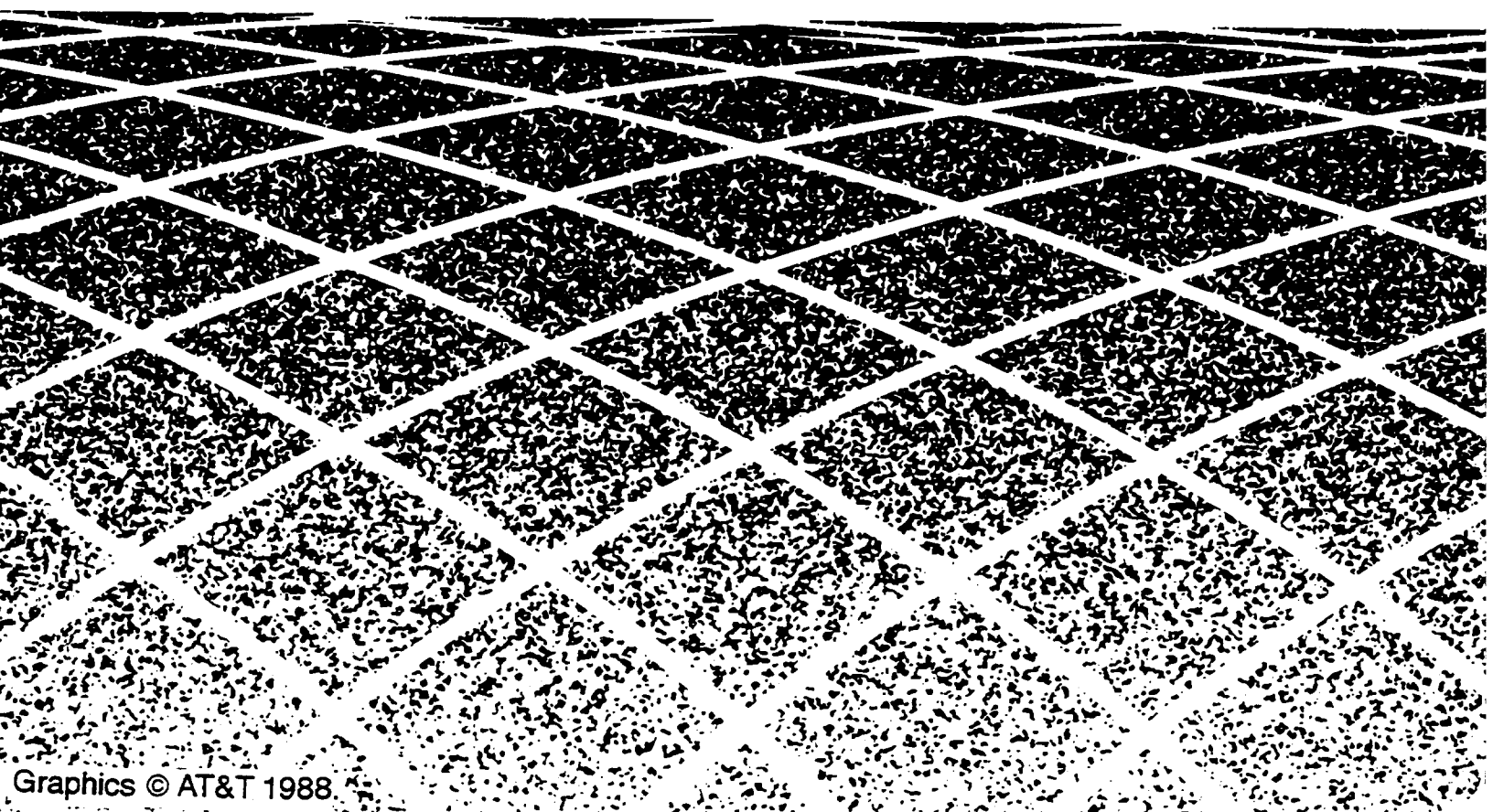




AT&T 824-102-149
Issue 1
January 1995

***SLC*[®]-2000 Access System Operations Systems Engineering Guide**



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Document No.: AT&T 824-102-149

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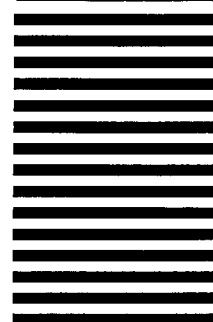
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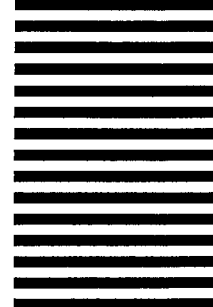
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About This Document

Purpose

This document includes operations systems (OS) information for the *SLC*[®]-2000 Access System, Release 3.02.01 and Release 4.0 for the DLC subsystem, and for the SONET subsystem, OC-3 Releases 6.2.2 (linear) and 7.1.2 (ring).

Intended Audiences

This document is primarily for network operations planners, facility maintenance center personnel, transmission engineers, and technical support staff. It may be used by anyone desiring specific information about the OS interfaces of the *SLC*-2000 Access System.

Reason for Reissue

This section will provide the reasons for reissuing this document in the future.

How To Use This Document

This document contains one main part, indicated by the blue tab, for the *SLC-2000 Access System*. Within the blue tab are white tabs, marking various sections that relate to the specified product.

This document is a companion to AT&T 824-102-148, *2000 Family of Products Operations Systems Guide*, that contains information on the DDM-2000 Multiplexer and FT-2000 OC-48 Lightwave System.

Customer Assistance and Technical Support

AT&T provides customer assistance on the *SLC-2000 Access System* including, but not limited to, troubleshooting assistance, technical consultation, operational problem consultation, procedural advice, and emergency recovery assistance from a qualified system support professional from the Regional Technical Assistance Center (RTAC).

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

Related Documentation/Training

This section contains the system documentation plan, bibliography (list of references), and how to get information on training courses.

SLC-2000 Access System Documentation Plan

The following documents provide additional information about the SLC-2000 Access System.

- AT&T 363-205-003, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, Applications, Planning, and Ordering Guide.*

Audience – Network planners, engineers, product evaluators, and standardization groups.

Content -- Benefits and features, applications, product description, operation administration and maintenance (OA&M), planning and engineering, ordering, and technical specifications.

- AT&T 363-205-004, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, User/Service Manual.*

Audience -- Engineers, installers, administrators, operation and maintenance personnel, and technical support.

Content -- Applications, physical and functional description, administration, powering, technical specifications, construction and installation, and operation and maintenance (in TOP format).

- AT&T 363-208-000, *SLC-2000 Access System, Applications, Planning, and Ordering Guide.*

Audience -- Network planners, engineers, product evaluators, standardization groups, and ordering personnel.

Content -- Benefits and features, applications, services, product description, parts list, ordering information, system specifications and requirements, and environmental data. Refer to the customer assembly manual for ordering configurations for central office and remote terminal frame arrangements.

- AT&T 363-208-001, *SLC-2000 Access System, User/Service Manual.*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- System overview, system description, introduction to each system interface, administration & provisioning, operations and maintenance procedures (in task-oriented practice - TOP format), and maintenance support information (alarm tables, etc.).

- AT&T 363-208-003, *SLC-2000 Access System, Command and Message Manual*.

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- A tutorial on system commands and messages, also detailed information about the system commands in manual-page format. The document pages are organized by user interface panel (UIP) commands and craft interface terminal (CIT) commands.

- AT&T 363-208-010, *SLC-2000 Access System, Customer Assembly Manual for RT Frames*.

Audience -- Customers that plan to install the equipment.

Content -- Configuration drawings and detailed instructions for ordering, installing, assembling, and connecting the equipment in an RT frame arrangement. This document includes installation procedures, cabling and wiring diagrams, the application schematic diagrams (SDs), a parts list, and supporting information. Shelf assembly, cable routing, and frame installation are provided.

- AT&T 363-208-011, *SLC-2000 Access System, Customer Assembly Manual for COT Frames*.

Audience -- Customers that plan to install the equipment.

Content -- Configuration drawings and detailed instructions for ordering, installing, assembling, and connecting the equipment in a COT frame arrangement. This document includes installation procedures, cabling and wiring diagrams, the application schematic diagrams (SDs), a parts list, and supporting information. Shelf assembly, cable routing, and frame installation are provided.

- AT&T 363-208-022, *SLC-2000 Access System, Software Release Description -- Release 3.2*.

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release

that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 363-208-023, *SLC-2000 Access System, Software Release Description -- Release 4.0.*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 363-206-218, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 7.0.2*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 363-206-242, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 6.2*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 363-206-243, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 7.1*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content -- Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 363-206-246, *DDM-2000 OC-12 Multiplexer, Software Release Description, Release 2.2*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content – Provides information about the software release and procedures for implementation. Describes the features and capabilities provided in the release. Lists operating issues from the previous release that have been resolved, the operating issues in this release, and any work-arounds.

- AT&T 824-102-148, *2000 Family of Products, Operations Systems Engineering Guide (OSEG)*

Audience -- Installers, technicians, engineers, and troubleshooters.

Content – Provides detailed information about the Operations System (OS) interface to the DDM-2000 and FT-2000 systems for engineering an OS.

The documents listed in the documentation plan support the following tasks.

- Planning
 - AT&T 363-208-000, *SLC-2000 Access System, Applications, Planning, and Ordering Guide*
 - AT&T 363-205-003, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, Applications, Planning, and Ordering Guide*.
 - AT&T 824-102-148, *2000 Family of Products, Operations Systems Engineering Guide (OSEG)*
- System engineering
 - AT&T 363-208-000, *SLC-2000 Access System, Applications, Planning, and Ordering Guide*
 - AT&T 363-208-010, *SLC-2000 Access System, Customer Assembly Manual for RT Frames* (equipment required for RT frame arrangements)
 - AT&T 363-208-011, *SLC-2000 Access System, Customer Assembly Manual for COT Frames* (equipment required for COT frame arrangements)
 - AT&T 363-205-003, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, Applications, Planning, and Ordering Guide*
- Ordering
 - AT&T 363-208-000, *SLC-2000 Access System, Applications, Planning, and Ordering Guide* (parts list)
 - AT&T 363-208-010, *SLC-2000 Access System, Customer Assembly Manual for RT Frames*
 - AT&T 363-208-011, *SLC-2000 Access System, Customer Assembly Manual for COT Frames*

- AT&T 363-205-003, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, Applications, Planning, and Ordering Guide*
- Circuit order and channel unit applications
 - AT&T 363-208-000, *SLC-2000 Access System, Applications, Planning, and Ordering Guide*
 - AT&T 915-710-116, *SLC Series 5 Carrier System, Channel Unit Application and Prescription Setting System Installation*
- System Installation
 - AT&T 363-208-010, *SLC-2000 Access System, Customer Assembly Manual for RTs*
 - AT&T 363-208-011, *SLC-2000 Access System, Customer Assembly Manual for COT Frames*
- Acceptance, turn-up, maintenance, and system provisioning
 - AT&T 363-208-001, *SLC-2000 Access System, User/Service Manual* (TOP procedures and AT&T Data Sheets)
 - AT&T 363-208-003, *SLC-2000 Access System, Command and Message Manual* (command pages)
 - AT&T 363-205-004, *SLC-2000 Multi-Services Distant Terminal (MSDT) Feature, User/Service Manual*
- Cabling/wiring maintenance
 - AT&T 363-208-010, *SLC-2000 Access System, Customer Assembly Manual for RT Frames*
 - AT&T 363-208-011, *SLC-2000 Access System, Customer Assembly Manual for COT Frames*
- Channel unit installation
 - AT&T 363-208-001, *SLC-2000 Access System, User/Service Manual* (TOP procedures)
 - AT&T 915-710-116, *SLC Series 5 Carrier System, Channel Unit Application and Prescription Setting*
- Administration
 - AT&T 363-208-001, *SLC-2000 Access System, User/Service Manual*
- Remote Operations
 - AT&T 824-102-148, *2000 Family of Products Operations System Engineering Guide*
 - AT&T 363-208-003, *SLC-2000 Access System, Command and Message Manual*

Training

The National Product Training Center in Dublin, Ohio, provides management courses for planning, engineering, and ordering as well as training for telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses may be available. Consult your local AT&T Account Executive for more information or reservations.

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

- LE2000, *SLC-2000 Management Overview*

Audience -- Telecommunication managers responsible for the planning, implementation, and maintenance of the *SLC-2000 Access System*.

Length -- 2 days

Content -- Applications, planning considerations, features and benefits, functional description, testing, basic maintenance, and ordering procedures.

Media -- Instructor-led format with visual media and class discussion. End-of-unit review exercises are used to reinforce the lecture. Each student will be provided with AT&T 363-208-000, the *SLC-2000 Access System, Applications, Planning, and Ordering Guide*.

Prerequisite -- Previous knowledge of the DDM-2000 as provided in course LW2212 -- DDM-2000 OC-3 and OC-12 Multiplexers Applications and Architecture.

- TR4610, *SLC-2000 Access System Turn-up and Testing*

Audience -- Telecommunication personnel responsible for installing and maintaining the system.

Length -- 4 days

Content -- A comprehensive study of the *SLC-2000 Access System*, including a physical description, functional description, System and the MSDT that includes a physical description, functional description, testing, basic maintenance, and system turn-up.

Media -- A combination of instructor lectures and class discussion. The information will be reinforced with end-of-unit review exercises and hands-on exercises on operational systems that are typical of those in the field.

Prerequisite — Students *must* be familiar with the DDM-2000 as provided in courses LW2603X -- DDM-2000 Multiplexer OC-3 or LW2612 -- DDM-2000 Multiplexer OC-12.

For information on these and other training courses available, on schedules, fees, and registration, call your company's training coordinator. If your company does not have an assigned training coordinator, call this toll-free number (Monday through Friday, 7:30 a.m. to 5:30 p.m. EST) to order a product training catalog, get more information on a course, find out about new courses, or register for a class:

1-800-TRAINER (872-4637)
In Canada, 1-800-221-1647

When you call 1-800-TRAINER, select Option 22 (press

ABC
2

 two times on a touch-tone phone) for AT&T product training.

You may also use a computer and modem to log into the on-line catalog, COMCATS (Computerized Catalog System):

DIAL:	1-800-662-0662 or 614-764-5566
login:	comcats
password:	at&tcats

Set your terminal options to the following values:

- 300/1200/2400 baud rate
- full duplex
- space parity
- 7 data bits
- 1 stop bit.

If you have trouble accessing COMCATS, call 1-800-TRAINER and ask to speak with the COMCATS Administrator.

Electronic Documentation

Documentation for the *SLC-2000* Access System is available in electronic form, on CD-ROM (compact disk, read-only memory). CD-ROM has many advantages over traditional paper documentation, including cost savings, search and retrieve capability, and the assurance of the most current documentation. CD-ROM is available by annual subscription (on standing order).

- To order, call your Technical Information Resource Manager, your AT&T Account Executive, or the AT&T Customer Information Center (1-800-432-6600).

- For pricing information, contact your AT&T Network Systems Account Executive or the AT&T Customer Information Center (1-800-432-6600).
- For CD-ROM technical information, call AT&T Documentation Support (1-800-334-0404).

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Introduction

1

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Introduction

1

Overview

This issue of the *SLC[®]-2000 Access System Operations Systems Engineering Guide* documents the operations systems (OS) information for the *SLC[®]-2000 Access System*, Release 3.02.01 and Release 4.0 for the DLC (digital loop carrier) subsystem, and for the SONET (synchronous optical network) subsystem, OC-3 Releases 6.2.2 (linear) and 7.1.2 (ring).

