the alarm report to 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 Step 16.

    If the red ALM LED turns off and there are no more failed circuit packs, you are done with this procedure. If there are more failed circuit packs (circuit packs in the ACT-FLT state are switched to protection), return to Step 3 for clearing the remaining circuit pack failures.

16. Replace the CLKDR circuit pack that you extracted in Step 15 with the original CLKDR circuit pack (one with alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
17. Replace the SWIO circuit pack that you extracted in Step 11 with the original SWIO circuit pack (one with the alarm report attached to it). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
18. Since replacing the circuit pack with its ALM LED lit does not clear the alarm, the failure is most likely due to backplane 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 8) for assistance. If there are any other interface and switch circuit pack failures, return to Step 3.

Clearing CONTBUS Conditions

The CONTBUS alarm condition is caused by a failure associated with the serial control bus between the SWIO or SWCS circuit pack indicating the alarm and its associated SCI circuit pack (SCI-1 for SWCS-{1-32} and SCI-2 for SWIO-{1-32}). 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 Step 2.

2. Obtain a new SWIO or SWCS circuit pack.

3. Replace the SWIO or SWCS circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Obtain a diagnostic report for the SCI circuit pack associated with the SWIO or SWCS circuit pack indicating the alarm by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SCI circuit pack location: `SCI-{1,2}`
   SCI-1 is associated with SWCS-{1-32} circuit packs and SCI-2 is associated with SWIO-{1-32} circuit packs.

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified SCI circuit pack passes, go to Step 7. Otherwise, continue with Step 5.

5. Obtain a new SCI circuit pack.
6. Replace the SCI circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 7.
7. If the alarm does not clear after replacing and/or diagnosing circuit packs, the failure is most likely due to cabling or backplane problems. Contact the system administrator or next level of support for assistance in clearing the problem.

Clearing SYNCCLK0 and SYNCCLK1 Conditions

The SYNCCLK0 and SYNCCLK1 alarm conditions are caused by a failure associated with the connection between the SWIO or SWCS circuit pack indicating the alarm and the associated CLKGN circuit pack (CLKGN-0 for SYNCCLK0 and CLKGN-1 for SYNCCLK1). To clear SYNCCLK conditions, perform the following procedure.

1. Obtain a diagnostic report for the SWIO or SWCS circuit pack indicating the alarm by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIO/SWCS circuit pack location: `{ SWCS-{1-32}, 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 Step 2.
2. Obtain a new SWIO or SWCS circuit pack.
3. Replace the SWIO or SWCS circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 4.

4. Obtain a diagnostic report for the CLKGN circuit pack associated with the clock indicating the failure by entering the following command:

   `DGN-DET-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = CLKGN circuit pack location: `CLKGN-{0,1}`
   CLKGN-0 is associated with the condition SYNCCLK0 and CLKGN-1 is associated with the condition SYNCCLK1.

   Diagnostics take up to 15 minutes to complete.

   If the diagnostics for the specified CKLGN circuit pack passes, go to Step 7. Otherwise, continue with Step 5.

5. Obtain a new CLKGN circuit pack.

6. Replace the CLKGN circuit pack that failed diagnostics (attach diagnostic report to failed circuit pack). Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   If the alarm clears, you are done with this procedure. Otherwise, continue with Step 7.

7. If the alarm does not clear after replacing and/or diagnosing circuit packs, the failure is most likely due to cabling or backplane problems. Contact the system administrator or next level of support for assistance in clearing the problem.

Protection Circuit Pack Failures

This procedure clears an alarm condition caused by the failure of the DS1RY or MUXPS circuit pack to switch traffic to the MUXP circuit pack, SMUX circuit pack, or DS1 protection circuit packs (two DS1IPs and a SWIF). Usually, there is an alarm condition and the green LED on the DS1RY or MUXPS circuit pack is *not* lit.

If the red ALM LED is lit on one of the MUXP, SMUXP, or DS1 protection (either DS1IP or SWIF) circuit packs, go to the section titled "Failed MUXP, SMUXP, or DS1 Protection Circuit Packs" (page 12-127). 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 12-128).

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

3. Replace the failed interface protection circuit pack. After extracting the failed circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

4. Check to see if the red ALM LED on the circuit pack is off.

   If it is off, you are done with this procedure.

   If the red ALM LED does not turn off, replace the original circuit pack (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

3. Replace the failed DS1RY or MUXPS circuit pack. After extracting the failed circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

4. Check to see if the red ALM LED on the circuit pack is off.

   If it is off, 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 FILTER ALARM LED. An alarm for Switch Bay fan assemblies ED-2C816-30,G1 or ED-2C906-30 are caused by power being lost (blown fuse or circuit breaker) or fan failure. An alarm for Switch Bay fan assembly ED-9C130-30,G1 or Interface Bay fan assembly ED-9C130-30,G2 are caused by power being lost (blown fuse or circuit breaker), fan failure, or dirty or clogged air filter. Figures 12-5 (ED-2C816-30,G1 or ED-2C906-30 fan assemblies) and 12-6 (ED-9C130-30,G1 or ED-9C130-30,G2 fan assemblies) show the location of the alarm LEDs and other functional buttons.

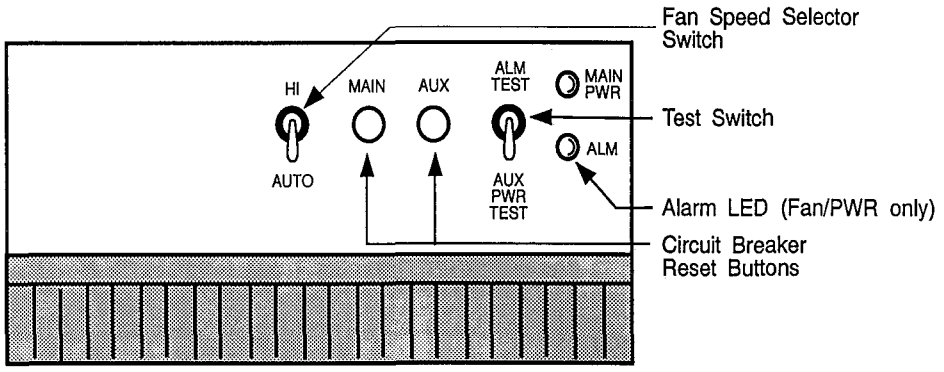


Figure 12-5. **ED-2C816-30,G1 and ED-2C906-30 Fan Assemblies**

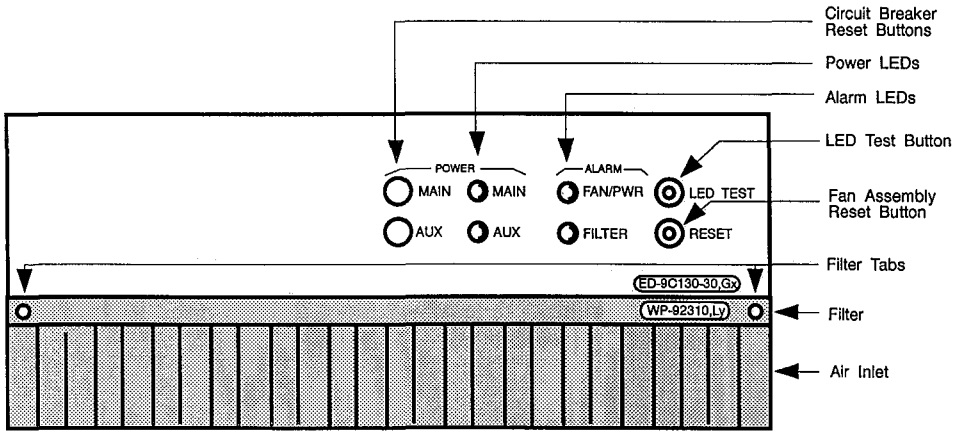


Figure 12-6. **ED-9C130-30 Fan Assembly With Enhanced Alarm Display**

1. Determine which fan assemblies have an alarm LED lit and what type of fan assemblies (ED-2C816-30,G1, ED-2C906-30, ED-9C130-30,G1, and ED-9C130-30,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,G1 and G2, the ED number is located on the front of the fan assembly.

2. For ED-9C130-30,G1 and G2, if the yellow FILTER LED is lit, perform the procedure in the next section titled "Fan Filter Alarm" (page 12-131) before continuing with Step 3.
3. In the fuse and alarm panel, check for blown fuses (for ED-2C940-30 Fuse and Alarm Panel, stem extended from base of fuse holder; for ED-9C114-30 Fuse and Alarm Panel, lit alarm lamp) associated with the fan assembly selected in Step 1. Refer to Table 12-16 for fuse locations. Replace blown fuses. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for replacing fuses, if necessary.
4. Check the fan assembly for triggered circuit breaker indicators (circuit breaker reset button pops up). If a circuit breaker triggered, press the circuit breaker reset button (MAIN and/or AUX) on the fan assembly.

Table 12-16. **Fuse Chart for Fan Assemblies**

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse and Alarm Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—
Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8, 1nd 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.									
Duplex Power (ED-9C114-30 Fuse and Alarm Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

5. If you replaced a fuse associated with fan assembly ED-9C130-30,G1 or ED-9C130-30,G2 and if the FAN/PWR alarm LED remains lit and/or the MAIN or AUX LED is not lit, press the RESET button on the fan assembly to attempt to clear the alarm on the fan assembly.

   If the alarm can be cleared by pressing the RESET button, within 2 minutes the FAN/PWR LED turns off and 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`

6. If the FAN/PWR alarm clears and the yellow FILTER LED is not lit, you are done with this procedure.

   If the FAN/PWR alarm clears and the yellow FILTER LED is lit, go to the procedure in the next section titled 'Fan Filter Alarm".

7. If after replacing the fuse(s), resetting the circuit breakers, and if necessary the fan filter and/or resetting the fan assembly the alarm remains or the ALM or FAN/PWR LED remains lit, replace the fan assembly by referring to the section titled "Replacing a Fan Assembly" (page 14-13).

Fan Filter Alarm

This procedure is used to replace the ED-9C130-30,G1 or G2 fan assembly air filter.

You need a fan assembly air filter WP-92310,L4A (COMCODE 407234970) for each fan assembly with its yellow FILTER alarm LED lit or for fan filters being replaced for routine maintenance. If the fan filter is being replaced for routine maintenance, after performing this procedure record the date in the Routine Maintenance Checklist (Table 3-1).

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

1. Locate the fan assembly with its yellow FILTER alarm LED lit.
2. Extract the air filter from the fan assembly selected in Step 1 by pulling on the tabs on both end of the filter. Refer to Figure 12-7.

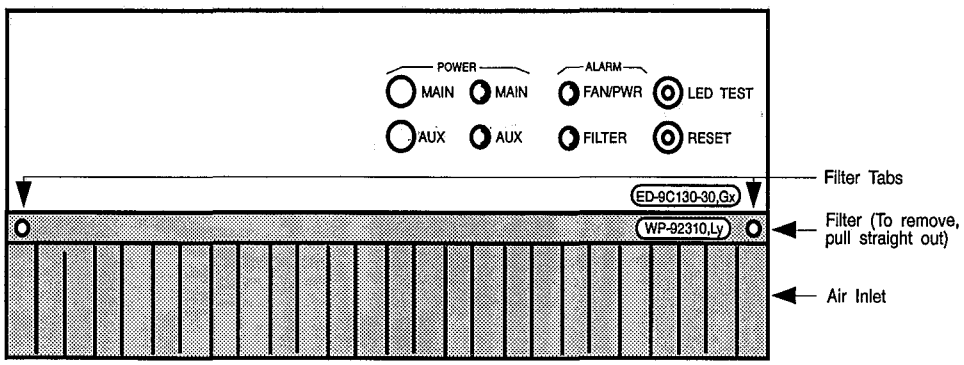


Figure 12-7. **ED-9C130-30 Fan Assembly — Air Filter Location**

3. Clean visible dirt from area that air filter was extracted from.
4. Make sure the new air filter is flat (that is, is not warped or bowed).

   If 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 12-7.
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, refer to the section titled "Fan Assembly Initialization" (page 14-23) to initialize the fan assembly. If the initialization fails, contact the system administrator or next level of support for assistance.
9. Press and release the LED TEST button the fan assembly selected in Step 1. Refer to Figure 12-7, 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 any of the LEDs fail to light during the test, make a note of the failed LEDs and refer to the section titled "Replacing LEDs in an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-27) to replace fan assembly LEDs after completing this procedure.

10. If there are any other fan assemblies with their yellow FILTER alarm LED lit, return to Step 1.
11. If your DACS IV-2000 has both the ED-2C816-30,G1/ED-2C906-30 and the ED-9C130-30 fan assemblies, set the automatic fan filter notification message to ON (default value). If your DACS IV-2000 has only the ED-9C130-30 fan assembly, set the automatic fan filter notification message to OFF by entering the following command:

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

    Where:

    a = Target ID (optional)

    b = Report mode: { `ON, OFF` }

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 timing reference (SYNCPRI and SYNCSEC) any of the following alarm conditions indicates a BITS timing failure: AIS, EOR, EXJIT, EXPHR, FRQOF, LOS, LOF, OOF, PHSTP, TRBER, and TRMNBER. When a major alarm is raised with an equipment location associated with the Synchronizer Module (SYNCN) and an alarm condition ALLREFFAIL, all BITS timing references have failed. For all other alarm conditions and equipment locations refer to the section titled "Prioritizing Alarms" (page 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. Retrieve the synchronizer mode of operation by entering the following command:

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

   Where:

   a = Target ID (optional)

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

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

   Where:

   c = Synchronizer mode: { NORM, HLDOVR, FST, FRNG }

   If the synchronizer mode is HLDOVR, go to Step 4. Otherwise continue with Step 3.
3. When instructed to do so change the synchronizer mode to holdover mode by referring to the section titled "Changing Synchronizer Modes" (page 6-22).
4. Have the personnel responsible for the BITS timing reference fix the indicated failure at the timing source.

5. If the alarm condition is not EOR, go to Step 6. Otherwise, for the DS1TX (TX) circuit pack associated with the failed timing reference (EOR alarm condition), perform the following procedure:

   a. Remove the DS1TX (TX) circuit pack associated with the failed timing reference (EOR alarm condition) from service by entering the following command:

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

      Where:

      a = Target ID (optional)

      b = Timing extractor port locations: `TX-{0,1}`

      An alarm associated with the DS1TX occurs with the condition set to `MAN`.

   b. Restore the DS1TX circuit pack removed in Step 5a by entering the following command:

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

      Where:

      a = Target ID (optional)

      b = Timing extractor port location: `TX-{0,1}`

      This command takes up to 1 minute to complete. The `MAN` *alarm clears.*

6. When instructed to do so change the synchronizer mode to phase-locked mode (normal mode) by referring to the section titled "Changing Synchronizer Modes" (page 6-22).

Minor Alarms Due to Redundant Controller Failure

Perform this procedure if a minor alarm indication is for a failed control complex, one of the PRI disk drives, or SEC disk drive fuses.

If there is major alarm indication and there is a failure in the Redundant Controller Module, refer to the section titled "Redundant Controller Failure" (page 12-105).

NOTE:
After the standby control complex becomes active, the FAILURE and MJ alarms clear and a MN alarm is issued for the failed control complex.

1. Check for blown fuses associated with the failed control complex, PRI disk drive, or SEC disk drive. Fuses for control complexes, PRI disk drives, and the SEC disk drive are located in fuse boards FBF, FBG, and FBH.

   If the only alarm condition is associated with the SEC disk drive (SEC) and the SEC fuses are not blown, refer to the section titled "CPY-MEM Command or Database Backup Failure" (page 13-8).

   If there are no blown fuses, go to Step 3; otherwise continue with Step 2.

2. For each blown fuse perform the following procedure:

   a. Pick one of the blown fuses (or the one that blew if only one) to replace.

   b. Partially extract the circuit pack associated with the blown fuse chosen in Step 2a.

   c. Replace the blown fuse.

   d. If the fuse:

      - Does not blow again, continue with Step 2e.
      - Blows again, reinstall the circuit pack that you extracted in Step 2b.

      Failure cannot be cleared by replacing a fuse or its associated circuit pack. If there are no other blown fuses, refer all problems associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) and return to Step 2a.

   e. Reinstall the circuit pack that you extracted in Step 2b.

f. If the fuse:

- Does not blow again and there are more blown fuses, return to Step 2a; otherwise go to Step 2g.
- Blows again, obtain a new circuit pack for the circuit pack associated with the blown fuse, and replace the failed circuit pack. After extracting the failed circuit pack attach the alarm report to it. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

  If the fuse blows again, the failure cannot be cleared by replacing a fuse or its associated circuit pack. Return the original circuit pack (one with the alarm report attached to it) to the frame. If there are no other blown fuses, refer all problems associated with fuses or circuit packs to your system administrator or your next level of support for assistance in clearing the problem and do not continue with this procedure. If there are other blown fuses, make a note of this problem (to be referred to your system administrator or your next level of support) and return to Step 2a.

g. If the ALM LED of all circuit packs turn off, continue with Step 4; otherwise continue with Step 3.

3. If the lit ALM LEDs are associated with a PRI disk drive and/or the SEC disk drive, continue with Step 4; otherwise perform the following procedure:

   a. Determine the state of all the circuit packs in the 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:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG 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.

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 PRI disk drive, retrieve the state of the PRI disk drive by entering the following command:

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

Where:

a = Target ID (optional)

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

A sample output response:

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

Where:

e = PRI disk drive location: PRI-{1,2}

f = Equipment state

If the state of the PRI disk drive is OOS-MTCE, go to Step 5. Otherwise, refer to the section titled "Replacing One PRI Disk Drive" (page 14-4).

5. If the state of the PRI disk drive is OOS-MTCE, restore the PRI disk drive to service by entering the following command:

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

   Where:

   a = Target ID (optional)

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

   This command takes up to 15 minutes to complete. After completion of this command, the contents of the in-service PRI disk drive are copied to the PRI disk drive you restored.

   If the ALM LED remains lit on the PRI disk drive you restored, refer to the section titled "Replacing One PRI Disk Drive" (page 14-4). 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.

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 two option switches set to the IN position. All others on that side of the Switch Bay must be set to the OUT position.

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 (P links) connection to pins P51 and P52 on the backplane associated with the DS3PM circuit pack.

   If the TABS link is not connected to pins P51 and P52 on the backplane, make the connection and continue with Step 8 [refer to the introductory information of the section titled "Provisioning DS3PM Circuit Packs" (page 5-42) for P link arrangements and connections]. If the TABS link is connected to pins P51 and P52 on the backplane, continue with Step 2.

2. Determine the state for each PMGR1 or 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}**

   A sample output response is:

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

   Where:

   e = PMGR1 circuit pack location: { MUX-{1-32}-{1-31}, SWIF-{1-32}-{1-8} }
   DS3PM circuit pack location: DS3PM-{1-32}

   f = Equipment state

3. Choose any circuit pack that is in the OOS-FLT, POS-FLT, or ACT-FLT state.

4. Obtain a diagnostic report for the PMGR1 circuit pack that failed, or attempt to restore the 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-{1-6}-{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 no other PMGR1 and DS3PM circuit pack failures, you are done with this procedure. Otherwise, continue with Step 5.

5. Obtain a new circuit pack of the same type as the failed circuit pack.
6. If you are replacing a 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 12-8 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 Step 8.

   If you replaced a PMGR1 circuit pack and its red ALM LED does not turn off, continue with Step 9.

   If you replaced a PMGR1 circuit pack and its red ALM LED turned off and there are no more failed PMGR1 and 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.
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 you are done with this procedure.

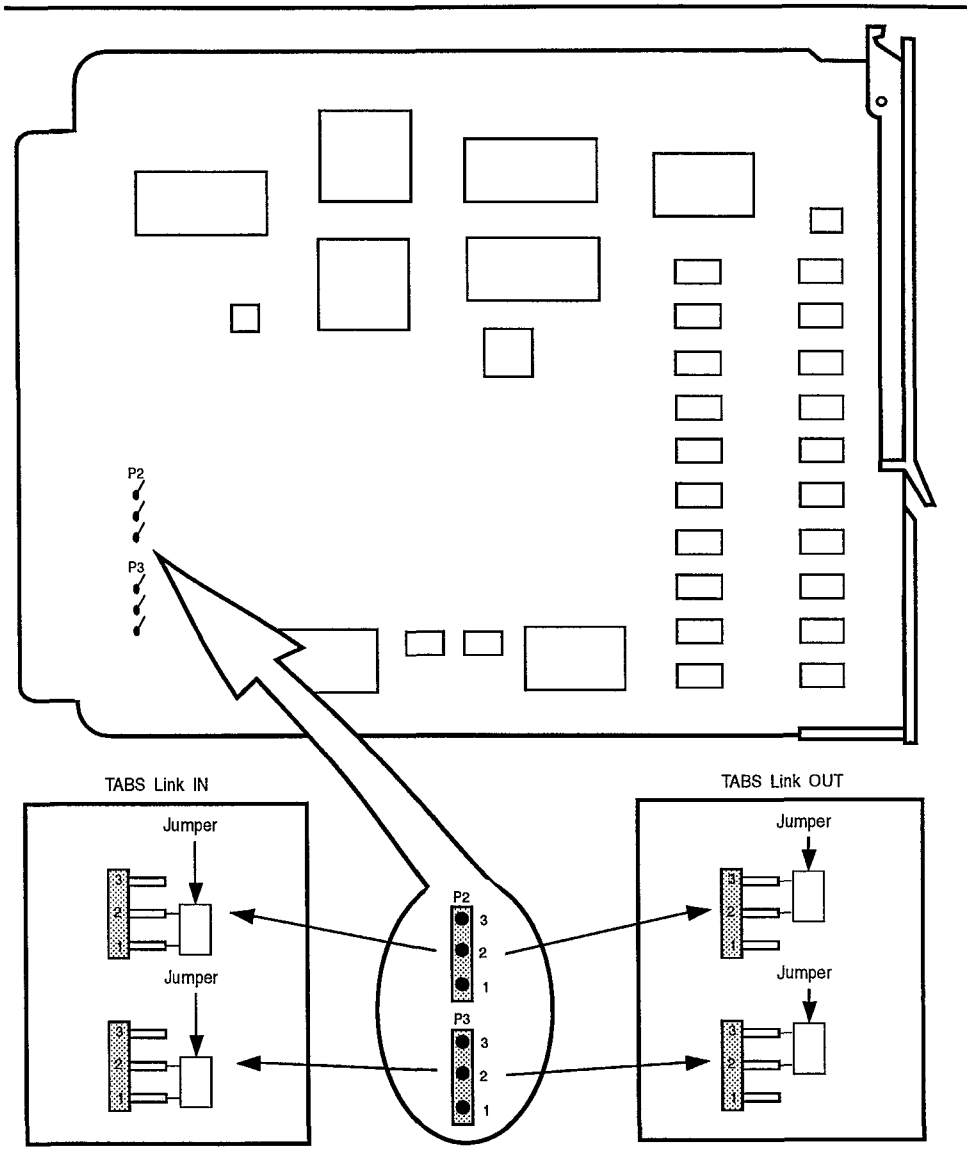


Figure 12-8. **Location of TABS Link Option Switches on DS3PM1 (AKM62)**

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. Otherwise you are done with this procedure.

Time of Day Clock Failure

Perform this procedure only if you received a minor alarm and the ALM LEDs on the ECI circuit packs are lit. If you received a major alarm, refer to the section titled "Prioritizing Alarms" (page 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. 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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Contents

Diagnostic Messages

13

This chapter consists of procedures required to clear problems that are indicated by diagnostic messages generated by the DACS IV-2000 in response to user- or system-generated diagnostics.

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

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

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

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}, 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-{0,1}**, **MTC-{0,1}**, **SSC-{0,1}**, **ECI-{1,2}**, **SCI-{1,2}**, and **CILINK-{1,2}-{1-6}**.

Diagnostics can be performed on the Memory Storage Module entity **MEM**, which contains the entities **PRI-{1,2}** and **SEC**. The **PRI-{1,2}** and **SEC** can also be diagnosed discretely with the MC in the IS or OOS state.

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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for detailed information.

Diagnostics can take up to 15 minutes to complete.

2. Determine the equipment location and results from the output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

Where:

e = Equipment location: { MC, 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}, DPLL-{0,1}, TB-{0,1} }

f = Actual/Failed diagnostic phases: < 4 Digit hex number >

g = Diagnostics result: {PASS, FAIL }

h = Expected diagnostic data: < "1-40 Legal Characters" >

i = Measured diagnostic data: < "1-40 Legal Characters" >

If parameter *g* contains FAIL on any line of the output response, determine the failed equipment from parameter *e* and perform the procedure listed in Table 13-1 to clear the failed equipment.

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 14-10).
PRI	Go to the section titled "Replacing One PRI Disk Drive" (page 14-4) for single disk drive failures or the section titled "Replacing Both PRI Disk Drives" (page 14-6) for failures of both disk drives.
SEC	Go to the section titled "Replacing the SEC Disk Drive" (page 14-9).
DPLL SYNC TB (TBS3) TX (DS1TX)	Go to the section titled "Synchronizer Module Failure" (page 12-36)
UC	Go to the section titled "Unit Controller Failure" (page 12-113)
CLKGN CLKDR SWCS SWIO MUX SMUX SWIF* CILINK DS1IF DS1IP DS1RY DS3PM MUXPS MUXP SMUXP	Go to the section titled "Interface, Switch Module Circuit Pack Failures" (page 12-114)

* Includes protection circuit packs

REPT DGNDET EQPT Message

The system generates this message autonomously to provide detailed information about the autonomous detection of a failed circuit pack. This procedure defines the method for clearing the failure. If this message appears frequently and/or repeatedly, contact your system administrator or your next level of supervision for technical assistance.

1. Determine the equipment location from the `REPT DGNDET EQPT` output message:

```
   TID YY-MM-DD HH:MM:SS
A  a COMPLD
   /* LOC:ITER,PHASES,RESULT,EXPECTED,MEASURED */
   "b:1,d,FAIL,f,g"
;
```

Where:

b = 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}, DPLL-{0,1}, TB-{0,1} }`

d = Failed diagnostic phases: < 4 Digit hex number >

f = Expected diagnostic data: < "1-40 Legal Characters" >

g = Measured diagnostic data: < "1-40 Legal Characters" >

NOTE:

For details about the contents of parameter *c*, see the appendix on "Diagnostic Tests" in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

If the standby `CLKGN-{0,1}` is specified as the equipment location and the measured diagnostic data is `"SWIO-{1-32} DOES NOT DETECT CLKGN-{0,1}"` and the SWIO circuit pack is active, a failure within the SWIO circuit pack can cause the CLKGN diagnostics to fail. If the CLKGN circuit pack is switched and/or the alarm clears on the CLKGN circuit pack, the SWIO circuit pack specified contains the failure. This SWIO circuit pack is used in the rest of this procedure instead of the CLKGN circuit pack.

2. Diagnose the failed equipment by entering the following command:

   DGN-DET-EQPT:*[a]*:*b*:::*[d]*;

   Where:

   a = Target ID (optional)

   b = Equipment location: equipment specified in parameter *b* of the REPT DGNDET EQPT message.

   d = Diagnostic phases: specify diagnostic phase only if parameter *b* of the REPT DGNDET EQPT message is MC.

   Diagnostics can take up to 15 minutes to complete.

3. Determine equipment location and results from the following output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

   Where:

   e = Equipment location: { MC, 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}, DPLL-{0,1}, TB-{0,1} }

   f = Actual/Failed diagnostic phases: < 4 Digit hex number >

   g = Diagnostics result: { PASS, FAIL }

   h = Expected diagnostic data: < "1-40 Legal Characters" >

   i = Measured diagnostic data: < "1-40 Legal Characters" >

   If parameter *g* contains FAIL on any line of the output message, determine the failed equipment from parameter *e* and perform the procedure listed in Table 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.

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 or during an autonomous database backup (CTYPE of SS ERROR), go to the next section titled "CPY-MEM Command or Database Backup 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 12-142).

   If a REPT EXCPTN SYS message is output after a **RTRV-SYSID** command with the condition type PROGFLT, the SEC disk drive is in the OOS-FLT state due to a blown fuse. Refer to the section titled "Minor Alarms Due to Redundant Controller Failure" (page 12-134) to replace the blown fuse associated with the SEC disk drive.

   Refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) 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 or Database Backup Failure

This procedure is used when you get a REPT EXCPTN SYS message after entering a **CPY-MEM** command or during an autonomous database backup. Types of conditions that can cause a REPT EXCPTN SYS message to be output for a **CPY-MEM** command denial are:

- The optical disk is bad or the contents is corrupted
- SSC circuit pack failed
- The SEC failed
- One PRI failed
- Both PRIs failed

In addition to the condition type (CTYPE) and detailed equipment location (EIDDET) parameters of the REPT EXCPTN SYS message, Table 13-2 shows exceptions for PRI and SEC locations associated with the return code (RC) parameter.

Table 13-2. **PRI and SEC Error Information — RC Parameter of REPT EXCPTN SYS Message**

RC Hex Code (Last 8 Digits)	Error Condition
fffffd00	Header failed although sector number matched
fffffd01	Data field error
ffffd02	Sector not found
ffffd03	Sector overrun
fffffd04	No data synchronization
fffffd05	First in first out (FIFO) data lost
fffffd06	Correction failed
fffffe1f	PRI disk seek error
fffffe20	Optical disk seek error

1. If you did not specify the SEC disk drive in the **CPY-MEM** command or if parameter *f* of the REPT EXCPTN SYS message does not begin with 000000e8 (0e8 indicates SEC failure and 0f0/0f1 indicate PRI-1/PRI-2 failure, respectively), go to Step 2. Otherwise perform the following procedure:

   a. Retrieve the state of the SEC disk drive by entering the following command:

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

      Where:

      a = Target ID (optional)

      A sample output response is:

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

      Where:

      f = Equipment state: { IS, OOS-FLT, OOS-MTCE }

      If the SEC disk drive is in the OOS-FLT state, clear the failure by referring to the section titled "Minor Alarms Due to Redundant Controller Failure" (page 12-134) before performing this procedure. If the SEC disk drive is in the OOS-MTCE state, go to Step 1b. Otherwise, continue with Step 1d.

   b. Attempt to restore the SEC disk drive to service by entering the following command:

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

      Where:

      a = Target ID (optional)

      If the command is denied with the error code SCCF (secondary cartridge checksum failure), go to Step 1c (the optical disk cartridge has been corrupted and needs to be reformatted). If this command completes (up to 1 minute and the green ON LED lights), go to Step 1g.

   c. Format the optical disk cartridge by entering the following command:

      CPY-MEM:*[a]*:::INIT,SEC,FORMAT;

      Where:

      a = Target ID (optional)

      This command takes up to 15 minutes to complete. After the command completes go to Step 1g.