This section introduces the *SLC-2000 Access System* and briefly describes OS interfaces.

Introduction to the *SLC[®]-2000 Access System*

The *SLC-2000 Access System* is part of AT&T Network Systems 2000 Product Family that provides integral DLC, FITL (fiber in the loop), SONET multiplexer, and circuit testing features. It builds on items that customers have found to be useful and successful in networks such as single-ended maintenance features and upgrade capabilities.

The *SLC-2000* system may be configured for SONET or DS1 feeder. Release 3.02.01 may also be configured as a remote terminal (RT) or central office terminal (COT) in either feeder configuration. DDM-2000 and *SLC-2000* systems can be mixed in the same SONET subnetwork.

This document covers four basic configurations:

- *SLC-2000* system RT interface to a DDM-2000 OC-3 in a CO (Figure 1-1)
- *SLC-2000* system RT interface with a SONET feeder to a *SLC-2000* COT (Figure 1-2)
- Combined *SLC-2000* system, DDM-2000 OC-3 and DDM-2000 OC-12 Multiplexer (Figure 1-3)
- *SLC-2000* system RT interface with a DS1 feeder to a *SLC-2000* COT (Figure 1-4)

This document also covers testing with an external RTU as shown in Figure 1-5.

Many more network configurations may be supported. The information in these examples may be extrapolated to define those configurations. Refer to AT&T 363-208-000, *SLC[®]-2000 Access System, Applications, Planning, and Ordering Guide* for more detail.

With the SONET feeder, the central office (CO) SONET terminal provides the gateway network element (GNE) feature for other network elements connected in the same SONET subnetwork via the SONET data communication channel (DCC). Therefore, if a TL1/X.25 interface is desired, only one X.25 port is required per subnetwork. Alarm information obtained via parallel or telemetry byte-oriented serial (TBOS) protocol is remoted to the GNE via a DCC. In the configuration shown in Figure 1-4, there is no DCC for remote operations. Alarm information carried on the TR8 datalinks is output on the parallel telemetry interface. TBOS protocol is not supported. Separate X.25 ports for the RT and COT are required. The transaction language 1 (TL1) X.25 interface to the RT is remoted through a DS0 channel. Section 7 of this manual provides more detail on this configuration.

Throughout this document there are references to Craft Interface Terminal (CIT) commands. SONET (DDM-2000 and the *SLC-2000* SONET subsystem) CIT commands are shown in lower case; *SLC-2000* system DLC CIT commands are shown in upper case. Information on these commands may be obtained from the following documents:

- AT&T 363-208-003, *SLC[®]-2000 Access System, Command and Message Manual*
- AT&T 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*

Introduction to Operations Systems Interfaces

The *SLC-2000* Access System supports TBOS and parallel telemetry interfaces for alarm surveillance. A TL1 interface is provided for a full range of operations, administration, maintenance and provisioning functions.

A Remote Test Unit (RTU) may be used at the RT for drop testing of switched services and for special services testing.

TL1/X.25 Interface

The *SLC-2000* system's TL1/X.25 interface complies with Bellcore TR-TSY-000833, Issue 3, Revision 1*, and TR-NWT-000833, Issue 4, Supplement 1, and TR-NWT-000833, Issue 5, Revision 1. The X.25 "short stack" protocol is based on TR-TSY-000827, Issue 1. It supports four virtual channels. The virtual channels in the X.25 link can be used to provide remote access between users and the *SLC-2000* system via a packet data network. The remote user could be an operations system such as Bellcore NMA, Bellcore OPS/INE, ACD FNESS**, AT&T TRansvu-II, AT&T DACScan™-2000, AT&T SNC-2000, or user at a terminal. The TL1 message set used on this X.25 link is continually being expanded to offer expanded remote reporting and control capabilities. The TL1 interface communicates directly with the OS, not requiring the use of telemetry remote units or mediation devices (MDs). The *SLC-2000* system's TL1 interface provides significantly more detailed alarm and status information than the TBOS or parallel telemetry interfaces. It supports performance monitoring (PM) threshold-crossing alerts (TCAs) and retrievals of current and historical PM data. Figures 1-1, through 1-4 show possible configurations and the location of the X.25 ports.

Telemetry Byte-Oriented Serial (TBOS) Protocol

Serial telemetry is provided using the TBOS protocol. TBOS telemetry offers more detailed alarm, status, and control (AS&C) information (for the SONET subsystem only), to and from a remote maintenance center than the parallel telemetry interface. The link is a 2400-baud RS-422 interface. The TBOS AS&C link can be shared among multiple *SLC-2000/DDM-2000* networks. Since a link has eight displays and each shelf requires one display, any combination of *SLC-2000* system and *DDM-2000* OC-3 shelves, not exceeding eight, can be supported on

* Where TR-TSY-000833, Issue 3, Rev. 1, was deficient, the *SLC-2000* system conforms to Bellcore's TR-NWT-000833, Issue 4.

** ACD FNESS only supports the *SLC-2000* system.

one AS&C. Figures 1-1, 1-2, and 1-3 outline the basic configurations in which TBOS is supported.

Parallel Telemetry Protocol

Parallel telemetry brings a minimum set of alarm and status information to an operations center. Figures 1-1, 1-2, 1-3, and 1-4 illustrate the possible configurations. Four alarm closures indicate critical, major, minor, and power minor alarms at the local or remote system. Status closures target these alarms as either near end or far end. Other status closures indicate failures in the incoming OC-3 signal or incoming low speed interfaces and system identification when alarms are combined among several shelves in a bay. DLC alarms are reported from the RT to the CO via TR8 data links and the TR303 EOC. The alarms associated with a VRT appear on the parallel telemetry interface of the CO terminal on which the VRT terminates.

Office alarms are provided by a set of discrete relays that control office audible and visual alarms. Separate relays handle critical, major, and minor alarms, although the critical and major alarms can be wired to the office major alarm, if desired. Refer to AT&T 363-208-001, *SLC®-2000 Access System User/Service Manual* for details. If a DDM-2000 is resident in the CO, also consult AT&T 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*.

The user-definable miscellaneous discrete interface transports alarm and status information from collocated equipment at remote sites. At each remote site, a total of 15 alarm/status inputs are available to monitor environmental conditions like open doors or high temperatures. Fourteen of these inputs are user-assignable, while the fifteenth point is dedicated to the AC/DC rectifier and fan equipment used in most remote sites. When a DS1 feeder is used only eight of the alarm and status points are available, points 2 through 8, and 15. Each user-assignable input is provisionable with a name and a status condition or a minor, major, or critical alarm, which in turn determines user panel and OS interface reporting.

Another discrete input at the SLC-2000 system RT triggers an alarm at the COT. This is for dual ringing generator failure.

Four control outputs are also provided at each remote site to control auxiliary equipment like generators and pumps in SONET feeder configurations.

When equipped for parallel telemetry and a SONET feeder, the remote miscellaneous discrete closures correspond to 15 discrete alarm/status outputs and 4 control inputs at the associated central office shelf. When using serial telemetry and a SONET feeder, the remote alarm/status and control closures are mapped into each system's remote TBOS display.

When equipped for parallel telemetry and DS1 feeder, the remote miscellaneous discrete closures correspond to alarm/status outputs on CO terminals as shown in Section 7.

RTU Interface

Remote testing is supported in the *SLC-2000* system via TL1 messages. The *SLC-2000* system accepts TL1 messages which will perform a variety of functions to provide test access. The test heads that the *SLC-2000* system currently supports are Reliance's INTS system and Teradyne's 4TEL system. Reliance's INTS system is primarily used for testing special services but can be equipped to test POTS lines. Teradyne's 4TEL system is used only for testing POTS. The RTU interfaces with the OS via a VF line (e.g., a dial-up connection). See Figure 1-5. The test head interfaces with the *SLC-2000* system via TL1 messages on an RS232 port which terminates on the LAN card in the *SLC-2000* ARM shelf. The RS232 interface (and thus the LAN card) is not required for POTS testing with the INTS system.

The RTU TL1 messages that the *SLC-2000* system supports are based on Bellcore's TR-TSY-000834, Issue 4. See AT&T 363-208-001, *SLC[®]-2000 Access System, User/Service Manual* for details about other testing arrangements with the integral testhead, or use of a bypass pair.

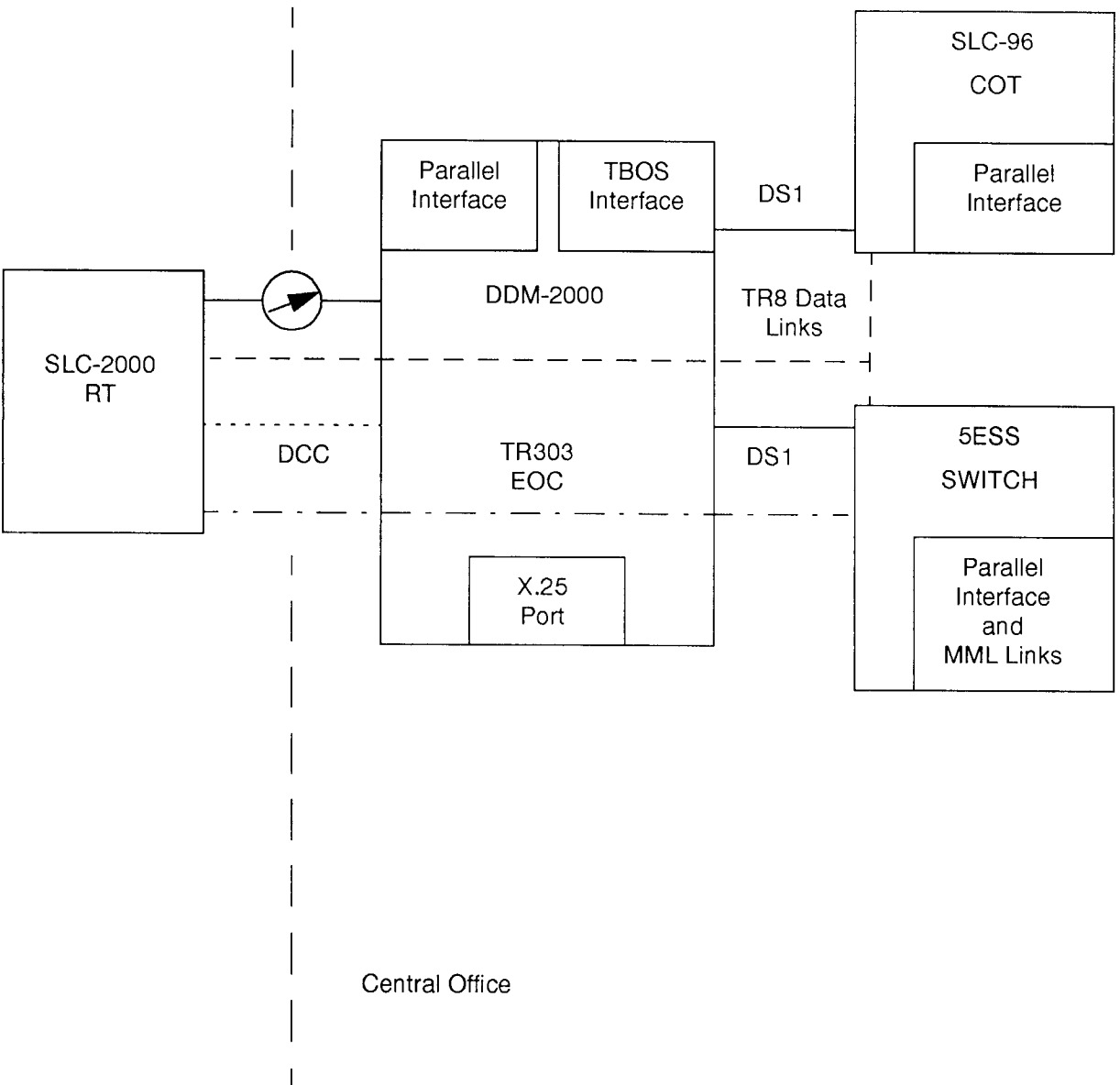


Figure 1-1. Configuration 1: SLC-2000 System RT Interface to a DDM-2000 OC-3 in a CO

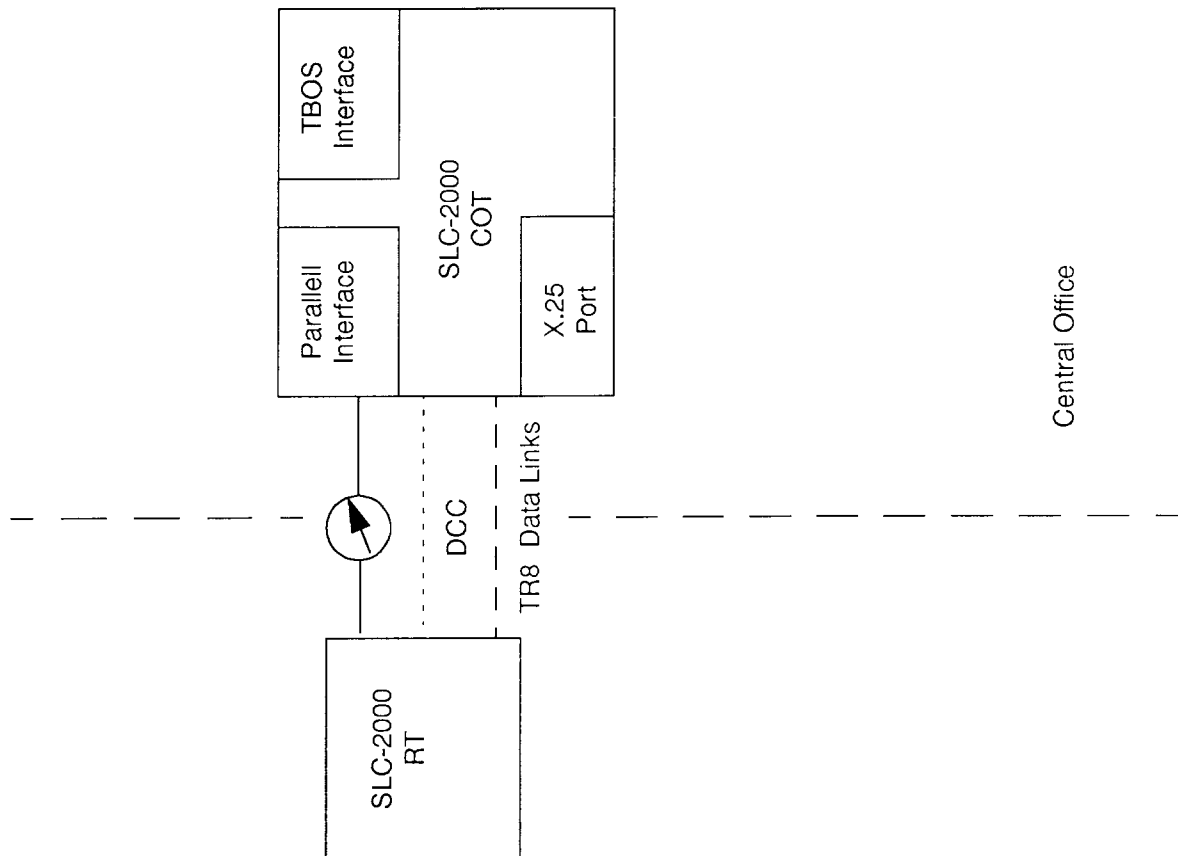


Figure 1-2. Configuration 2: SLC-2000 System RT Interface with a SONET Feeder to a SLC-2000 COT

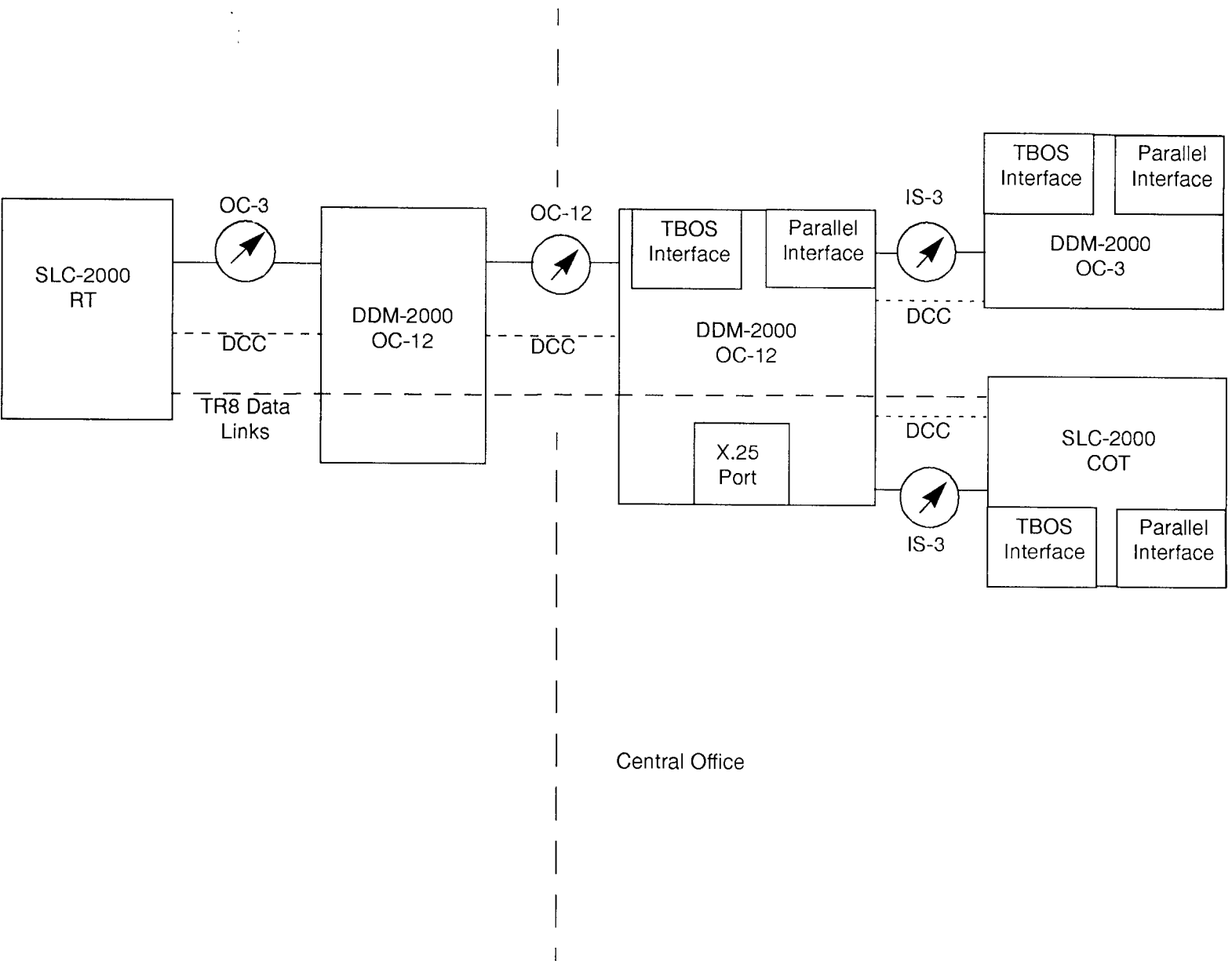


Figure 1-3. Configuration 3: Combined SLC-2000 System, DDM-2000 OC-3 and DDM-2000 OC-12 Multiplexer

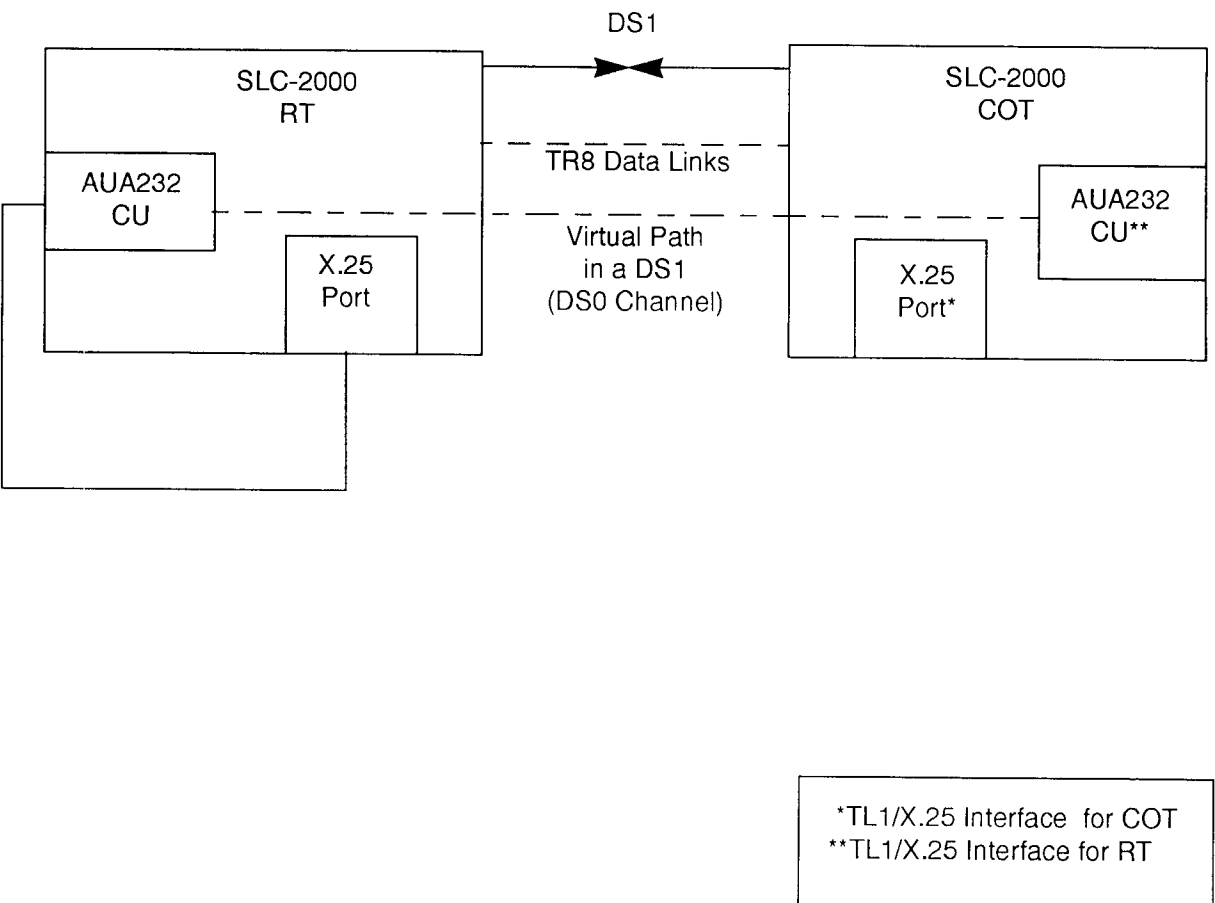


Figure 1-4. Configuration 4: SLC-2000 System RT Interface with a DS Feeder to a SLC-2000 COT

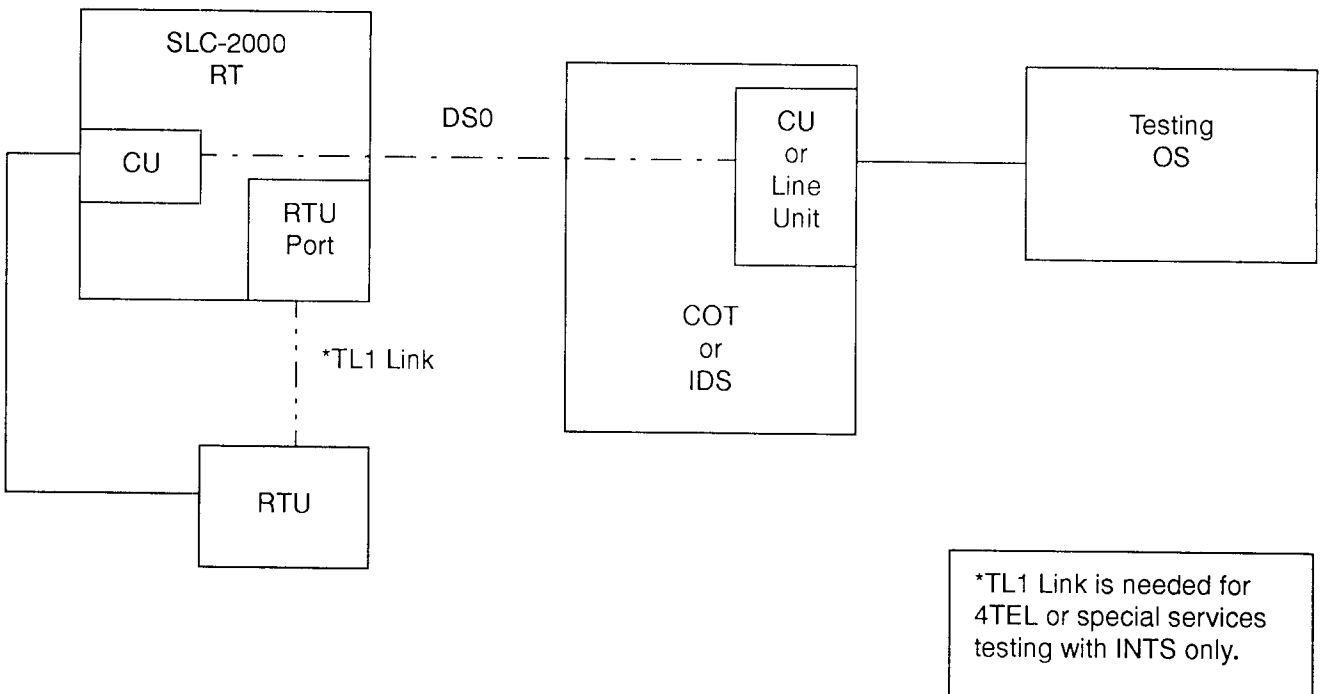


Figure 1-5. Illustration of the OS to RTU Link

***SLC*[®]-2000 Access System**
Introduction

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Overview

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SLC[®]-2000 Access System

Introduction

2

Overview

The following five sections of the *SLC[®]-2000 Access System Operations Systems Engineering Guide* describe the operations systems (OS) interfaces for the *SLC[®]-2000 Access System*, Release 3.02.01 and Release 4.0 for the DLC subsystem, and Releases 6.2.2 (linear) and 7.1.2 (ring) for the SONET subsystem, OC-3. These sections provide information on TL1/X.25, serial telemetry, parallel telemetry, Remote Test Unit, and DS1 Feeder interfaces. The sections are tabbed accordingly.

**SLC[®]-2000 Access System TL1/X.25
Interface**

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***SLC*[®]-2000 Access System TL1/X.25 Interface**

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Overview

This section provides information on the TL1/X.25 interface for the *SLC*[®]-2000 Access System, Release 3.02.01 and 4.0 for the DLC subsystem, and for the SONET subsystem, OC-3 Releases 6.2.2 (linear) and 7.1.2 (ring). This section includes information about TL1-related provisioning, X.25 specifications, and Transaction Language 1 (TL1) messages and parameter details for SONET feeder configurations.



NOTE:

Section 7 of this document contains information about the *SLC*[®]-2000 Access System central office terminal and remote terminal interfaces with the DS1 feeder to the operations systems.

Introduction

The *SLC*-2000 system and DDM-2000 support a TL1/X.25 interface to report alarm and status conditions and performance-monitoring data to alarm surveillance operations systems (OSs) such as *NMA*^{*} operations systems. The TL1/X.25 interface provides significantly more detailed information (such as identify-

^{*}NMA is a trademark of Bell Communications Research, Inc.

ing specific circuit packs and facilities) than the telemetry byte-oriented serial (TBOS) protocol or parallel telemetry interfaces. This interface supports SONET and DLC subsystem features.

The SLC-2000 system's TL1/X.25 interface is via a synchronous EIA-232D port, capable of operating at 1200*, 2400, 4800, 9600, or 19200 baud. (Refer to the SLC-2000 Central Office Terminal Application Schematic SD-7C180-01, CAD 14, and the SLC-2000 Remote Terminal Application Schematic SD-7C174-01.)

The SLC-2000 system's TL1 messages are based on Bellcore's TR-TSY-000833, Issue 3, Revision 1**, and TR-NWT-000833, Issue 4, Supplement 1, and TR-NWT-000833, Issue 5, Revision 1. The X.25 "short stack" protocol is based on TR-TSY-000827, Issue 1.

The TL1 messages for DDM-2000 and the SLC-2000 system are very similar. Refer to AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide* for the DDM-2000 messages. The following autonomous messages are supported for the SLC-2000 system and the DS1 feeder interface. However, only the messages identified with the diamond (♦) symbol are applicable for the DS1 feeder interface.

- ♦REPORT ALARM (REPT ALM) ---
autonomous reports of alarm conditions
- ♦REPORT ALARM ENVIRONMENT (REPT ALM ENV) ---
autonomous reports of environmental alarm conditions
- ♦REPORT CONDITION (REPT COND) ---
periodic autonomous reports of standing status conditions
- ♦REPORT DATABASE CHANGE (REPT DBCHG) ---
autonomous reports of provisioning changes
- ♦REPORT EVENT (REPT EVT) ---
autonomous reports of status conditions, including performance-monitoring (PM) threshold-crossing alerts (TCAs).
- REPORT PERFORMANCE MONITORING (REPT PM) ---
autonomous reports of performance-monitoring (PM) data
- REPORT SWITCH (REPT SW) ---
autonomous reports of autonomous circuit pack protection switches

* In order to prevent output buffer overflow in the SLC-2000 system, it is recommended that a data rate of at least 2400 bits per second be used.

** Where TR-TSY-000833, Issue 3, Rev. 1, was deficient, SLC-2000 conforms to Bellcore's TR-NWT-000833, Issue 4.

The following command/response messages are supported for the *SLC-2000* system and the DS1 feeder interface. However, only the messages identified with the diamond (♦) symbol are applicable for the DS1 feeder interface.