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

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

Where:

a = Target ID (optional)

This command takes up to 1 minute to complete. After completion the green ON LED extinguishes.

e. Load a different Release 4.0 optical disk into the SEC disk drive (refer to "Extracting/Installing Optical Disk Cartridge" (page 6-26), if necessary).

f. Restore the SEC disk drive to service by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 1 minute to complete. After completion the green ON LED lights.

If this command fails, check and/or replace the optical disk and/or SEC disk drive, as necessary.

g. 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)

A sample output response is:

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

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

If the MC is in the OOS-MCOND state, go to Step 4. Otherwise, continue with Step 3.

3. If parameter *f* of the `REPT EXCPTN SYS` message begins with `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 PRI Disk Drive" (page 14-4).

    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. 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) and you are done with this procedure.

8. If you did not specify the SEC disk drive in the **CPY-MEM** command, go to Step 9. Otherwise, perform the following procedure:

   a. Replace the SEC disk drive by using the section titled "Replacing the SEC Disk Drive" (page 14-9). The optical disk that is loaded into the SEC disk drive in the "Replacing the SEC Disk Drive" procedure must be the one you used for the **CPY-MEM** command.

b. Make sure the MC is in the appropriate state (IS or OOS-MCOND) so that you can 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 5 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 you are done with this procedure.

9. If you did not specify the PRI disk drive in the **CPY-MEM** command, go to Step 10. Otherwise, perform the following procedure:

a. Retrieve the state of the MC by entering the following command:

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

Where:

a = Target ID (optional)

A sample output response is:

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

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

If the MC is in the OOS-MCOND state, go to Step 9b. Otherwise, continue with Step 9c.

b. Put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;

Where:

a = Target ID (optional)

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

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

a = Target ID (optional)

This command takes up to 1 minute to complete. After completion the green ON LED extinguishes.

d. Load a optical disk that has been formatted for Release 4.0, contains the Release 4.0 programs and the latest copy of the database into the tape drive. Refer to the section titled "Extracting/Installing Optical Disk Cartridge" (page 6-26), if necessary.

e. Restore the SEC disk drive to service by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 1 minute to complete. After completion the green ON LED lights.

If this command fails, check and/or replace the optical disk and/or SEC disk drive, as necessary [(refer to the section titled "Replacing the SEC Disk Drive" (page 14-9) for replacing the SEC disk drive].

f. Remove both of the PRI disk drives from service by entering the following command:

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

Where:

a = Target ID (optional)

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

This command takes up to 5 minutes to complete.

g. Partially extract one of the PRI disk drives from its slot.

h. Format the remaining PRI disk drive by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-{1,2}`

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 10.

i. Copy the Release 4.0 programs onto the PRI disk by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 11 minutes to complete.

If this command is denied, go to Step 10.

j. Copy the database onto the PRI disk drive by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 12.5 minutes to complete.

If this command is denied, go to Step 10.

k. Reset the system by entering the following command:

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

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, refer to the section titled "Reset and Boot" (page 6-7).

l. If the MC needs to be in the IS state for the **CPY-MEM** command that caused the REPT EXCPTN SYS message, go to Step 9m. Otherwise, put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;**

Where:

a = Target ID (optional)

m. 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 PRI disk drive extracted in Step 9g.
- Restore the PRI disk drive to service by entering the following command:

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

Where:

a = Target ID (optional)

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

This command takes up to 3 minutes to complete.

If PRI disk drive restores, you are done with this procedure. Otherwise replace this disk drive using the section titled "Replacing One PRI Disk Drive" (page 14-4).

10. Perform the following procedure using the PRI disk drive which was extracted in Step 9g:

a. Retrieve the state of the MC by entering the following command:

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

Where:

a = Target ID (optional)

A sample output response is:

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

Where:

f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

If the MC is in the OOS-MCOND state, go to Step 10c. Otherwise, continue with Step 10b.

b. Put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]*:**MC::OOS-MCOND**;

Where:

a = Target ID (optional)

c. Remove the in-service (IS) PRI disk drive from service by entering the following command:

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

Where:

a = Target ID (optional)

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

This command takes up to 1 minute to complete.

d. Extract the PRI disk drive you removed in Step 10cc from its slot, and insert the disk drive extracted in Step 9g into its slot.

e. Format the PRI disk drive inserted in Step 10d by entering the following command:

`CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-{1,2}`

This command takes up to 15 minutes to complete.

If this command is denied, go to Step 11.

f. Restore the PRI disk drive inserted in Step 10d to service by entering the following command:

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

a = Target ID (optional)

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

This command takes up to 3 minutes to complete.

If this command is denied, go to Step 11.

g. Copy the Release 4.0 programs onto the PRI disk drive by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 11 minutes to complete.

If this command is denied, go to Step 11.

h. Copy the database onto the PRI disk drive by entering the following command:

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

Where:

a = Target ID (optional)

This command takes up to 12.5 minutes to complete.

If this command is denied, go to Step 11.

i. Reset the system by entering the following command:

CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

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, refer to the section titled "Reset and Boot" (page 6-7).

j. If the MC needs to be in the IS state for the **CPY-MEM** command that caused the REPT EXCPTN SYS message, go to Step 10k. Otherwise, put the MC in the OOS-MCOND state by entering the following command:

ED-STATE-EQPT:*[a]***:MC::OOS-MCOND;**

Where:

a = Target ID (optional)

k. 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 first and second entity locations from the REPT CMPR MEM output message:

```
    TID#0 YY-MM-DD HH:MM:SS
A   a REPT CMPR MEM
    /* MEM1,LOC1,MEM2,LOC2:DTYPE,DATA1,DATA2 */
    "WKG,c,d,e:f,g,h"
;
```

Where:

c = First entity location: { CPU-{0,1}, ECI-{1,2}, UC-{1-32}, DS3PM-{1-32} }

d = Second memory type: { WKG, PRI }

e = Second entity location: { CPU-{0,1}, ECI-{1,2}, CLKGN-{0,1}, SWCS-{1-32}, SWIO-{1-32}, UC-{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}, {1-32}-{1-8}-{1-28}, {1-32}-{1-31} }

f = Data type: Refer to the REPT CMPR MEM command entry in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for valid data types.

g = First memory data: <4-8 Hex Digit Number>

h = Second memory data: <4-8 Hex Digit Number>

If parameter *c* (LOC1) is UC-{1-32} and parameter *e* (LOC2) is an interface circuit pack (DS1IF, SWIF, MUX, or SMUX), go to Step 3. If parameter *c* (LOC1) is CPU-{0,1} and parameter *e* (LOC2) is a circuit pack, go to Step 2. Otherwise, go to Step 5.

2. For the circuit pack identified in parameter *e* (LOC2), perform the following procedure:

   a. Diagnose the circuit pack specified in parameter *e* of the `REPT CMPR MEM` message by entering the following command:

   `DGN-DET-EQPT:`*`[a]`*`:`*`b`*`;`

   Where:

   a = Target ID (optional)

   b = Equipment location: equipment specified in parameter *e* of the `REPT CMPR MEM` message.

   Diagnostics can take up to 15 minutes to complete.

   b. Determine the equipment location and results from the following output response:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:PHASES,RESULT,EXPECTED,MEASURED */
   "e:f,g,h,i"
;
```

   Where:

e = Equipment location: `{ MC, 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} }`

   e = Actual/Failed diagnostic phases: < 4 Digit hex number >

   f = Diagnostics result: `{ PASS, FAIL }`

   g = Expected diagnostic data: < "1-40 Legal Characters" >

   h = Measured diagnostic data: < "1-40 Legal Characters" >

   If parameter *g* contains `FAIL` on any line of the output message, go to Step 2f. If all phases pass, go to Step 2i.

   f. Obtain a new circuit pack of the same type that failed diagnostics identified in Step 2b.

   g. Extract the failed circuit pack and attach the diagnostic report to the circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

h. Install the new circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   If you installed an UC circuit pack, go to Step 4. Otherwise, go to Step 5.

i. If the circuit pack identified in Step 2b is an UC circuit pack, remove the UC from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   A major (MJ) alarm is issued when you remove an UC from service.

j. Extract the circuit pack identified in Step 2b. Refer to Chapter 2 for extracting circuit packs, if necessary.

k. Install the circuit pack extracted in Step 2j. Refer to Chapter 2 for installing circuit packs, if necessary.

   If you installed an UC circuit pack, go to Step 4. Otherwise, go to Step 5.

3. Remove the unit controller from service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   A major (MJ) alarm is issued when you remove an UC from service.

4. Restore the unit controller to service by entering the following command:

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

   Where:

   a = Target ID (optional)

   b = UC circuit pack location: `UC-{1-32}`

   This command takes up to 5 minutes to complete. The major alarm clears (CL) after the UC is restored. If after restoring the UC an alarm occurs on the interface circuit pack identified in Step 1, after finishing this procedure refer to the section titled "Interface, Switch Module Circuit Pack Failures" (page 12-114) to clear the interface circuit pack failure.

5. Verify that the MC is in the IS state by entering the following command:

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

   Where:

   a = Target ID (optional)

   A sample output response is:

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

   Where:

   f = Equipment state: { IS, OOS-MCOND, OOS-FLT, OOS-MTCE }

6. If the MC is not in the IS state, restore the MC to service before continuing with this procedure by entering the following command:

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

   Where:

   a = Target ID (optional)

   The MC takes up to 5 minutes to restore.

7. Make certain that all databases are current by entering the following command:

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

   Where:

   a = Target ID (optional)

   This command takes up to 15 minutes to complete.

8. If the REPT CMPR MEM message is not cleared after entering the **CPY-MEM** command (for example, this can indicate bad RAM on the CPU), contact your system administrator or next level of support for technical assistance to clear the trouble.

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 3-20).

Replacing and Installing Components

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Replacing and Installing Components

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This chapter provides procedures for replacing certain failed components (found as the result of trouble clearing activities of Chapters 12 and 13), equipping interface and synchronizer modules that are blank, 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 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Procedures included in this chapter for changing older version equipment to newer versions are:

- Switch interface: SWIF1 (AKM49) to SWIF2 (AKM50)
- Switch interface-protection: SWIF1 (AKM49) to SWIF2 (AKM50)
- Multiplexer-protection: MUXP1 (AKM55) to MUXP2 (AKM70)
- Multiplexer: MUX1 (AKM52) to MUX2 (AKM68B)
- Interface module: DS3 Interface-32 Module to STS1 Interface-16 Module
- Interface module: DS3 Interface-16 Module to STS1 Interface-16 Module
- Synchronizer Module: Version 1 to Version 2 circuit packs
- Clock generator: CLKGN2 (AWR7) to CLKGN3 (AWR11)

Replacing Failed Components

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)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = CLKGN circuit pack location: CLKGN-{1,2}

   f = Equipment state

   If the CLKGN with the alarm indication is not in the OOS-FLT state, refer the problem to your system administrator or next level of support for assistance in clearing the trouble.

2. Obtain the diagnostic report for the failed CLKGN by entering the following command:

   DGN-DET-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = CLKGN circuit pack location: **CLKGN-{0,1}**

   Diagnostics take up to 15 minutes to complete. This report is used for further reference and/or trouble report generation.

3. Obtain a new CLKGN circuit pack.
4. Extract the CLKGN circuit pack that failed. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the new CLKGN circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

   The red ALM LED on the new CLKGN circuit pack turns off within 10 seconds.

   If the red ALM LED on the CLKGN circuit pack that you replaced does not turn off, refer to the section titled "Interface, Switch Module Circuit Pack Failures" (page 12-114) to clear the alarm.

Replacing One PRI Disk Drive

CAUTION:
Replace a PRI disk drive only if directed to do so by your system administrator, or trouble clearing procedures in Chapters 12 and 13.

The following procedure is used to replace a system PRI disk drive that has failed and its mate PRI disk drive is still in service.

If both PRI disk drives have failed, refer to the next section titled "Replacing Both PRI Disk Drives" (page 14-6).

1. Obtain a new PRI5 disk drive.

NOTE:
Inserting a pre-PRI5 disk drive causes the main controller (MC) to be placed in the OOS-MCOND state and a major alarm associated with the MC.

2. Determine the state of the two PRI disk drives by entering the following command:

   RTRV-STATE-EQPT:*[a]*:PRI-1&-2;

   Where:

   a = Target ID (optional)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = PRI disk drive location: PRI-{1,2}

   f = Equipment state

   The failed PRI disk drive is in the OOS-FLT state, and the PRI disk drive's red ALM LED is turned on.

3. Extract the failed PRI disk drive from the slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out to remove the PRI disk drive from the slot.

4. To insert the new PRI disk drive, hold the PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into the slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch.

5. Initialize the new PRI disk drive by entering the following command:

   `CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

   Where:

   a = Target ID (optional)

   d = PRI disk drive location: `PRI-[1,2]`

   This command takes up to 15 minutes to complete.

6. Restore the replaced PRI disk drive to service by entering the following command:

   `RST-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = PRI disk drive location: `PRI-[1,2]`

   This command takes up to 5 minutes to complete.

   During execution of this command, the contents of the in-service PRI disk drive are copied to the new PRI disk drive, and you are done with this procedure.

Replacing Both PRI Disk Drives

CAUTION:
Replace PRI disk drives only if directed to do so by your system administrator, or trouble clearing procedures in Chapters 12 and 13.

If both PRI disk drives fail (the DACS IV-2000 enters the OOS-MCOND state), perform this procedure to replace both failed PRI disk drives and restore the MC to the in-service (IS) state.

If only one PRI disk drive has failed, refer to the previous section titled "Replacing One PRI Disk Drive" (page 14-4).

1. Obtain two new PRI5 disk drives.

NOTE:
Inserting a pre-PRI5 disk drive causes unexpected operation problems.

2. Extract one of the failed PRI disk drives from its slot by carefully operating the latch. Grasp the PRI disk drive by the chassis and pull straight out to remove the PRI disk drive from its slot.
3. Repeat Step 2 for the other failed PRI disk drive.
4. Determine the contents of the optical disk in the SEC disk drive by entering the following command:

   `RTRV-SYSID:`*[a]*`;`

   Where:

   a = Target ID (optional)

   The following response appears (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* MEMTYPE,IDBLK,SYSTYPE,SWID,TID,DATE,TIME,PATCH#,
   CALCK,HEADCK,INTEGCK */
   ...
   "SEC,PROG,DACS IV-2000 (256),4-00-1-r,,,,,,,"
   "SEC,DBASE,DACS IV-2000 (256),4-00-1-r,h,i,j,,,,"
   ...
;
```

   Where:

   h = Target ID of the DACS IV-2000 backup

   i = Date of backup

   j = Time of backup

If the output message does show that the official Release 4.0 software and the latest backup database (associated with the proper TID) is present, go to Step 10. Otherwise, continue with Step 5 (incorrect optical disk is inserted).

5. Remove the SEC disk drive from service by entering the following command:

   `RMV-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED extinguishes.

6. Obtain the official Release 4.0 optical disk which also contains the latest database backup disk associated with the DACS IV-2000's TID.
7. Remove the wrong optical disk from the SEC disk drive.
8. Insert the correct optical disk drive (obtained in Step 6) into the SEC disk drive.
9. Restore the SEC disk drive to service by entering the following command:

   `RST-EQPT:[a]:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete. After completion the green ON LED lights.

10. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

`INIT-SYS:[a]::::9;`

Where:

a = Target ID (optional)

The system takes up to 30 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 6-7).

11. Log in to the DACS IV-2000. Refer to Chapter 4 for logging in procedures, if necessary.

12. Install only one new PRI5 disk drive. To insert the new PRI disk drive, hold the new PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into its slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch. Repeat this step for the other failed PRI disk drive.

13. Initialize the new PRI disk drives by entering the following command for each PRI disk drive:

    `CPY-MEM:`*[a]*`:::INIT,`*d*`,FORMAT;`

    Where:

    a = Target ID (optional)

    d = PRI disk drive location: `PRI-[1,2]`

    This command takes up to 15 minutes to complete.

14. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

    `RST-EQPT:`*[a]*`:`*b*`;`

    Where:

    a = Target ID (optional)

    b = PRI disk drive location: `PRI-[1,2]`

    This command takes up to 5 minutes to complete.

15. Copy the programs from the optical disk to the PRI disk drives by entering the following command:

    `CPY-MEM:`*[a]*`:::SEC,PRI,PROG;`

    Where:

    a = Target ID (optional)

    This command takes up to 11 minutes to complete.

16. Copy the database from the optical disk to the PRI disk drives by entering the following command:

    `CPY-MEM:`*[a]*`:::SEC,PRI,DBASE;`

    Where:

    a = Target ID (optional)

    This command takes up to 12.5 minutes to complete.

17. Reset the system by entering the following command:

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before performing a system reset.

`INIT-SYS:`*[a]*`::::9;`

Where:

a = Target ID (optional)

The system takes up to 30 minutes to reset. For more information on booting the DACS IV-2000, refer to the section titled "Reset and Boot" (page 6-7).

18. Log in to the DACS IV-2000. Refer to Chapter 4 for logging in procedures, if necessary.
19. Install the other new PRI5 disk drive. To insert the new PRI disk drive, hold the new PRI disk drive by the chassis and align it with the slot in the frame. With the latch raised, insert the PRI disk drive into its slot. Push at the bottom and the top with one slow, continuous motion until the PRI disk drive stops. When the PRI disk drive is firmly in place, close the latch. Repeat this step for the other failed PRI disk drive.
20. Initialize the new PRI disk drives by entering the following command for each PRI disk drive:

`CPY-MEM:`*[a]*`::INIT,`*d*`,FORMAT;`

Where:

a = Target ID (optional)

d = PRI disk drive location: `PRI-[1,2]`

This command takes up to 15 minutes to complete.

21. Restore the PRI disk drives to service by entering the following command for each PRI disk drive:

`RST-EQPT:`*[a]*`:`*b*`;`

Where:

a = Target ID (optional)

b = PRI disk drive location: `PRI-[1,2]`

This command takes up to 5 minutes to complete.

After completion the second PRI disk drive is updated with the software and latest database.

Replacing the SEC Disk Drive

Replace the SEC disk drive *only* if directed to do so by your system administrator, next level of support, or if indicated in trouble clearing procedures in Chapters 12 and 13.

1. Obtain a new SEC5 disk drive.

NOTE:
Inserting a pre-SEC5 drive prevents the SEC from being restored with the `RST-EQPT` command.

2. Remove the SEC disk drive from service by entering the following command:

   `RMV-EQPT:`*[a]*`:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 1 minute to complete. After completion the green ON LED extinguishes.

3. Disengage the SEC disk drive from the slot by carefully operating the latch. Extract the SEC disk drive with one slow, continuous motion.

4. Insert the new SEC disk drive into the slot. Raise the latch and push on the bottom part of the SEC disk drive until the latch engages the slot (do not push with the latch). Close the latch (push down) to secure the SEC disk drive.

   The LED on the SEC disk drive indicates access or usage of the SEC disk drive and does not indicate a failure condition.

5. Load a DACS IV-2000 (256) Release 4.0 optical disk in the SEC disk drive. If necessary, refer to "Extracting/Installing Optical Disk Cartridge" (page 6-26).

6. Restore the SEC disk drive to service by entering the following command:

   `RST-EQPT:`*[a]*`:SEC;`

   Where:

   a = Target ID (optional)

   This command takes up to 5 minutes to complete. After completion the green ON LED lights.

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 PRI disk drive or the SEC disk drive. Use the sections titled "Replacing One PRI Disk Drive" (page 14-4), "Replacing Both PRI Disk Drives" (page 14-6), or "Replacing the SEC Disk Drive" (page 14-9).

CAUTION:
This procedure is used only to replace a main controller circuit pack that failed diagnostics.

1. If there is a red ALM LED on a power supply circuit pack in the Redundant Controller Power Module that is lit, go to the section titled "Power Circuit Pack Failure" (page 12-81).
2. Locate the circuit pack in the Redundant Controller Module that failed diagnostics.
3. If only one circuit pack (CPU, MTC, 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}`

    A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

    Where:

    e = Control complex location: `CC-{0,1}`

    f = Equipment state

    If the state of the control complex is OOS, go to Step 3e. If the state of the control complex is STBY, go to Step 3d. Otherwise, go to Step 3b (control complex in ACT state).

b. Put the MC in the OOS-MCOND state by entering the following command:

`ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

Where:

a = Target ID (optional)

After this command completes, the red MAJOR and red FAILURE ALM LEDs on the status panel turn on.

c. Perform a control complex side switch so that the standby control complex becomes the active control complex by entering the following command:

`RST-EQPT:`*[a]*`:MC:,:`*e*`;`

Where:

a = Target ID (optional)

e = Control complex (to become active) location: `CC-{0,1}`

This command takes up to 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 one or both ECI circuit packs have failed diagnostic messages, perform the procedure titled "ECI Circuit Pack Failure" (page 12-107) for the ECI circuit packs indicating diagnostic failure. Otherwise, go to Step 5.
5. If you receive two `REPT EXCPTN SYS` messages indicating that the time-of-day clock (TODC) needs to be reset, edit the date and time by entering the following command.

   ED-DATE:*[a]*:::*c*,*d*;

   Where:

   a = Target ID (optional)

   c = Date: `[00-39,81-99][01-12][01-31]`

   d = Time: `[00-23][00-59][00-59]`

Replacing 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 14-13).
   - 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 14-13)
   - ED-9C130-30,G1 — front mounted Switch Bay fan assembly. 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. 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 other system failures.

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.

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 an ED-2C816-30,G1 Fan Assembly" (page 14-14). For fan assembly ED-2C906-30, continue with the section titled "Removing an ED-2C906-30 Fan Assembly" (page 14-15).

Removing an ED-2C816-30,G1 Fan Assembly

1. Remove the right and left stile strips and the lower backplane cover from the rear of the 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.

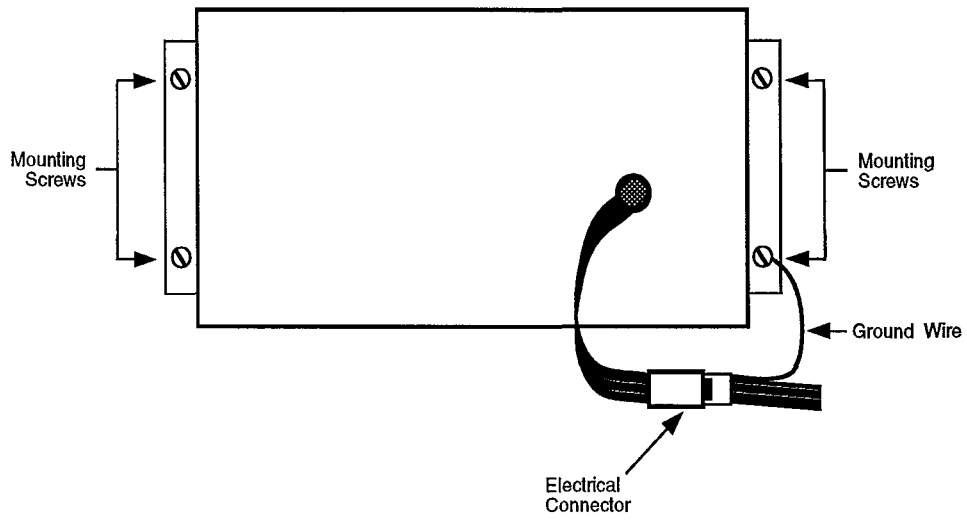


Figure 14-1. ED-2C816-30,G1 Fan Assembly (Rear View)

4. From the back of the frame, slide out the failed fan assembly.

CAUTION:
When extracting the fan assembly, do not cut, crimp, or disconnect N-rate cables.

5. Install the new fan assembly by referring to the section titled"Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 14-16).

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.

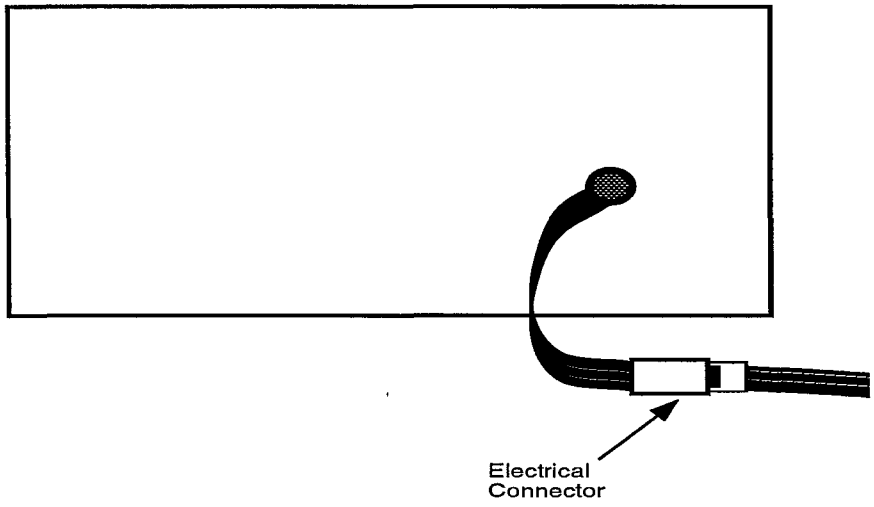


Figure 14-2. **ED-2C906-30 Fan Assembly (Rear View)**

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 14-5).
5. From the front of the frame, slide out the failed fan assembly.

CAUTION:
When extracting the fan assembly, do not cut, crimp, or disconnect N-rate cables.

6. Install the new fan assembly by referring to the section titled "Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly" (page 14-16).

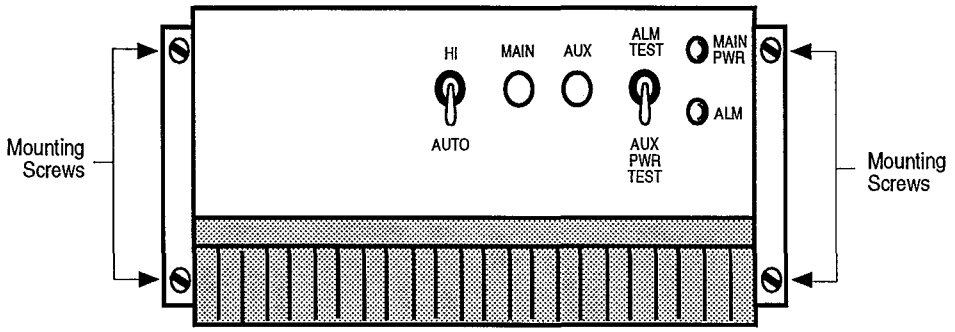


Figure 14-3. **ED-2C906-30 Fan Assembly (Front View)**

Installing an ED-2C816-30,G1 or ED-2C906-30 Fan Assembly

1. Insert the new fan assembly and secure with the four mounting screws. For the ED-2C906-30 fan assembly (front mounted), before securing the mounting screws make sure the power cable is accessible in the rear. For the ED-2C816-30,G1 fan assembly, make sure one of the screws secures the ground wire (refer to Figure 14-1).

⚠ CAUTION:
When installing the new fan assembly, do not cut, crimp, or disconnect N-rate cables.

2. Reconnect the electrical connector in the back of the fan assembly. The connector plug is keyed to attach only one way.
3. Reinstall the lower backplane cover and the right and left stile strips to the Switch Bay.
4. Make sure that the air inlet below and in front of the fan assembly is unobstructed.
5. Reinsert the AUX Fan Assembly Fuse (Fuse B13-2).
6. Check to see that the red ALM LED is on and the fans are operating at *high* speed.
7. Reinsert the Main Fan Assembly Fuse (Fuse E6).
8. Check to see that the green MAIN PWR LED is on, the red ALM LED is off, the major alarm (MJ) is cleared, and the fans are operating at its reduced speed (switch in AUTO position).

9. Check to see that the fan assembly is operational in both the AUTO and HI speed positions (refer to Figure 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.

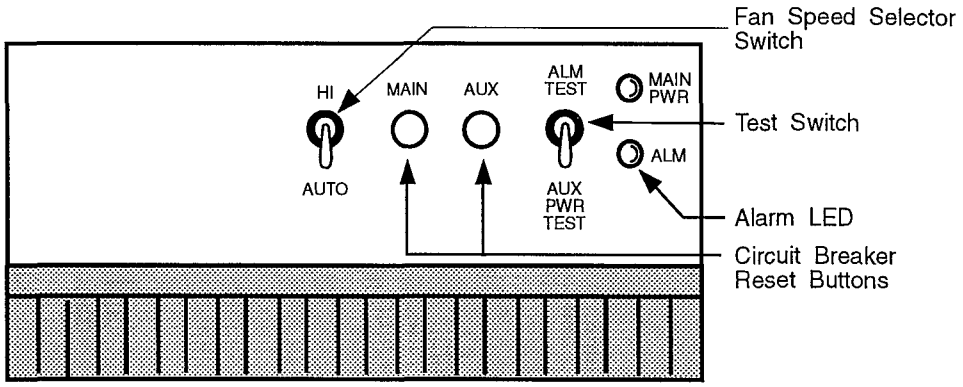


Figure 14-4. ED-2C816-30,G1 and ED-2C906-30 Fan Assembly — Test Switch and Alarm LED

10. Perform the alarm failure test by placing the test switch (refer to Figure 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 */
    "CPU-{0,1}:INT,"
    FAN,
    (0 - 512 bytes of hexadecimal data)
;
```

      Where:

      a = Autonomous sequence number: 001-999

- After approximately 20 seconds:
  - — The red MAJOR alarm LED on the status panel turns on.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE
    FAN:MJ,INT,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: `001-999`

- Approximately 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`

11. 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 */
    "CPU-{0,1}:INT,"
    FAN,
    (0 - 512 bytes of hexadecimal data)
;
```

      Where:

      a = Autonomous sequence number: `001-999`

- After approximately 10 seconds:
  - — The red MAJOR alarm LED on the status panel turns on.
  - — The system responds with the following message:

```
    TID YY-MM-DD HH:MM:SS
**  b REPT ALM EQPT
    /* LOC:NTFCNCDE,CTYPE,SRVEFF,,,LOCN::,TROUBLE */
    FAN:MJ,INT,NSA,,,NEND::,NIMAN
;
```

    Where:

    b = Autonomous sequence number: 001-999

- After approximately 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

This procedure is used to replace ED-9C130-30,G1 (Switch Bay) or ED-9C130-30,G2 (Interface Bay) fan assemblies.