- ♦ **ACTIVATE-USER (ACT-USER) ---**
establishes a user login session
- ♦ **ALLOW-MESSAGE (ALW-MSG) ---**
allows autonomous message reporting
- ♦ **CANCEL-USER (CANC-USER) ---**
terminates a user login session
- DELETE-CROSS CONNECT (DLT-CRS-rr) ---**
deletes a STS1 or VT1 cross connection
- ♦ **DELETE-CROSS CONNECT-T0 (DLT-CRS-T0) ---**
deletes a T0 cross connection
- ♦ **DELETE -T0 (DLT-T0) ---**
deletes a T0 CU line termination
- ♦ **DELETE-USER-SECURITY (DLT-USER-SECU) ---**
deletes a user login
- ♦ **EDIT-DATE (ED-DAT) ---**
changes the date and/or time
- ♦ **EDIT-PRIVATE IDENTIFIER (ED-PID) ---**
changes a user's password
- ♦ **EDIT-T0 (ED-T0) ---**
adjust line (CU) provisioning
- ♦ **EDIT-USER SECURITY (ED-USER-SECU) ---**
edits the security parameters associated with a user
- ENTER (ENT-rr) --**
enter the attributes of a T1, T3, EC1, OC3, STS1, or VT1 transmission entity
- ENTER CROSS-CONNECTION (ENT-CRS-rr) --**
enter a STS1 or VT1 cross-connection
- ♦ **ENTER-CROSS CONNECT-T0 (ENT-CRS-T0) ---**
enters a T0 cross connection

- ◆ **ENTER-SYSTEM (ENT-SYS) ---**
modifies a network element's system attributes
- ◆ **ENTER-T0 (ENT-T0) ---**
enter a T0 line termination on a CU
- ◆ **ENTER-USER-SECURITY (ENT-USER-SECU) ---**
enters a user login
- ◆ **INHIBIT-MESSAGE (INH-MSG) ---**
inhibits autonomous message reporting
- INITIALIZE-REGISTER (INIT-REG) ---**
initializes (resets) current performance-monitoring storage registers
- ◆ **INITIALIZE-SYSTEM (INIT-SYS) ---**
initializes (resets) provisionable parameters to their default values
- ◆ **OPERATE-ALARM CUTOFF (OPR-ACO) ---**
operates the alarm cutoff (ACO) to silence office audible alarms
- OPERATE-LOOPBACK (OPR-LPBK) ---**
operates a loopback
- OPERATE-PROTECTION SWITCH (OPR-PROTNSW) ---**
operates OC-N line protection switching capabilities
[OC-3 Release 6.2, and later]
and operates ring path protection switching capabilities
[OC-3 Release 7.1, and later, ring only]
- OPERATE-SYNCHRONIZATION SWITCH (OPR-SYNCNSW) ---**
operates DS1 synchronization input reference protection switching capabilities
- RELEASE-LOOPBACK (RLS-LPBK) ---**
releases a loopback
- RELEASE-PROTECTION SWITCH (RLS-PROTNSW) ---**
releases OC-N line protection switching capabilities
[OC-3 Release 6.2, and later, except ring]
and releases path protection switching requests
[OC-3 Release 7.1, and later, ring only]
- RELEASE-SYNCHRONIZATION SWITCH (RLS-SYNCNSW) ---**
releases DS1 synchronization input reference protection switching capabilities

- ◆ RETRIEVE-ALARM (**RTRV-ALM**) ---
retrieves current alarm conditions
- ◆ RETRIEVE-ALARM-ENVIRONMENT (**RTRV-ALM-ENV**) ---
retrieves current environmental alarm conditions
- ◆ RETRIEVE-AUTONOMOUS OUTPUT (**RTRV-AO**) ---
retrieves autonomous messages
- RETRIEVE-ATTRIBUTE (**RTRV-ATTR-rr**) ---
retrieves EC1, T1, and T3 alarm level attributes
- ◆ RETRIEVE-ATTRIBUTE-ENVIRONMENT (**RTRV-ATTR-ENV**) ---
retrieves environmental attributes
- ◆ RETRIEVE-CONDITION (**RTRV-COND**) ---
retrieves current status conditions
- RETRIEVE-CROSS CONNECT (**RTRV-CRS-rr**) ---
retrieves STS1 or VT1 cross connections
- ◆ RETRIEVE-CROSS CONNECT T0 (**RTRV-CRS-T0**) ---
retrieves T0 cross connections
- ◆ RETRIEVE-EQUIPMENT (**RTRV-EQPT**) ---
retrieves circuit pack information
- ◆ RETRIEVE-HEADER (**RTRV-HDR**) ---
retrieves system ID, time, and date
- RETRIEVE-MAP (**RTRV-MAP**) ---
retrieves the topological map of the SONET subnetwork
- RETRIEVE-PERFORMANCE MONITORING (**RTRV-PM**) ---
retrieves performance-monitoring data, including historical PM data.
- RETRIEVE-PERFORMANCE MONITORING SCHEDULE (**RTRV-PMSCHED-rr**) ---
retrieves EC1, OC3, STS1, T1, T3, and VT1 active PM report schedules
- RETRIEVE (**RTRV-rr**) ---
retrieves T1, T3, EC1, OC3 STS1, or VT1 attributes
- ◆ RETRIEVE-STATE-VEQPT (**RTRV-STATE-VEQPT**) ---
retrieve states of logical equipment entities
- ◆ RETRIEVE-SYSTEM (**RTRV-SYS**) ---
retrieves a network element's system attributes

- ◆ **RETRIEVE-T0 (RTRV-T0) ---**
retrieve line (CU) provisioning
- ◆ **RETRIEVE-USER-SECURITY (RTRV-USER-SECU) ---**
retrieves user logins
- SCHEDULE-PERFORMANCE MONITORING REPORT (SCHED-PMREPT-rr) ---**
schedules an EC1, OC3, STS1, T1, T3, or VT1 PM report
- SET-ATTRIBUTE (SET-ATTR-rr) ---**
sets DS1, DS3, and EC1 alarm level attributes
- ◆ **SET-ATTRIBUTE-ENVIRONMENT (SET-ATTR-ENV) ---**
sets the environmental alarm/status point attributes
- ◆ **SET-SYSTEM IDENTIFICATION (SET-SID) ---**
sets the system ID, that is, the Source Identifier (SID)/Target Identifier (TID)
- SWITCH-TO PROTECTION (SW-TOPROTN) ---**
operates circuit pack protection switching capabilities
- SWITCH-TO WORKING (SW-TOWKGG) ---**
releases circuit pack protection switching requests
- TEST-TRANSMISSION-T1 (TEST-TRMSN-T1) ---**
sets up an automated transmission test at the DS1 signal level
- TEST-TRANSMISSION-T3 (TEST-TRMSN-T3) ---**
sets up an automated transmission test at the DS3 signal level

TL1-Related Provisioning

The following list summarizes the TL1-related parameters (described below) that are provisionable via hardware switch settings on the SYSCTL [or OHCTL, in the case of the network element (NE) number and section DCC user side/network side] circuit pack or software provisionable in a SLC-2000 system. The rules for provisioning these parameters are the same as those for the DDM-2000 OC-3 multiplexer.

- Site and NE numbers
- CO/RT Select
- Target identifier (TID)
- Gateway network element (GNE)
- Miscellaneous discrete environmental alarm level
- Miscellaneous discrete environmental description
- Far end communication
- Section DCC user side/network side
- Network service access point (NSAP)
- Security.

Refer to AT&T 363-208-001, *SLC[®]-2000 Access System User/Service Manual* for the specific switch addresses and settings. The craft interface terminal (CIT) user interface commands **set-ne**, **set-attr-env**, and **set-fecom** are used to set the software provisionable parameters, and the **rtrv-ne**, **rtrv-attr-env**, **rtrv-fecom**, and **rtrv-nmap** commands report all the parameter values. The CIT commands can be found in AT&T 363-208-003, *SLC[®]-2000 Access System Command and Message Manual*, and AT&T 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*.

Figures 3-1 and 3-2, presented later in this section, provide examples of TL1-related provisioning for a DDM-2000 and SLC-2000 system. Figure 3-1 provides TL1-related provisioning examples for DDM-2000 OC-3 and SLC-2000 system applications. Figure 3-2 provides a TL1-related provisioning example for a combined SLC-2000 system and DDM-2000 OC-3 and OC-12 application. See AT&T 824-102-148, AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide*, Section 3 for details about DDM-2000.

Additional DDM-2000 and SLC-2000 system software provisionable parameters exist that affect when, if, and how TL1 messages are output. Although not described in detail here, the alarm level of incoming (low speed group C only for the SLC-2000 system), DS1, DS3, and EC1 facility failures is provisionable. Also provisionable are the failure thresholds for DS1s, DS3s, EC1s, OC-3s, and the performance-monitoring (PM) threshold crossing alert (TCA) thresholds for DS1s,

VT1.5s, DS3s, EC1s, STS1s, and OC-3s. Refer to AT&T 363-208-001, *SLC®-2000 Access System User/Service Manual* or, AT&T 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*.

Site and Network Element (NE) Numbers

Site number is provisionable via hardware switch settings on the SYSCTL circuit pack, and the NE number is provisionable via hardware switch settings on the OHCTL circuit pack. For proper TL1 operation, the combination of site and NE numbers must uniquely identify each DDM-2000 or SLC-2000 system within a subnetwork. This provisioning requirement applies even when unique target identifier (TID) values are provisioned (see following paragraphs).

The site number should be used to distinguish systems that are in different buildings or enclosures. Systems which share the same site may be given the same site number, but should be assigned unique NE numbers.

CO/RT Select

The selection of central office (CO) or remote terminal (RT) is provisionable for the SONET subsystem via hardware switch settings on the SYSCTL circuit pack. The selection of CO or RT controls the appropriate processing of the miscellaneous discrete environmental alarm and status points. The TL1 GNE is normally in the CO and thus is usually provisioned as such. Note that this is different from the DLC subsystem terminal type parameter (described in the parallel telemetry section) for the SLC-2000 system.

Target Identifier (TID)

Each DDM-2000 and SLC-2000 system TID must be provisioned using the CIT user interface command **set-ne**. The TID is a unique identifier of the subject system and must match the TID provisioned in the OS. The TID may consist of up to 20 alphanumeric characters or hyphens (-) with no spaces allowed. The terms TID and source identifier (SID) are generally used interchangeably. The TID is typically the *CLLI*^{*} code of the system, although additional characters such as the relay rack and unit number [or synchronous optical network (SONET) carrier ID (SCID)] may need to be appended to the *CLLI* code to assure that the TID is unique.

* COMMON LANGUAGE is a registered trademark and CLEI, CLLI, CLCI, and CLFI are trademarks of Bell Communications Research, Inc.

Prior to the first use of this command, the initial value of TID is Site**x**NE**y**, where **x** and **y** are the site and NE numbers

Gateway Network Element (GNE)

One system in each subnetwork must be provisioned as the GNE using the **set-ne** CIT user interface command. The CO system with the physical X.25 connection to the OS must be provisioned as the GNE; all other systems in the same subnetwork are *not* GNEs. The GNE also serves as the directory services network element (dsne).

The **rtrv-ne** CIT user interface command indicates *if* the queried system is a GNE. The **rtrv-ne** command also includes the *address* of the GNE from the perspective of each queried system.

A CO DDM-2000 or SLC-2000 system can serve as the GNE for all the remote SLC-2000 system shelves in the same subnetwork.

Miscellaneous Discrete Environmental Alarm Level

The alarm level to be associated with each miscellaneous discrete environmental point may be provisioned using the **set-attr-env** CIT user interface command. If a miscellaneous discrete environmental point is provisioned as an alarm (minor, major, or critical), the TL1 autonomous message REPT ALM ENV is used to report the alarm. If a miscellaneous discrete environmental point is provisioned as not alarmed, the TL1 autonomous message REPT EVT COM is used to report the condition. The default is that each miscellaneous discrete environmental point is a minor alarm.

The CO/RT select must be set to RT before provisioning the miscellaneous discrete environmental alarm levels or descriptions.

Miscellaneous Discrete Environmental Description

The description to be associated with each miscellaneous discrete environmental alarm and status point may be provisioned using the **set-attr-env** CIT user interface command. The provisioned description will appear as the *almmsg* or *conddescr* parameter values in applicable TL1 messages. The default description for each miscellaneous discrete environmental alarm and status point is environment1, environment2, etc.

The CO/RT select must be set to RT before provisioning the miscellaneous discrete environmental alarm levels or descriptions.

Far End Communication

Far end communication over the SONET section data communications channel (DCC) may be provisioned, using the CIT user interface command **set-fecom**, as either enabled (default) or disabled. The TL1 messages are exchanged using the section DCC in the OC-3 signals. (The section DCC is *not* available on EC1 signals.) If far end communication is enabled for all intervening section DCCs, each system transmits/receives its TL1 messages to/from the TL1 GNE system to which it is connected via OC-3 facilities. Thus, a remote system's TL1 messages can be forwarded to the OS via the TL1 GNE system, and vice versa.

If far end communication is disabled, the exchange of TL1 messages is restricted accordingly, effectively partitioning the SONET subnetwork.

If far end communication is enabled but the section DCC (or the OC-3 itself) fails, the TL1 GNE (see above) autonomously reports the communication failure status condition for each unintentionally isolated system, (the SID of the isolated system is placed in the *AID* field of the autonomous message). The system adjacent to the section DCC (or OC-3) failure also autonomously reports a DCC alarm condition.

In ring applications, all section DCCs should be enabled for communications survivability. The TL1 GNE forwards one copy of each TL1 message (*not* multiple redundant TL1 message copies) to the OS.

Section DCC User Side/Network Side

For the DDM-2000 and SLC-2000 system, the section DCC user side/network side must be provisioned via hardware switch settings on the OHCTL circuit pack. There is a separate switch for each possible OC-3 termination on the DDM-2000 or SLC-2000 system. Each *end* (that is, the near-end and the far-end) of the section DCC must be provisioned *differently*. For example, if the near-end of a section DCC is provisioned to "ON", the far-end of the same section DCC must be provisioned to "OFF", or vice versa.

The **rtrv-ne** command reports the section DCC user side/network side parameter values. If not provisioned correctly, the exchange of TL1 messages on the section DCC is restricted, effectively partitioning the SONET subnetwork. There is no interdependency among multiple section DCCs terminating on the same system.

Network Service Access Point (NSAP)

Another provisionable parameter is the network service access point (NSAP), but the factory default values of that software parameter suffice for currently supported applications. The CIT user interface command **set-ulsdcc** is used to provision the NSAP, and the **rtrv-ulsdcc** command reports the NSAP parameter value. If the NSAP is provisioned incorrectly, the exchange of TL1 messages on the section DCC may be restricted, possibly partitioning the SONET subnetwork.

Security

Network element security administration messages are supported by the DDM-2000 and SLC-2000 systems. An active TL1 access login session is required at each NE in order to interact with that NE (including receiving autonomous message output as well as using TL1 commands). Until a successful login attempt is completed for a given Network Element and virtual circuit, there is no communication (autonomous or command responses) outbound from the Network Element. The ACT-USER command is used to set up this session with each Network Element. The logins ("user identifiers") and passwords ("private identifiers") are the same as those used for CIT access.

The CANC-USER command is used to terminate a login session with the Network Element. A login session also terminates automatically if a Network Element resets, or if there is a "GNE-OS" or "GNE-remote Network Element" communication failure.

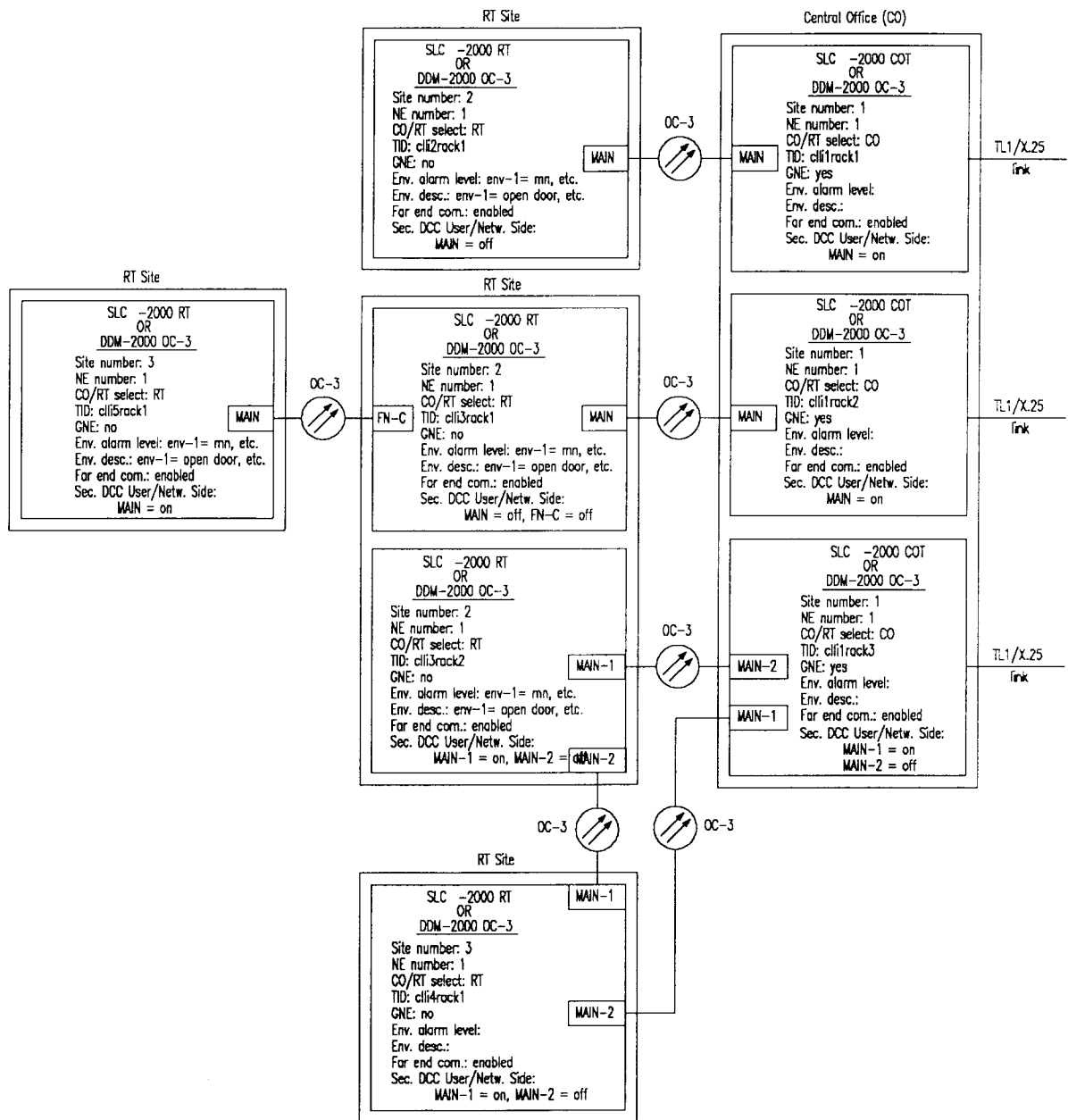
Each login has an access privilege associated with it:

- There are two "privileged" logins. Privileged users are the only ones that can add, change, or delete logins. Privileged users also have access to all system capabilities.
- "General" users have access to all nonprivileged system capabilities.
- "Reports-only" users can only make inquiries of the SONET NE and define their own password. Specifically, they can only access nonprivileged RTRV commands, as well as the ED-PID command for changing their password. Users also have access to all DLC commands for the SLC-2000 system.

The following commands are provided for managing user logins, passwords, and security privileges: DLT-USER-SECU, ED-PID, ED-USER-SECU, ENT-USER-SECU, and RTRV-USER-SECU. See the "TL1 Message Details" section for detailed descriptions of these commands, and the security levels of all the commands.

TL1-Related Provisioning Examples

Figures 3-1 and 3-2 on the following pages provide examples of TL1-related provisioning for DDM-2000 and *SLC-2000* systems. Figure 3-1 provides TL1-related provisioning examples for DDM-2000 OC-3 and *SLC-2000* system applications. Figure 3-2 provides a TL1-related provisioning example for a combined *SLC-2000* system and DDM-2000 OC-3 and OC-12 application. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide*, Section 3 for details about DDM-2000.



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Figure 3-1. Example of TL1-Related Provisioning for SLC-2000 OC-3 Only Applications



Figure 3-2. Example of TL1-Related Provisioning for a Combined SLC-2000 OC-3 and OC-12 Application

SLC-2000 System Alarm, Status, and Data Base Change Refreshment of the OS After X.25 Failures

If the X.25 link between the TL1 GNE and the OS is restored after a temporary failure, including TL1 output buffer overflow, every affected DDM-2000 and *SLC-2000* system in the subnetwork automatically reports its current alarm and status in individual autonomous messages to the OS. This happens as soon as the TL1 session is reactivated with ACT-USER, and each *SLC-2000* system also reports data base changes in autonomous messages. This automated process may include some autonomous messages the OS had already received and may not include some autonomous clear messages (for example, conditions that cleared while the X.25 link was unavailable), but the process assures the OS is aware of all existing alarm and status conditions.

The same process occurs automatically any time communication is restored between the TL1 GNE and other systems in the same subnetwork after a temporary failure. Each of the systems that was temporarily isolated from the OS effectively reports its current alarm and status in individual autonomous messages to the OS. Each of the temporarily isolated systems also reports data base changes in individual autonomous messages to the OS.

Each DDM-2000 and *SLC-2000* system maintains its own TL1 buffers; thus an *individual* system, after a TL1 output buffer overflow, may report its current alarm and status in individual autonomous messages to the OS. This is also true of data base change autonomous messages.

One *SLC-2000* System Subnetwork per TL1/X.25 Link

Each CO DDM-2000 and *SLC-2000* system is capable of supporting a direct, synchronous TL1/X.25 link to the OS. The TL1/X.25 link from each system in a CO is separate for each system. Multiple TL1/X.25 physical links in a CO may be combined through an X.25 concentrator, such as the AT&T *Datakit*® II Virtual Circuit Switch (VCS) Module or Remote Shelf.

X.25 Technical Specifications

The following paragraphs list X.25 detailed technical specifications that are supported by the *SLC-2000* Access System.

The *SLC-2000* system supports three X.25 permanent virtual circuits (PVCs), as well as one switched virtual circuit (SVC), as listed in Table 3-1. PVC ID 2 is intended for a maintenance OS and PVC ID 3 is intended for a memory administration OS.

Table 3-1. TL1/X.25 Interface - PVC Assignments

PVC ID	SVC ID	Logical Group #	Logical Channel #	Use
1	-	0	1	Command/Response Messages
2	-	0	2	Autonomous Maintenance Messages and Command/Response Messages
3	-	0	3	Autonomous Provisioning Messages (REPT DBCHG) and Command/Response Messages
	1	0	16	Autonomous Provisioning Messages Autonomous Maintenance Messages and Command/Response Messages

In Table 3-1, "Autonomous Maintenance Messages" refers to all autonomous messages except REPT DBCHG.

At the packet layer, a *SLC-2000* system is configured as active data-terminating equipment (DTE) with the parameters listed in Table 3-2.

Table 3-2. TL1/X.25 Interface – X.25 Packet Layer Parameters

Parameter	Value
Packet size	256 bytes
Window size	2 packets
D bit support	No
M bit support	Yes*

* Only supported on output messages. All input (command/response) messages must be contained in a single packet.

For SVC facilities, the following parameters listed in Table 3-3 should be set to the specified values for communication to take place.

Table 3-3. TL1/X.25 Interface – Valid SVC Facilities

Parameter	Value
Window negotiation	2
Packet size negotiation	8 (256 bytes)
Modulo	8
Reverse charging	Don't care*
Closed User Group	Don't care*

* SLC-2000 system will always accept the call request packet, should these facilities be present, but it does not attempt to validate the information.

At the link layer, a SLC-2000 system uses the standard link access procedure B (LAPB) protocol with the parameters listed in Table 3-4.

Table 3-4. TL1/X.25 Interface – LAPB Link Layer Parameters

Parameter	Value
Maximum frame size	2104 bits
Modulo	8
Window size	7 frames
n2	7 retries
T1	3 seconds
T3	20 seconds

The SLC-2000 system uses synchronous, full duplex, continuous carrier communication. Data rates of 1200, 2400, 4800, 9600, and 19200 baud are supported. *It is recommended that data rates of at least 9600 baud be used.* At 1200 baud, when multiple or significant network failures occur, or multiple large performance monitoring command responses are requested, the SLC-2000 system's output buffers could overflow due to such a data transmission bottleneck.

The EIA-232D (V.24) interface is configured as DTE, using the pins listed in Table 3-5.

Table 3-5. TL1/X.25 Interface – EIA-232D Pin Connections

Pin	Description
2	Transmitted Data (TD)
3	Received Data (RD)
4	Request to Send (RTS)
5	Clear to Send (CTS)
6	DCE Ready (DSR)
7	Signal Ground (SG)
8	Received Line Signal Detector (DCD)
15	Transmitter Signal Element Timing (DCE to DTE) (TC)
17	Receiver Signal Element Timing (DCE to DTE) (RC)
20	DTE Ready* (DTR)

* DTE is always on when the *SLC-2000* system is powered.

The X.25 circuits between a GNE *SLC-2000* system and the OS may be transported via an X.25 packet network, dedicated private line, or circuit-switched network at the user's option.

Dial-Up Modem Connections

If a dial-up modem connection is desired, a pair of AT&T *Dataphone*® II 2224 CEO modems may be used. The following switch settings were used during testing with *Dataphone* II 2224 CEO modems:

Front panel switches S1-S8: down down down up down up up down.

Internal timing option switches (accessible only with the cover removed): both closed (move the slide toward the side with the numbers).

ACCUNET® Interface

If a connection to an ACCUNET system is desired, the AT&T *Dataphone* II Digital 2500 DSU Stand-Alone system may be used. The settings include 12 slide switches provisioned as follows:

1	Enabled	Remote Digital Loopback
2	Disabled	Elastic Store
3	Enabled	Data Mode
4	Disabled	Circuit Assurance
5	Disabled	System Status
6	Disabled	Timing = DDS
7	Disabled	
8	Disabled	Streaming Terminal
9	Enabled	Continuous RTS
10	Enabled	Speed = 9600 b/s
11	Disabled	
12	Disabled	

The following jumpers are included:

- Front panel switches (Enabled)
- Local loopback through DTE connector (Disabled)
- TM connected to DTE connector (Pin 25)
- Frame ground connected to signal ground.

Datakit[®] Provisioning

X.25 ports in a *Datakit* II VCS (DK-II) network may be configured to interface with DDM-2000 and SLC-2000 system equipment and operations systems. By using a *Datakit* network between the GNEs, the *NMA* host, OPS/INE (Operations Systems/Intelligent Network Elements) host, and/or ACD FNESS, costly dedicated and private lines are eliminated. A *Datakit* network also offers the following: increased network reliability; decreased network complexity; faster installation of a new circuit; centralized network management; easier, less costly reconfiguration; alternate routing. These benefits are transparent to the end points.

The following paragraphs detail the steps needed to configure the *Datakit* II X.25 module and its constituent ports on the SLC-2000 system and OS ends of the connection. Specific dialogs are given that describe the exact input and output sequences required to enter this information into the *Datakit* II data base. The prompts in the example are based on *Datakit* II, Release 3 documentation and may differ for other releases. In the sample dialogs, text in constant width font is verbatim output from *Datakit* II, text in **bold** font is data to be entered verbatim into *Datakit* II, and text in *italics* surrounded by angle brackets <> stands for a special control key on a keyboard.

Background and Assumptions

This section provides necessary background information and describes in detail the assumptions made about the *Datakit II* network used to connect an *NMA* and OPS/INE to the *SLC-2000* system. Figure 3-3 provides an example network. *Datakit II* nodes BOST5 and MVNSMA are highlighted, and examples presented in this section are based on this figure. It is assumed that there are two PVCs; that is, LCN 2 is used between a *SLC-2000* system and *NMA*, and LCN3 is used between the *SLC-2000* system and OPS/INE. Furthermore, an SVC (LCN16) and a PVC (LCN1) is used between the ACD FNESS OS and the *SLC-2000* system.

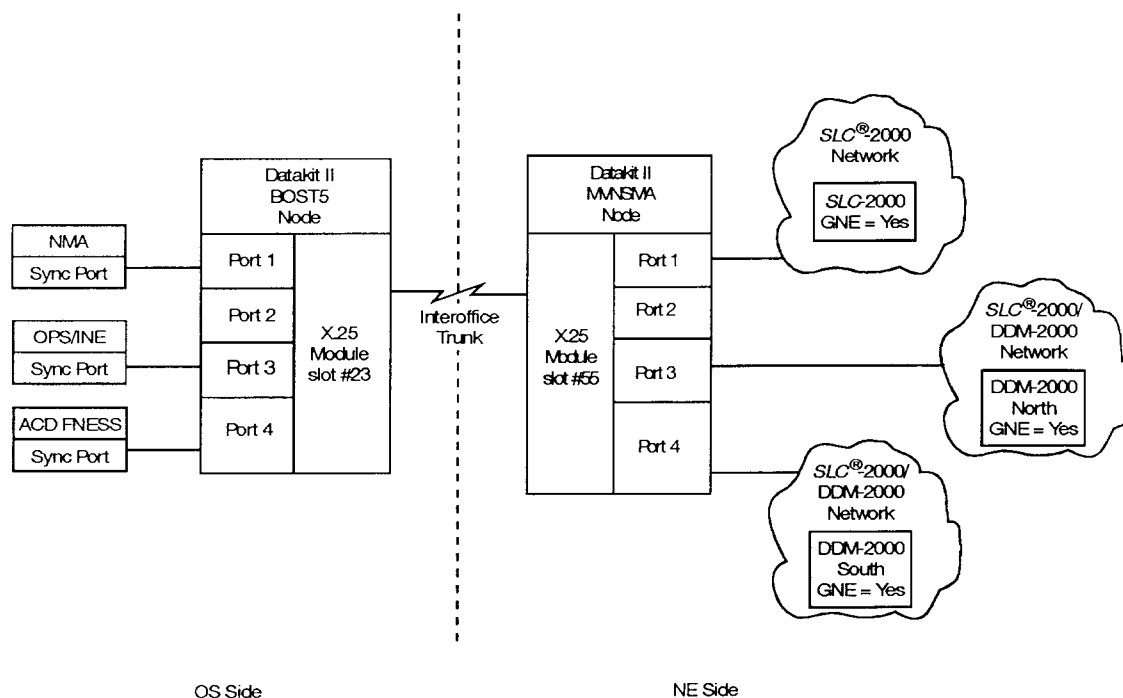


Figure 3-3. SLC-2000 System Datakit Provisioning Example

The connection between each *SLC-2000* system and the *NMA* host consists of an X.25 permanent virtual circuit (PVC). LCN2 is used to carry autonomous TL1 alarm messages from the *SLC-2000* system network GNE node to the *NMA*, and to carry commands from *NMA* to the *SLC-2000* system and the responses to these commands from the *SLC-2000* GNE. Even if information for LCN2 is flowing

in one direction only, a 2-way PVC is required by the *NMA*. LCN3 is used to carry REPT-DBCHG autonomous TL1 messages and TL1 command/response messages for OPS/INE.

The PVCs from multiple *SLC-2000* system networks may connect logically to the same physical port on an OS. The *Datakit* X.25 module "concentrates" the PVCs from the *SLC-2000* systems onto one port of the OS host.