Removing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly

⚠ CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Pull the Main Fan Assembly Fuse (for ED-2C940-30 fuse panel, indicator fuse first, if applicable) on the fuse panel of the failed fan assembly. Refer to Table 14-1 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.

   The red FAN/PWR LED on the fan assembly turns on and the system responds with the following 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`

Table 14-1. **Fuse Chart for Fan Assemblies**

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—
Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8, 1nd 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.									
Duplex Power (ED-9C114-30 Fuse Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

2. Pull the AUX Fan Assembly fuse (for ED-2C940-30 fuse panel, indicator fuse first, if applicable) on the fuse panel of the failed fan assembly. Refer to Table 14-1 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.
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.
4. Remove the lower backplane cover from the rear of the bay containing the failed fan assembly.
5. Disconnect the electrical connector and the J1 and J2 (if connected) connectors at the back of the fan assembly. Refer to Figure 14-5.

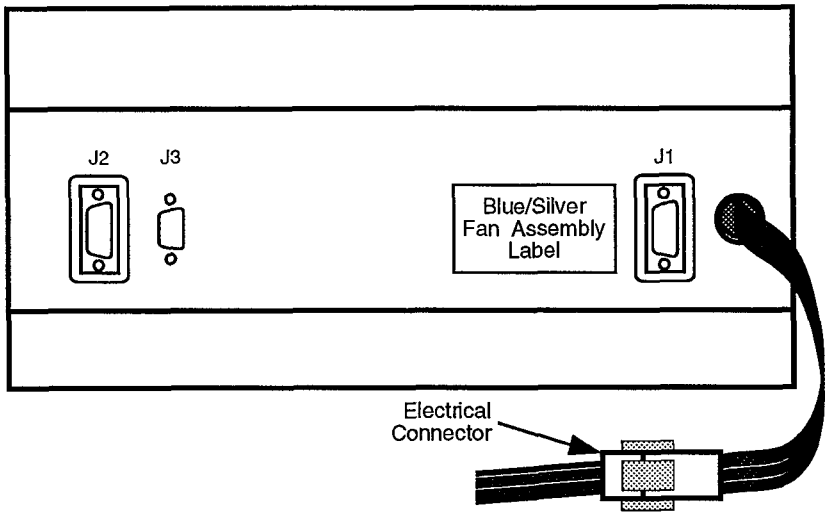


Figure 14-5. **ED-9C130-30 Fan Assembly (Rear View)**

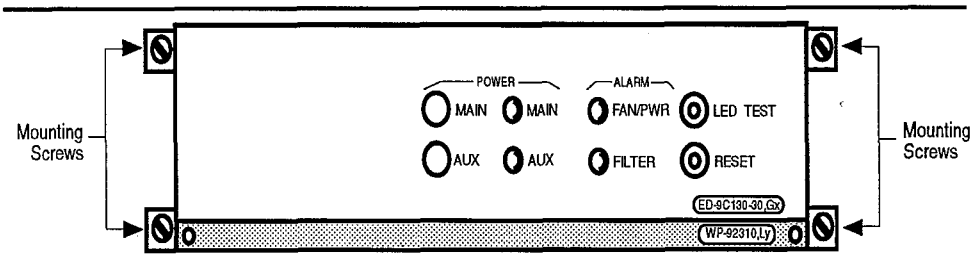


Figure 14-6. **ED-9C130-30 Fan Assembly (Front View)**

6. Remove the right and left stile strips from the front of the bay containing the failed fan assembly.
7. 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).
8. From the front of the frame, slide out the failed fan assembly.

CAUTION:
When extracting the fan assembly, do not cut, crimp, or disconnect N-rate cables.

9. Install the new fan assembly by referring to the section titled "Installing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-22).

Installing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly

CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Insert the new fan assembly three quarters of the way into the frame.

CAUTION:
When installing the new fan assembly, do not cut, crimp, or disconnect N-rate cables.

2. At the back of the frame, make sure the power cable from the fan assemble is accessible. That is, the power cable is not pinched between the fan assembly and the frame.
3. At the front of the frame, slide the fan assembly all the way in and secure with the four mounting screws. Refer to Figure 14-6.
4. Reinstall the right and left stile strips to the front of the bay containing the new fan assembly.
5. Reconnect the electrical connector and the J1 and J2 (if previously disconnected) connectors in the back of the fan assembly. The power connector plug is keyed to attach only one way. Refer to Figure 14-5.
6. Reinstall the lower backplane cover to the rear of the bay containing the new fan assembly.

7. At the front of the fan assembly, make sure that the fan filter is installed properly.

   If the fan filter is missing, obtain a fan filter (WP-92310,L100) and install it.

8. Make sure that the air inlet below the fan assembly is unobstructed.
9. Reinsert the AUX Fan Assembly Fuse for the new fan assembly. Refer to Table 14-1 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.
10. Reinsert the Main Fan Assembly Fuse for the new fan assembly. Refer to Table 14-1 for fuse location. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.
11. Initialize the fan assembly by referring to the section titled "Fan Assembly Initialization" (page 14-23).

Fan Assembly Initialization

NOTE:
The fan assembly provides constant cooling to the system by measuring the system impedance and setting the fan speed accordingly. The following steps are required for the fan to learn about the system airflow impedance.

CAUTION:
It is important to perform the following steps with the system in its normal running condition to ensure constant cooling capability for the system. If the fan filter is removed or if airflow impedance around the system is changed in any way during initialization (for example, a cover is removed), the initialization will be bad. If this happens, the initialization must be run again. An initialization of the fan assembly can ***not*** *be stopped, it must be allowed to run to its completion and run again correctly.*

1. Make sure a clean 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.

   If the initialization fails, contact the system administrator or next level of support for assistance.

8. Test the power, alarm, and LEDs of the fan assembly by referring to the section titled "Power Alarm and LED Test" (page 14-24).

Power Alarm and LED Test

NOTE:
The default power source for the fan assembly is the main power source. The fan assembly switches from the main to the auxiliary power source if the main power source shuts down. The fan assembly alarms if either the main or auxiliary power sources shut down.

The LED TEST button on the front panel of the fan assembly provides test capability of the fan assembly's LEDs to ensure they are in working order.

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 19 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 any of the LEDs fail to light during the test, refer to the section titled "Replacing LEDs in an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-27) to replace fan assembly LEDs.

   If the alarm LEDs do not turn off and/or the power LEDs do not turn on, contact your system administrator or next level of support for assistance. Otherwise, you are done with this procedure.

Replacing LEDs in an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly

This procedure is used to replace the alarm (FAN/PWR and FILTER) and power on (MAIN and AUX) LEDs of an ED-9C130-30,G1 (Switch Bay) or ED-9C130-30,G2 (Interface Bay) fan assembly. Replacement LEDs can be ordered from McLean Engineering, Inc., Princeton-Junction, New Jersey.

CAUTION:
This procedure must be completed in 40 minutes to prevent any damage to circuit packs.

CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Obtain the necessary LEDs (green, red, and/or yellow), a flat-head screwdriver, needle-nose plier, and a 1/8 inch and 1/4 inch nut drivers.

NOTE:
If your office procedures require you to replace all LEDs at the same time, obtain two green, one red, and one yellow LED.

2. Remove the fan assembly by performing Steps 1 through 8 of the procedure in the section titled "Removing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-20).
3. Place the fan assembly upside-down with the front facing you on a flat surface (as shown in Figure 14-7).
4. Remove the fan filter, using the tabs, by sliding it toward the front of the fan assembly.
5. Remove the bolts from the fan on the left side (closest to the LEDs) using a 1/4 inch nut driver. Refer to Figure 14-7.
6. Move the fan out of the way of the LEDs making sure not to disconnect any wiring.

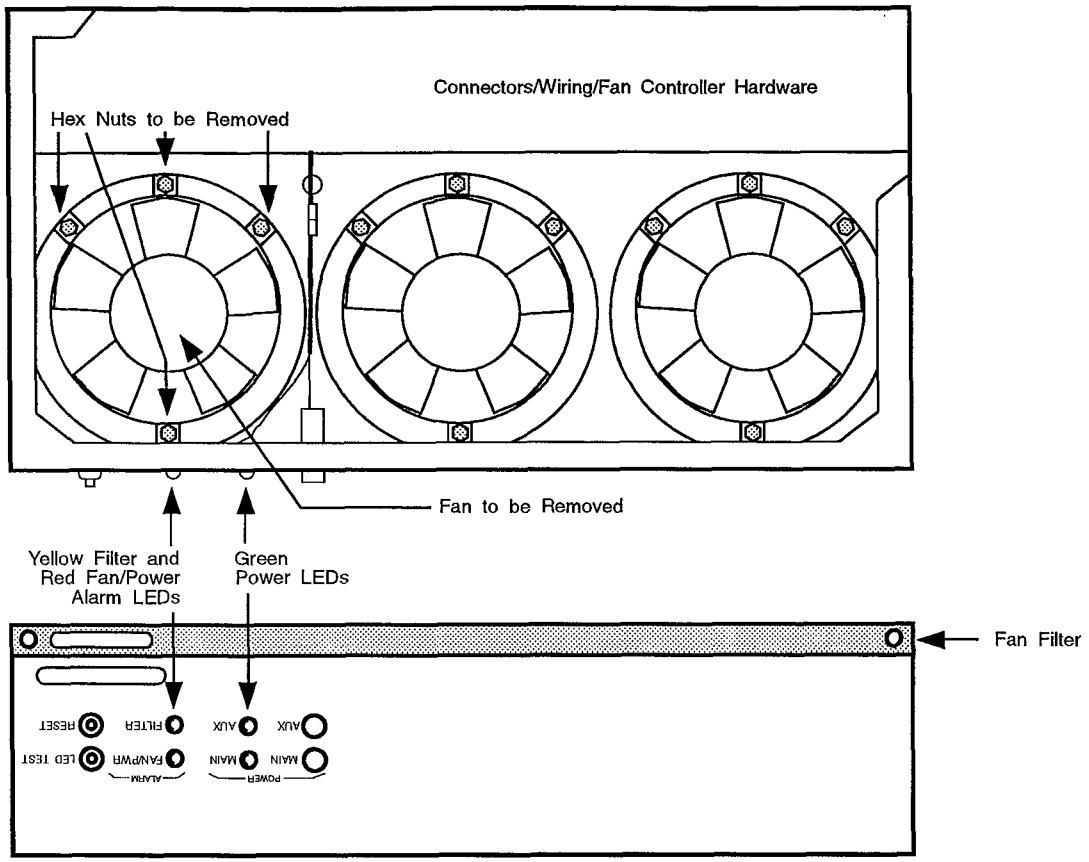


Figure 14-7. **Remove Fan From ED-9C130-30 Fan Assembly**

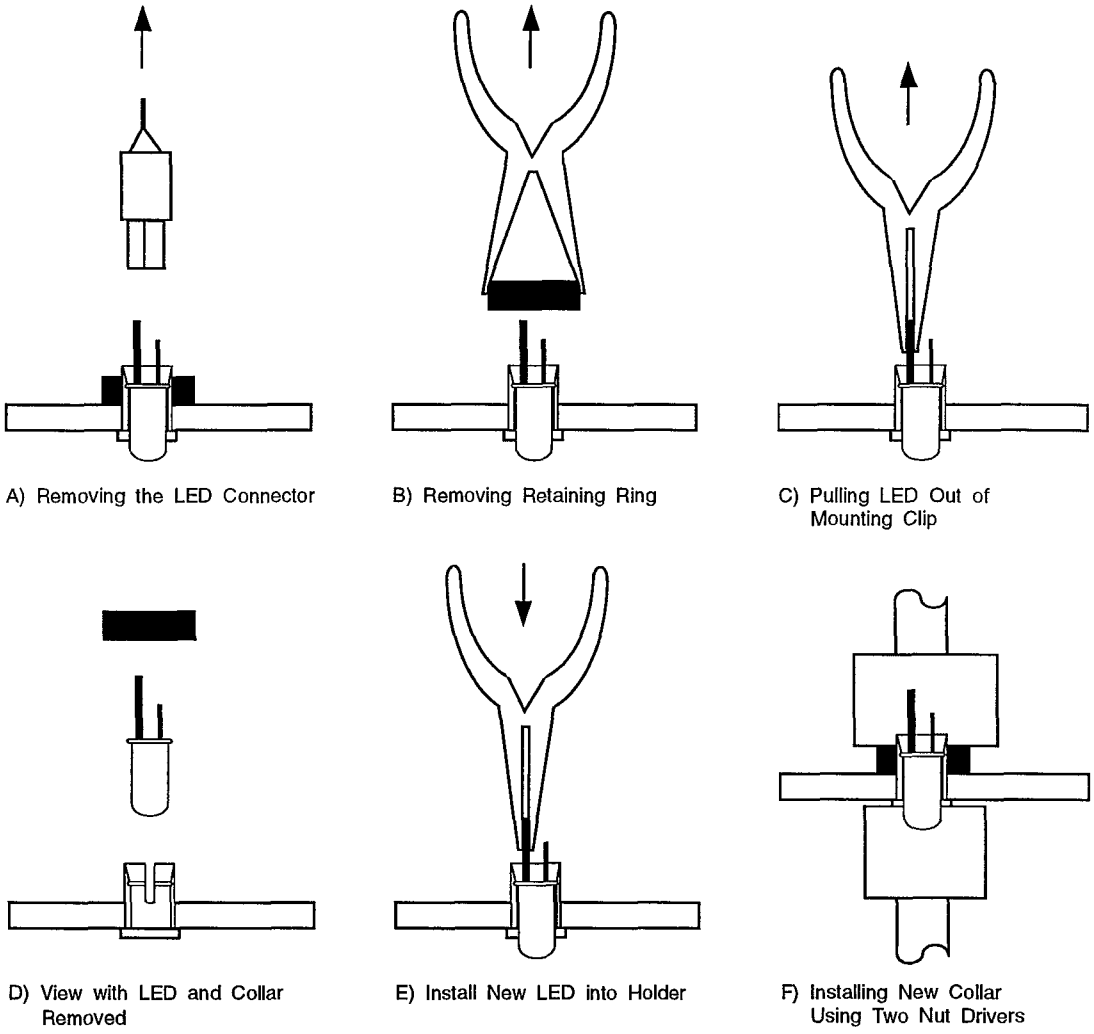


Figure 14-8. **Replacing an LED in an ED-9C130-30 Fan Assembly**

7. Note the position of the connector on the failed LED and remove the connector. Refer to Figure 14-8A.
8. Note the position of the wires (long and short) extending from the LED. When re-connecting the LED, reversing the connection causes the LED not to function.

9. Using a needle-nose plier, remove the black LED retaining ring. Refer to Figure 14-8B.
10. Using a needle-nose plier, remove the failed LED from the LED mounting clip by pulling (with moderate pressure) on the long wire of the LED. Refer to Figure 14-8C.
11. Using a needle-nose plier, insert the new LED (of the same color) into the LED mounting clip with the short and long wires in the same position as the failed LED. Apply pressure until it *snaps* into place. Refer to Figure 14-8E.
12. Using a 1/8 inch nut driver from the front of the fan assembly and a 1/4 inch driver from inside the fan assembly, re-install the LED retaining ring. Refer to Figure 14-8F.
13. Re-install the connector with the white/black wire attached to the short LED wire.

⚠ CAUTION:
Reversing the connection to the LED causes the LED not to function.

14. Repeat Steps 7 through 13 for any remaining LEDs that need to be replaced.
15. Re-position the fan moved in Step 6 back in to place being careful not to pinch or disconnect any wiring.
16. Using a 1/4 inch nut driver and starting with the bolt nearest the LEDs, re-install the four bolts removed in Step 5.
17. Re-install or replace the air filter (depending on condition of removed air filter) into the fan assembly.
18. Install the fan assembly by performing Steps 1 through 14 of the procedure in the section titled "Installing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-22).

19. Press and release 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.

20. 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 any of the LEDs fail to light during the test, the connection to the LED may have been reversed. This procedure needs to be redone (except the LEDs do not need to be removed) 30 minutes later (to allow equipment to cool before removing fan again) to switch the polarity of the LED connector. If the LEDs fail to light after checking the LED connector, contact your system administrator or next level of support for assistance.

    If the alarm LEDs do not turn off and/or the power LEDs do not turn on, contact your system administrator or next level of support for assistance. Otherwise, you are done with this procedure.

Replacing Firmware in ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly

This procedure is used to replace the fan controller firmware EPROM of an ED-9C130-30,G1 (Switch Bay) or ED-9C130-30,G2 (Interface Bay) fan assembly. Replacement firmware kits (J98786A-1,List 115) are available from AT&T. Each kit contains a replacement EPROM, control board label (WP92310L2A), and rear panel label (WP92310L4A).

⚠ CAUTION:
For each fan assembly being upgraded with new controller firmware, this procedure must be completed in 40 minutes to prevent any damage to circuit packs.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when working at the frame or on the fan assembly.

1. Check the blue/silver label on the rear of each ED-9C130-30 fan assembly to verify that it needs to be updated. If all of the fan assembly labels have the model number WP92310L4A, you are done with this procedure. For each fan assembly with the model number WP92310L4, perform this procedure starting with Step 2.
2. Obtain the necessary number of fan firmware replacement kits (J98786A-1,List 115) and a flat-head screwdriver.
3. Remove the fan assembly by performing Steps 1 through 8 of the procedure in the section titled "Removing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-20).
4. Place the fan assembly upside-down with the front facing you on a flat surface.
5. Remove the fan filter, using the tabs, by sliding it toward the front of the fan assembly.
6. Remove the 26-pin connector from the fan assembly control board. Refer to Figure 14-9 for location.
7. Remove the EPROM from the fan assembly control board. Refer to Figure 14-9 for location.
8. Install the new EPROM into its socket, ensuring that the notch on the center of the EPROM is located as indicated in Figure 14-9.
9. Install the new WP92310L2A label on the control board in the location shown in Figure 14-9.

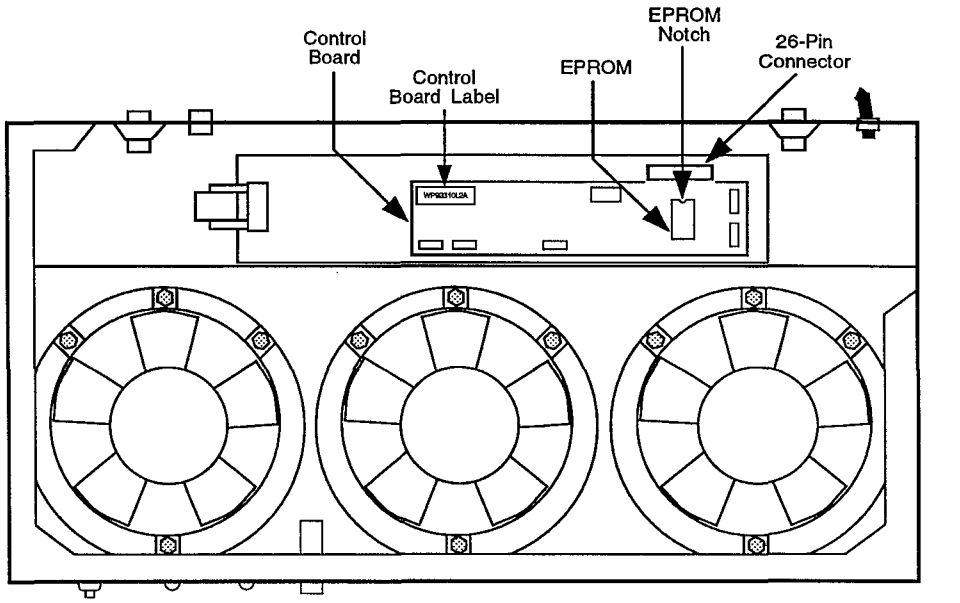


Figure 14-9. **ED-9C130-30 Fan Assembly EPROM Location**

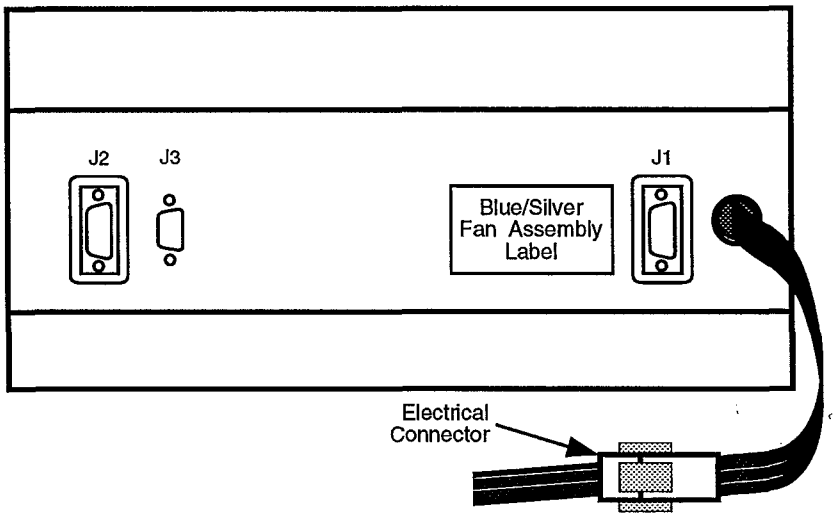


Figure 14-10. **Rear Label Location for ED-9C130-30 Fan Assembly**

10. Re-install the 26-pin connector to the fan assembly control board. Refer to Figure 14-9 for location.
11. Re-install or replace the air filter (depending on condition of removed air filter) into the fan assembly.
12. Remove (peel off) the blue/silver label from the rear of the fan assembly and replace it with the new label (WP92310L4A). Refer to Figure 14-10 for location of fan assembly label.
13. Install the fan assembly by performing Steps 1 through 14 of the procedure in the section titled "Installing an ED-9C130-30,G1 or ED-9C130-30,G2 Fan Assembly" (page 14-22).
14. Press and release 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.

    If there are any more fan assemblies that need to be upgraded, return to Step 3 for the next fan assembly.

Equipping the Synchronizer Module

The procedures in this section are used to equip a Synchronizer Module and replace CLKGN2 circuit packs in a DACS IV-2000 (256) frame that is running Release 4.0 (256) software. The Synchronizer Module and CLKGN3 circuit packs must be equipped before adding any STS1 Interface Modules. Table 14-2 lists the needed circuit packs for equipping the Synchronizer Module.

Table 14-2. Synchronizer Module Equipage Requirements

Equipment	Code	Quantity
DPLL1/DPLL2	AWP9/AWP15	2
DS1TX1/DS1TX2	AWS5/AWS9	2
TBS31/TBS32	AWS3/AWS8	2
AWS-type filler assemblies	846960664	2
CLKGN3 (Switch Module)	AWR11	2
SYNC to CLKGN3 clock cables	846976272	2

If the Switch Module contains CLKGN2 circuit packs, you are going to be instructed to replace them with CLKGN3 circuit packs while provisioning the Synchronizer Module. When installing CLKGN3 circuit packs wiring changes are going to be made to the backplane of the Switch and Redundant Controller Modules.

CAUTION:
When replacing CLKGN2 circuit packs, this procedure involves removal of backplane covers and access to the Switch, Redundant Controller, and Synchronizer Module backplanes. Make sure that ESD wrist straps are worn and the System Administrator is notified prior to removal of any backplane covers.

Installing Synchronizer Module Circuit Packs

This procedure is used to install version 2 Synchronizer Module circuit packs.

NOTE:
This procedure assumes that the Synchronizer Module backplane and wiring for the Synchronizer Module has been installed. If this has not been done, contact your system administrator or next level of support for further assistance and do **not** perform this procedure until instructed.

CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs, making connections to the SYNC-0 and SYNC-1 connectors, or removing chassis covers.

1. Obtain the necessary DPLL, DS1TX, and TBS3 circuit packs (all circuit packs must be of the same version, 1 or 2) and filler assemblies. Refer to Table 14-2 for circuit pack codes and quantities.
2. In order to provide network timing, two DS1 references from the Building Integrated Timing Supply (BITS), or equivalent, must be terminated to both sides of the Synchronizer Module. Therefore, a bridging repeater should be used to provide each synchronizer (SYNC) side with the same reference from the BITS source. Figure 14-11 shows how the DS1 references must be provided to the timing reference terminal pin fields (TS0 and TS1) above the fuse and alarm panel of the Switch Bay. The Synchronizer Module is already wired to the TS0 and TS1 terminal pin fields.

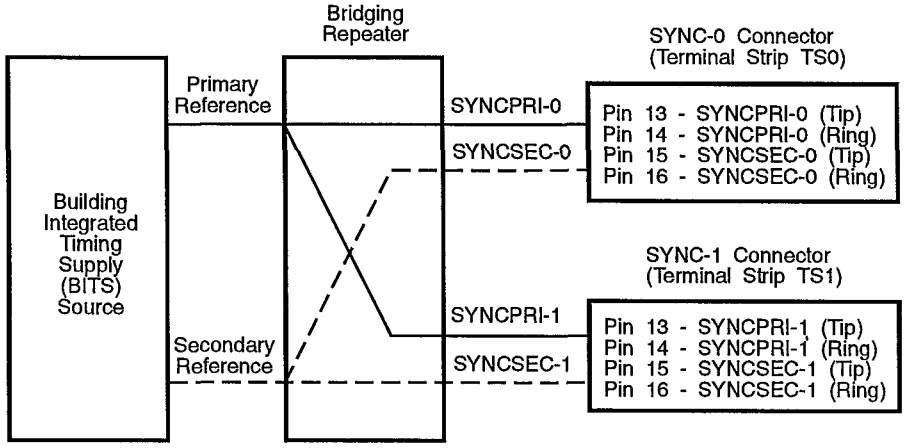


Figure 14-11. **Example of DS1 Timing References From the BITS Source**

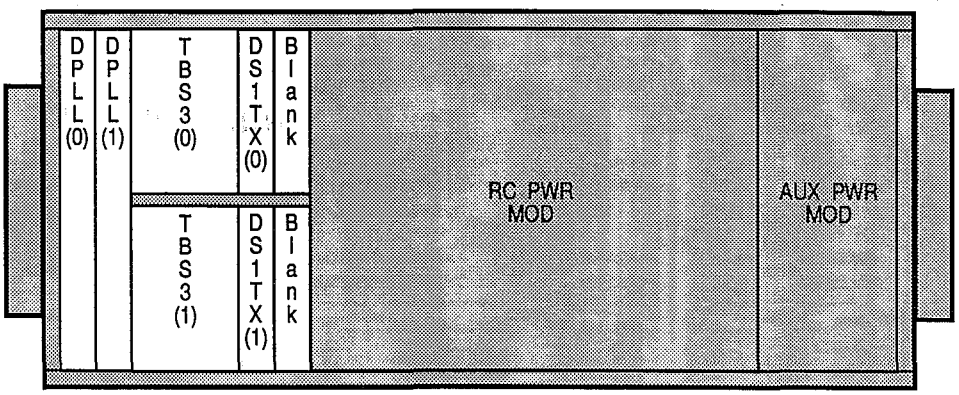


Figure 14-12. **Synchronizer Module Circuit Pack Locations**

3. From the front of the Synchronizer Module, remove the chassis covers.
4. Install, one at a time, the DPLL, TBS3, DS1TX, and AWS-type filler assemblies (blanks) circuit packs into the Synchronizer Module (refer to Figure 14-12 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

   The red ALM LEDs on the DPLL2, TBS32, and DS1TX2 circuit packs are lit.
5. Allow the TBS3 circuit packs to temperature stabilize by waiting for 30 minutes before continuing with this procedure.
6. Provision the Synchronizer Module and BITS timing references and change the CLKGN circuit packs' timing mode by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-20).

Changing Clock Generator From CLKGN2 (AWR7) to CLKGN3 (AWR11)

This procedure allows you to change a clock generator (CLKGN) circuit pack from CLKGN2 (AWR7) to CLKGN3 (AWR11). This procedure is only performed when referenced while provisioning the Synchronizer Module and CLKGN2 circuit packs are currently installed.

⚠ CAUTION:
Disconnecting any wires may cause loss of traffic.