All *Datakit* nodes between the node containing the X.25 modules connecting to the *SLC-2000* systems, and the node containing the X.25 module connecting to the OS host, must have installed *Datakit* II, Release 2.1 software or higher. *Datakit* I (2000) nodes running releases 3.4 software and lower do not support PVCs, nor can they act as tandem nodes for X.25 PVCs. In the intermediate tandem nodes, if any, the only requirement is to define routing through the node for the PVC. Routing should be specified using *Datakit* exchange or X.121 service area addresses. The specifics of routing are dependent on the network topology and local naming conventions.

Any internodal trunks between *Datakit* nodes should have a minimum speed of 56KB in order to insure adequate throughput performance and response time.

Security

For PVCs, no security is needed nor can any be specified, since the two end points are specified by the network administrator, and no other entity can gain access.

For SVCs, security can be an option on the *Datakit* II node. Security options include network access restrictions, originating group security, use of the select group feature, and closed user group (CUG) security. However, the *SLC-2000* system does *not* attempt to validate CUG facilities.

Groups

A group is a logical bundle of ports/channels within a *Datakit* II node. A group can consist of either trunk modules, for internodal connections, or any other module type, for local connections. The configuration in Figure 3-3 requires four groups, two each at the BOST5 and MVNSMA nodes. BOST5 has one group for PVCs on the local *NMA* port(s) and one group for the trunk(s) between BOST5 and MVNSMA. MVNSMA has one group for PVCs on the local DDM-2000 and *SLC-2000* system ports and one group for the trunk(s) between BOST5 and MVNSMA. In MVNSMA, each DDM-2000 and *SLC-2000* system port could belong to its own individual group, if desired; but, for this example, one universal group is sufficient for the PVCs.

To illustrate this example, assume that there is a group called `slc_pvc` defined for the PVCs on the local SLC-2000 system ports in the MVNSMA node. The `DEVICE OR HOST` parameter for this group is assumed to be `slc2000`. This group must be defined as a `2way` group and should not be given any passwords. The `HOST AUTOBAUD` feature should be `off` and the `ROUND ROBIN SERVICE` parameter should be `none` for this group. A similar group (call it `os_pvc`) must be defined in the BOST5 node for the X.25 NMA, OPS/INE, and ACD FNESS ports.

Trunk groups must be defined in both nodes and in any intermediate nodes.

For SVCs, a different group (for example, `slc_svc`) should be created at the MVNSMA node. Likewise, another group (for example, `os_svc`) should be created at the BOST5 node. Each group should be created with `DIRECTION` equal to `2WAY`, `DEVICE OR HOST` equal to `slc2000`, and `ROUND ROBIN SERVICE` equal to `none`. The `PASSWORD` field can either be none or an eight-character value, depending upon the application.

Referring to Figure 3-3, the sync ports and group names are associated as follows:

OS Side (BOST5 Node)		NE Side (MVNSMA Node)	
<i>Sync Port</i>	<i>Group Name</i>	<i>Sync Port</i>	<i>Group Name</i>
NMA	os_pvc	DDM-2000 North	slc_pvc
OPS/INE	os_pvc	DDM-2000 North	slc_pvc
SLC OS	os_svc	SLC-2000	slc_svc

Destination Addresses

Every *Datakit II* destination is uniquely identified by an address, which consists of a maximum of four parts or levels in a hierarchy. *Datakit II* VCS uses two types of addresses: mnemonic and X.121. For mnemonic addresses, each level consists of up to 8 alphanumeric characters. For X.121 addresses, each part consists only of three to four digits depending on level. For mnemonic addresses, the level hierarchy is arranged as follows:

network/area/exchange/local address.

For X.121 addresses, the hierarchy is arranged as follows:

DNIC/service region/service area/endpoint number,

where (assuming the North American numbering plan):

- DNIC has four digits

- Service Region (SR) has three digits.
- Service Area (SA) has three digits.
- Endpoint Number (EPN) has four digits.

There is a direct correspondence between the mnemonic and X.121 addresses at each level in the hierarchy. An address can be a mixture of the two structures; for example:

DNIC/area/exchange/endpoint number.

Note that an address can have four levels, but only the minimum number of levels that uniquely defines the destination is needed. *Datakit* addressing is analogous to the telephone network numbering plan. In an office complex, usually one dials only the last four digits of the telephone number, which for *Datakit* corresponds to the local address or endpoint number. When calling outside the complex, one uses an exchange, followed by the four digit number. This corresponds in *Datakit* addressing to exchange/local address or service area/endpoint number. Similarly, the analogy follows for area codes, service regions, etc. Hence, one uses the minimum number of levels required to call the destination.

Refer to Figure 3-3. Assume the following address assignments have been defined at the respective nodes in this figure (using the **enter** or **change node** commands):

Level	Mnemonic	X.121
Node BOST5		
network,DNIC	netel	2345
area,service region	mab	617
Node MVNSMA		
network,DNIC	netel	2345
area,service region	ma	508
Node BOST5		
exchange,service area	bos	123
Node MVNSMA		
exchange,service area	mvd1	957

Since the nodes exist in the same network but in different areas, three levels of addressing are needed to uniquely identify a destination; that is,

area/exchange/local address

or

service region/service area/endpoint number.

The local addresses or endpoint numbers (EPNs) used in this example are described in the next section.

PVC Addresses

In order to identify a particular PVC circuit associated with an X.25 destination, extensions to the address structure described above are needed. These additions are:

module.port.pvc number

The complete address is:

network/area/exchange/local address.module.port.pvc number

or

DNIC/service region/service area/endpoint number.module.port.pvc number

Destination addresses that use a mixture of mnemonic and X.121 levels are used in the example and have the following structure:

area/exchange/endpoint number.module.port.pvc number

As shown in Figure 3-3, the BOST5 node is assumed to have an X.25 module installed in slot 23, with port 1 of the module connected to an *NMA* synchronous port, port 3 of the module connected to an *OPS/INE* synchronous port, and port 4 of the module connected to an *ACD FNESS* synchronous port. The PVCs on the *NMA* port(s) will point to the destination PVCs on the *SLC-2000* system ports.

The *MVNSMA* node has an X.25 module in slot 55. Port 1 is connected to the *SLC-2000* system Network. Port 3 is connected to *DDM-2000 North*. Port 4 is connected to *DDM-2000 South*. The assigned EPN for the PVCs on port 1 is 2100; on port 3 it is 2300; on port 4, it is 2400. Therefore, in order for the *NMA* host to access the destination PVCs in the *MVNSMA* node, the destination addresses that would be specified in the BOST5 node would be

ma/mvdk1/2100.55.1.2	for the SLC-2000
ma/mvdk1/2300.55.3.2	for DDM-2000 North
ma/mvdk1/2400.55.4.2	for DDM-2000 South.

Similarly, in order for the *OPS/INE* to access the destination PVCs in the *MVNSMA* node, the destination addresses that would be specified in the BOST5 node would be

ma/mvdk1/2100.55.1.3
ma/mvdk1/2300.55.3.3
ma/mvdk1/2400.55.4.3.

Lastly, for the ACD FNESS host to access the destination PVCs in the MVNSMA node, the destination addresses that would be specified in the BOST5 node would be

ma/mvdk1/2100.55.1.1
ma/mvdk1/2300.55.3.1
ma/mvdk1/2400.55.4.1.

SVC Addresses

When placing a call from the ACD FNESS (that is, submitting a call indication packet) to the "SLC-2000 System Network", a user should specify the EPN assigned to the SVCs for that port in the "DTE Called Address" in the call indication packet. The EPN for the SVCs on the "SLC-2000 System Network" port is 2100. Therefore, 2100 should be used as the "DTE Called Address" in the call indication packet.

Data Base Configuration

After entering the groups described earlier into the *Datakit* nodes' data bases, the X.25 modules must be entered, followed by the specification of the individual port parameters. The details for entering these port parameter specifications are listed in the following paragraphs. The following sections give the exact prompts and responses for entering the X.25 modules and ports on each end node.

Module Specification

NE Side (MVNSMA Node)

This section provides a detailed example dialog required to set up the X.25 module in the MVNSMA *Datakit* II node. This example is based on Figure 3-3. The parameters entered here determine the X.25 link level and administrative characteristics of the module. The dialog assumes the *Datakit* network administrator is using the node's A or B port console, and that the node is actively running using the CC0 controller.

```
CC0> enter<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: module<ret>
MODULE ADDRESS: 55<ret>
```

```
DOWNLOAD SERVER [(controller)]: <ret>  
SOFTWARE VERSION [(standard)]: <ret>
```

```
DEFAULT NETWORK LEVEL WINDOW SIZE [2, 3: +(2)]: <ret>  
DEFAULT PACKET SIZE [128, 256: +(128)]: 256<ret>
```

INFO: Flow control parameter negotiation for all ports on this module is being turned on based on the specified window or packet size values.

```
NUMBER OF USER CHANNELS [1-50: +(50)]: <ret>
```

```
INTERNAL BAUD RATE [1200, 2400, 4800, 9600, 19200, 48k, 56k,  
64k, none: +(9600)]: <ret>
```

```
MODULE ADDRESS: <del>
```

Note that the response to the INTERNAL BAUD RATE prompt is dependent on the type of X.25 I/O board to which the SLC-2000 system port is connected in the *Datakit* node. The response shown above assumes a DCE I/O board (either AWJ5 or AWJ18) is physically installed in the node to which the SLC-2000 system port cable is connected. A DCE I/O board is used when the SLC-2000 system port is directly cabled to the *Datakit* node with no intervening modems or modem-eliminators. The DCE I/O board acts like a modem and provides the necessary timing signals.

NMA, OPS/INE and ACD FNESS End

For the OS end, the X.25 module is defined in the BOST5 node the same as above except for the slot location and the number of user channels. The number of channels depends on the number of systems being monitored through the X.25 module in BOST5. The maximum number per *module* is 50 because the X.25 packet size and window size are set at 256 and 2, respectively. Therefore, one X.25 module connected to *NMA* can support the monitoring of 25 DDM-2000 and SLC-2000 systems. If OPS/INE is added to the same X.25 module as *NMA*, the maximum number of shelves that both *NMA* and OPS/INE will monitor is 16. Similarly, if the ACD FNESS is connected, then even fewer networks may be monitored.

Port Configuration

Network Element End

This section provides a detailed example dialog required to set up the X.25 channels in the MVNSMA *Datakit* II node in order to connect to both the DDM-2000 and SLC-2000 system Network Elements (NEs) in the office. Refer to Figure 3-3.

The parameters shown here determine the X.25 network level characteristics and channel assignments of each port in the module. As shown on the following pages, the *enter* and *restore* commands are used to configure the data base and place the module ports in service.

The dialog details the configuration of the nine PVC channels, three per DDM-2000 or SLC-2000 system, as described above for *NMA* commands and monitoring, *OPS/INE* provisioning and monitoring and *ACD FNESS* commands, and 3 SVCs for the *ACD FNESS* monitoring.

```
CC0>enter x25 port<ret>
MODULE ADDRESS: 55<ret>
PORT NUMBER [1-4]: 1<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
  "SLC-2000 Network"<ret>

PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>

MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple,
transparent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-50: +(50)]: 1<ret>
SVC DIRECTION [originate, receive, 2way: +(2way)]: <ret>
SVC GROUP [up to 8 chars]: slc_svc<ret>
NUMBER OF RECEIVE ONLY CHANNELS [0-1: +(0)]: 1<ret>

INFO: No channels left for originate only channels.

ADDRESS CHECKING [on, off: +(on)]: off
ENDPOINT NUMBER FOR SVC CHANNELS FOR PORT 1 [0000-9999]:
2150<ret>
CLOSED USER GROUP PROFILE ID [up to 8 chars, none:
+(none)]:<ret>

INFO: Flow control parameter negotiation is turned on based
      on the specified window and packet size values.

THROUGHPUT CLASS NEGOTIATION [on, off: +(off)]: <ret>
FAST SELECT ACCEPTANCE [on, off: +(on)]:off
```

NUMBER OF PVC CHANNELS [0-49: +(49)]: 15<ret>
PVC GROUP [up to 8 chars]: slc_pvc<ret>
ENDPOINT NUMBERS FOR PVC CHANNELS [0000-9999]: 2100<ret>

INFO: Enter assignment of destinations to logical channels
using the following prompts. Hit <DEL> once when
finished making entries.

PVC LOGICAL CHANNEL NUMBER [1-15]: <del>

PORT NUMBER [1-4]: 3<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
"DDM-2000 Network - North"<ret>
PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>
MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
ACTION WHEN N2 COUNT EXCEEDED [disconnect, reset: +(reset)]:
<ret>
ACTION WHEN DISC RECEIVED [disconnect, reset: +(reset)]:
<ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple,
transparent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-34: +(34)]: 1<ret>
SVC DIRECTION [originate, receive, 2way: +(2way)]: <ret>
SVC GROUP [up to 8 chars]: slc_svc<ret>
NUMBER OF RECEIVE ONLY CHANNELS [0-1: +(0)]: 1<ret>

INFO: No channels left for originate only channels.

ADDRESS CHECKING [on, off: +(on)]: off
ENDPOINT NUMBER FOR SVC CHANNELS FOR PORT 1 [0000-9999]:
2350<ret>
CLOSED USER GROUP PROFILE ID [up to 8 chars, none:
+(none)]:<ret>

INFO: Flow control parameter negotiation is turned on based
on the specified window and packet size values.

THROUGHPUT CLASS NEGOTIATION [on, off: +(off)]: <ret>
FAST SELECT ACCEPTANCE [on, off: +(on)]:off

NUMBER OF PVC CHANNELS [0-33: +(33)]: 15<ret>
PVC GROUP [up to 8 chars]: slc_pvc<ret>
ENDPOINT NUMBER FOR PVC CHANNELS FOR PORT 3 [0000-9999]:
2300<ret>

INFO: Enter assignment of destinations to logical channels
using the following prompts. Hit <DEL> once when
finished making entries.

PVC LOGICAL CHANNEL NUMBER [1-15]: <del>

PORT NUMBER [1-4]: 4<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
"DDM-2000 Network - South"<ret>
PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>
MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
ACTION WHEN N2 COUNT EXCEEDED [disconnect, reset: +(reset)]:
<ret>
ACTION WHEN DISC RECEIVED [disconnect, reset: +(reset)]:
<ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple,
transparent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-18: +(18)]: 1<ret>
SVC DIRECTION [originate, receive, 2way: +(2way): <ret>
SVC GROUP [up to 8 chars]: slc_svc<ret>
NUMBER OF RECEIVE ONLY CHANNELS [0-1: +(0)]: 1<ret>

INFO: No channels left for originate only channels.

ADDRESS CHECKING [on, off: +(on)]: off
ENDPOINT NUMBER FOR SVC CHANNELS FOR PORT 1 [0000-9999]:
2450<ret>
CLOSED USER GROUP PROFILE ID [up to 8 chars, none:
+(none)]:<ret>

INFO: Flow control parameter negotiation is turned on based
on the specified window and packet size values.