1. Retrieve the state of the CLKGN circuit packs to determine which side is active (ACT) and which side is standby (STBY) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:CLKGN-0&&-1;

   Where:

   a = Target ID (optional)

   The following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE "/
   "CLKGN-0:f"
   "CLKGN-1:f"
;
```

   Where:

   f = State of CLKGN circuit packs: { ACT, STBY }

2. Retrieve the state of the SYNC circuit packs to determine which side is active (ACT) and which side is standby (STBY) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:SYNC-0&&-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"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

   Where:

   f = State of SYNC circuit packs: { ACT, STBY }

   If SYNC-0 and CLKGN-0 are ACT, go to Step 3.

   If SYNC-1 and CLKGN-1 are ACT, go to Step 4.

3. Switch the CLKGN-1 circuit pack to ACT (while leaving the SYNC-1 circuit pack in the STBY state) by entering the following command:

   `SW-DX-EQPT:[a]:CLKGN-1;`

   Where:

   a = Target ID (optional)

   This command takes less than 1 minute to complete.

   Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms. Continue with Step 5.

4. Switch the CLKGN-0 circuit pack to ACT (while leaving the SYNC-0 circuit pack in the STBY state) by entering the following command:

   `SW-DX-EQPT:[a]:CLKGN-0;`

   Where:

   a = Target ID (optional)

   This command takes less than 1 minute to complete.

   Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms. Continue with Step 8.

5. The following procedure is used to replace CLKGN-0 with a CLKGN3 circuit pack:

CAUTION:
Make sure you are wearing an ESD wrist strap at all times when accessing the frame.

a. Extract the CLKGN-0 circuit pack from the Switch Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

A major (MJ) alarm occurs when CLKGN-0 is extracted.

b. Edit the hardware ID of the CLKGN-0 circuit pack slot by entering the following command:

`ED-EQPT:`*[a]*`:CLKGN-0:::AWR11;`

Where:

a = Target ID (optional)

c. Install a CLKGN3 circuit pack into the CLKGN-0 circuit pack slot.

If CLKGN-1 has not been replaced with a CLKGN3 circuit pack, the red ALM LED of CLKGN-0 is lit. If CLKGN-1 has already been replaced, no alarm is issued and CLKGN-0 enters the STBY state.

d. Verify the CLKGN-0 circuit pack's provisioned parameters by entering the following command:

`RTRV-EQPT:`*[a]*`:CLKGN-0;`

Where:

a = Target ID (optional)

A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<>::STATE */
   "CLKGN-0::PCODE=f,CCODE=g::..."
;
```

Where:

f = Provisioned circuit pack code: AWR11 is setting for CLKGN3 circuit packs

g = Circuit pack code: AWR11 is setting for CLKGN3 circuit packs

If the circuit pack codes do not match re-enter the ED-EQPT command to make sure the codes match.

e. Diagnose CLKGN-0 by entering the following command:

DGN-DET-EQPT:*[a]*:CLKGN-0;

Where:

a = Target ID (optional)

Diagnostics can take up to 15 minutes to complete.

If diagnostics fail, replace the failed CLKGN3 circuit pack with a new one and attach the diagnostic report to the failed circuit pack. If you replaced the CLKGN3 circuit pack, re-run the diagnostics.

f. If the new CLKGN3 circuit pack fails, contact your system administrator or next level of support.

6. If CLKGN-1 has not been replaced with a CLKGN3 circuit pack, make CLKGN-0 the active clock generator by entering the following command:

SW-DX-EQPT:*[a]*:CLKGN-0:::FRCD;

Where:

a = Target ID (optional)

This command takes less than 1 minute to complete. After completion, the alarm clears (CL) and the ALRM LED turns off on CLKGN-0 and, if CLKGN-1 has not been replaced, a major (MJ) alarm occurs and the red ALM LED lights on CLKGN-1.

Executing the SW-DX-EQPT command can result in REPT ALM EQPT messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

7. If both CLKGN circuit packs have been replaced with CLKGN3 circuit packs, you are done with this procedure. Otherwise, continue with Step 8.

8. The following procedure is used to replace CLKGN-1 with a CLKGN3 circuit pack:

CAUTION:
Make sure you are wearing an ESD wrist strap at all times when accessing the frame.

a. Extract the CLKGN-1 circuit pack from the Switch Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

A major (MJ) alarm occurs when CLKGN-1 is extracted.

b. Edit the hardware ID of the CLKGN-1 circuit pack slot by entering the following command:

`ED-EQPT:`*[a]*`:CLKGN-1:::AWR11;`

Where:

a = Target ID (optional)

c. Install a CLKGN3 circuit pack into the CLKGN-1 circuit pack slot.

If CLKGN-0 has not been replaced with a CLKGN3 circuit pack, the red ALM LED of CLKGN-1 is lit. If CLKGN-0 has already been replaced, no alarm is issued and CLKGN-1 enters the STBY state.

d. Verify the CLKGN-1 circuit pack's provisioned parameters by entering the following command:

`RTRV-EQPT:`*[a]*`:CLKGN-1;`

Where:

a = Target ID (optional)

A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC::<>::STATE */
   "CLKGN-1::PCODE=f,CCODE=g::..."
;
```

Where:

f = Provisioned circuit pack code: `AWR11` is setting for CLKGN3 circuit packs

g = Circuit pack code: `AWR11` is setting for CLKGN3 circuit packs

If the circuit pack codes do not match re-enter the `ED-EQPT` command to make sure the codes match.

e. Diagnose CLKGN-1 by entering the following command:

`DGN-DET-EQPT:`*[a]*`:CLKGN-1;`

Where:

a = Target ID (optional)

Diagnostics can take up to 15 minutes to complete.

If diagnostics fail, replace the failed CLKGN3 circuit pack with a new one and attach the diagnostic report to the failed circuit pack. If you replaced the CLKGN3 circuit pack, re-run the diagnostics.

f. If the new CLKGN3 circuit pack fails, contact your system administrator or next level of support.

9. If CLKGN-0 has not been replaced with a CLKGN3 circuit pack, make CLKGN-1 the active clock generator by entering the following command:

`SW-DX-EQPT:`*[a]*`:CLKGN-1:::FRCD;`

Where:

a = Target ID (optional)

This command takes less than 1 minute to complete. After completion, the alarm clears (CL) and the ALRM LED turns off on CLKGN-1 and, if CLKGN-0 has not been replaced, a major (MJ) alarm occurs and the red ALM LED lights on CLKGN-0.

Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

10. If both CLKGN circuit packs have been replaced with CLKGN3 circuit packs, you are done with this procedure. Otherwise, go to Step 5.

Equipping Interface Modules

The procedures in this section are used to equip blank STS1, DS3, and DS1 Interface Modules.

Equipping STS1 Interface Modules

This procedure is used to equip an STS1/DS3 Interface-16 Shelf within an STS1/DS3/DS1 or STS1/DS3 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position).

NOTE:
For STS1 Interface-16 Modules, up to 15 SMUX1 circuit packs are installed and one N-rate cable is connected to the shelf position. The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group.

1. Obtain the necessary circuit packs. Refer to Table 14-3 for circuit pack codes and quantities.

Table 14-3. **STS1 Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC2	AKM59B	1
CLKDR1	AKM56	2
MUXPS1	AKM53	1
SMUXP1	AKM85	1
SMUX1	AKM84	1-15*
BXA1	AKM64	14-0†
SWIO1 (Switch Module)	AWR6	2

* A total of 15 SMUX1 and BXA1 circuit packs is required (for example, if only 5 SMUX1 circuit packs are needed, 10 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused SMUX circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

2. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

   a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 14-35) before continuing with this procedure.

   b. Check to see if the Synchronizer Module is active by entering the following command:

      `RTRV-STATE-EQPT:`*[a]*`:SYNC-0&SYNC-1;`

      Where:

      a = Target ID (optional)

      A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "DPLL-1:f"
   "SYNC-1:f"
   "TB-1:f"
;
```

      Where:

      f = Equipment state: [`ACT, STBY, OOS, OOS-MTCE, OOS-FLT`]

      If any of the entities are in the `AVAIL` and/or `OOS` state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-20) before continuing with this procedure.

3. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in section titled "Provisioning Interface Modules (Units)" (page 5-12)] with the new STS1 Interface-16 Module information.

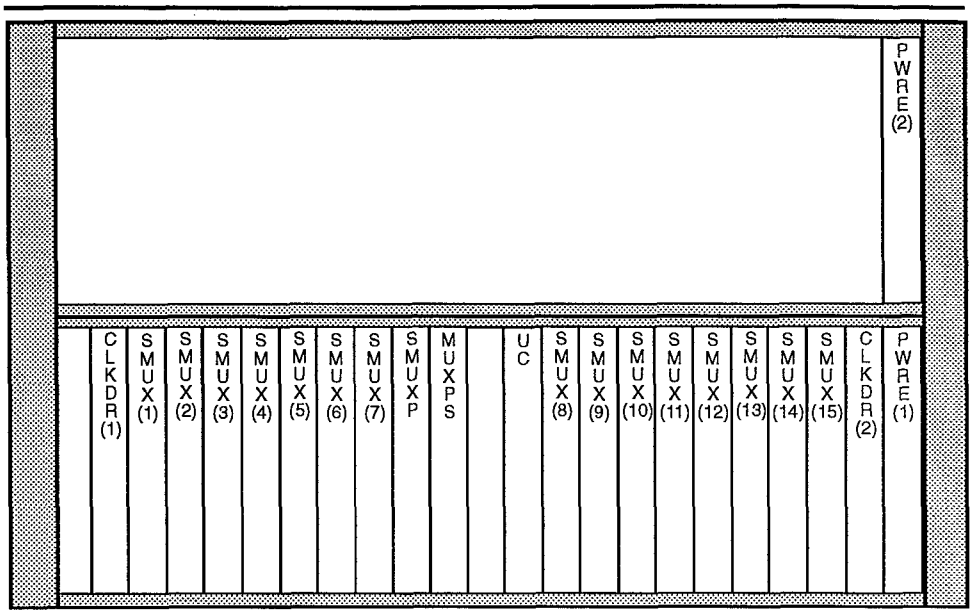
   This information is used for SWIO circuit pack location, cable testing, and provisioning.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

4. At the Switch Module (identified in Step 3), extract the two AWR-type filler assemblies (846103760) associated with the SWIO circuit pack slots of the STS1 Interface-16 Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Install the two SWIO1 circuit packs into the slots where the AWR-type filler assemblies (846103760) were extracted in Step 4. Refer to Chapter 2 for installing circuit packs, if necessary.
6. From the front of the STS1 Interface-16 Module, remove the chassis covers from the lower half of the module.
7. From the front of the STS1 Interface-16 Module, remove the chassis cover from the PWRE-2 circuit pack slot.
8. Install the two PWRE3 circuit packs into their slots (refer to Figure 14-13 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
9. Install the two CLKDR1 circuit packs into their slots (refer to Figure 14-13 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
10. Install the UC2 circuit pack into its slot (refer to Figure 14-13 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

⚠ CAUTION:
Inserting UC circuit packs in any other slot other than an UC circuit pack slot can cause multiple alarms.

11. Install the MUXPS1 circuit pack into its slot (refer to Figure 14-13 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the SMUXP1 circuit pack into its slot (refer to Figure 14-13 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
13. Install the SMUX1 circuit packs into their slots, starting with the lowest numbered position first and installing the SMUX1 circuit packs in sequential order (refer to Figure 14-13 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
14. If there are any empty SMUX circuit pack slots, install the BXA1 circuit packs into the remaining SMUX circuit pack slots (refer to Figure 14-13 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.



Note: Number in parentheses is circuit pack position in module.

Figure 14-13. **STS1 Interface-16 Module Circuit Pack Locations**

15. Test the UC control cable by performing the following procedure:

    a. Put the MC into the OOS-MCOND state by entering the following command:

    ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;**

    Where:

    a = Target ID (optional)

    b. Test the UC control cable by entering the following command:

    TEST-UNIT-CABLE:*[a]*::*c*;**

    Where:

    a = Target ID (optional)

    c = Control cable ID: `J{1-32}`
    Same number as the Unit number of the STS1 Interface-16 Module.

    During the test the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

In addition after the test the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

Where:

d = Control cable ID: `J{1-32}`

e = Test result: { `PASS, FAIL` }

c. Restore the MC to service by entering the following command:

`RST-EQPT:`*`[a]`***`:MC;`**

Where:

a = Target ID (optional)

This command takes up to 5 minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

16. Provision the STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-12).
17. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23).
18. Test the N-rate cable connections to the STS1 Interface-16 Module by referring to the section titled "Interbay (N-rate) Cables" (page 15-11).

NOTE:

N-rate cables are installed to all interface module shelf position at the time of installation of new frames or added interface bays.

If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

19. Test the external cable connections to the STS1 Interface-16 Module by referring to the section titled "External Cables" (page 15-13).

    If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

20. Test the protection switch function of the STS1 Interface-16 Module by referring to the section titled "Protection Switch Function" (page 15-21).

    If any of the tests fail refer the failures to the system administrator or next level of support.

    After all tests have passed, the STS1 Interface-16 Module equipped in this procedure is ready for service.

Equipping DS3 Interface Modules

This procedure is used to equip an STS1/DS3 Interface-16 Shelf or a DS3 Interface-32 Shelf within in an STS1/DS3/DS1, STS1/DS3, or DS3 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position).

NOTE:
For DS3 Interface-32 Modules, up to 31 MUX2 circuit packs are installed and two N-rate cables are connected to the shelf position. For DS3 Interface-16 Modules, up to 15 MUX2 circuit packs are installed and one N-rate cable is connected to the shelf position. The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group.

1. Obtain the necessary circuit packs. Refer to Table 14-4 (for DS3 Interface-16 Modules) or Table 14-5 (for DS3 Interface-32 Modules) for circuit pack codes and quantities.

Table 14-4. **DS3 Interface-16 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC2	AKM59B	1
CLKDR1	AKM56	2
MUXPS1	AKM53	1
MUXP2	AKM70	1
MUX2	AKM68B	1-15*
DS3PM1 (optional)	AKM62	0-1†
BXA1	AKM64	15-0‡
SWIO1 (Switch Module)	AWR6	2

* A total of 15 MUX2 and BXA1 circuit packs is required (for example, if only 5 MUX2 circuit packs are needed, 10 BXA1 circuit packs are required).

† If the DS3 Interface-16 Module is not equipped with a DS3PM1 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

Table 14-5. **DS3 Interface-32 Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC2	AKM59B	1
CLKDR1	AKM56	4
MUXPS1	AKM53	1
MUXP2	AKM70	1
MUX2	AKM68B	1-31*
DS3PM1 (optional)	AKM62	0-1†
BXA1	AKM64	31-0‡
SWIO1 (Switch Module)	AWR6	4

* A total of 31 MUX2 and BXA1 circuit packs is required (for example, if only 5 MUX2 circuit packs are needed, 26 BXA1 circuit packs are required).

† If the DS3 Interface-32 Module is not equipped with a DS3PM1 circuit pack, a BXA circuit pack is required in the DS3PM circuit pack slot.

‡ BXA circuit packs must be inserted into unused MUX and DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

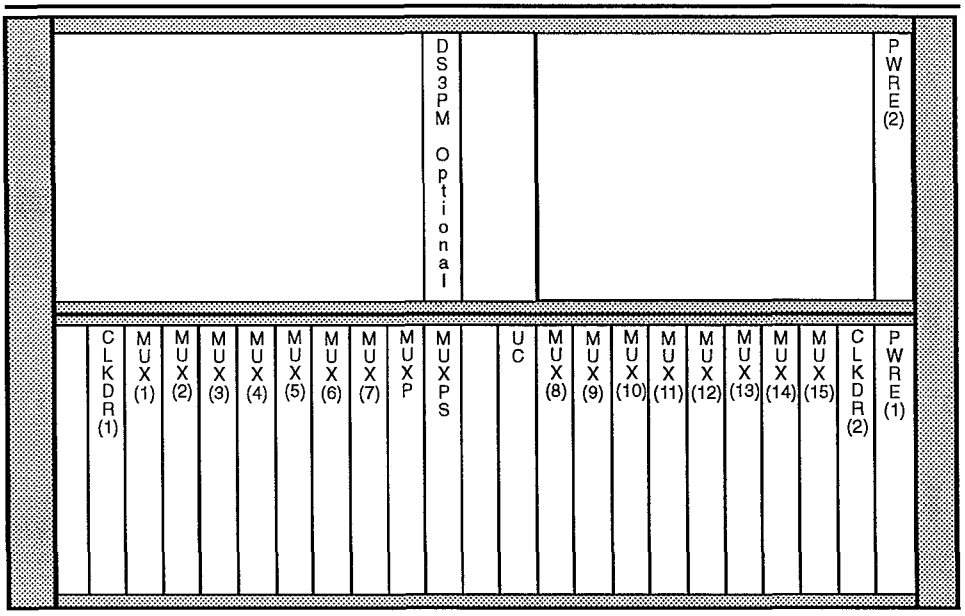
2. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in section titled "Provisioning Interface Modules (Units)" (page 5-12)] with the new DS3 Interface-16 or DS3 Interface-32 Module information.

   This information is used for SWIO circuit pack location, cable testing, and provisioning.

⚠ CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

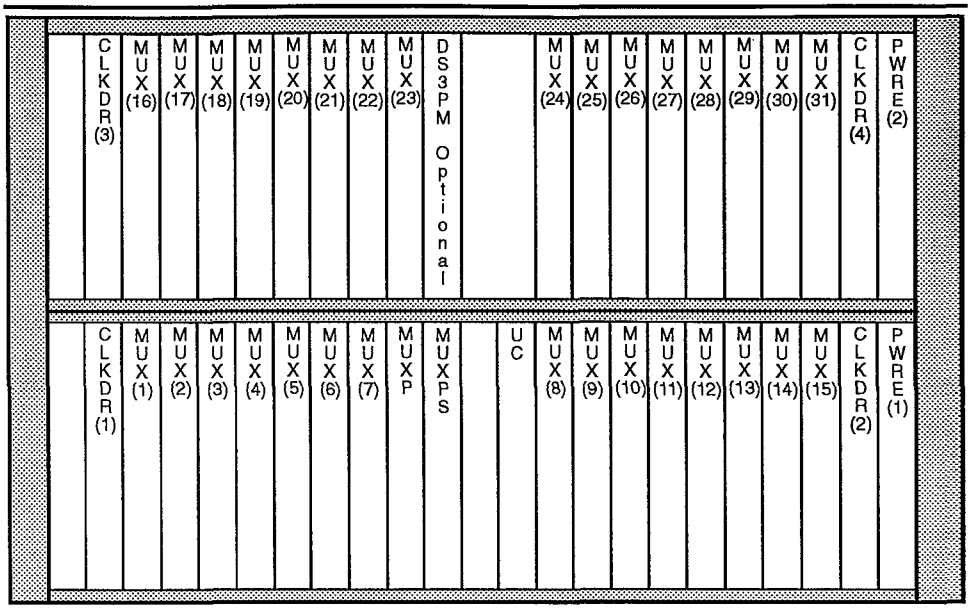
3. At the Switch Module (identified in Step 2), extract the two AWR-type filler assemblies (846103760) associated with the SWIO circuit pack slots of the DS3 Interface-16 Module or the four AWR-type filler assemblies (846103760) associated with the SWIO circuit pack slots of the DS3 Interface-32 Module being equipped. Refer to Chapter 2 for extracting circuit packs, if necessary.

4. Install the two or four SWIO1 circuit packs into the slots where the AWR-type filler assemblies (846103760) were extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
5. From the front of the DS3 Interface Module, remove the chassis covers from the lower half of the module.
6. If you are equipping a DS3 Interface-16 Module, remove the chassis cover from the PWRE-2 and DS3PM circuit pack slots.
7. If you are equipping a DS3 Interface-32 Module, remove the chassis covers from the upper half of the module.
8. Install the two PWRE3 circuit packs into their slots (refer to Figure 14-14 or 14-15 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
9. Install the two or four CLKDR1 circuit packs into their slots (refer to Figure 14-14 or 14-15 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.



Note: Number in parentheses is circuit pack position in module.

Figure 14-14. **DS3 Interface-16 Module Circuit Pack Locations**



Note: Number in parentheses is circuit pack position in module.

Figure 14-15. **DS3 Interface-32 Module Circuit Pack Locations**

10. Install the UC2 circuit pack into its slot (refer to Figure 14-14 or 14-15 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

⚠ CAUTION:
Inserting UC circuit packs in any other slot other than an UC circuit pack slot can cause multiple alarms.

11. Install the MUXPS1 circuit pack into its slot (refer to Figure 14-14 or 14-15 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the MUXP2 circuit pack into its slot (refer to Figure 14-14 or 14-15 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
13. Install the MUX circuit packs into their slots, starting with the lowest numbered position first and installing the MUX2 circuit packs in sequential order (refer to Figure 14-14 or 14-15 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.

14. If there are any empty MUX circuit pack slots, install the BXA1 circuit packs into the remaining MUX circuit pack slots (refer to Figure 14-14 or 14-15 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
15. If you are not equipping the DS3 Interface Module with an DS3PM circuit pack, install a BXA1 circuit pack into the DS3PM circuit pack slot (refer to Figure 14-14 or 14-15 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
16. If you are equipping the DS3 Interface Module with a DS3PM circuit pack, adjust the TABS link connections by performing Steps 1 and 2 of the procedure in the section titled "Provisioning DS3PM Circuit Packs" (page 5-42).
17. If you are equipping the DS3 Interface Module with an DS3PM circuit pack, install the DS3PM circuit pack adjusted in Step 16 into the DS3PM circuit pack slot (refer to Figure 14-14 or 14-15 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
18. Test the UC control cable by performing the following procedure:
    a. Put the MC into the OOS-MCOND state by entering the following command:

       ED-STATE-EQPT:*[a]*:MC::OOS-MCOND;**

       Where:

       a = Target ID (optional)

    b. Test the UC control cable by entering the following command:

       TEST-UNIT-CABLE:*[a]*::*c*;**

       Where:

       a = Target ID (optional)

       c = Control cable ID: `J{1-32}`
       Same number as the Unit number of the STS1 Interface-16 Module.

       During the test the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

       In addition after the test the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

Where:

d = Control cable ID: `J{1-32}`

e = Test result: { `PASS, FAIL` }

c. Restore the MC to service by entering the following command:

`RST-EQPT:`*`[a]`***`:MC;`**

Where:

a = Target ID (optional)

This command takes up to 5 minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

19. Provision the DS3 Interface Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-12).
20. Provision the MUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23).
21. If you are equipping the DS3 Interface Module with an DS3PM circuit pack, provision the DS3PM circuit pack by performing Steps 3 and 4 of the procedure in the section titled "Provisioning DS3PM Circuit Packs" (page 5-42).
22. Test the N-rate cable connections to the DS3 Interface Module by referring to the section titled "Interbay (N-rate) Cables" (page 15-11).

NOTE:

N-rate cables are installed to all interface module shelf position at the time of installation of new frames or added interface bays.

If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

23. Test the external cable connections to the DS3 Interface Module by referring to the section titled "External Cables" (page 15-13).

    If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

24. Test the protection switch function of the DS3 Interface Module by referring to the section titled "Protection Switch Function" (page 15-21).

    If any of the tests fail refer the failures to the system administrator or next level of support.

    After all tests have passed, the DS3 Interface Module equipped in this procedure is ready for service.

Equipping DS1 Interface Modules

This procedure is used to equip a DS1 Interface Shelf or a DS1 Interface-Protection Shelf within in an STS1/DS3/DS1 or DS1 Interface Bay that was initially installed as a blank shelf (that is, supplied with a cover over the shelf position. DS1 Interface-Protection Shelves within an interface bay must be equipped first before any of the associated DS1 Interface Shelves.

NOTE:
For DS1 Interface Modules, up to eight DS1 interface groups (DS1IF/SWIF circuit packs) are installed. For DS1 Interface-Protection Modules, up to seven DS1 interface groups (DS1IF/SWIF circuit packs) and one DS1 interface protection group (DS1IP/SWIF circuit packs) are installed. Both DS1 Interface and DS1 Interface-Protection Modules are serviced by half an N-rate cable (that is, one N-rate cable is connected to two DS1 Interface Shelves). The N-rate cables generally are connected to shelf positions when the interface bays are initially installed by the installation group.

1. Obtain the necessary circuit packs. Refer to Table 14-6 (for DS1 Interface-Protection Modules) or Table 14-7 (for DS1 Interface Modules) for circuit pack codes and quantities.

Table 14-6. **DS1 Interface-Protection Module Equipage Requirements**

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC2	AKM59B	1
CLKDR1	AKM56	2
DS1RY1	AKM48	4
DS1IP1	AKM47	2
DS1IF1	AKM46	2-14*
SWIF2	AKM50	2-8*
BXA1	AKM64	19-0†
SWIO1 (Switch Module)	AWR6	2

* For each unused DS1 interface group (DS1IF/SWIF circuit packs), three BXA circuit packs are required (for example, if only 3 DS1 interface groups are needed, 13 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused DS1IF and SWIF circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

Table 14-7. DS1 Interface Module Equipage Requirements

Functional Name	Circuit Pack Code	Quantity
PWRE3	556C	2
UC2	AKM59B	1
CLKDR1	AKM56	2
DS1RY1	AKM48	4
DS1IF1	AKM46	2-16*
SWIF2	AKM50	1-8*
BXA1	AKM64	22-0†
SWIO1 (Switch Module)	AWR6	2

* For each unused DS1 interface group (DS1IF/SWIF circuit packs), three BXA circuit packs are required (for example, if only 3 DS1 interface groups are needed, 16 BXA1 circuit packs are required).

† BXA circuit packs must be inserted into unused DS1IF and SWIF circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

2. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in section titled "Provisioning Interface Modules (Units)" (page 5-12)] with the new DS1 Interface-Protection or DS1 Interface Module information.

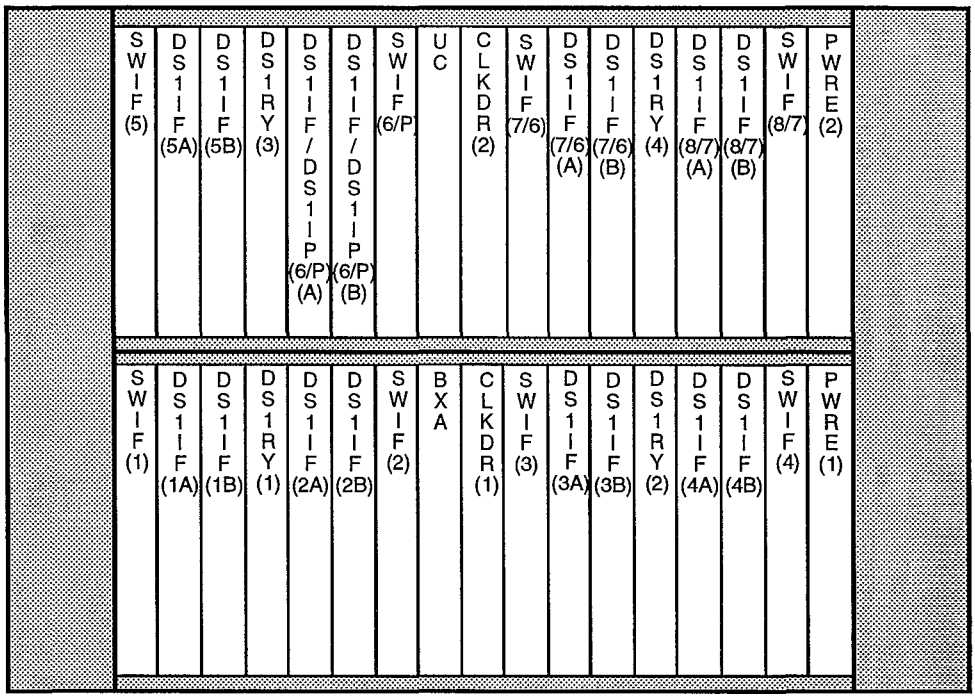
   This information is used for SWIO circuit pack location, cable testing, and provisioning.

CAUTION:
Make sure that ESD wrist straps are worn when extracting and installing circuit packs or removing chassis covers.

3. At the Switch Module (identified in Step 2), if there are two AWR-type filler assemblies (846103760) in the SWIO circuit pack slots associated with the DS1 Interface Module being equipped, extract them. Refer to Chapter 2 for extracting circuit packs, if necessary.

NOTE:
Since two DS1 Interface Modules are associated with one SWIO circuit pack pair, SWIO circuit packs are installed for a pair of adjacent DS1 Interface Modules (upper two or lower two DS1 Interface Module shelf positions in an interface bay).

4. Install the two SWIO1 circuit packs into the slots where the AWR-type filler assemblies (846103760) were extracted in Step 3. Refer to Chapter 2 for installing circuit packs, if necessary.
5. From the front of the DS1 Interface Module, remove the chassis covers from the lower and upper halves of the module.
6. Install the two PWRE3 circuit packs into their slots (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
7. Install the two CLKDR1 circuit packs into their slots (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.



Note: Number in parentheses is circuit pack position in module. For entries with slashes (/), the entry before the slash corresponds to the DS1 Interface Module and the entry after the slash corresponds to the DS1 Interface-Protection Module.

Figure 14-16. **DS1 Interface Module Circuit Pack Locations**

8. Install the UC2 circuit pack into its slot (refer to Figure 14-16 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.

⚠ CAUTION:
Inserting UC circuit packs in any other slot other than an UC circuit pack slot can cause multiple alarms.

9. Install the MUXPS1 circuit pack into its slot (refer to Figure 14-16 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
10. Install the four DS1RY circuit packs into their slots (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
11. For DS1 Interface-Protection Modules, install the two DS1IP circuit packs into their slots (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
12. For DS1 Interface-Protection Modules, install a SWIF2 circuit pack into the SWIF protection slot (refer to Figure 14-16 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
13. Install the DS1IF circuit packs into their slots, starting with the lowest numbered position first and installing the DS1IF1 circuit packs in sequential order (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
14. Install the SWIF2 circuit packs into their slots, starting with the lowest numbered position first and installing the SWIF2 circuit packs in sequential order (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
15. If there are any empty DS1IF and SWIF (beside the protection slot) circuit pack slots, install the BXA1 circuit packs into the remaining DS1IF and SWIF circuit pack slots (refer to Figure 14-16 for circuit pack locations). Refer to Chapter 2 for installing circuit packs, if necessary.
16. Install a BXA circuit pack into the slot between SWIF-2 and CLKDR-1 circuit pack slots (refer to Figure 14-16 for circuit pack location). Refer to Chapter 2 for installing circuit packs, if necessary.
17. Test the UC control cable by performing the following procedure:
    a. Put the MC into the OOS-MCOND state by entering the following command:

       `ED-STATE-EQPT:`*[a]*`:MC::OOS-MCOND;`

       Where:

       a = Target ID (optional)

b. Test the UC control cable by entering the following command:

TEST-UNIT-CABLE:*[a]*::*c*;

Where:

a = Target ID (optional)

c = Control cable ID: **J{1-32}**
Same number as the Unit number of the STS1 Interface-16 Module.

During the test the UC alarm LED turns off for three seconds. After the three seconds, the UC alarm LED turns on and remains on. Make sure the correct alarm LED turns off.

In addition after the test the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* CABLE:RESULT*/
   "d:e"
;
```

Where:

d = Control cable ID: J{1-32}

e = Test result: { PASS, FAIL }

c. Restore the MC to service by entering the following command:

RST-EQPT:*[a]*:MC;

Where:

a = Target ID (optional)

This command takes up to 5 minutes to complete.

If the above test fails or the wrong alarm LED lights, refer the problem to the system administrator or next level of support before continuing with this procedure.

18. Provision the DS1 Interface Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-12).
19. Provision the DS1IF and SWIF circuit packs as needed by referring to the section titled "Provisioning SWIF and DS1IF Circuit Packs" (page 5-31).

20. Test the N-rate cable connections to the DS1 Interface Module by referring to the section titled "Interbay (N-rate) Cables" (page 15-11).

NOTE:

N-rate cables are installed to all interface module shelf position at the time of installation of new frames or added interface bays.

If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

21. Test the external cable connections to the DS1 Interface Module by referring to the section titled "External Cables" (page 15-13).

    If any of the tests fail refer the failures to the system administrator or next level of support before continuing with this procedure.

22. Test the protection switch function of the DS1 Interface Module by referring to the section titled "Protection Switch Function" (page 15-21).

    If any of the tests fail refer the failures to the system administrator or next level of support.

    After all tests have passed, the DS1 Interface Module equipped in this procedure is ready for service.

Upgrading Equipment

The procedures in this section are used to upgrade older versions of circuit packs to newer versions.

Changing Synchronizer Module Circuit Packs From Version 1 to Version 2

This procedure allows you to change Synchronizer Module circuit packs from DS1TX1/DPLL1/TBS31 (AWS5/AWP9/AWS3) to DS1TX2/DPLL2/TBS32 (AWS9/AWP15/AWS8). This change is required to enable the use of LEDs (on version 2 circuit packs) to aid in alarm isolation and maintenance activities. This procedure takes about 1.5 to 2 hours to complete.

1. Make sure there are no alarms active by entering the following command:

   RTRV-ALM-ALL:*[a]*;

   Where:

   a = Target ID (optional)

   If any alarms are present, go to the procedure titled "Isolating Failures" (page 12-10) before performing this procedure.

2. Obtain two each of the DS1TX2 (AWS9), DPLL2 (AWP15), and TBS32 (AWS8) circuit packs.

3. Place the synchronizer (SYNCN) in the holdover mode by entering the following command:

   SET-SYNCN:*[a]*:**SYNCN:::HLDOVR**;

   Where:

   a = Target ID (optional)

4. Make the synchronizer side-0 (SYNC-0) the active side by entering the following command:

   SW-DX-EQPT:*[a]*:**SYNC-0**;

   Where:

   a = Target ID (optional)

   This command takes less than 1 minute to complete.

   After the switch is complete all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

Executing the **SW-DX-EQPT** command can result in REPT ALM EQPT messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms.

5. Remove synchronizer side-1 (SYNC-1) from service by entering the following command:

   RMV-EQPT:*[a]*:SYNC-1;**

   Where:

   a = Target ID (optional)

   An alarm occurs on the synchronizer side with the condition set to MAN.

6. Extract the SYNC-1 DPLL1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
7. Install a DPLL2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.
8. Extract the SYNC-1 TBS31 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
9. Install a TBS32 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

   The TBS32 circuit pack's red ALM LED is lit.

   The DPLL2 circuit pack's red ALM LED is lit.

10. Extract the SYNC-1 DS1TX1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
11. Install a DS1TX2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DS1TX2 circuit pack's red ALM LED is lit.

12. Edit the hardware ID of the SYNC-1 DPLL circuit pack slot by entering the following command:

    ED-EQPT:*[a]*:DPLL-1:::AWP15;**

    Where:

    a = Target ID (optional)

13. Edit the hardware ID of the SYNC-1 TBS3 (TB) circuit pack slot by entering the following command:

    ED-EQPT:*[a]*: TB-1:::AWS8;**

    Where:

    a = Target ID (optional)

14. Edit the hardware ID of the SYNC-1 DS1TX (TX) circuit pack slot by entering the following command:

    ED-EQPT:*[a]*:TX-1:::AWS9;**

    Where:

    a = Target ID (optional)

15. Verify the SYNC-1 TBS32 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TB-1;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "TB-1:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWS8 is setting for TBS32 circuit packs

    g = Circuit pack code: AWS8 is setting for TBS32 circuit packs

    If the circuit pack codes do not match re-enter the **ED-EQPT** command to make sure the codes match.

16. Verify the SYNC-1 DPLL2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:DPLL-1;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "DPLL-1:...:PCODE=f,CCODE=g,..."
;
```

Where:

f = Provisioned circuit pack code: `AWP15` is setting for DPLL2 circuit packs

g = Circuit pack code: `AWP15` is setting for DPLL2 circuit packs

If the circuit pack codes do not match re-enter the **`ED-EQPT`** command to make sure the codes match.

17. Verify the SYNC-1 DS1TX2 circuit pack's provisioned parameters by entering the following command:

    `RTRV-EQPT:`*`[a]`***`:TX-1;`**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:UTYPE:<>:CLEI:STATE */
    "TX-1:...:PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: `AWS9` is setting for DS1TX2 circuit packs

    g = Circuit pack code: `AWS9` is setting for DS1TX2 circuit packs

    If the circuit pack codes do not match re-enter the **`ED-EQPT`** command to make sure the codes match.

18. Let the TBS32 circuit pack temperature stabilize for 30 minutes before continuing with this procedure.

19. Restore SYNC-1 by entering the following command:

    `RST-EQPT:`*`[a]`***`:SYNC-1::::FRCD;`**

    Where:

    a = Target ID (optional)

    This command takes up to 1 minute to complete. After completion, alarm messages for the DPLL-1, TBS3-1, and DS1TX-1 circuit packs appear, the green ACT LEDs on the DPLL-1 and TBS3-1 circuit packs light, an alarm indicating the SYNCN is in free running mode appears, and SYNC-0 enters the OOS-FLT state.

    If the SYNC-1 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure. Otherwise, continue with Step 20.

20. Restore the DS1TX-1 circuit pack to allow timing from the building integrated timing supply (BITS) by entering the following command:

    `RST-EQPT:`*[a]*`:TX-1;`

    Where:

    a = Target ID (optional)

    This command takes up to 1 minute to complete.

    The DS1TX-1 circuit pack's red ALM LED remains lit.

21. Place the synchronizer in the phase-locked (normal) mode by entering the following command:

    `SET-SYNCN:`*[a]*`:SYNCN:::NORM;`

    Where:

    a = Target ID (optional)

    The DS1TX-1 circuit pack's red ALM LED turns off and the green ACT LED lights. The major (MJ) alarm remains on SYNC-0 and DS1TX-0 circuit packs.

22. Remove SYNC-0 from service by entering the following command:

    `RMV-EQPT:`*[a]*`:SYNC-0;`

    Where:

    a = Target ID (optional)

    An alarm occurs on the synchronizer side with the condition set to MAN.

23. Extract the SYNC-0 DPLL1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

24. Install a DPLL2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DPLL2 circuit pack's red ALM LED is lit.

25. Extract the SYNC-0 TBS31 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

26. Install a TBS32 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The TBS32 circuit pack's red ALM LED is lit.

27. Extract the SYNC-0 DS1TX1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

28. Install a DS1TX2 circuit pack into the vacant slot. Refer to Chapter 2 for extracting and installing circuit packs, if necessary.

    The DS1TX2 circuit pack's red ALM LED is lit.

29. Edit the hardware ID of the SYNC-0 DPLL2 circuit pack slot by entering the following command:

    ED-EQPT:*[a]*:DPLL-0:::AWP15;**

    Where:

    a = Target ID (optional)

30. Edit the hardware ID of the SYNC-0 TBS32 (TB) circuit pack slot by entering the following command:

    ED-EQPT:*[a]*: TB-0:::AWS8;**

    Where:

    a = Target ID (optional)

31. Edit the hardware ID of the SYNC-0 DS1TX2 (TX) circuit pack slot by entering the following command:

    ED-EQPT:*[a]*:TX-0:::AWS9;**

    Where:

    a = Target ID (optional)

32. Verify the SYNC-0 TBS32 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TB-0;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC::<>:CLEI:STATE */
    "TB-0::PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWS8 is setting for TBS32 circuit packs

    g = Circuit pack code: AWS8 is setting for TBS32 circuit packs

    If the circuit pack codes do not match re-enter the **ED-EQPT** command to make sure the codes match.

33. Verify the SYNC-0 DPLL2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:DPLL-0;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC::<>:CLEI:STATE */
    "DPLL-0::PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWP15 is setting for DPLL2 circuit packs

    g = Circuit pack code: AWP15 is setting for DPLL2 circuit packs

    If the circuit pack codes do not match re-enter the **ED-EQPT** command to make sure the codes match.

34. Verify the SYNC-0 DS1TX2 circuit pack's provisioned parameters by entering the following command:

    RTRV-EQPT:*[a]*:TX-0;**

    Where:

    a = Target ID (optional)

    A sample output response is (only pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC::<>:CLEI:STATE */
    "TX-0::PCODE=f,CCODE=g,..."
;
```

    Where:

    f = Provisioned circuit pack code: AWS9 is setting for DS1TX2 circuit packs

    g = Circuit pack code: AWS9 is setting for DS1TX2 circuit packs

    If the circuit pack codes do not match re-enter the **ED-EQPT** command to make sure the codes match.

35. Let the SYNC-0 TBS32 circuit pack temperature stabilize for 30 minutes before continuing with this procedure.

36. Restore SYNC-0 by entering the following command:

    `RST-EQPT:[a]:SYNC-0;`

    Where:

    a = Target ID (optional)

    This command takes up to 3 minute to complete. After completion, SYNC-0 enters the stand-by (STBY) state.

    If the SYNC-0 does not restore, contact your system administrator or next level of support for assistance before continuing this procedure.

37. Restore the DS1TX-0 circuit pack to allow timing from the BITS by entering the following command:

    `RST-EQPT:[a]:TX-0;`

    Where:

    a = Target ID (optional)

    This command takes up to 1 minute to complete.

38. Make SYNC-0 the active side by entering the following command:

    `SW-DX-EQPT:[a]:SYNC-0;`

    Where:

    a = Target ID (optional)

    This command takes less than 3 minute to complete. After completion, the green ACT LEDs on TB-0, DPLL-0, and TX-0 are lit and the green ACT LEDs on TB-1, DPLL-1, and TX-1 turn off.

    All alarms associated with the synchronizer clear and all synchronizer circuit pack red ALM LEDs turn off.

    After the switch is complete all circuit packs associated with a synchronizer side are switched. These circuit packs include: DPLL, TBS3, DS1TX, and CLKGN circuit packs.

    Executing the `SW-DX-EQPT` command can result in `REPT ALM EQPT` messages indicating failures on the SWIO circuit packs. These alarms clear in a matter of seconds and are considered transient alarms. Traffic is not affected by these spurious alarms. Also, executing the `SW-DX-EQPT` command on the synchronizer will cause the synchronizer mode to change to FST, then to NORM for the version 2 circuit packs.

    If there are any alarms associated with the synchronizer, contact your system administrator or next level of support for assistance in clearing the trouble. If there are no alarms, you are done with this procedure.

Changing Switch Interface From SWIF1 (AKM49) to SWIF2 (AKM50)

This procedure allows you to change a switch interface (SWIF) circuit pack from SWIF1 (AKM49) to SWIF2 (AKM50). Since DS1 performance monitoring functions are not protected, you are **not** required to provision a SWIF2 circuit pack in the DS1 interface protection group.

CAUTION:
Before performing this procedure, clear any protection switches involving the DS1 protection group being changed. In addition, release any DS1 loopbacks and disconnect any DS1 performance monitoring connections involving the circuit packs being changed.

1. Switch the SWIF1 circuit pack to protection by entering the following command:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = SWIF circuit pack location: `SWIF-{1-32}-{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.

⚠ 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**

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWIF protection circuit pack location: SWIF-{1-32}-P

   f = Equipment state

CAUTION:
Do not continue with this procedure if the basic state of the SWIF protection circuit pack is ACT. Protection switches must be cleared before performing this procedure. Refer to necessary alarm clearing procedures to clear protection switches.

2. Extract the SWIF protection circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A 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 Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)

This procedure allows you to change a multiplexer protection (MUXP) circuit pack from MUXP1 (AKM55) to MUXP2 (AKM70).

The MUXP2 circuit pack supports the functions of the MUX2 (AKM68B) circuit pack. Therefore, the MUXP2 circuit pack must be provisioned before any MUX2 circuit packs are provisioned in a DS3 Interface Module.

CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed.

1. Determine the state of the MUXP1 circuit pack by entering the following command:

   `RTRV-STATE-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

b = MUXP circuit pack location: **MUXP-{1-32}**

A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

Where:

e = MUXP circuit pack location: MUXP-{1-32}

f = Equipment state

CAUTION:
Do not continue with this procedure if the basic state of the MUXP is ACT. Protection switches must be cleared before performing this procedure. Refer to the necessary alarm clearing procedures to clear protection.

2. Extract the MUXP1 circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

   A major (MJ) alarm occurs on the MUXP circuit pack when the MUXP1 circuit pack is extracted.

3. Edit the hardware ID of the MUXP slot by entering the following command:

   ED-EQPT:*[a]*:*b*:::**AKM70;**

   Where:

   a = Target ID (optional)

   b = MUXP circuit pack location: **MUXP-{1-32}**

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 (AKM68B)

This procedure allows you to change a multiplexer (MUX) circuit pack from MUX1 (AKM52) to MUX2 (AKM68B).

NOTE:
The MUXP2 (AKM70) circuit pack must be provisioned in the DS3 Interface Module before changing from MUX1 to MUX2. Refer to section titled "Changing Multiplexer Protection From MUXP1 (AKM55) to MUXP2 (AKM70)" (page 14-71), if necessary.

CAUTION:
Before performing this procedure, clear any protection switches involving the MUXP circuit pack being changed. In addition, release any DS1 loopbacks and disconnect any DS1 performance monitoring connections involving the MUX circuit packs being changed.

1. Determine the provisioned LBO (PLBO) and the circuit pack LBO (CLBO) of the MUX1 circuit pack by entering the following command:

   RTRV-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: **MUX-{1-32}-{1-31}**

   A sample output response is (only pertinent parameters are shown):

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:UTYPE:<>:CLEI:STATE */
   "d:..., PLBO=h, CLBO=i, ..."
;
```

   Where:

   d = MUX circuit pack location: MUX-{1-32}-{1-31}

   h = Provisioned LBO setting: { INIT, OUT, IN }.

   i = Circuit pack LBO setting: { OUT, IN }

2. Switch the MUX1 circuit pack to protection by entering the following command:

   `SW-TOPROTN-EQPT:`*[a]*`:`*b*`;`

   Where:

   a = Target ID (optional)

   b = MUX circuit pack location: `MUX-{1-32}-{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 5-3 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 5-84).

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 associated Switch Module, 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 AWR-type filler assemblies (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. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

    a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 14-35) before continuing with this procedure.

    b. Check to see if the Synchronizer Module is active by entering the following command:

    `RTRV-STATE-EQPT:`*[a]*`:SYNC-0&SYNC-1;`

    Where:

    a = Target ID (optional)

    A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

    Where:

    f = Equipment state: { ACT, STBY, OOS, OOS-MTCE, OOS-FLT }

    If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-20) before continuing with this procedure.

18. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in the section titled "Provisioning Interface Modules (Units)" (page 5-12)] with the new STS1 Interface-16 Module information.

19. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-12).

20. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23).

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 5-84).

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. If you are provisioning any STS1 Interface-16 Modules, perform the following procedure to verify that the Synchronizer Module is equipped and provisioned:

   a. Check the Synchronizer Module to ensure that it is equipped with the necessary DS1TX, DPLL, and TBS3 circuit packs. If the Synchronizer Module is empty, refer to the section titled "Equipping the Synchronizer Module" (page 14-35) before continuing with this procedure.

   b. Check to see if the Synchronizer Module is active by entering the following command:

      `RTRV-STATE-EQPT:[a]:SYNC-0&SYNC-1;`

      Where:

      a = Target ID (optional)

      A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "SYNC-0:f"
   "DPLL-0:f"
   "TB-0:f"
   "SYNC-1:f"
   "DPLL-1:f"
   "TB-1:f"
;
```

      Where:

      f = Equipment state: [ACT, STBY, OOS, OOS-MTCE, OOS-FLT]

      If any of the entities are in the AVAIL and/or OOS state, provision the Synchronizer Module by referring to the section titled "Provisioning Synchronizer Module Circuit Packs and Timing References" (page 5-20) before continuing with this procedure.

8. Update the Interface Modules Provisioning Worksheet [Figure 5-1, in the section titled "Provisioning Interface Modules (Units)" (page 5-12)] with the new STS1 Interface-16 Module information.

9. Provision the interface module as an STS1 Interface-16 Module by referring to the section titled "Provisioning Interface Modules (Units)" (page 5-12).

10. Provision the SMUX circuit packs as needed by referring to the section titled "Provisioning MUX and SMUX Circuit Packs" (page 5-23).

Acceptance Testing

15

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Contents

Acceptance Testing

15

This chapter consists of procedures required for acceptance testing of the DACS IV-2000. There are procedures for testing a complete system or a single bay. These procedures are optional, but if they are performed, they must only be performed after installation or after the system has been moved or rearranged.

⚠ CAUTION:
These procedures must never be performed on a system that is in service with established cross-connections.

If you are unfamiliar with the general safety precautions associated with the DACS IV-2000, refer to Chapter 2 first before performing any of the procedures in this chapter.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Testing the System

Testing of the DACS IV-2000 is performed after installation has been completed. This assures you that the system has been installed properly and is ready to be placed into service. The testing procedures for a new system consist of the following:

- Visual Inspection ["Visual Inspections" (page 15-4)]
- Link Operation ["Link Operation" (page 15-5)]
- Control Complexes ["Operation of Control Complexes" (page 15-8)]
- Frame Alarm Operation ["Frame Alarm Operation" (page 15-9)]
- Interbay (N-rate) cables ["Interbay (N-rate) Cables" (page 15-11)]
- External Cables ["External Cables" (page 15-13)]
- Fan Assemblies: ED-9C130-30,G1 or ED-9C130-30,G2 ["Fan Assembly (ED-9C130-30,G1 or ED-9C130-30,G2)" (page 15-17)]
- Protection Switch Function ["Protection Switch Function" (page 15-21)]
- Alarm and Telemetry Outputs ["Alarm and Telemetry Outputs" (page 15-23)]

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 given above. Also, obtain office or equipment records for the system you are testing.

Testing Added Interface Bays

Perform these procedures only when adding a new interface bay to an in-service frame. If you are accepting an entirely new frame, go to the procedure for "Testing the System" (page 15-2).

The procedure for testing a new interface bay consists of the following:

- Visual Inspection ["Visual Inspections" (page 15-4)]
- Interbay (N-rate) Cables ["Interbay (N-rate) Cables" (page 15-11)]
- External Cables ["External Cables" (page 15-13)]
- Fan Assemblies (for interface bays with a fan assembly) ["Fan Assembly (ED-9C130-30,G1 or ED-9C130-30,G2)" (page 15-17)]
- Protection Switch Function ["Protection Switch Function" (page 15-21)]

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 given above. Also, obtain any office or equipment records for the system you are expanding with an interface bay.

Acceptance Testing Procedures

This section contains the procedures referenced in the sections titled "Testing the System" (page 15-2) [new frame orders] and "Testing Added Interface Bays" (page 15-3) [growth interface bays]. Refer to those sections for the procedures to be performed.

Visual Inspections

Refer any problems found in this procedure that are not corrected easily to the installation group.

1. Check front and back of frame for damage (dents, broken mountings, etc.) resulting from transportation and mounting of equipment.
2. Look over shelf mountings to verify that shelves are aligned properly and mounted securely.
3. Check to see that all circuit packs are completely engaged.
4. Look for broken or bent pins near the edges of each backplane; damage can occur to these pins even with 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 Redundant Controller Module (TTY1-1 is on bay position 11 and TTY2-1 is on bay position 13) **OR** to the TTY1-1 or TTY2-1 connector on the status panel in the front of the bay using an 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 an ED-2C940-30 Fuse and Alarm Panel or any fuse alarm lamp on an ED-9C114-30 Fuse and Alarm Panel are *not* lit.

    If any lamps are lit, have the installation group correct the problem before continuing.

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.

1. Verify that your terminal is set for the following major characteristics:

   Baud: 9600
   Duplex: Full
   Parity: Even
   Data bits: 7
   Stop bits: 1
   Flow Control:
   DC3 (Terminal connection)
   ACK (Computer connection)
   Answerback: NO

NOTE:
Refer to the manual for your terminal to see the terminal setup. Some terminal models do not allow you to set every characteristic listed above. For these terminals, set only the required characteristics.

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:*[a]*:::*c*;

   Where:

   a = Target ID (optional)

   c = Target ID: <1 to 18 characters>

5. Verify that you entered the correct network element by entering the following command:

   RTRV-NE;

   A sample output header response is:

```
   TID YY-MM-DD HH:MM:SS
M  c CTAG COMPLD
   /* NETYPE,NESIZE,SFTWR-VRSN:<> */
```

   If the desired TID (first line of response) is not displayed, redo Step 4 to enter the correct TID.

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)

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If the information entered is not what you wanted, redo Step 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)

   A sample output is (only the pertinent parameters are shown):

```
    TID YY-MM-DD HH:MM:SS
M   c CTAG COMPLD
    /* NETYPE,NESIZE,SFTWR-VRSN:<> */
    "...e:..."
;
```

   Where:

   e = Software version: {0-9}.{0-9}.{1-99}.m

   Match the output against office records to be sure the correct software release is loaded on the frame. If your software version is incorrect, refer the problem to the installation group.

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)

   The following output response appears (only the parameters that are pertinent are shown):

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE,PTYPE,BAUD,MESSAGE,DIALOG/TLMTRY,POLL,FLOW, */
    /* K,N2,T1,T3,W,P,T20,T22,T23,T25,R20,R22,R23,R25,D-BIT */
    "d:...,g,...,k,..."
    "..."
;
```

   Where:

   d = Link location: CILINK-{1,2}-{1-6}

   e = Link state: { IS, OOF-FLT, OOS-PRTCL, OOS-MTCE }

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}**

Operation of Control Complexes

This procedure is used to check the operation of each control complex. This test exercises the interfaces to the secondary storage system, the switch matrix, and the unit controllers (and associated N-rate and other cabling) of each control complex. This procedure assumes that the equipped interface modules have been provisioned.

⚠ CAUTION:
Electrostatic discharge (ESD) can cause damage to the components of a DACS IV-2000. Wear an ESD wrist strap when extracting and installing circuit packs or working near the frame.

1. Extract the CPU circuit pack with its green on-line LED lit. Refer to Chapter 2 for extracting circuit packs, if necessary.

   The major (MJ) and processor major (FAILURE) alarm LEDs light on the status panel and the frame starts a control complex side switch.

2. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

   The system takes up to 30 minutes to reset. Refer to the section titled "Reset and Boot" (page 6-7) for detailed information on system reset. The minor (MN) alarm LED on the status panel remains lit due to the CPU circuit pack extracted in Step 1.

3. Re-install the CPU circuit pack extracted in Step 1. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm LED on the status panel should extinguish within a few seconds.

   If any alarm LEDs remain lit, have the installation group correct the problem before continuing with this procedure.

4. Extract the CPU circuit pack with its green on-line LED lit (the CPU circuit pack tested in Step 2). Refer to Chapter 2 for extracting circuit packs, if necessary.

   The major (MJ) and processor major (FAILURE) alarm LEDs light on the status panel and the frame starts a control complex side switch.

5. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

   The system takes up to 30 minutes to reset. Refer to the section titled "Reset and Boot" (page 6-7) for detailed information on system reset. The minor (MN) alarm LED on the status panel remains lit due to the CPU circuit pack extracted in Step 4.

6. Re-install the CPU circuit pack extracted in Step 4. Refer to Chapter 2 for installing circuit packs, if necessary.

   The minor alarm LED on the status panel should extinguish within a few seconds.

   If any alarm LEDs remain lit, have the installation group correct the problem before continuing with the next procedure.

Frame Alarm Operation

This procedure is used to check the LED test function and to test the frame alarm operation.

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)

NOTE:
The ACO LED is tested only when the LED test button on the status panel is depressed. Using the **EX-EQPT** command does not test the ACO LED.

The LEDs light on the circuit packs in the following order:

Order	Module
1	SWCS Circuit Packs
2	SWIO Circuit Packs
3	Redundant Controller
4	Synchronizer*
5	Redundant Controller Power
6	Auxiliary Power
7	Switch Power
8	Interface module (left to right, bottom to top)†

* Synchronizer version 1 circuit packs do not contain LEDs. Therefore, these circuit packs are not included as part of the LED Test function. Version 2 circuit packs are included as part of the LED Test function.

† Interface Bay modules vary depending on the type of bay (DS1, STS1/DS3/DS1, DS3, or STS1/DS3 Interface Bay).

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 commands:

   RTRV-STATE-EQPT:*[a]*:SWCS-1&&-32;

   Where:

   a = Target ID (optional)

   A sample output is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = SWCS circuit pack location: SWCS-{1-32}

   f = Equipment state: basic states are ACT or OOS

4. Choose any SWCS circuit pack in the ACT state and extract it from the frame (refer to Chapter 2 for extracting circuit packs, if necessary).

   Wait for the alarm delay interval (up to 30 seconds). Wait for the MN alarm LED and minor alarm aisle lights to light, an alarm to sound, and an autonomous message. The alarm can be silenced by pressing the ACO push-button.

   Default for the alarm delay interval is 10 seconds. This can be changed to any interval between 0 and 30 seconds using the **ED-NE** command.

   If the alarm indication sequence does not occur, refer the problem to the installation group before continuing with this procedure.

5. Extract another SWCS circuit pack in the ACT state (refer to Chapter 2 for extracting circuit packs, if necessary).

   Wait for the alarm delay interval (up to 30 seconds). Wait for the MJ alarm LED and the red aisle lights to light, an alarm to sound, and an autonomous message. The alarm can be silenced by pressing the ACO push-button.

   If the alarm indication sequence does not occur, refer the problem to the installation group before continuing with this procedure.

6. Reinstall both SWCS circuit packs (refer to Chapter 2 for installing circuit packs, if necessary) and wait for the alarm lamps to go off (20 to 30 seconds).

   If the alarm lamps do not go off, refer the problem to the installation group before continuing to the next procedure.

Interbay (N-rate) Cables

N-rate cables use two labels. One label identifies the cable that connects to the interface module. This label is marked in the format **Jn-a** (where **n** is the number of the connector 1-16 and **a** is the N-rate cable A-T). The other label identifies the cable that connects to the Switch Module. This label is marked in the format **JnS-a** (where **n** is the number of the connector 1-16 and **a** is the N-rate cable A-T).

For example, an N-rate cable ID identified in the DACS IV-2000 (256) database as C-J12 corresponds to a physical cable labeled J12-C at the interface module end and J12S-C at the Switch Module 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.

Specifying a range J1-X through J16-X, where X is one of the allowed connector letter suffixes (A-T, excluding I, O, Q, and S), tests all N-rate connectors assigned to two DS1 Interface Modules (which can include one DS1 Interface-Protection Module), one DS3 Interface-16 Module, or one STS1 Interface-16. 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 2-1), 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, once for the N-rate cables of each module:

   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 N-rate 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 response. If the result of any test is FAIL, note the interface circuit pack(s) involved in the failed test and refer them to the installation group. (Refer to output message of the command **TEST-CABLE**, in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual [AT&T 365-340-702].)

   The normal response contains two groups. Each group consists of eight lines of output, one for each N-rate cable connector, each of which indicates PASS for all four N-rate signals in each interface module connector.

4. Test each interface module in the frame according to the above procedure until you have completed the testing of all interbay cabling.

External Cables

Do *not* use this procedure to test cables that cannot be looped back at the far-end equipment toward the DACS IV-2000. These cables must be tested as part of the test of the far-end equipment. All of the DS1 ports to be tested must be in the IDLE-REL state. Use the **RTRV-STATE-T1** command to determine the state of the ports.

Perform external cable tests on all cable pairs connected to the DACS IV-2000 that can be looped back at the far-end equipment toward the DACS IV-2000 under test (output cable to input cable).

- To test cables terminating on a DS1 Interface Module, go to the next section titled "DS1 Interface Modules" (page 15-14).
- 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 15-15).
- 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 15-15).
- 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 15-16).

⚠ 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 2-1), 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).

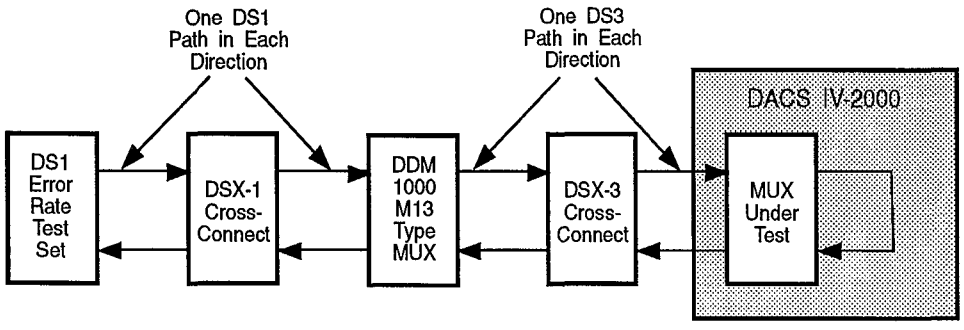


Figure 15-1. External Cable Test (Only DS3 Interfaces)

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 or 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 initializes the fan assembly and tests the main and auxiliary power alarm capabilities, power source switching, and LED functionality.