THROUGHPUT CLASS NEGOTIATION [on, off: +(off)]: <ret>

```
FAST SELECT ACCEPTANCE [on, off: +(on)]:off
NUMBER OF PVC CHANNELS [0-17: +(17)]: 15<ret>
PVC GROUP [up to 8 chars]: slc_pvc<ret>
ENDPOINT NUMBER FOR PVC CHANNELS [0000-9999]: 2400<ret>
```

INFO: Enter assignment of destinations to logical channels
using the following prompts. Hit <DEL> once when
finished making entries.

```
PVC LOGICAL CHANNEL NUMBER [1-15]: <del>
PORT NUMBER [1-4]: <del>
```

Since DDM-2000 and SLC-2000 system ports are the destination end of the PVC circuit, no PVC destinations are specified in the last set of prompts.

```
CC0>restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: module<ret>
MODULE ADDRESS: 55<ret>
"REPORT STATUS: Module is active"
```

```
CC0>restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 55<ret>
PORT NUMBER [1-4]: 1<ret>
"restore x25 port 55 1"
```

```
CC0>restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 55<ret>
PORT NUMBER [1-4]: 3<ret>
"restore x25 port 55 3"
```

```
CC0>restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 55<ret>
PORT NUMBER [1-4]: 4<ret>
"restore x25 port 55 4"
```

OS End

To define the X.25 port in BOST5 (specifically, the PVCs on that port that point to the SLC-2000 system PVCs in MVNSMA), assume 50 user channels were specified in the definition of the module. Again, the *enter* and *restore* commands are used to configure the data base and place the module ports in service.

```
CC0>enter x25 port<ret>
MODULE ADDRESS: 23<ret>
PORT NUMBER [1-4]: 1<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
    "NMA Interface"<ret>
PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>
MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
ACTION WHEN N2 COUNT EXCEEDED [disconnect, reset: +(reset)]:
<ret>
ACTION WHEN DISC RECEIVED [disconnect, reset: +(reset)]:
<ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple,
transparent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-50: +(50)]: 0<ret>
NUMBER OF PVC CHANNELS [0-50: +(50)]: 3<ret>
PVC GROUP [up to 8 chars]: os_pvc<ret>
ENDPOINT NUMBERS FOR PVC CHANNELS [0000-9999]: 3100<ret>

INFO: Enter assignment of destinations to logical channels
      using the following prompts.  Hit <DEL> once when
      finished making entries.

PVC LOGICAL CHANNEL NUMBER [1-3]: 1<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2100.55.1.2<ret>

PVC LOGICAL CHANNEL NUMBER [1-3]: 2<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2300.55.3.2<ret>

PVC LOGICAL CHANNEL NUMBER [1-3]: 3<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2400.55.4.2<ret>

PVC LOGICAL CHANNEL NUMBER [1-3]: <del>

PORT NUMBER [1-4]: 3<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
    "OPS/INE Interface"<ret>
```

```
PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>
MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
ACTION WHEN N2 COUNT EXCEEDED [disconnect, reset: +(reset)]:
<ret>
ACTION WHEN DISC RECEIVED [disconnect, reset: +(reset)]:
<ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple, transpar-
ent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-47: +(47)]: 0<ret>
NUMBER OF PVC CHANNELS [0-47: +(47)]: 3<ret>
PVC GROUP [up to 8 chars]: os_pvc<ret>
ENDPOINT NUMBERS FOR PVC CHANNELS [0000-9999]: 3300<ret>
```

INFO: Enter assignment of destinations to logical channel
using the following prompts. Hit <DEL> once when
finished making entries.

```
PVC LOGICAL CHANNEL NUMBER [1-3]: 1<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2100.55.1.3<ret>
```

```
PVC LOGICAL CHANNEL NUMBER [1-3]: 2<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2300.55.3.3<ret>
```

```
PVC LOGICAL CHANNEL NUMBER [1-3]: 3<ret>
PVC DESTINATION [up to 72 chars, none: +(none)];
ma/mvdk1/2400.55.4.3
```

```
PVC LOGICAL CHANNEL NUMBER [1-3]: <del>
```

```
PORT NUMBER [1-4]: 4<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
"ACD FNESS Interface"<ret>
PORT TYPE [host, pdn: +(pdn)]: host<ret>
CLOCKING TYPE [internal, external: +(external)]:
internal<ret>
MAXIMUM NUMBER OF OUTSTANDING I-FRAMES (K) [1-7: +(7)]:
<ret>
```

WAITING ACKNOWLEDGEMENT TIMER (T1) [2-20: +(3)]: <ret>
MAXIMUM ATTEMPTS TO COMPLETE A TRANSMISSION (N2) [2-15:
+(7)]: <ret>
ACTION WHEN N2 COUNT EXCEEDED [disconnect, reset: +(reset)]:
<ret>
ACTION WHEN DISC RECEIVED [disconnect, reset: +(reset)]:
<ret>
BILLING STATUS [on, off: +(off)]: <ret>
DEFAULT CALLING ADDRESS [up to 15 digits, none: +(none)]:
<ret>
LOCAL X.3 PROFILE ID [up to 20 chars, mbit, simple, transpar-
ent: +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-44: +(44)]: 3<ret>
SVC DIRECTION [originate, receive, 2way: +(2way)]: <ret>
SVC GROUP [up to 8 chars]: os_svc<ret>
ADDRESS CHECKING [on, off: +(off)]: off <ret>
ENDPOINT NUMBERS FOR SVC CHANNELS FOR PORT 4 [0000-9999]:
3450<ret>
CLOSED USER GROUP PROFILE ID [up to 8 chars none: +(none)]:
<ret>

INFO: Flow control parameter negotiation is turned on
based on the specified window and packet size values.

THROUGHPUT CLASS NEGOTIATION [on, off: +(off)]: <ret>
FAST SELECT ACCEPTANCE [on, off: +(off)]: off <ret>
PREDEFINED DESTINATION [up to 72 chars, none: +(none)]:
NUMBER OF PVC CHANNELS [0-41: +(41)]: 3 <ret>
PVC GROUP [up to 8 chars]: os_pvc<ret>
ENDPOINT NUMBERS FOR PVC CHANNELS [0000-9999]: 3400<ret>

INFO: Enter assignment of destinations to logical channel
using the following prompts. Hit <DEL> once when
finished making entries.

PVC LOGICAL CHANNEL NUMBER [1-3]: 1<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2100.55.1.1<ret>

PVC LOGICAL CHANNEL NUMBER [1-3]: 2<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2300.55.3.1<ret>

PVC LOGICAL CHANNEL NUMBER [1-3]: 3<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2400.55.4.1

PVC LOGICAL CHANNEL NUMBER [1-3]: <del>

```
CC0> restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: module<ret>
MODULE ADDRESS: 23<ret>
"REPORT STATUS: Module is active"
```

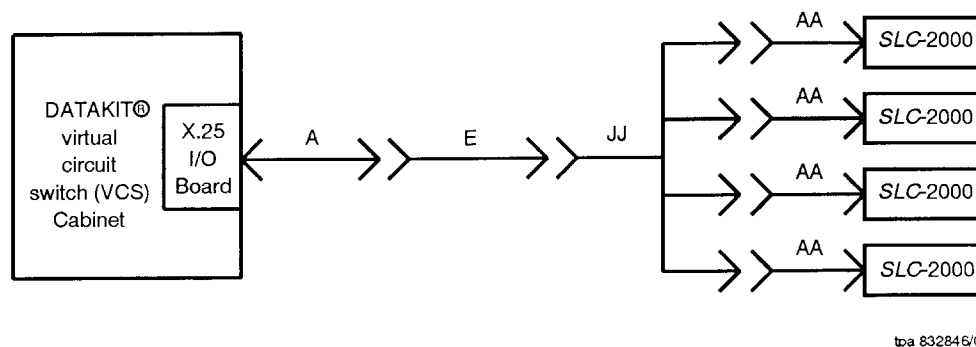
```
CC0> restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 23<ret>
PORT NUMBER [1-4]: 1<ret>
"restore x25 port 23 1"
```

```
CC0> restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 23<ret>
PORT NUMBER [1-4]: 3<ret>
"restore x25 port 23 3"
```

```
CC0> restore<ret>
OBJECTS [...x25...]: x25<ret>
COMPONENT [module, port]: port<ret>
MODULE ADDRESS: 23<ret>
PORT NUMBER [1-4]: 4<ret>
"restore x25 port 23 4"
```


SLC-2000 System Cabling

Referring to Figure 3-3, it is assumed that the *Datakit II* node in the MVNSMA office has an AWJ5 or AWJ18 DCE I/O board installed and directly connected to each of the SLC-2000 system network element X.25 ports (J45). The normal cabling arrangement for a DTE device is a 50-pin connection to the *Datakit* DCE I/O board. Figure 3-4 shows a preferred cabling arrangement.



tpa 832846/01

Figure 3-4. *Datakit II* to SLC-2000 System Cabling Arrangement

Cables A, E, and JJ can be ordered from the *Datakit* product line using the part numbers listed below. The X.25 cable can be ordered through SLC-2000 system.

LETTER CODE	CABLE NAME	DRAWING	GROUP NUMBER	COMMENTS
A*	B25FS-1MOD	ED-5P055-31	G(200),G(C)	50-pin M to 50-pin M, shielded
E	B25A	ED-5P055-31	G(106),G(A or F)	Optional 50-pin F to 50-pin M
JJ	SYNC4-M	ED-5P055-31	G(160),G(R)	50-pin F to 4 RS232 25-pin M connectors
AA	X.25 Cable	ED-8C724-20	G(342),G(343)	25-pin F to 25-pin M RS232

* Cable A should be inserted into the top 50-pin connector of the X.25 I/O board.

NMA Data Base Definition

The provisioning, including the *SLC-2000* system equipment hierarchy, required in the *NMA* operation system to monitor the *SLC-2000* system via TL1/X.25 is specified in Methods documents prepared by Bellcore under the Operations Systems Modifications for Intelligent Network Elements (OSMINE) contract with AT&T. RBOC customers may contact AT&T's Technical Support Organization or Regional Technical Assistance Center for copies of these documents.

TL1 Message Details

The following pages provide detailed information about the input and output parameters for the supported TL1 messages. Both autonomous messages (generated by the DDM-2000 and *SLC-2000* system independent of any request) and command/response messages (generated in response to a request from the OS or OS user) are supported.

The following parameter detail tables are included at the end of this section:

- Access Identifiers (AIDs)
- Alarm and status condition descriptions
- Monitored parameter types
- Condition types

The DDM-2000 and *SLC-2000* system is case insensitive for all TL1 commands. For example, the DDM-2000 and *SLC-2000* system accepts both `RTRV-ALM-ALL` and `rtrv-alm-all` as equivalent commands. Parameter values received are also case insensitive, except for the user identifier (*uid*) and private identifier (*pid*) parameters.

All alphabetic characters in the DDM-2000 and *SLC-2000* system TL1 command responses and autonomous messages are output in upper case except the correlation tag (*ctag*), access identifier (*aid*), condition description (*conddescr*), alarm message description (*almmsg*), and error text. The *ctag* is output exactly as it is received from the OS to assure compatibility. The *aid* is always displayed in lower case in the DDM-2000 and *SLC-2000* system user interface, and the same is done for the DDM-2000 and *SLC-2000* system's TL1 interface. The *conddescr*, *almmsg*, and error text are output in mixed case for readability.

The DDM-2000 and *SLC-2000* system does not support parameter grouping.

TL1 commands and command parameter values (and DDM-2000 and *SLC-2000* system user interface commands) which are to be input exactly as shown (upper-, lower- or mixed-case alphabetic characters are acceptable, as mentioned

above) are printed in **bold type**. System responses are printed in *courier* type. Descriptive names of entry values are shown in *italic type*. (*Italic type* is also used for emphasis elsewhere in this document.) Items enclosed in brackets "[]" indicate optional parameters.

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NAME

REPT ALM: Report Alarm

DESCRIPTION

REPT ALM messages are generated autonomously by the SLC-2000 system to report a condition that requires immediate attention by the craft at the OS. These alarm messages have alarm severity associated with them.

If a condition defaults or is provisioned to have an alarm level of critical, major, or minor, the occurrence (and clearing) of that condition is reported in a REPT ALM message.

An alarm condition reported to the OS via the REPT ALM message has a corresponding REPT ALM clearance message that is generated when the alarm condition clears.

OUTPUT FORMAT

```

      sid date time
almcde atag REPT ALM modifier
      "[aid]:ntfcncde,condtype,srveff,ocrdat,ocrtm[, , , thlev]:
      \"conddescr\"[: ,tblislt]"
;

```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).

<i>almcde</i>	Alarm code. This has one of the following values: *C Critical alarm ** Major alarm * Minor alarm - A Automatic message (nonalarm). This is used only to report a cleared alarm.
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the SLC-2000 system. The SLC-2000 system uses only whole numbers from 001 through 999.
<i>modifier</i>	This is a message modifier to the REPT ALM message and has one of the following values: - COM Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system. - EC1 This reports a facility-related condition at the electrical carrier signal level 1. - EQPT This reports an equipment-related condition. - OC3 This reports a facility-related condition at the optical carrier signal level 3. - STS1 This reports a facility-related condition at the synchronous transport signal level 1. - T1 This reports a facility-related condition at the DS1 level. - T3 This reports a facility-related condition at the DS3 level. - VT1 This reports a facility-related condition at the virtual tributary signal level 1.5.
<i>aid</i>	Access identifier. This is the address of the equipment component or facility for which an alarm is being reported. The <i>aid</i> is set to null only if the modifier is COM. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ntfncode</i>	Notification code. This is the alarm level and has one of the following values: - CR Critical alarm - MJ Major alarm - MN Minor alarm - CL Cleared alarm

<i>condtype</i>	Condition type. This has one of the values listed in Tables 3-13 and 3-14 at the end of this section.
<i>srveff</i>	Service effect. This indicates the effect of the reported alarm on service and has one of the following values: SA Service-affecting condition NSA Non-service-affecting condition. A message reporting the clearing of an alarm has the same <i>srveff</i> value as the one reporting the alarm. In the particular case of <i>SLC-2000</i> system with SONET Release 7.1 (rings), SONET VT1.5 and STS-1 path-specific alarms accurately convey the true service effect. Ring node-specific alarm conditions which may be partially or fully protected by the the rest of the ring are reported as <i>NSA</i> .
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).
<i>thlev</i>	Threshold level. If an incoming facility degradation or failure (or clear) is reported, the <i>thlev</i> value is the bit error ratio (BER) threshold level, in integer form, representing the closest negative power of 10 to the BER. Otherwise, this parameter is not reported.
<i>conddescr</i>	Condition description. This is the text description of the reported condition. If further explanation, including likely causes, of a reported condition is required, refer to Tables 3-9 and 3-10 at the end of this section.
<i>tblislt</i>	Trouble isolated. If a reported condition is isolated to the reported <i>aid</i> , the <i>tblislt</i> value is <i>ISLTD</i> to indicate that the <i>aid</i> identifies the circuit pack that should be replaced by craft to correct the reported condition. If the reported condition is a circuit pack link alarm, the value is <i>NIMAN</i> to indicate that the fault has to be manually isolated and that the <i>aid</i> field identifies the suspected units. Otherwise, the <i>tblislt</i> parameter is not reported.

EXAMPLE OUTPUT

```
SITE7NE1 91-08-29 10:17:43
* 030 REPT ALM EQPT
"fn-c-1:MN,OC3TERM,NSA,08-29,10-17-41:
\"OLIU CP failed\":,ISLTD"
;
```

```
SITE7NE1 91-08-29 10:18:47
A 031 REPT ALM EQPT
"fn-c-1:CL,OC3TERM,NSA,08-29,10-18-47:
\"OLIU CP good\" "
;
```


NAME

REPT ALM ENV : Report Alarm Environment

DESCRIPTION

REPT ALM ENV messages are generated autonomously by the SLC-2000 system to inform the OS an environmental alarm condition has occurred.