NOTE:
The fan assembly provides constant cooling to the system by measuring the system impedance and setting the fan speed accordingly. Initialization of the fan assembly is required so that the fan assembly can learn about the system airflow impedance.

CAUTION:
It is important to perform the first seven steps with the system in its normal running condition to ensure constant cooling capability for the system. If the fan filter is removed or if airflow impedance around the system is changed in any way during initialization (for example, a cover is removed), the initialization will be bad. If this happens, the initialization (first seven steps of this pro-

cedure) 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.*

Figure 15-2 shows the location of the fan assembly controls, fan filter, and air inlet.

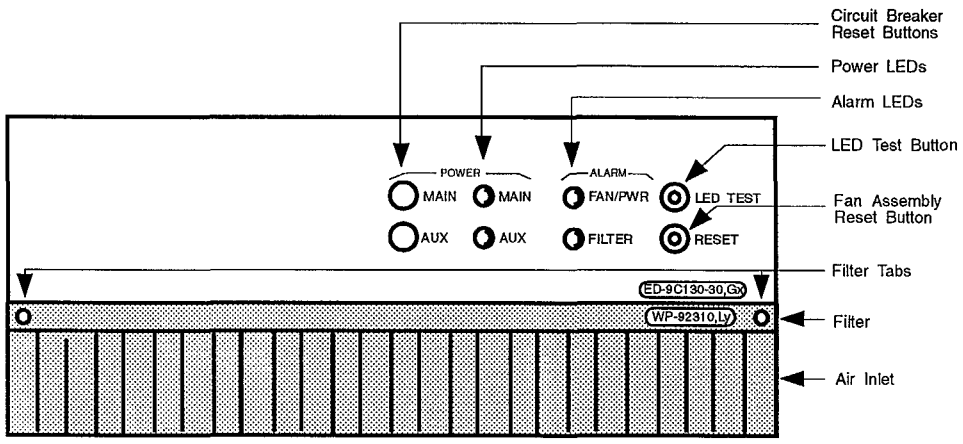


Figure 15-2. **ED-9C130-30 Fan Assembly (Front View)**

1. Make sure there is no constriction of airflow around the system (no boxes or other obstructions around the air inlet of the fan assembly.
2. Make sure that a clean fan filter is present and installed properly.

   If the fan filter is missing or dirty, refer the problem to the installation group.
3. Make sure all covers are installed on the system.
4. Make sure all doors (if applicable) are closed except as necessary for access to the RESET button on the fan assembly.
5. Press and hold the RESET button on the fan assembly. Refer to Figure 15-2, 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.

   The remainder of this procedure tests the main and auxiliary power alarm capabilities, power source switching, and LED functionality.

8. Pull the main fuse from the Fuse and Alarm panel at the top of the Switch Bay for the fan assembly being tested (refer to Table 15-1). For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.

   The red FAN/PWR LED on the fan assembly turns on and the system responds with the following 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.

9. Replace the main fuse pulled in Step 8 in the Fuse and Alarm panel. For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.

10. 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.

Table 15-1. Fuse Chart for Fan Assemblies

Power Source	Bay 1	Bay 2	Bay 3	Bay 4	SW Bay	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse Panel)									
Main	—	A16	B18	A17	E6	A19	B19	A18	—
Auxiliary	—	D16	D15	C17	B13-2	C19	D17	D19	—
Note: All load fuses for bays 1, 2, 3, 4, 6, 7, 8, 1nd 9 are 10A and all indicator fuses are 0.5A. The Switch Bay fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A.									
Duplex Power (ED-9C114-30 Fuse Panel)									
Main	E1	A15	A16	B16	A17	B19	A19	A18	E5
Auxiliary	F1	C15	C16	D16	C17	D19	C19	C18	F5
Note: All fuses are 10A with a red alarm lamp to indicate failure.									

11. Pull the auxiliary fuse for the fan assembly being tested from the Fuse and Alarm panel (refer to Table 15-1).For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for extracting fuses, if necessary.

    The red FAN/PWR LED on the fan assembly turns on and the system responds with the following 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.

12. Replace the auxiliary fuse pull in Step 11 in the Fuse and Alarm panel.For ED-9C114-30 Fuse and Alarm Panel, refer to Chapter 2 for installing fuses, if necessary.

13. 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.

14. 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}-{1-16} }

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 or 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.

NOTE:
Extracting a circuit pack without first switching the circuit pack to protection is not standard practice and leads to switch times greater than 60 ms.

3. Determine if all operations switched to the protection circuit pack by entering the following command:

   RTRV-STATE-EQPT:*[a]*:*b*;

   Where:

   a = Target ID (optional)

   b = MUX, SMUX, or DS1IF circuit pack location:
   `{ DS1IF-{1-32}-{1A-8B}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-16} }`

   A sample output response is:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* LOC:STATE */
   "e:f"
;
```

   Where:

   e = MUX, SMUX, or SWIF circuit pack location:
   `{ DS1IF-{1-32}-{1A-8B}, MUX-{1-32}-{1-31}, SMUX-{1-32}-{1-16} }`

   f = Equipment state: basic states are `AVAIL, ACT, EQPD, OOS, PNDG,` or `POS`

4. Check to see if all operations switched.

   Operations switched if the output message contains OOS and the green ACT LED on the DS1RY or MUXPS circuit packs are lit. If this does not occur, refer the problem to the installation group.

5. Reinstall the circuit pack. Refer to Chapter 2 for installing circuit packs, if necessary.

6. Repeat Steps 2 and 3 for the other DS1IF, MUX, and SMUX circuit pack associated with the cross-connection made in Step 1.

7. Disconnect the cross-connection made in Step 1 by entering the following command:

   `DLT-CRS-T1:`*[a]*`:`*b*`,`*c*`:::1WAY;`

   Where:

   a = Target ID (optional)

   b = FROM DS1 port location:

   c = TO DS1 port location:

   FROM/TO DS1 Ports

   DS1 Interface-P Module: `{1-32}-{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}`

8. Repeat this procedure for all other service DS1IF, MUX, and SMUX circuit packs.

Alarm and Telemetry Outputs

If the DACS IV-2000 is not connected to the office alarm and telemetry systems, do not perform this procedure.

The following procedure is used to test alarm and telemetry outputs.

1. Extract one SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.
2. If the yellow MN LED on the status panel is lit, and the minor office alarm is sounding, press the ACO push-button on the status panel.

   If these conditions do not occur, refer the problem to the installation group before proceeding.
3. Wait for the minor office alarm to stop sounding (up to 30 seconds) and contact the central telemetry observation point to see if the `SWCS Fail NSA` and `SWCS Protection Switch Active` telemetry scan points (point 9 and point 33 of the summary scan points) was detected.

   If the scan point is not activated, there is a problem with the connection or with the telemetry system. Refer the problem to the installation group.

   If the alarm does not stop, refer the problem to the installation group.
4. If the `SWCS Fail NSA` and `SWCS Protection Switch Active` telemetry scan points is activated, extract a second SWCS circuit pack. Refer to Chapter 2 for extracting circuit packs, if necessary.

5. If the red MJ LED on the status panel is lit, and the major office alarm is sounding, press the ACO push-button on the status panel.

   If these conditions do not occur, refer the problem to the installation group before proceeding.

6. Wait for the major office alarm to stop sounding (up to 30 seconds) and contact the central telemetry observation point to check the `SWCS Fail SA` telemetry scan point (point 8 of the summary scan points).

   If the scan point is not activated, there is a problem with the connection or with the telemetry system. Refer the problem to the installation group.

   If the alarm does not stop, refer the problem to the installation group.

7. Reinstall the two SWCS circuit packs that you unplugged earlier in this procedure. Refer to Chapter 2 for installing circuit packs, if necessary.

8. Wait for the major and minor office alarms to clear, and contact the central telemetry observation point to make sure the telemetry scan points (8, 9, 33) are no longer activated.

   The alarms take up to 30 seconds to clear.

   If they do not clear, refer the problem to the installation group.

Emergency Power Removal/Restoral

16

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Contents

Emergency Power Removal/Restoral

16

This chapter consists of procedures required for removing and restoring -48V power from/to the DACS IV-2000. Removing power results in a total loss of all transmission through the system, but may be necessary to conserve office battery supply or to allocate battery supply elsewhere to minimize service loss in the network. Restoring power may be necessary to recover from a planned removal of power, or an unplanned loss of -48V power due to natural disaster, power equipment failure, etc.

⚠ CAUTION:
These procedures must only be performed if instructed to due so by the system administrator.

⚠ CAUTION:
The person performing the procedures in this chapter must be properly trained and be very familiar with the DACS IV-2000 system architecture and command and message set.

The commands associated with the information in this chapter use only the parameters relevant to the operation. If you require more information about the commands, refer to the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702).

Emergency Power Removal

This procedure is used to remove the -48V power from the DACS IV-2000. Removing power results in a total loss of all transmission through the system, but may be necessary to conserve office battery supply or to allocate battery supply elsewhere to minimize loss in the network.

This procedure takes about 1.5 hours to complete. The first 30 minutes is allowed for visual and operational checks of the power equipment and the DACS IV-2000. The database backup takes up to 30 minutes. The power down procedure takes up to 30 minutes to complete. These time estimates are based on one installer/ craftsperson performing the procedure.

NOTE:
If any of the steps specified in this procedure cannot be completed as indicated, contact the system administrator or next level of support for assistance.

CAUTION:
*This procedure has a **high** service risk rating, since there is a service interruption to the end customer. This procedure is intended for use in emergency situations only. This procedure has a **low** implementation risk rating, since there is **no** potential service loss if this procedure is not implemented immediately. This procedure can be implemented at any time as needed.*

CAUTION:
The proper alarm monitoring centers must be notified prior to executing this procedure, since system alarms will occur during the procedure.

CAUTION:
All standard practices concerning electrical-static discharge (ESD) must be followed whenever performing any activity on the DACS IV-2000.

1. If not already done so, connect a local craft terminal to one of the TTY1-1 or TTY2-1 on the status panel (provided no connections are made to the link on the back of the frame) by referring to the section titled "Adding a Terminal to a Snider Link" (page 7-22).

CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors or both TTY2-1 connectors at the same time.

NOTE:
Any equivalent terminal can be used as long as the options are set accordingly, and the terminal interface is EIA-232-D.

2. If not already done so, connect a printer to the terminal used in Step 1 by referring to Steps 2 and 3 of the section titled "Adding a Printer in Tandem With a Terminal" (page 7-25).
3. Verify that the printer is ready and properly equipped (power is on, paper and ribbon are installed, etc.). If the printer is not ready or properly equipped, notify the system administrator or next level of support.
4. Retrieve the state of the main controller (MC) by entering the following command:

   RTRV-STATE-EQPT:*[a]*:MC;

   Where:

   a = Target ID (optional)

   From the output responses, determine the state. A sample output response is:

```
    TID YY-MM-DD HH:MM:SS
M   CTAG COMPLD
    /* LOC:STATE */
    "MC:f"
;
```

   Where:

   f = State: { IS, OOS-FLT, OOS-MCOND, OOS-MTCE }

   If the state of the MC is OOS-FLT refer to the section titled "Prioritizing Alarms" (page 12-10) to clear all failures before continuing with this procedure. If the state of the MC is OOS-MCOND or OOS-MTCE, continue with Step 5. Otherwise (MC is in the IS state), continue with Step 7.
5. Restore the MC to service by entering the following command:

   RST-EQPT:*[a]*:MC;

   Where:

   a = Target ID (optional)
6. Verify that the MC is in the IS state by entering the following command:

   RTRV-STATE-EQPT:*[a]*:MC;

   Where:

   a = Target ID (optional)

   If the MC is not in the IS state, contact the system administrator or next level of support for assistance.

7. Verify that there are no alarms on the DACS IV-2000 by entering the following command:

   RTRV-ALM-COM:*[a]*;

   Where:

   a = Target ID of frame with alarm(s)

   If no alarms are present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

   If there are alarms present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :NTFCNCDE,CTYPE,SRVEFF */
   ":c,d,e"
;
```

   Where:

   c = Notification code: { CR, MJ, MN }

   d = Condition type: { FAC, INT, GP }
   The value GP is specified for major or minor alarms.

   e = Service affecting: { NSA, SA }

   If there are any alarm present, refer to the section titled "Prioritizing Alarms" (page 12-10) to clear all alarms before continuing with this procedure. If there are no alarms, continue with Step 8.

8. Back up the system database by referring the section titled "Backing Up Database to SEC Disk" (page 6-32).

9. Verify that there are no alarms on the DACS IV-2000 by entering the following command:

   RTRV-ALM-COM:*[a]*;

   Where:

   a = Target ID of frame with alarm(s)

   If no alarms are present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
;
```

If there are alarms present, the following output response appears:

```
   TID YY-MM-DD HH:MM:SS
M  CTAG COMPLD
   /* :NTFCNCDE,CTYPE,SRVEFF */
   "c,d,e"
;
```

Where:

c = Notification code: { CR, MJ, MN }

d = Condition type: { FAC, INT, GP }
The value GP is specified for major or minor alarms.

e = Service affecting: { NSA, SA }

If there are any alarm present, refer to the section titled "Prioritizing Alarms" (page 12-10) to clear all alarms before continuing with this procedure. If there are no alarms, continue with Step 10.

10. Remove the MC from service by entering the following command:

    RMV-EQPT:*[a]*:MC;**

    Where:

    a = Target ID (optional)

    This command takes up to 1 minute to complete. Wait for the COMPLD *response before continuing with this procedure.*

11. Partially extract the four power circuit packs (two PWRFs and two PWRGs) in the Redundant Controller Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

12. Partially extract the four PWRA circuit packs in the Switch Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

CAUTION:
Transmission on the system is lost after partially extracting the PWRA circuit packs.

13. Partially extract the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.

14. Partially extract all of the PWRE circuit packs in all of the Interface Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.

Emergency Power Restoral

This procedure is used to restore the -48V power to the DACS IV-2000 from the battery distribution feeder board (BDFB). Power restoral is used to recover from a planned removal of power, or an unplanned loss of -48V power due to natural disaster, power equipment failure, etc.

This procedure takes about 1 hour to complete. The first 30 minutes is allowed for visual and operational checks of the power equipment and the DACS IV-2000. The power up sequence takes up to 30 minutes to complete. These time estimates are based on one installer/craftsperson performing the procedure.

NOTE:
If any of the steps specified in this procedure cannot be completed as indicated, contact the system administrator or next level of support for assistance.

CAUTION:
*This procedure has a **high** service risk rating, since there is a service interruption to the end customer. This procedure is intended for use in emergency situations only. This procedure has a **low** implementation risk rating, since there is **no** potential service loss if this procedure is not implemented immediately. This procedure can be implemented at any time as needed.*

CAUTION:
The proper alarm monitoring centers must be notified prior to executing this procedure, since system alarms will occur during the procedure.

CAUTION:
All standard practices concerning electrical-static discharge (ESD) must be followed whenever performing any activity on the DACS IV-2000.

1. If not already done so, connect a local craft terminal to one of the TTY1-1 or TTY2-1 on the status panel (provided no connections are made to the link on the back of the frame) by referring to the section titled "Adding a Terminal to a Snider Link" (page 7-22). Set the baud rate of the terminal to the initial system value of the DACS IV-2000.

CAUTION:
Never connect two terminal jacks into both TTY1-1 connectors or both TTY2-1 connectors at the same time.

NOTE:
Any equivalent terminal can be used as long as the options are set accordingly, and the terminal interface is EIA-232-D.

2. If not already done so, connect a printer to the terminal used in Step 1 by referring to Steps 2 and 3 of the section titled "Adding a Printer in Tandem With a Terminal" (page 7-25).
3. Verify that the printer is ready and properly equipped (power is on, paper and ribbon are installed, etc.). If the printer is not ready or properly equipped, notify the system administrator or next level of support.
4. Partially extract all of the circuit packs in the Redundant Controller Module (2 CPUs, 2 MTCs, 2 SSCs, 2 ECIs, 2SCIs, 1 UI, 2 PRIs, and 1 SEC). Refer to Chapter 2 for extracting circuit packs, if necessary.
5. Partially extract the four power circuit packs (two PWRFs and two PWRGs) in the Redundant Controller Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
6. Partially extract the four PWRA circuit packs in the Switch Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
7. Partially extract the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for extracting circuit packs, if necessary.
8. Partially extract all of the PWRE circuit packs in all of the Interface Modules. Refer to Chapter 2 for extracting circuit packs, if necessary.
9. Apply power to the system by installing the fuses or switching the circuit breakers to ON at the BDFB.
10. Install all of the PWRE circuit packs in all of the Interface Modules. Refer to Chapter 2 for installing circuit packs, if necessary.
11. Install the two PWRE circuit packs in the Auxiliary Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.
12. Install the four PWRA circuit packs in the Switch Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.

13. Install the four power circuit packs (two PWRFs and two PWRGs) in the Redundant Controller Power Module. Refer to Chapter 2 for installing circuit packs, if necessary.
14. Install all of the circuit packs in the Redundant Controller Module (2 CPUs, 2 MTCs, 2 SSCs, 2 ECIs, 2SCIs, 1 UI, 2 PRIs, and 1 SEC). Refer to Chapter 2 for installing circuit packs, if necessary.
15. Reset the system by pushing down and holding the RESET ENABLE switch and pressing the RESET button on the status panel.

⚠ CAUTION:
If your office procedures require you to do so, contact your system administrator or next level of support before restoring the main controller.

The system takes up to 30 minutes to reset. For more information on rebooting, refer to the section titled "Reset and Boot" (page 6-7).

Alarm, Scan, and Control Points

A

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Contents

Alarm, Scan, and Control Points

A

This appendix is provided to describe the interface between the DACS IV-2000 and telemetry operations systems (OSs). The AS&C points are used with administrative link (CILINKs 1-4 and 2-4). CILINKs 1-4 and 2-4 support 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 with the telemetry system initiating all communications by sending a request message to the DACS IV-2000 during each poll cycle. The system responds by sending the surveillance (or scan) point to the telemetry remote. The TABS protocol supports both point-to-point and multipoint architectures while TBOS only supports the point-to-point architecture. CILINKs 1-4 and 2-4 are used as a dedicated links. When using a General Telemetry Processor (GTP), the GTP must be connected to link 4 of the master ECI circuit pack at all times. If both ECI circuit packs are available, ECI-1 is the master ECI on system reset.

Types of AS&C Points

Point is a term which is used to describe a single element of binary information. Physically, an AS&C point can be a single bit position in a serial telemetry message or it can be a discrete relay contact closure. Functionally, three distinct classes of AS&C points exist as follows:

- Alarm Points — provide the telemetry remote with information concerning alarm conditions existing within the DACS IV-2000. This information is available as both dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 to the telemetry remote) and also as a set of discrete relay closures.

- Scan Points — provide the telemetry remote with status information concerning the DACS IV-2000. This information is available as dedicated binary bit positions in the telemetry messages (sent by the DACS IV-2000 to the telemetry remote).
- Control Points — provide the telemetry remote with operational control of certain aspects of the DACS IV-2000. This information is available as dedicated binary bit positions in the telemetry messages (received by the DACS IV-2000 from the telemetry remote).

Alarm Points via Relay Closures

Alarm points are provided, through relay closures, to telemetry remote equipment accepting discrete inputs (for example, the General Telemetry Processor [GTP]). The relay closures provide the same alarm information to the OS as is available locally through the office alarms. The DACS IV-2000 software supports relay closures for critical, major, and minor alarms. The conditions for activating each type of alarm point are:

- Critical Alarm (CR) — is set on the occurrence of a severe, service-affecting condition which requires immediate corrective action regardless of time-of-day or day-of-the-week.
- Major Alarm (MJ) — is set whenever there are one or more service-affecting failures or whenever failures which can mask service-affecting failures (for example, main controller failures).
- Minor Alarm (MN) — is set whenever there are one or more non-service-affecting failures exist, or when certain manually initiated functions (for example, manual protection switches are in effect).

Scan and Control Displays

The serial telemetry data is broken down into logical groups of 64 points each, called *displays*. This grouping, in general, conforms to the manner in which the data is shown on a terminal, with one display presenting a single terminal screen full of data. There are two types of displays:

- Scan — transmitted by the DACS IV-2000, consists of combinations of alarm and scan points. Scan point indications for momentary conditions (for example, an intermittent failure) are stretched to a minimum duration of 20 seconds to ensure that the conditions are sensed by the telemetry system. The 64th scan point in a display is reserved to indicate to the telemetry remote that serial link errors have occurred.
- Control — received by the DACS IV-2000, consists of control points from a remote site. Through the use of control points, certain aspects of system operation can be controlled by a remote site.

The DACS IV-2000 has the flexibility to support three levels of display sets:

- Summary — providing system level alarms and status identifying:
  - — Type of equipment or facility failure
  - — Presence of a protection switch or of a inhibition of protection switching (that is, lock-out) in a specific type of module

  This set does not indicate the specific facilities, equipment, or modules affected. The primary application for the summary set is as a backup source of alarm data when a message Operations System [OS] (for example, SCCS) is used as the primary source of alarm data.
- Detailed — providing expanded information which identifies the particular module(s) experiencing a problem and usually containing information to isolate a failure to the circuit pack level. This set also allows remote control of manual protection switching and the inhibition or the locking of protection switching. Selecting the detailed set automatically includes the transmission of the summary set.
- Extended Facility — providing additional circuit pack and interface port information, particularly on the DS1 facility level, on the VT1.5 facility level, on out-of-frame (OOF) conditions on DS2s within DS3 facilities, on DS3 input format mismatches, and on EC-1 facility conditions. For STS1 (modules 1-32), DS3 (modules 9-32), and DS1 (modules 33-64) Interface Modules there are control points included in the extended facility set. In addition, for DS3 (modules 9-32) and DS1 (modules 33-64) Interface Modules and Switch Input/Output (modules 3 and 4) Modules, the extended facility set includes detailed set information (scan and control points). Selecting the extended facility set automatically includes the transmission of the summary and detailed sets. 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-NWT-000474, Issue 1, or without an indication of the specific facilities affected or the circuit packs responsible for the failure. The main controller failure (MC:FAIL or OOS) point indicates failure(s) in the control complexes (CCs) circuit packs are preventing the execution of system control functions. The point 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 autolock). The type of module is specified, but not the specific protection group affected. If the equipment is in an abnormal state as a result of a manual control (for example, locking or forcing of protection switching), this is indicated by setting a scan point for *manual function initiated.* Failure of any frame audit that results in an autonomous message over the Snider and X.25 links also sets the Frame Audit Failure scan point for one polling cycle.

No control points are associated with the summary set. Table A-1 lists the summary set scan points.

Table A-1. **Summary Display Set Scan Points**

Display †	Point No.	Type *	Description
0	1	A	MC Fail or OOS
	2	A	PRI Fail or OOS
	3	A	SEC Fail
	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

* A = Alarm
S = Scan

† There is one display per system.

Table continued on next page.

Table A-1. Summary Display Set Scan Points (Continued)

Display †	Point No.	Type *	Description
0	27	A	MUX/PMGR1/SMUX Fail NSA
	28	A	Fan Fail
	29	A	Switch Module Manual Function Initiated
	30	A	DS1 Interface Module Manual Function Initiated
	31	A	DS3/STS1 Interface Module Manual Function Initiated
	32	A	Time of Day Clock Fail
	33	S	SWCS Protection Switch Active
	34	S	SWCS Protection Switch Locked
	35	S	SWCS Protection Switch Auto-Locked
	36	S	SWIO Protection Switch Active
	37	S	SWIO Protection Switch Locked
	38	S	SWIO Protection Switch Auto-Locked
	39	A	SYNC Reference Fail NSA
	40	S	DS1IF Protection Switch Active
	41	S	DS1IF Protection Switch Locked
	42	S	DS1IF Protection Switch Auto-Locked
	43	S	Incoming DS1 Fail
	44	S	Multiple Incoming DS1s Fail
	45	-	Unassigned
	46	S	MUX/SMUX Protection Switch Active
	47	S	MUX/SMUX Protection Switch Locked
	48	S	MUX/SMUX Protection Switch Auto-Locked
	49	-	Unassigned
	50	S	CILINK 1-4 OOS or Lock-Out
	51	S	Transfer to SEC Fail

* A = Alarm
S = Scan

† There is one display per system

Table continued on next page.

Table A-1. **Summary Display Set Scan Points (Continued)**

Display †	Point No.	Type *	Description
0	52	A	Frame Audit Fail
	53	S	CILINK 1-1 OOS or Lock-Out
	54	S	CILINK 1-2 OOS or Lock-Out
	55	S	CILINK 1-3 OOS or Lock-Out
	56	S	CILINK 1-5 OOS or Lock-Out
	57	S	CILINK 1-6 OOS or Lock-Out
	58	S	CILINK 2-1 OOS or Lock-Out
	59	S	CILINK 2-2 OOS or Lock-Out
	60	S	CILINK 2-3 OOS or Lock-Out
	61	S	CILINK 2-4 OOS or Lock-Out
	62	S	CILINK 2-5 OOS or Lock-Out
	63	S	CILINK 2-6 OOS or Lock-Out
	64	-	Reserved

* A = Alarm
S = Scan

† There is one display per system.

Detailed Display Set

Most applications that use the telemetry AS&C points as the primary source of maintenance data need more detail than is provided by the summary set. The following paragraphs describe the functions provided by the detailed AS&C points and include tables with the specific scan and control points needed for each product.

Most equipment failures are identified by the specific affected circuit pack. The failures are specified as either NSA or SA as specified in Bell Communications Research TA-NWT-000474, Issue 1. An NSA alarm indicates the failure of a circuit pack that does not affect service, such as a controller, or a failure that resulted in a successful protection switch to restore service. In the latter case, a scan point is provided to indicate the state of the protection switch. SA alarms indicate failures that result in service being lost.

The DACS IV-2000 can distinguish between equipment failures and incoming facility failures. Incoming DS3 failures are assigned individual alarm points, while incoming DS1 failures are indicated by a multiple scan point that specifies the affected module but not the individual DS1.

Terminating DS3 facilities have four alarm points[1] per DS3. The first alarm point indicates a loss-of-signal (LOS) or high bit error rate (BER) condition. The BER can be determined through either bipolar violations (BPVs), which is the default, or by monitoring DS3 parity errors. The alarm point is set when the BER exceeds the threshold of 10^{-3} (default) through 10^{-9} as provisioned. The second alarm point indicates an out-of-frame (OOF) condition. Under LOS or when the BER is high enough to cause an OOF, both alarm points are set. The other two alarm points indicate detection of incoming DS3 alarm indication signal (AIS) and detection of incoming DS3 idle signal.

The DS1 facilities associated with the DS1 Interface Module have two scan points indicating that one or more of the incoming DS1 signals to the module have either an LOS condition or a BER that exceeds the threshold of 10^{-3} (default) through 10^{-9} as determined by monitoring BPVs.

Control points allow manual protection switching of individual circuit packs and permit inhibiting (lockout) protection switching. Three controls are provided:

- Make protection switch — transfers service to the protection circuit pack if it is available and good and locks it in that state. This control has no effect if service on the indicated circuit pack is already on protection, if protection is unavailable, or if protection is inhibited (locked).
- Lock protection — inhibits service from being transferred to the protection circuit pack. In this state, no automatic switch to protection occurs if the service circuit pack is diagnosed as bad.
- Unlock protection — allows manual or automatic protection switching on the indicated circuit pack. If a manual protection switch has been made on a *good* circuit pack, the unlock control allows the DACS IV-2000 to release the switch. No control point is provided to force a circuit pack into the unprotected state if it is in the protected state and diagnosed as bad.

For each control, a corresponding scan point is provided to allow verification that the action specified by the control was completed.

Tables A-2 through A-11 define the scan and control points required for each module or assembly of the DACS IV-2000. Scan points are divided by type into alarm and scan points, and alarm points are further designated as either NSA or SA.

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.

1. An additional alarm point is provided in the extended display set for DS3 format mismatches. Refer to the section titled "Extended Facility Display Sets" (page A-24) for more information on the extended display sets.

Table A-2. **Detailed Display Set (RC/SYNC/SW Modules) — Scan Points**

Display †	Point No.	Type *	Description
1	1	A	MC Fail
	2	A	PRI-1 Fail
	3	A	SEC Fail NSA
	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

* A = Alarm
S = Scan

† There are six displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-2. **Detailed Display Set (RC/SYNC/SW Modules) — Scan Points (Continued)**

Display †	Point No.	Type *	Description
1	60-61	A	ECI-{1,2} Fail or OOS
	62-63	S	SYNC-{0,1} Active
	64	-	Reserved
2	1-32	A	SWIO-{1-32} Fail SA
	33	A	SWCS-32Fail SA
	34-39	S	CILINK 1-{1-6} OOS-FLT, Protocol, or Lock-Out
	40-45	S	CILINK 2-{1-6} OOS-MTCE
	46-51	S	CILINK 2-{1-6} OOS-FLT, Protocol, or Lock-Out
	52	A	TBS3 Fail SA
	53-54	A	TBS3-{0,1} Fail NSA
	55	A	DPLL Fail SA
	56-57	A	DPLL-{0,1} Fail NSA
	58-59	-	Unassigned
	60-62	S	Reserved
	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 Fail NSA
	38	A	DS1TX-1 Fail NSA
	39-40	-	Unassigned
	41	A	SYNCPRI-0 (DS1TX-0 Primary Reference) Fail NSA
	42	A	SYNCSEC-0 (DS1TX-0 Primary Reference) Fail NSA

* A = Alarm
S = Scan

† There are six displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-2. Detailed Display Set (RC/SYNC/SW Modules) — Scan Points (Continued)

Display †	Point No.	Type *	Description
3	43	A	SYNCPRI-1 (DS1TX-1 Primary Reference Fail NSA
	44	A	SYNCSEC-1 (DS1TX-1 Primary Reference) Fail NSA
	45-46	-	Unassigned
	47	A	SYNC Mode Fail NSA
	48-63	-	Unassigned
	64	-	Reserved
4	1-16	S	SWIO Pair {1-16} Protection Switch Auto-Locked
	17-48	S	SWIO-{1-32} Protection Switch Locked
	49	A	MC OOS-MCOND
	50-51	A	CC-{0,1} OOS-MTCE
	52	A	PRI-1 OOS-MTCE
	53	-	Unassigned
	54	A	PRI-2 OOS-MTCE
	55-56	-	Unassigned
	57	A	Transfer to SEC Fail Minor NSA
	58-63	-	Unassigned
	64	-	Reserved
5	1-31	A	SWCS-{1-31} 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 = Scan

† There are six displays for the RC/SYNC/SW Modules.

Table A-3. **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
	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
	19	SWIO-10 Lock Protection
	20	SWIO-10 Unlock Protection

† There are five displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-3. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display †	Point No.	Description
	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
3	34	SWIO-17 Unlock Protection
	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

† There are five displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-3. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display †	Point No.	Description
3	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-30 Lock 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
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

† There are five displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-3. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display †	Point No.	Description
	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
5	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
	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

† There are five displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-3. Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)

Display †	Point No.	Description
5	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
	57	SWCS-29 Lock Protection
	58	SWCS-29 Unlock Protection
	59	SWCS-30 Lock Protection

† There are five displays for the RC/SYNC/SW Modules.

Table continued on next page.

Table A-3. **Detailed Display Set (RC/SYNC/SW Modules) — Control Points (Continued)**

Display †	Point No.	Description
5	60	SWCS-30 Unlock Protection
	61	SWCS-1 Lock Protection
	62	SWCS-31 Unlock Protection
	63	SWCS-32 Lock Protection
	64	SWCS-32 Unlock Protection

† There are five displays for the RC/SYNC/SW Modules.

DS1 Interface Modules

Tables A-4 and A-5 list the detailed scan and control points, respectively, for each DS1 Interface and DS1 Interface-Protection Module. The same points are used for both the DS1 Interface and DS1 Interface-Protection Modules. Detailed display sets for modules 33-64 are part of the extended displays sets.

Table A-4. **Detailed Display Set (DS1 INTFC Module) — Scan Points**

Display †	Point No.	Type *	Description
1	1	A	Power Circuit Pack(s) Fail
	2	-	Unassigned
	3	A	UC Fail or OOS
	4	A	CLKDR Fail SA
	5-6	A	CLKDR-{1,2} Fail NSA
	7-22	A	DS1IF-{1-16} Fail SA
	23-38	A	DS1IF-{1-16} Fail NSA
	39-46	A	SWIF-{1-8} Fail SA
	47-54	A	SWIF/PMGR-{1-8} Fail NSA
	55-58	A	DS1RY-{1-4} Fail SA
	59	A	SW Module Manual Function Initiated

* A = Alarm
S = Scan

† There are two displays per DS1 Interface Module

Table continued on next page.

Table A-4. Detailed Display Set (DS1 INTFC Module) — Scan Points (Continued)

Display †	Point No.	Type *	Description
1	60-63	-	Unassigned
	64	-	Reserved
2	1	S	DS1 Incoming Fail
	2	S	Multiple DS1s Incoming Fail
	3	-	Unassigned
	4-19	S	DS1IF-{1-16} Protection Switch Active
	20-35	S	DS1IF-{1-16} Protection Switch Locked
	36	S	DS1IF Protection Switch Auto-Locked
	37-63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are two displays per DS1 Interface Module

Table A-5. Detailed Display Set (DS1 INTFC Module) — Control Points

Display †	Point No.	Description
1	1	Unassigned
	2	DS1IF-{1A,1B} Switch to Protection
	3	Unassigned
	4	DS1IF-{2A,2B} Switch to Protection
	5	Unassigned
	6	DS1IF-{3A,3B} Switch to Protection
	7	Unassigned
	8	DS1IF-{4A,4B} Switch to Protection
	9	Unassigned
	10	DS1IF-{5A,5B} Switch to Protection
	11	Unassigned
	12	DS1IF-{6A,6B} Switch to Protection

† There is one display per DS1 Interface Module

Table continued on next page.

Table A-5. Detailed Display Set (DS1 INTFC Module) — Control Points (Continued)

Display †	Point No.	Description
	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
1	29	DS1IF-{3A,3B} Unlock Protection
	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

† There is one display per DS1 Interface Module

Table continued on next page.

Table A-5. **Detailed Display Set (DS1 INTFC Module) — Control Points (Continued)**

Display †	Point No.	Description
1	46-47	Unassigned
	48	DS1IF-{8A,8B} Lock Protection
	49	DS1IF-{8A,8B} Unlock Protection
	50-64	Unassigned

† There is one display per DS1 Interface Module

DS3 Interface Modules

The same points are assigned to the DS3 Interface-16 or DS3 Interface-32 Modules, except that the points referring to MUX number 17-32 or CLKDR number 3-4 are not needed for the DS3 Interface-16 Modules. MUX-16 (DS3 Interface-16 Modules) and MUX-32 (DS3 Interface-32 Modules) refers to the MUXP circuit packs. These points are always set to 0 in the DS3 Interface-16 Module displays. Tables A-6 and A-7 list the required scan and control points, respectively. In addition to equipment failures, alarm points are required to indicate incoming DS3 facility alarms. These points specify whether the DS3 is OOF or if there is a LOS or BER exceeding the selected threshold (either 10^{-3} or 10^{-6}). Detailed display sets for modules 9-32 are part of the extended displays sets.

Table A-6. **Detailed Display Set (DS3 INTFC Module) — Scan Point**

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

* A = Alarm
S = Scan

† There are five displays per DS3 Interface Module

Table continued on next page.

Table A-6. Detailed Display Set (DS3 INTFC Module) — Scan Point (Continued)

Display †	Point No.	Type *	Description
1	15-18	-	Unassigned
	19-49	S	MUX-{1-31} Protection Switch Active
	50-63	-	Unassigned
	64	-	Reserved
2	1	S	MUX Protection Switch Auto-Locked
	2-32	S	MUX-{1-31} Protection Switch Locked
	33-63	A	DS3 Signal-{1-31} ID Error
	64	-	Reserved
3	1-31	A	MUX-{1-31} Fail SA
	32-62	A	MUX/PMGR-{1-32} Fail NSA
	63	A	MUX-32 (MUXP) Fail NSA
	64	-	Reserved
4	1-31	A	Incoming DS3 Signal-{1-31} LOS/BER
	32-62	A	Incoming DS3 Signal-{1-31} OOF
	63	A	MUX-32 (MUXP) Fail SA
	64	-	Reserved
5	1-31	A	Incoming DS3 Signal-{1-31} AIS Detected
	32-62	A	Incoming DS3 Signal-{1-31} Idle Detected
	63	-	Unassigned
	64	-	Reserved

* A = Alarm
S = Scan

† There are five displays per DS3 Interface Module

Table A-7. **Detailed Display Set (DS3 INTFC Module) — Control Points**

Display †	Point No.	Description
1	1	Unassigned
	2-32	MUX-{1-31} Switch to Protection
	33-64	Unassigned
2	1	MUX-1 Lock Protection
	2	MUX-1 Unlock Protection
	3	MUX-2 Lock Protection
	4	MUX-2 Unlock Protection
	5	MUX-3 Lock Protection
	6	MUX-3 Unlock Protection
	7	MUX-4 Lock Protection
	8	MUX-4 Unlock Protection
	9	MUX-5 Lock Protection
	10	MUX-5 Unlock Protection
	11	MUX-6 Lock Protection
	12	MUX-6 Unlock Protection
	13	MUX-7 Lock Protection
	14	MUX-7 Unlock Protection
	15	MUX-8 Lock Protection
	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

† There are two displays per DS3 Interface Module

Table continued on next page.

Table A-7. Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)

Display †	Point No.	Description
	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
2	38	MUX-19 Unlock Protection
	39	MUX-20 Lock Protection
	40	MUX-20 Unlock Protection
	41	MUX-21 Lock Protection
	42	MUX-21 Unlock Protection
	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

† There are two displays per DS3 Interface Module

Table continued on next page.

Table A-7. Detailed Display Set (DS3 INTFC Module) — Control Points (Continued)

Display †	Point No.	Description
2	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

† There are two displays per DS3 Interface Module

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-8. **Extended Display Set (DS1 INTFC Module) — Scan Points**

Display †	Point No.	Type *	Description
1	1-56	S	Incoming DS1 Signal-{1-56} Fail
	57-63	-	Unassigned
	64	-	Reserved
2	1-56	S	Incoming DS1 Signal-{57-112} Fail
	57-63	-	Unassigned
	64	-	Reserved
3	1-56	S	Incoming DS1 Signal-{113-168} Fail
	57-63	-	Unassigned
	64	-	Reserved
4	1-56	S	Incoming DS1 Signal-{169-224} Fail
	57-63	-	Unassigned
	64	-	Reserved

* S = Scan

† There are four displays per DS1 Interface Module.

DS3 Facilities

For each service MUX circuit pack in a DS3 Interface Module, one alarm point is provided to indicate signal format mismatches (M13 or CBIT) and seven alarm points are provided to indicate DS2 signals within the incoming DS3 facility that are OOF. Table A-9 lists these points. These scan points require four additional displays for each DS3 Interface Module.

Table A-9. **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
3	1-7	A	DS3 19, DS2-{1-7} OOF
	8-14	A	DS3 20, DS2-{1-7} OOF
	15-21	A	DS3 21, DS2-{1-7} OOF
	22-28	A	DS3 22, DS2-{1-7} OOF
	29-35	A	DS3 23, DS2-{1-7} OOF
	36-42	A	DS3 24, DS2-{1-7} OOF

* A = Alarm

† There are four displays per DS3 Interface Module.

Table continued on next page.

Table A-9. Extended Display Set (DS3 INTFC Module) — Scan Points (Continued)

Display†	Point No.	Type *	Description
3	43-49	A	DS3 25, DS2-{1-7} OOF
	50-56	A	DS3 26, DS2-{1-7} OOF
	57-63	A	DS3 27, DS2-{1-7} OOF
	64	-	Reserved
4	1-7	A	DS3 28, DS2-{1-7} OOF
	8-14	A	DS3 29, DS2-{1-7} OOF
	15-21	A	DS3 30, DS2-{1-7} OOF
	22-28	A	DS3 31, DS2-{1-7} OOF
	29-59	A	DS3 Signal-{1-31} Format Mismatch
	60-63	-	Unassigned
	64	-	Reserved

* A = Alarm

† There are four displays per DS3 Interface Module.

STS1 Interface Module AS&C Points

All AS&C points for STS1 Interface Modules are provided as extended alarm sets. Alarm, scan, and control points are provided for equipment associated with STS1 Interface Modules. In addition, for each incoming STS-1 facility to a SMUX circuit pack, eight alarm points (120 alarm points for each SMUX circuit pack) are provided to indicate:

- Loss of signal or high bit error rate (LOS/T-BERL)
- Loss of frame (LOF)
- Loss of pointer (LOP)
- Line alarm indication signal (AISL)
- Path alarm indication signal (AISP)
- Path yellow (YEL)
- Far-end remote failure (FERF)
- Signal label match failure (SLMF)

For a VT1.5 tributary signal within an EC-1 facility, the following points are provided:

- Fifteen alarm points to identify one or more VT LOP condition(s)
- Fifteen status points to identify one or more VT path yellow condition(s) has been detected on an upstream tributary failure

Tables A-10 and A-11 lists the extended set scan and control points, respectively.

Table A-10. **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} LOF/T-BERL
	48-62	A	Incoming STS-1 Signal-{1-15} LOF
	63	-	Unassigned

* A = Alarm
S = Scan

† There are five displays per STS1 Interface-16 Module.

Table continued on next page.

Table A-10. Extended Display Set (STS1 INTFC Module) — Scan Points (Continued)

Display†	Point No.	Type *	Description
3	64	-	Reserved
	1-15	A	Incoming STS-1 Signal-{1-15} LOP
	16-30	A	Incoming STS-1 Signal-{1-15} AISL
	31-45	S	Incoming STS-1 Signal-{1-15} AISP
	46-60	S	Incoming STS-1 Signal-{1-15} YEL
	61-63	-	Unassigned
	64	-	Reserved
4	1-15	S	Incoming STS-1 Signal-{1-15} FERF
	16-30	A	Incoming STS-1 Signal-{1-15} SLMF
	31-63	-	Unassigned
	64	-	Reserved
5	1-15	A	STS1-{1-15}, VT1.5-{1-28} VT LOP
	16-30	S	STS1-{1-15}, VT1.5-{1-28} VT AISP
	31-45	S	STS1-{1-15}, VT1.5-{1-28} VT YEL
	46-63	-	Unassigned
	64	-	Reserved

A = Alarm
S = Scan

† There are five displays per STS1 Interface-16 Module.

Table A-11. Extended Display Set (STS1 INTFC Module) — Control Points

Display†	Point No.	Description
1	1	Unassigned
	2-16	SMUX-{1-15} Make Protection Switch
	17	SMUX-1 Lock Protection
	18	SMUX-1 Unlock Protection
	19	SMUX-2 Lock Protection
	20	SMUX-2 Unlock Protection

† There is one display per STS1 Interface-16 Module.

Table continued on next page.

Table A-11. **Extended Display Set (STS1 INTFC Module) — Control Points (Continued)**

Display†	Point No.	Description
1	21	SMUX-3 Lock Protection
	22	SMUX-3 Unlock Protection
	23	SMUX-4 Lock Protection
	24	SMUX-4 Unlock Protection
	25	SMUX-5 Lock Protection
	26	SMUX-5 Unlock Protection
	27	SMUX-6 Lock Protection
	28	SMUX-6 Unlock Protection
	29	SMUX-7 Lock Protection
	30	SMUX-7 Unlock Protection
	31	SMUX-8 Lock Protection
	32	SMUX-8 Unlock Protection
	33	SMUX-9 Lock Protection
	34	SMUX-9 Unlock Protection
	35	SMUX-10 Lock Protection
	36	SMUX-10 Unlock Protection
	37	SMUX-11 Lock Protection
	38	SMUX-11 Unlock Protection
	39	SMUX-12 Lock Protection
	40	SMUX-12 Unlock Protection
	41	SMUX-13 Lock Protection
	42	SMUX-13 Unlock Protection
	43	SMUX-14 Lock Protection
	44	SMUX-14 Unlock Protection
	45	SMUX-15 Lock Protection
	46	SMUX-15 Unlock Protection
	47-63	Unassigned
	64	Reserved

† There is one display per STS1 Interface-16 Module.

Display Requirements

The number of displays required depends on the choice of AS&C set and on the configuration of the system. The following paragraphs discuss the total number of displays required for each of the three AS&C sets previously described.

Summary AS&C Points

The summary set consists of a single scan display.

Detailed and Extended AS&C Points

Tables A-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 or 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/STS-1 equivalents and, therefore, the number of DS1 Interface Modules must be reduced by 4 for each DS3 Interface-32 Module and by 2 for each DS3 Interface-16 or STS1 Interface-16 Module in the system.

The maximum number of displays (detailed and extended) is 198 (6 for the Redundant Controller, Synchronizer, Switch, and Switch Power Modules and 192 for the 32 DS1 Interface Modules) for a DACS IV-2000 configuration consisting of a fully equipped switch, 32 DS1 Interface Modules, and no DS3 or STS1 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.

The DACS IV-2000 can be equipped in a variety of configurations with different combinations of DS1, DS3, and STS1 interfaces. The configuration with the most displays has 32 DS1 Interface Modules and no DS3 or STS1 Interface Modules and requires 70 detailed displays (6 for the Redundant Controller, Switch, Synchronizer, and Switch Power Modules and 64 for the 32 DS1 Interface Modules).

Table A-12. Number of Scan Point Displays

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
RC, SYNC, and SW Modules	1	6	0
DS1 Interface Module (1-32)	32	2	4
DS3 Interface Module (1-8)	8	5	4
DS3 Interface Module (9-16)	8	0	9
STS1 Interface Module (1-16)	16	0	5

Table A-13. Number of Control Point Displays

Module Type	Maximum Modules	Number of Displays per Module	
		Detailed	Extended
RC, SYNC, and SW Modules	1	5	2
DS1 Interface Module (1-32)	32	1	0
DS3 Interface Module (1-8)	8	2	0
DS3 Interface Module (9-16)	8	0	2
STS1 Interface Module (1-16)	16	0	1

Display Numbering

Table A-14 lists the AS&C display numbering assignments.

Table A-14. **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

Table continued on next page.

Table A-14. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
79-80	80	DS1 Interface 17
81-82	82	DS1 Interface 18
83-84	84	DS1 Interface 19
85-86	86	DS1 Interface 20
87-88	88	DS1 Interface 21
89-90	90	DS1 Interface 22
91-92	92	DS1 Interface 23
93-94	94	DS1 Interface 24
95-96	96	DS1 Interface 25
97-98	98	DS1 Interface 26
99-100	100	DS1 Interface 27
101-102	102	DS1 Interface 28
103-104	104	DS1 Interface 29
105-106	106	DS1 Interface 30
107-108	108	DS1 Interface 31
109-110	110	DS1 Interface 32
111-119	-	Unused
120-123	-	DS3 Interface 1 Extended Facilities
124-127	-	DS3 Interface 2 Extended Facilities
128-131	-	DS3 Interface 3 Extended Facilities
132-135	-	DS3 Interface 4 Extended Facilities
136-139	-	DS3 Interface 5 Extended Facilities
140-143	-	DS3 Interface 6 Extended Facilities
144-147	-	DS3 Interface 7 Extended Facilities
148-151	-	DS3 Interface 8 Extended Facilities
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

Table continued on next page.

Table A-14. Scan Point Display Numbering (Continued)

Scan Display	Control Display	Module
168-171	-	DS1 Interface 5 Extended Facilities
172-175	-	DS1 Interface 6 Extended Facilities
176-179	-	DS1 Interface 7 Extended Facilities
180-183	-	DS1 Interface 8 Extended Facilities
184-187	-	DS1 Interface 9 Extended Facilities
188-191	-	DS1 Interface 10 Extended Facilities
192-195	-	DS1 Interface 11 Extended Facilities
196-199	-	DS1 Interface 12 Extended Facilities
200-203	-	DS1 Interface 13 Extended Facilities
204-207	-	DS1 Interface 14 Extended Facilities
208-211	-	DS1 Interface 15 Extended Facilities
212-215	-	DS1 Interface 16 Extended Facilities
216-219	-	DS1 Interface 17 Extended Facilities
220-223	-	DS1 Interface 18 Extended Facilities
224-227	-	DS1 Interface 19 Extended Facilities
228-231	-	DS1 Interface 20 Extended Facilities
232-235	-	DS1 Interface 21 Extended Facilities
236-239	-	DS1 Interface 22 Extended Facilities
240-243	-	DS1 Interface 23 Extended Facilities
244-247	-	DS1 Interface 24 Extended Facilities
248-251	-	DS1 Interface 25 Extended Facilities
252-255	-	DS1 Interface 26 Extended Facilities
256-259	-	DS1 Interface 27 Extended Facilities
260-263	-	DS1 Interface 28 Extended Facilities
264-267	-	DS1 Interface 29 Extended Facilities
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

Table continued on next page.

Table A-14. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
285-289	285-286	DS3 Interface 10
290-294	290-291	DS3 Interface 11
295-299	295-296	DS3 Interface 12
300-304	300-301	DS3 Interface 13
305-309	305-306	DS3 Interface 14
310-314	310-311	DS3 Interface 15
315-319	315-316	DS3 Interface 16
320-323	-	DS3 Interface 9 Extended Facilities
324-327	-	DS3 Interface 10 Extended Facilities
328-331	-	DS3 Interface 11 Extended Facilities
332-335	-	DS3 Interface 12 Extended Facilities
336-339	-	DS3 Interface 13 Extended Facilities
340-343	-	DS3 Interface 14 Extended Facilities
344-347	-	DS3 Interface 15 Extended Facilities
348-351	-	DS3 Interface 16 Extended Facilities
352-355	355	STS1 Interface 1
356-359	359	STS1 Interface 2
360-363	363	STS1 Interface 3
364-367	367	STS1 Interface 4
368-371	371	STS1 Interface 5
372-375	375	STS1 Interface 6
376-379	379	STS1 Interface 7
380-383	383	STS1 Interface 8
384-387	387	STS1 Interface 9
388-391	391	STS1 Interface 10
392-395	395	STS1 Interface 11
396-399	399	STS1 Interface 12
400-403	403	STS1 Interface 13
404-407	407	STS1 Interface 14

Table continued on next page.

Table A-14. **Scan Point Display Numbering (Continued)**

Scan Display	Control Display	Module
408-411	411	STS1 Interface 15
412-415	415	STS1 Interface 16
416	-	STS1 Interface 1 Extended Facilities
417	-	STS1 Interface 2 Extended Facilities
418	-	STS1 Interface 3 Extended Facilities
49	-	STS1 Interface 4 Extended Facilities
420	-	STS1 Interface 5 Extended Facilities
421	-	STS1 Interface 6 Extended Facilities
422	-	STS1 Interface 7 Extended Facilities
423	-	STS1 Interface 8 Extended Facilities
424	-	STS1 Interface 9 Extended Facilities
425	-	STS1 Interface 10 Extended Facilities
426	-	STS1 Interface 11 Extended Facilities
427	-	STS1 Interface 12 Extended Facilities
428	-	STS1 Interface 13 Extended Facilities
429	-	STS1 Interface 14 Extended Facilities
430	-	STS1 Interface 15 Extended Facilities
431	-	STS1 Interface 16 Extended Facilities

Glossary

A

ABS (Absent)
The circuit pack and a blank circuit pack is not in the associated slot.

ACO (Alarm Cutoff)
A button on the Status Panel used to silence audible alarms. Audible alarms can also be silenced using the `OPR-ACO-ALL` command.

ACT (Active)
The circuit pack or module is in service and not protected. If it is a traffic-carrying circuit pack or module, it is carrying traffic.

Alarm
An indication that a failure has occurred within a piece of equipment and/or a transmission facility.

Alarm Delay
Specifies the alarm delay (in seconds) for software-detected alarm conditions. Initial value is 10 seconds.

Alarm Indication Signal (AIS)
A signal transmitted downstream if the incoming signal is defective.

All-Ones Signal
Signal that is defined to contain all ones, AIS is an example of an all-ones signal.

Alphanumeric Characters
Letters and digits.

Alternate Mark Inversion (AMI)
A DS1 line code in which alternate one bits are positive and negative, but zero substitution is not used.

ASCII Characters
Letters, digits, and symbols used in the American Standard Code for Information Interchange.

AS&C (Alarm, Scan, and Control) Points
Interface between the DACS IV-2000 and telemetry operations systems (OSs).

Attribute (ATTR)
Alarm indication level: critical, 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.

Autonomous
Done by the system without direction by you.

Auto-provisioning
Put into the provisioned state automatically by the system.

AVAIL (Available)
Circuit pack or interface module is not provisioned and not assigned in the database. The circuit pack or interface module is not monitored by the system.

B

B3ZS
Bipolar with 3-zero substitution; a DS3 or STS-1 line code.

B8ZS
Bipolar with 8-zero substitution; a DS1 line code.

Battery Distribution Feeder Board (BDFB)
Lineage 2000 (or equivalent) battery plant (-48 Vdc nominal) used to supply power to the DACS IV-2000. New Release 4.0 frame orders use two BDFBs (red and blue power feeds), while existing frames software upgraded to Release 4.0 use one BDFB.

Baud Rate
Transmission rate (bits per second) on a link.

BER Metric
Specifies the metric for calculating bit error rate at a DS3 interface port. Options are bipolar 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 (BER) Threshold
Point at which an alarm is issued for bit errors.

BLK (Blank)
Circuit pack slot contains a bus extender (blank) circuit pack.

Blue Code
Same as alarm indication signal (AIS).

Boot
To transfer contents of backup memory into the system's working memory.

Broadcast
To take a signal from a single input port and connect it to multiple output ports.

Byte
Usually refers to a group of eight consecutive binary digits, but sometimes used for bit groups of other sizes.

C

Call Redirect
Autonomous action taken when the ECI circuit pack 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.

C-bit Parity
Parity checks on blocks of data are used to detect bits in error. C-bit parity is a DS3 format specified by ANSI T1.107 that supports near-end and far-end path performance monitoring, contains far-end alarm/control, and three end-to-end overhead communications channels.

CILINK (Communication Interface Link)
Access port that allows users or operations systems (OSs) to communicate with the DACS IV-2000.

Clear (CL)
The state where an alarm condition no longer exists.

Clear-channel
A channel in which all bandwidth is used, with no overhead bits.

Command Mode
One of two modes used to communicate with the DACS IV-2000. This mode involves entering commands directly into the system without any prompts.

Condition
The type of alarm failure, such as internal and loss of signal.

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 (CC)
A set of circuit packs (CPU/MTC/SSC) that provide all control functions for the DACS IV-2000. For the redundant controller, two control complexes are provided for increased reliability of the main controller.

Critical (CR)
Indicates a severe, service-affecting condition.

Cross-Connect
Hardware used to interconnect line-terminating equipment, multiplexers, and other equipment, allowing access to these facilities and having the ability to change these facilities as required.

Crosstalk
An unwanted signal induced into one transmission line from another transmission line.

Current Value
In the dialog mode, 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
An electronic device used with a multiplexed signal for recovering signals combined within it and restoring the distinct individual channels of these signals.

Diagnose
To test a circuit pack.

Display Number
Specifies a TABS display number.

Double Ampersand (&&)
Specifies multiple addressed ranges of equipment, links, or ports. For example, 1&&-6 means equipment/link/port locations 1 through 6.

Driven
A condition in which an interface with a connection is being monitored.

DS1GRP
A group of 28 DS1 ports in either an SWIF, a MUX, or an SMUX [VT1.5(DS1) signals] 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 Mbits/s (ANSI T1.107). A DS1 signal is produced by combining 192 payload bits and one framing bit; for example, 24 DS0 signals (eight bits per DS0) can be combined with one framing bit, thereby transmitting 193 bits per frame.

DS2 Signal
A logical signal with a data rate of 6.312 Mbits/s (ANSI T1.107). A DS2 signal is produced by combining seven DS1 signals.

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. The initial value is M13, the common multiplexer format.

DS3 Idle Signal
A signal that can be optionally applied to any DACS IV-2000 output port that is not cross-connected to any input port. This signal lets *downstream* network elements know that the facility is operating normally even though the DACS IV-2000 is not sending a normal DS3 signal.

DS3 Interface Port
Specifies a DS3 port on a MUX circuit pack. If the value UNIT is given, it indicates all the DS3 interface ports in that DS3 Interface Module.

DS3 Signal
A logical or electrical B3ZS signal with a data rate of 44.736 Mbits/s (ANSI T1.107). For the DACS IV-2000, 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

Electrical Carrier 1 (EC-1)
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).

Electromagnetic Compatibility (EMC)
A measure of equipment tolerance to external electromagnetic fields.

Electromagnetic Interference (EMI)
Interference generated in a circuit by electromagnetic radiation energy coupling.

Electrostatic Discharge (ESD)
Static electrical energy potentially harmful to circuit packs and humans.

Enter
To provision a circuit pack or interface module by a command, not automatically by the system.

Entity
A specific piece of hardware (such as a circuit pack, memory device, or 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.

EQPT (Equipped)
The circuit pack or interface module is in the system database and physically in the frame, but is not yet provisioned.

Equalizer
A circuit adjustment used to maintain signal strength between desired limits.

F

Facility
A one-way or two-way circuit connected to the DACS IV-2000 that carries a transmission signal (such as a DS1 or STS-1 signal).

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 (for example, 193 bits in a DS1 signal), which contains twenty-four 8-bit bytes and a synchronizing frame bit. Also refers to an assembly of equipment units, such as a DACS IV-2000 frame.

G

Grooming
Rearrangement of DS1/VT1.5 signals in DS3/STS-1 signals.

H

Hardware ID
Specifies the hardware identification (type and version) of a circuit pack.

Header
The first line of a message.

Header Date
Specifies the current date as YYMMDD, where YY is the last two digits of the year, MM is the month, and DD is the day of the month.

Header Time
Specifies the current time of day as HHMMSS, where HH is the hour (00 to 23), MM is the 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 momentary disruption of service.

Hot Standby
A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack.

I

Idle
An output port is idle if it is not cross-connected to an input port.

Idle Code
A signal I that is transmitted downstream automatically from an idle output port; it can also be transmitted downstream by a manual command from a cross-connected output port. The DS1 idle code (the same as DS1 alarm indication signal) consists of all ones.

In-Service (IS)
A state in which the circuit pack is performing normal service functions, in either active or standby mode.

Input Status
The input signal status of a DS1, DS3, VT1.5, or STS1 interface port, which 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 (quasi-random signal source) — a DS1 port is provisioned as the QRSS for the system.

Initial values are INIT for a DS1 interface port, DRVN for a DS3, VT1.5, and STS-1 interface port, and DRVN for DS1 ports of an DS3 interface port.

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 network element originates the line signal and the other terminates the line signal.

Line Buildout
An attenuating (signal-reducing) element used to keep DS3 or STS-1 output signal strength within desired limits. The line buildout setting for MUX or SMUX circuit packs includes:

- IN — the line buildout is in use, reducing the output signal strength
- OUT — the line buildout is not in use
- INIT — initialized (unset)

Linecode Type
Specifies the code type for a DS1 port terminating in a DS1 circuit pack, B8ZS or AMI.

Line Layer
The third layer of the standard SONET signal, used for reliable transport of the path layer payload and its overhead across the physical medium. The added overhead is accessed at points where STS signals are formed or terminated. Both lower layers (the photonic and section layers) exist to provide transport for this layer.

Link ID
The location and type of a user interface link.

Literal Character
A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

Location
An identifier for a specific circuit pack, interface module, interface port, or communications link.

Loopback (LPBK)
A circuit arrangement that causes a received signal to be returned to its source.

Loopback State
Specifies the state of 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 Condition (MCOND)
A circuit pack state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that cannot be performed while normal service is being provided.

Mapped
Cross-connected.

Memory Class
One of two types of memory in the DACS IV-2000: PROG (software release) or DBASE (database).

Memory Data
Specifies the data (eight hexadecimal digits) associated with a memory type.

Memory Location
Specifies the equipment, DS1 interface port, DS3 MUX port, or STS-1 SMUX port location associated with a memory type.

Memory Type
Specifies the memory device, which may be:

- WKG — working (system) random access memory
- PRI — primary backup (disk)
- SEC — secondary backup (optical disk), INIT.

Menu/Prompt Mode
One of two modes used to communicate with the DACS IV-2000. When operating in this mode, the system lets you choose commands from menus and then prompts you for information to complete the command.

Major (MJ)
Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

Minor (MN)
Indicates a non-service-affecting equipment or facility failure.

Multiplexer
An electronic device that allows two or more signals to pass over one communications circuit.

Multipoint Address
Specifies the Layer 2 (multipoint) address used on a TABS link.

N

N-Rate Cable
A cable that carries an N-rate signal (27.648 Mbits/s), which includes 14 DS1 signals, half of an STS-1(cc-SPE) signal, or 14 STS-1(VT1.5) signals and timing information.

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.

Outage
A disruption of service that lasts for more than one second.

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 (quasi-random signal source) — an externally generated DS1 test signal, assumed to be quasi-random.

Initial value is NORM.

P

Parity Check
A check that tests whether the number of ones (or zeros) in an array of binary bits is odd or even; checks to determine that the received signal is the same as the transmitted signal.

Path
A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Layer
The highest of the four layers of a standard SONET signal, used to transport services between path terminating network elements. Examples of such services include DS1s, DS3s (synchronous and asynchronous), and video signals.

Path Overhead (POH)
Informational bytes assigned to and transported with the payload until the payload is demultiplexed.

Payload Pointer
The pointer that shows the location of the beginning of the Synchronous Payload Envelope (SPE).

Photonic Layer
The lowest of the four layers in a standard SONET signal, used to convert STS signals and OC (optical carrier) signals.

Poll Timing
Specifies how often (in seconds) the system expects a poll request from a telemetry remote on a TABS link.

Port
The place of access on an interface circuit pack that connects the DACS IV-2000 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.

Provision
To set parameters to establish the environment required for correct interaction of hardware, software, and peripherals.

Provisioned (PROV)
The circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

Pulse Code Modulation (PCM)
The process by which analog signals are sampled, quantized, and coded into a digital bit stream.

Q

Quasi-random Signal Source (QRSS)
Equipment that generates a specific, reproducible but complicated digital test signal that resembles a normal traffic-carrying DS1 signal.

R

Redlined
A circuit that is given special protection against unintentional disconnection.

Released
If an input port, it is not under test access; if an output port, it is not cross-connected to an input port under test access.

Return to Zero
A code form having two information states termed zero and one and having a third state or an at-rest condition to which the signal returns during each period.

Rollover
Operation used when the transmission facility between the system and an upstream system is to be replaced.

S

Section
The portion of a transmission facility, including terminating points, between:

- a terminal network element and a line-terminating network element, or
- two line-terminating network elements.

A terminating point is the point, after single regeneration, at which performance monitoring is done.

Section Layer
The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

Side Switch
The autonomous action taken when the active control complex (CC) fails. A side switch takes up to 5 minutes to complete and switches the standby CC to the active state.

Single Ampersand (&)
Specifies multiple addressed equipment, links, or ports. For example, 1&-5 means equipment/link/port locations 1 and 5.

Snider
Protocol (message format) used on administrative links.

Software ID
Number that provides the software version information for the system. The software ID contains:

- a 1-digit number that indicates the software release
- a 2-digit number that indicates the issue
- a 3-digit number that indicates 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 (STBY)
The circuit pack is in service but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

State
The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

STSX-1
Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the STS-1 level.

STS1 Interface Port
Specifies an STS1 port on an SMUX circuit pack.

STS Envelope Capacity
Bandwidth within, and aligned to, the STS frame that carries the STS SPE.

STS Path Overhead
Nine evenly distributed path overhead bytes per 125 µs starting at the first byte of the STS SPE. STS path overhead provides for communications between the point of assembly of an STS SPE and its point of disassembly.

STS Payload Capacity
The maximum bandwidth within the STS SPE that is available for payload.

STS-1 Signal
The basic building block signal in the SONET standard (ANSI T1.105 and Bellcore TR-NWT-000253, *SONET Transport Systems: Common Generic Criteria for Operations Communications Routing and LAN Support* (Issue 7, September 1992). An STS-1 signal has a data rate of 51.84 Mbits/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 125 µs. The first three columns of an STS-1 signal are the *transport overhead*, which contains overhead bytes of *section* (nine bytes) and *line* (eighteen bytes) layers. The remaining 87 columns of 9 rows of bytes (783 bytes) make up the *STS-1 envelope capacity.*

STS Synchronous Payload Envelope (STS SPE)
A 125-µs frame structure composed of STS path overhead and bandwidth for payload.

STS Transport Overhead
The overhead (informational bytes that contain the line and section overhead) added to the STS SPE for transmission.

Synchronous
The essential characteristic of time scales or signals such that their corresponding significant instances occur at precisely the same average rate.

Synchronous Network
The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Payload
Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame; that is, no variable bit stuffing rate adjustments are required to fit the payload in the transmission signal.

Subrate
In the Digital Data System, a data bit rate that is either 2.4, 4.8, or 9.6 kbits/s.

T

T1
Transmission carrier system at the rate of 1.544 Mbits/s (same as DS1 signal).

T2
Transmission carrier system at the rate of 6.312 Mbits/s (same as DS2 signal).

T3
Transmission carrier system at the rate of 44.736 Mbits/s (same os DS3 signal).

Terminated
Output mode in which idle code is transmitted downstream.

Test Access
Allows the DACS IV-2000 the ability to apply and monitor test signals in accordance with Bellcore TA-TSY-000203.

Test Mode
Specifies the test access mode.

Test Signal Identification (TSID)
Unique name given to a DS1 test signal.

Tributary
One of the 28 DS1 (1.544 Mbits/s) channels in a DS3 (44.736 Mbits/s) signal or one of 28 VT1.5 (1.728 Mbits/s) channels in an STS-1 (51.84 Mbits/s) signal.

U

User Community Authorization Level (UCAL)
One of five levels that specify the user authorization level: 5 identifies a super user (system administrator); 1 identifies an ordinary user.

Unit
An interface module; the term is sometimes used instead of entity or subassembly.

Unit Type
Specifies the type of interface module:

- 32DS3 — for DS3 Interface-32 Module
- 16DS3 — for DS3 Interface-16 Module
- 16STS1 — for STS1 Interface-16 Module
- DS1 — for DS1 Interface Module
- DS1P — for DS1 Interface-Protection Module.

V

Virtual Tributary (VT)
A structure designed for transporting and switching some 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 Mbits/s. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies twelve columns of the 9-row structure and, for VT1.5s, contains four VTs per group.

VT Envelope Capacity
Bandwidth within, and aligned to, the VT Superframe that is available for the VT SPE.

VT Group
A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte-interleaved within the VT-organized SPE.

VT Path Overhead
One path overhead byte per 500-µs located at the first byte of the VT SPE. VT path overhead provides for communication between the point of assembly of the VT SPE and the point of its disassembly.

VT Payload Capacity
The maximum bandwidth within the VT SPE that is available for payload.

VT Superframe
The VT is organized into a 500-µs superframe structure overlaid on, and aligned to, a 125-µs STS1 SPE. Contained within this structure is the VT payload pointer and the VT SPE.

VT Synchronous Payload Envelope (VT SPE)
A 500-µs frame structure carried by the VT, composed of VT path overhead and bandwidth for payload. The envelope is contained within the VT envelope capacity and can have any alignment with respect to it.

W

Wideband Digital Cross-Connect System (WDCS)
A digital cross-connect system that interfaces any one or combinations of the following signals: SONET, DS3, DS1 and has the basic functionality of cross-connecting at the floating SONET Virtual Tributary 1.5 (VT1.5) or the DS1 level. A SONET WDCS is a DCS that cross-connects at the VT1.5 level and provides SONET signal multiplexing and termination. A DSC 3/1 is a DCS that cross-connects at the D1 level and provides DS3 multiplexing and termination.

Wideband Loopback
The connection of a VT1.5 [VT1.5(cc-SPE) or VT1.5(DS1)] tributary from an incoming STS-1 facility to the outgoing direction of the same facility. This type of loopback differs from a line loopback in that the signal being looped-back is not at the line rate, and it is necessary to modify the VT pointer bits to perform the loopback. The DACS IV-2000 implements the wideband loopback as a terminal loopback (the loopback point is in the cross-connect network).

Acronyms

Symbols

°C	Degrees Celsius
°F	Degrees Fahrenheit

Numerics

16DS3	DS3 Interface-16 Module
16STS1	STS1 Interface-16 Module
1WAY	One-Way Cross-Connection
2ASCCS	2A Switching Control Center System
2BSCCS	2B Switching Control Center System
2WAY	Two-Way Cross-Connection
32DS3	DS3 Interface-32 Module

A

ABT	Abort
AC	Alternating Current
ACCMD	Access Mode
ACCUM	DS3 Accumulation Period
ACK	Acknowledge
ACO	Alarm Cutoff
ACPWR	AC Power Failure
ACT	Activate Active
ACTIVE_REF	Active Timing Reference
ACTSIG	Active Signal Type
AI	Asynchronous Interface
AIS	Alarm Indication Signal
AISFRAMED	Alarm Indication Signal Framed
AISL	Alarm Indication Signal, Line
AISP	Alarm Indication Signal, Path
AISSL	AIS Seconds, Line
AISUNFRAMED	Alarm Indication Signal Unframed
ALLDS2SOOF	All DS2 within DS3 Signals Out-of-Frame
ALLREFFAIL	All Timing References Failed
ALM	Alarm
ALMDLY	Alarm Delay
ALSP	AIS/Loss-of-Pointer Seconds, Path
ALW	Allow
AMI	Alternate Mark Inversion
ANSI	American National Standards Institute
AS&C	Alarm, Scan, and Control
ASYN	Asynchronous
ASYNC	Asynchronous Protocol
Async	Asynchronous
ATTR	Attribute
AUD	Audit
AUTO	Automatic
AUTOCMPN	Automatic Camp-on
AUTORET	Automatic Carriage Return
AUX	Auxiliary
AUX PWR	Auxiliary Power
AVAIL	Available

B

B8ZS	Bipolar with Eight-Zero Substitution
BDCST	Broadcast
BDFB	Battery Distribution Feeder Board
BEC	Block Error Count
BER	Bit Error Rate
BERL	Line Bit Error Rate
BERM	Bit Error Rate Metric
BESP	Bursty Errored Seconds, Path
BITS	Building Integrated Timing Supply
BKUP	Backup
BKUPALM	Backup Alarm
BKUPMEMS	Backup Memory Secondary Failure
BOC	Bell Operating Company
BPV	Bipolar Violation
BRT	Business Remote Terminal
BUSA	Fuse Bus A
BUSB	Fuse Bus B
BUSC	Fuse Bus C
BUSD	Fuse Bus D
BUSE	Fuse Bus E
BXA	Bus Extender

C

CABLEID	Control Cable Identification
CANC	Cancel
CB	Compatibility Bulletin
CBIT	C-Bit Protocol

CC	Control Complex
cc	Clear Channel
CCITT	International Telegraph and Telephone Consultative Committee
CCODE	Circuit Pack (Hardware) Code
CD	Compact Disk
CEQL	Circuit Pack Equalizer
CHG	Change
CILINK	Communications Interface Link
CIT	Communications Interface Terminal
CKTLED	Circuit Pack LED
CL	Clear
CLBO	Circuit Pack Line Build Out
CLEI	Common Language Equipment Identification
CLKDR	Clock Distributor
CLKGN	Clock Generator
CLLI	Common Language Location Identification
CLRDLY	Clear Delay
CMD	Command
CMDCTAG	Command Correlation Tag
CMDSTAT	Command Status
CMPN	Camp-On
CMPR	Compare
COM	Common
COMPL	Complete
COMPLD	Completed
COND	Condition
CONDDESCR	Condition Description
CONF	Conference
CONN	Connect
CONTBUS	Control Bus Failure
CONTR	Controller
CP	Circuit Pack
CP-BITS	Copy of Parity Bits
CPE	Customer Premises Equipment
CPU	Central Processing Unit
CPY	Copy
CR	Carrier/Response Critical
CRC	Cyclic Redundancy Code
CRCERR	Number of Cyclic Redundancy Code 6 Errors
CRS	Cross-Connect
CRS1	Cross-Connect, One-Way
CRT	Circuit
CRTE	Create
CSS	Controlled Slipped Seconds
CTAG	Correlation Tag
CTYPE	Condition Type
CURR-F-END	Current F-End Port
CURVAL	Current Value
CV	Coding Violations
CVL	Coding Violations, Line
CVP	Coding Violations, Path

D

DACS	Digital Access and Cross-Connect System
DAYWK	Day of Week
DB	Database
DBASE	Database
DBCHG	Database Change
DC	Direct Current
DD	Date
DET	Detailed
DGN	Diagnose
DGNDET	Diagnostics Detailed
DISC	Disconnect
DLT	Delete
DLTCRS	Delete Cross-Connect
DM	Degraded Minute
DMODE	Dialog Mode
DN	Down
DP	Decision Point
DPLL	Digital Phase Lock Loop
DPLX	Duplex
DROPCRS	Drop Cross-Connect
DRVN	Driven
DS1	Digital Signal, Level 1
DS1GRP	DS1 Interface Group
DS1IF	DS1 Interface
DS1IP	DS1 Interface Protection
DS1P	DS1 Interface-Protection Module
DS1RY	DS1 Relay
DS1TX	DS1 Timing Extractor
DS2	Digital Signal, Level 2
DS2XRCV	DS2 X-Bits Receive
DS2XTR	DS2 X-Bits Transmit
DS3	Digital Signal, Level 3
DS3FRMTMISMATCH	DS3 Format Mismatch
DS3PM	DS3 Performance Monitoring
DSAB	Digital System Access Bay
DSX	Digital Signal Cross-Connect
DSX-1	Digital Signal Cross-Connect, Level 1

DSX-3	Digital Signal Cross-Connect, Level 3
DTLCH	Data Latch Error
DTYPE	Data Type
DX	Duplex

E

EC-1	Electrical Carrier, Level 1
EC1MAP	Provisioned EC-1 Format
ECASE	Type of Event
ECHO_STAT	Command Echo Status
ECI	Enhanced Communications Interface
ED	Edit
EEPROM	Electronic Erasable Programmable Read-Only Memory
EIA	Electronic Industries Association
EIDDET	Detailed Equipment Location
ENT	Enter
EOR	End-of-Range Error
EPROM	Electrical Programmable Read-Only Memory
EQL	Equalization
EQPD	Equipped
EQPT	Equipment
EQPWR	Equipment Power
EQTYPE	Equipment Type
ES	Errored Seconds
ESAL	Errored Seconds A, Line
ESAP	Errored Seconds A, Path
ESBL	Errored Seconds B, Line
ESBP	Errored Seconds B, Path
ESD	Electrostatic Discharge
ESF	Extended Super Frame
ESFPATH	Extended Super Frame, Path
ESL	Errored Seconds, Line
ESP	Errored Seconds, Path
EVT	Event
EX	Exercise
EXCPTN	Exception
EXJIT	Excessive Jitter
EXPHR	Excessive Phase Error
EXTERR	Error Detected External to System

F

FAC	Facility
FAD	Facility Access Digroup
FAILTHRES	Failure Threshold
FAILTYPE	Failure Type
FBA	Fuse Board A
FBB	Fuse Board B
FBC	Fuse Board C
FBD	Fuse Board D
FBF	Fuse Board F
FBG	Fuse Board G
FBH	Fuse Board H
FBI	Fuse Board I
FE	Far-End
FEAC	Far-End Alarm and Control
FEF	Family of Equipment Failure
FEND	Far-End
FENDNTE	Far-End Notification
FERF	Far-End Receive Failure Far-End Remote Failure
FIC	Frame Identification Code
FIFO	First In First Out
FLPBKL	Response to Far-End Loopback, Line
FLPBKM	Response to Far-End Loopback, DS1 Tributary
FLT	Fault
FMA-BITS	F&M Bits Adjusted
FMN-BITS	F&M Bits Non-Adjusted
FMT	DS1 Signal Format
FNCT	Function
FOMODE	From Port Output Mode
FRCD	Forced
FRD	Security Violation has Occurred
FRNG	Free-Running Mode
FRQOF	Frequency Offset Error
FS & ALM	Fuse and Alarm
FSNLN	Frequency Synthesizer Loss of Energy
FST	Fast-Start Mode
FSTO	Phase Lock Loop Fast Start Time-out

G

GA	Gauge

GP	General Purpose
GTP	General Telemetry Processor

H

HDA	Header Designation Assembly
HDR	Header
HH	Hour
HI	High
HLDOVR	Holdover Mode
HR	Hour

I

ICTLR	Interrupt Controller Error
ID	Identification
IHRER	Interrupt Holding Register Error
IMPROPBLK	Improper Blank
IMPROPRMVL	Improper Removal
IN	Input
INACTV	Inactivity
INC	Incoming Signal
INCL	Inclusive (Special Service Type)
INH	Inhibit
INHDS1FLPBK	Inhibit DS1 Far-End Loopback
INHDS1LPBK	Inhibit DS1 Near-End Loopback
INHDS3FLPBK	Inhibit DS3 Far-End Loopback
INHDS3LPBK	Inhibit DS3 Near-End Loopback
INHEC1LPBK	Inhibit EC-1 Near-End Loopback
INH-STATE	Inhibit State
INHSWPR	Inhibit Switch to Protection
INHSWWKG	Inhibit Switch to Working
INHVT1LPBK	Inhibit VT1.5 Near-End Loopback
INIT	Initialize
INPUT_CMD	Input Command
IN-STATE	Input Port State
INT	Internal
INTFC	Interface
INTFC-P	Interface-Protection
INTRVL	Interval Lock-Out
INVL	Report Interval
IP	In Progress
IS	In-Service
ISTAT	Input Port Status
ISTATE	Input Port State

L

L	Line
LAN	Local Area Network
LBO	Line Build Out
LCKD-OUT	Locked-Out
LED	Light Emitting Diode
LERDF	Line Error Detector Failure
LGN	Login
LGT	Logout
LINECDE	Linecode
LINKID	Link Identification
LINKNUM	Link Number
LOC	Location
LOCL	Local
LOCN	Location (Near- or Far-End)
LOF	Loss-of-Frame
LOOPE	Loop E-End
LOOPF	Loop F-End
LOP	Loss-of-Pointer
LOS	Loss-of-Signal
LOSSS	Loss-of-Signal Seconds, Section
LPBK	Loopback
LPBKF	Loopback, Far-End Request
LPBKI	Loopback, Internal
LPBKL	Loopback, Line
LPBKM	Loopback, DS1 Tributary
LPBK-STATE	Loopback State
LPBKT	Loopback, Terminal
LSSIG	Loss-of-Signal
LSTATE	Loopback State

M

MAN	Manual Removal
MANPROT	Manual Protection
MAP	Mapped
Mbits/s	Megabits per Second
MC	Main Controller
MCOND	Maintenance Condition
MEM	Memory Memory Storage
MIN	Minute
MINC	Multiple Incoming Signals
MJ	Major
MM	Minute Month

MML	Man-Machine Language
MN	Minor
MOD	Module
MONE	Monitor E-End
MONEF	Monitor E- and F-End
MONF	Monitor F-End
MONLEV	Monitored Level
MONPARM	Monitored Parameter
MONPORT	Monitored Port
MONVAL	Monitored Value
MTC	Maintenance Controller
MTCE	Maintenance
MTYPE	STS-1 Performance Monitoring Mode Type
MULPTADD	DS3PM Multipoint Address
MUX	Multiplexer
MUXP	Multiplexer Protection
MUXPS	Multiplexer Protection Switch

N

N	No
NA	No Alarm Not Available
NDRVN	Non-Driven
NE	Network Element
NEND	Near-End
NESIZE	Network Element Size
NET	Network Equipment
NETYPE	Network Element Type
NIMAN	Manual Isolation Must be Performed
NMA	Network Monitoring and Analysis
NORM	Normal
NOVAL	No Value
NSA	Non-Service Affecting
NTE	Network Terminating Equipment
NTFCNCDE	Notification Code
NUMINVL	Number of Intervals
NUMSW	Autolock Number of Switches

O

OC-12	Optical Carrier, Level 12
OC-3	Optical Carrier, Level 3
OC-48	Optical Carrier, Level 48
OMODE	Output Mode
ONEWAY	One-Way Cross-Connection
OOF	Out-of-Frame
OOFS	Out-of-Frame Seconds
OOS	Out-of-Service
OPR	Operate
OPS/INE	Operations Systems/Intelligent Network Elements
OS	Operations System
OSTATE	Output Port State
OUT-STATE	Output Port State

P

P	Path
PAD	Packet Assembler/Disassembler
PC	Personal Computer
PCODE	Provisioned Circuit Pack Code
PEQL	Provisioned Equalizer
PFLCH	Phase/Frequency Latch Error
PHSTP	Phase Step Error
PID	Password Identification
PLBO	Provisioned Line Build Out
PM	Performance Monitoring
PMCNFGRN	Performance Monitoring Configuration
PMGR	Performance Monitoring Generator/Receiver
PMMODE	Performance Monitoring Mode
PMREPT	Performance Monitoring Report
PMSCHED	Performance Monitoring Schedule
PMTYPE	DS3 Performance Monitoring Type Performance Monitoring Type
PNDG	Pending
POS	Provisioned Out-of-Service
PR	Provisioned
PRI	Primary Storage
PRMTR	Parameter
PROC	Process Identification
PROG	Program
PROGFLT	Program Fault
PROTLOC	Protection Equipment Location
PROTN	Protection
PRTCL	Protocol
PRTL	Partial
PRVG	Privilege
PSET	DS3 Performance Monitoring Parameter Set
PSHLN	Phase Shifter Output Loss-of-Energy

PSWD	Password
PTY	Parity
PTYPE	Protocol Type
PWR	Power
PWRA	Power A
PWRE	Power E
PWRF	Power F
PWRG	Power G

Q

QRSS	Quasi-Random Signal Source

R

RAMER	RAM Error
RBOC	Regional Bell Operating Company
RC	Redundant Controller Return Code
RC PWR	Redundant Controller Power
RCVEC1MAP	Received EC-1 Format
RCVVTMAP	Receive VT1.5 Format
RDLD	Redlined
REG	Register
REL	Release
REPT	Report
REPTDAT	Report Date
REPTTM	Report Time
RL	Retry Later
RLS	Release
RLSTM	Autolock Release Time
RMTMUXC	Remote Multiplexer
RMV	Remove
ROLL	Rollover
ROM	Read-Only Memory
ROMER	ROM Error
RST	Restore
RSTCRS	Restore Cross-Connect
RTRV	Retrieve
RTV	Real-Time Violation

S

SA	Service Affecting
SBIT	DS3 Stuff Bit Protocol
SBITFAIL	S Bits Failure
SCANPM	Scan Performance Monitoring
SCANTH	Scan Threshold
SCCS	Switching Control Center System
SCHED	Schedule
SCI	Switch Control Interface
SEC	Secondary Storage
SECU	Security
SEFS	Severely Errored Frame Seconds
SEFSS	Severely Errored Seconds, Section
SEQ	Sequence
SES	Severely Errored Seconds
SESL	Severely Errored Seconds, Line
SESP	Severely Errored Seconds, Path
SF	Super Frame
SFPATH	Super Frame, Path
SFTWR	Software
SHACCUM	DS1 Short Accumulation Period
SID	Source Identification
SIG-TYPE	Signal Type
SLMF	Signal Label Match Failure
SMODE	Synchronizer Mode
SMUX	SONET Multiplexer
SMUXP	SONET Multiplexer Protection
SOAKCLR	SONET Condition Clear Soak Time
SOAKON	SONET Condition Onset Soak Time
SONET	Synchronous Optical Network
SPE	Synchronous Payload Envelope
SPLTA	Split, A Direction
SPLTB	Split, B Direction
SPLTE	Split E-End
SPLTEF	Split E- and F-End
SPLTF	Split F-End
SPLX	Standard
SPR	Spare
SRV	Service
SRVEFF	Service Affecting
SS	Second Secondary Storage
SSC	Secondary Storage Controller
S	Section
SST	Special Service Type
STA	Start
STAT	Status
STBY	Standby
STP	Stop
STS-1	Synchronous Transport Signal, Level 1
STSX-1	Synchronous Transport Signal Cross-Connect, Level 1

SW	Switch
SW PWR	Switch Power
SWCS	Switch Center Stage
SWIF	Switch Interface
SWINTVL	Autolock Switching Interval
SWIO	Switch Input/Output
SWLOC	Switch Connection Equipment Location
SYNC	Synchronizer
Sync	Synchronous
SYNCCLK	Synchronizer Clock Failure
SYNCFRNG	Synchronizer Transitioned to Free-Running Mode
SYNCFST	Synchronizer Transitioned to Fast-Start Mode
SYNCHLDOVR	Synchronizer Transitioned to Hold-over Mode
SYNCN	Synchronizer
SYNCPRI	Primary Timing Reference
SYNCSEC	Secondary Timing Reference
SYPLN	Sync Pulse Generator Loss-of-Energy
SYS	System
SYSID	System Identification

T

T1ID	T1 Identification
TA	Technical Advisory
TABS	Telemetry Asynchronous Block Serial
TACC	Test Access
TAP	Test Access Port (FAD)
TB	Time Base (TBS3)
TBCOLD	Time Base Oven Cold
T-BER	Bit Error Rate Threshold
T-BERL	Line Bit Error Rate Threshold
TBIOER	Time Base Communication Error
TBLEN	Time Base Strobe Loss-of-Energy
TBNDF	Time Base Strobe Energy Detector Failure
TBOS	Telemetry Byte Oriented Serial
TBS3	Time Base Stratum 3
TELDISP	Telemetry Display Number
TERM	Terminated
TH	Threshold
THLEV	Threshold Level
TID	Target Identification
TL1	Transaction Language 1
TLI	Timing Link Interface
TLIP1FF	Timing Link Interface Port 1 Framing Format
TLIP1LC	Timing Link Interface Port 1 Linecode
TLIP2FF	Timing Link Interface Port 2 Framing Format
TLIP2LC	Timing Link Interface Port 2 Linecode
TLMTRY	Telemetry
TM	Time
TMDAY	Time of Day
TMOFST	Time Offset
TMPER	Time Period
TODC	Time-of-Day Clock
TOMODE	To Port Output Mode
TOPROTN	To Protection
TOWKG	To Working
TP	Testport
TPA	Type A Errored Seconds
TPB	Type B Errored Seconds
TPC	Type C Errored Seconds
TPPV	Testport Provisioned
TR	Technical Report
TR9	TR-TSY-000009 Remote Multiplexer
TRANSID	Transport Self-Identification
TRBER	High Bit Error Rate
TRC	Transmit Path Trace
TRMNBER	Minor Bit Error Rate
TRMSN	Transmission
TSG	Test Signal Generator
TSR	Test Signal Receiver
TSTPT	Testport
TTY	Terminal Typewriter
TWOWAY	Two-Way Cross-Connection
TX	Timing Extractor (DS1TX)

U

UART	Universal Asynchronous Receiver/Transmitter
UAS	Unavailable Seconds
UASL	Unavailable Seconds, Line
UASP	Unavailable Seconds, Path
UC	Unit Controller
UCAL	User Community Authorization Level

UCFC	User Community Functional Category
UCPL	User Community Priority Level
UI	Unit Interface
UID	User Identification
UNF	Unframed
UNFR	Unframed
UNKN	Unknown
UNSPEC	Unspecified
UPC	User Privilege Code
URTER	UART Error
UTYPE	Unit (Interface Module) Type User Type

V

V	Volt
Vdc	Volts dc Current
VIRT_CIRC	Virtual Circuit
VLDTY	Validity
VRSN	Version
VT	Virtual Tributary
VT1.5	Virtual Tributary, Level 1.5
VT1GRP	VT1.5 Signal Group
VTFLOAT	Floating Virtual Tributary Mode
VTLOCK	Locked Virtual Tributary Mode
VTMAP	Provisioned VT1.5 Format

W

WKG	Working
WTRSCE	Waiting for Resources

X

X1LEN	Synchronizer 1-ms Cross-Couple Loss-of-Energy
X3LEN	Synchronizer 30-ms Cross-Couple Loss-of-Energy
XBITRCV	DS3 X-Bits Receive
XCOOL	Synchronizer Cross-Couple Out-of-Lock Error
XCRTV	Synchronizer Cross-Couple Real-Time Violation Error
XCSUM	Synchronizer Cross-Couple Summary Error
XFLRG	Synchronizer Cross-Couple Fast Lock Range Error
XFQOF	Synchronizer Cross-Couple Frequency Offset Error
XLKDN	Synchronizer Cross-Couple Communications Link Error
XPOL	DS3 X-Bits Transmit

Y

Y	Yes
YEL	Yellow Signal
YY	Year

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Clearing 12-25, 12-27, 12-28
EC-1 Facilities, Clearing 12-60
T1 Facilities, Clearing 12-60
T3 Facilities, Clearing 12-68
VT1.5 Facilities, Clearing 12-60