If a miscellaneous discrete environmental point defaults to, or is provisioned to have, an alarm level of critical, major, or minor, the occurrence (and clearing) of that environmental point is reported in a REPT ALM ENV message. If provisioned as a status condition, a REPT EVT message is used to report the event.

For each miscellaneous discrete environmental alarm condition reported to the OS via the REPT ALM ENV message, a corresponding REPT ALM ENV clearance message is generated when the environmental alarm condition clears.

OUTPUT FORMAT

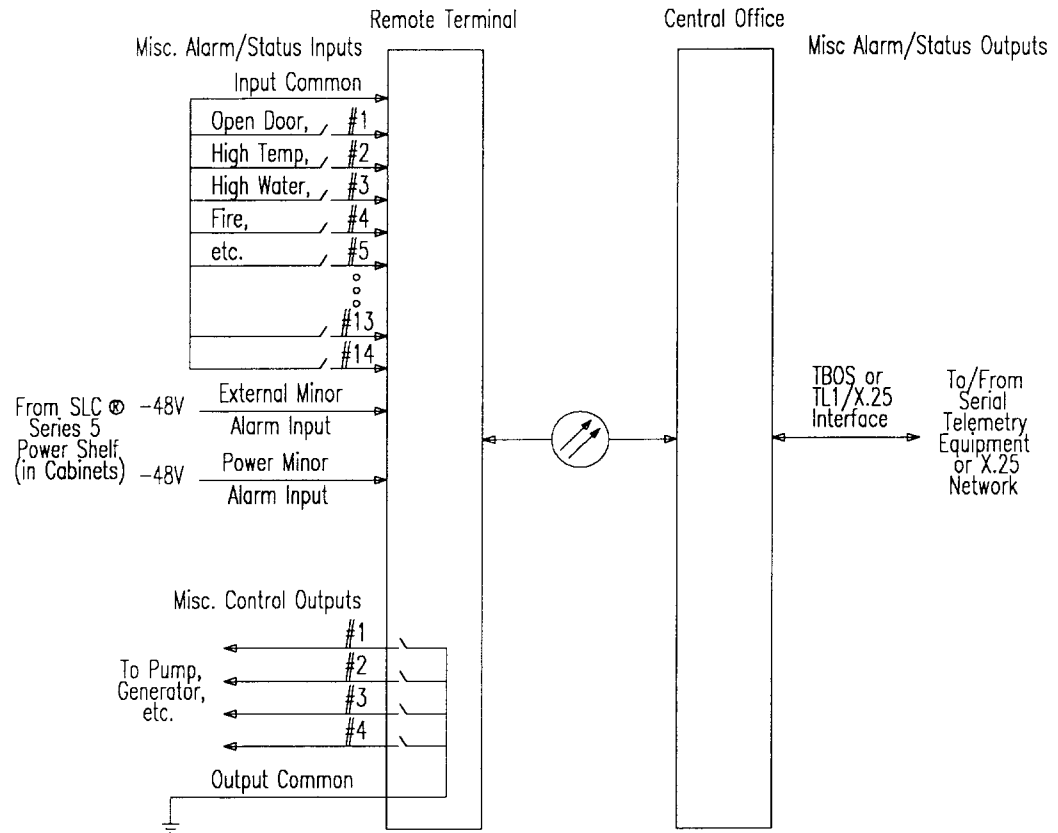
```
sid date time
almcde atag REPT ALM ENV
"aid:ntfcncde,almtype,ocrdat,ocrtm,\"almmsg\""
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).

<i>almcde</i>	Alarm code. This has one of the following values: *C Critical alarm ** Major alarm * Minor alarm - A Automatic message (nonalarm). This is used only to report a cleared alarm.
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the SLC-2000 system. The SLC-2000 system uses only whole numbers from 001 through 999.
<i>aid</i>	Access identifier. This is the address of the miscellaneous discrete environmental point for which an alarm is being reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ntfcncde</i>	Notification code. This is the alarm level and has one of the following values: - CR Critical alarm - MJ Major alarm - MN Minor alarm - CL Cleared alarm
<i>almtype</i>	Alarm type. The value of this parameter is MISC.
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).
<i>almmsg</i>	Alarm message. This is the text description of the reported condition. (The default is <i>environmentn</i> .) Refer to Tables 3-9 and 3-10 at the end of this section.

Figure 3-5 shows miscellaneous discrete environmental alarms and controls for TBOS or TL1/X.25 at the central office.



Notes:

1. In a remote terminal, the output common must be wired to ground in all applications.
2. Miscellaneous alarm input #1 is typically wired to open door alarm in AT&T cabinets.

Figure 3-5. Miscellaneous Discrete Environmental Alarms and Controls (TBOS or TL1/X.25 at Central Office)

EXAMPLE OUTPUT

```
SITE7NE1 91-01-01 02:30:29
* 003 REPT ALM ENV
  "env-3:MN,MISC,01-01,02-03-26,\"environment3\" "
;
```

NAME

REPT COND : Report Condition

DESCRIPTION

REPT COND messages are generated periodically and autonomously by the SLC-2000 system to report the active *status* conditions at the network element. REPT COND messages are generated every 6 hours, that is, at 6:00 A.M., 12:00 Noon, 6:00 P.M. and 12:00 Midnight.

Each REPT COND message reports one active status condition similar to the autonomous REPT EVT message used to report each status condition (non-alarmed event) when it occurred. Any status condition reported by an autonomous REPT EVT message, which is active when the periodic REPT COND messages are output, is included in a REPT COND message.

Any *active* status condition that was initially reported by an autonomous REPT EVT message with a *standing condition effect* (*condeff* = SC) is included in one of the periodic REPT COND messages.

The information content of each REPT COND message is effectively equivalent to a line in the response to a RTRV-COND command.

OUTPUT FORMAT

```
      sid date time
A atag REPT COND modifier

"[aid]:ntfcncde,condtype,srveff,ocrdat,ocrtm,,,\"conddescr\""
;
```

Each REPT COND message is output in the same order as the corresponding CIT *rtrv-alm* report.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.																
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).																
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).																
<i>A</i>	This indicates that the message is sent autonomously.																
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the SLC-2000 system. The SLC-2000 system uses whole numbers from 001 through 999.																
<i>modifier</i>	This is a message modifier to the REPT COND command. It has one of the following values: <table> <tr> <td>COM</td><td>Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system.</td></tr> <tr> <td>EC1</td><td>This reports a facility-related condition at electrical carrier signal level 1.</td></tr> <tr> <td>EQPT</td><td>This reports an equipment-related condition.</td></tr> <tr> <td>OC3</td><td>This reports a facility-related condition at the optical carrier signal level 3.</td></tr> <tr> <td>STS1</td><td>This reports a facility-related condition at synchronous transport signal level 1.</td></tr> <tr> <td>T1</td><td>This reports a facility-related condition at the DS1 level.</td></tr> <tr> <td>T3</td><td>This reports a facility-related condition at the DS3 level.</td></tr> <tr> <td>VT1</td><td>This reports a facility-related condition at the virtual tributary signal level 1.5.</td></tr> </table> The <i>modifier</i> value may be null if there are not any active status conditions to report.	COM	Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system.	EC1	This reports a facility-related condition at electrical carrier signal level 1.	EQPT	This reports an equipment-related condition.	OC3	This reports a facility-related condition at the optical carrier signal level 3.	STS1	This reports a facility-related condition at synchronous transport signal level 1.	T1	This reports a facility-related condition at the DS1 level.	T3	This reports a facility-related condition at the DS3 level.	VT1	This reports a facility-related condition at the virtual tributary signal level 1.5.
COM	Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system.																
EC1	This reports a facility-related condition at electrical carrier signal level 1.																
EQPT	This reports an equipment-related condition.																
OC3	This reports a facility-related condition at the optical carrier signal level 3.																
STS1	This reports a facility-related condition at synchronous transport signal level 1.																
T1	This reports a facility-related condition at the DS1 level.																
T3	This reports a facility-related condition at the DS3 level.																
VT1	This reports a facility-related condition at the virtual tributary signal level 1.5.																
<i>aid</i>	Access identifier. This is the address of the equipment component, facility, or repeater bay site ID for which an alarm is being reported. The <i>aid</i> is set to null only if the modifier is COM. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.																
<i>ntfcncde</i>	Notification code. This parameter value is always NA (not alarmed) for status conditions.																
<i>condtype</i>	Condition type. This has one of the values listed in Tables 3-13 and 3-14 at the end of this section.																

<i>srveff</i>	Service effect. This indicates the effect of the reported condition on service. This parameter value is always NSA (not service affecting) for status conditions
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).
<i>conddescr</i>	Condition description. This is the text description of the reported condition. If further explanation, including likely causes, of a reported condition is required, refer to Tables 3-9 and 3-10 at the end of this section.
<i>tblislt</i>	Trouble isolated. If a reported condition is isolated to the reported <i>aid</i> , the <i>tblislt</i> parameter value is ISLTD to indicate that the <i>aid</i> identifies the circuit pack that should be replaced by craft to correct the reported condition. Otherwise, the <i>tblislt</i> parameter is not reported.

EXAMPLE OUTPUT

```
ATT-SLC-2000 93-10-26 06:21:18
A 810 REPT COND COM
  "env-1:NA,MISC,NSA,10-26,06-23-18,,,,:\\"environment1\\" ,
;
```

NAME

REPT DBCHG : Report Database Change

DESCRIPTION

REPT DBCHG messages are generated by a network element to report database changes that have occurred as a result of line termination and cross-connection provisioning commands, and changes due to external events such as circuit pack insertion and removal.

The REPT DBCHG message is generated in response to the following database changes:

Change in line termination provisioning

Any time the **ENT-rr** command is entered on the OS-NE interface, or the equivalent command is entered via the CIT, and successfully executes, a REPT DBCHG message is generated indicating the new settings.

Change in line termination alarm attribute provisioning

Any time the **SET-ATTR** command is entered on the OS-NE interface, or the equivalent command is entered via the CIT, and successfully executes, a REPT DBCHG message is generated indicating the new settings. The system will report this as if the **ENT-rr** command had been entered.

Change in a cross-connection for a SONET signal path

Anytime a SONET signal path cross-connection is changed by an **ENT-CRS-rr**, or **DLT-CRS-rr** command on the OS-NE interface, or the equivalent command is entered via the CIT, a REPT DBCHG message is generated indicating the new or deleted cross-connection.

Conversion of STS-1 cross-connection to VT1.5 cross-connection

Anytime a STS-1 cross-connection is converted to 28 VT1.5 cross-connections by a **CNVT-CRS** command, a REPT DBCHG message is generated indicating that deleted STS-1 cross-connection, and then 28 REPT DBCHG messages are generated indicating the created VT1.5 cross-connections. These messages are reported as if a user had entered one **DLT-CRS-STs1** and 26 **ENT-CRS-VT1** CIT commands.

System initialization

Anytime the **INIT-SYS** command is entered on the OS/NE or CIT interface (SONET subsystem), a REPT DBCHG message is transmitted before the system resets.

Controller reset

Anytime the system controller resets (including on power-up), a REPT DBCHG message is transmitted after the controller has successfully recovered from the reset.

Change in a DS0 cross-connection

Anytime a DS0 cross-connect is changed by an ENT-CRS-T0, or DLT-CRS-T0 command on the OS-NE interface or via the CIT, a REPT DBCHG message is generated indicating the new or deleted cross-connection. Any time DS0 cross-connections are created by a INIT-CRS-T0 (CIT) or INIT-CRS (UIP) command, a REPT DBCHG message, indicating an ENT-CRS-T0 operation, is generated for each cross-connect.

Channel Unit insertion or removal

This pertains to channel units in an MDS, DT servers in an MDS, and channel units in DTs.

Change in TR-008 Digroup service state

This may be caused by a cross connection or a QLS port state change.

Change in Logical INA DS1 service state

This may be caused by a cross-connection or a QLS port state change.

Change in Line Group service state

This may be caused by common plug-in insertion/removal.

Change in line (T0) termination provisioning

Any time the ED-T0, ENT-T0, or DLT-T0 command is entered on the OS-NE interface or via the CIT, and successfully executes, a REPT DBCHG message is generated indicating the new settings.

Any time the CPY-T0 command is entered via the CIT, and successfully executes, a REPT DBCHG message is generated indicating a DLT-T0 operation, followed by a REPT DBCHG message indicating an ENT-T0 operation with the new settings.

Change in the number of timeslots

This applies to DT provisioning any time the DT provisioning is changed via the ED-DT command (supported only on the CIT.)

Change in TR-303 VRT service state

In Release 4, anytime the service state of a TR-303 VRT changes, a REPT DBCHG message is generated indicating the new state.

UPDATE

Anytime the UPDATE function is asserted, a REPT DBCHG is transmitted.

OUTPUT FORMAT

```

    sid date time
A atag REPT DBCHG
    "umb:ccb,aid,[com_block]:[spec_block]:[state_block];
;
```

Trailing commas after the last non-null parameter value within a parameter block are *not* included in the output message. Also, trailing colons after the last non-null parameter block are *not* included in the output message.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>A</i>	This indicates that the message is sent autonomously.
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the <i>SLC-2000</i> system. The <i>SLC-2000</i> system uses whole numbers from 001 through 999.

umb

Update management block. This parameter field is used for returning the time and date of the database change, and the source ID of the command that caused the change (when applicable). Parameters within the update management block are positionally independent and are specified using a name defined construct of: `PARAMETER=value` in a comma separated list. The parameters are listed and explained below.

TIME	This reflects the time that the database change occurred and is in the form: HH-MM-SS. The time is the same as the time that is in the REPT DBCHG message header.
DATE	This reflects the date that the database change occurred and is in the form: YY-MM-DD. The date is the same as the date that is recorded in the history log for the database change record.
SOURCE	If the database change occurs as a result of a TL1 command with a non-null <i>ctag</i> , the SOURCE field contains this value. Otherwise this parameter is not included in the message.

ccb Command code block. This is a single position defined parameter block which indicates the trigger information of the action which created the database update. If a TL1 command created this update, the command code parameter is specified in the form:

`<verb>-<modifier>[-<modifier>]`

If the database change was caused by a user interface command, a button push caused the database change, or a TBOS control input, the command code block contains the equivalent TL1 command which would have had to been entered to make the change. The format is shown above.

If the database change was caused by execution of the `SET-ATTR-rr` command, the command code block contains the `ENT-rr` command with the appropriate *rr* value.

If a plug-in insertion caused the database update, the command code parameter is set equal to `PLUGIN`. If a plug-in removal caused the database update, the command code is set to `UNPLUG`.

The Command Code Block is blank when reporting TR-008 digroup, and INA DS1, Line Group, and TR-303 VRT state changes.

For controller reset, the *ccb* will be equal to `RESET`. For the UPDATE function, the *ccb* will be equal to `UPD-SYS`.

aid Access identifier. This is the address of the object entity which the database update has affected.

For cross-connect changes, this is the pair of AIDs specified in the cross-connection command. For line termination provisioning changes, this field contains the AID of the line which was provisioned. For system initialization, `RESET`, and `UPDATE` events, this field will be null. For Digroup, INA DS1, Line Group, TR-303 VRT (when supported) or Channel Unit state changes, this field contains the AID of the entity for which the state change occurred. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.

com_block Common block. This is a position defined field. If the database change is the result of a TL1 command which contains parameters in this block, the parameter values are included in this block in the same order as the corresponding TL1 command.

spec_block Specific block. This is a name defined field. If the database change is the result of a TL1 command which contains parameters in this block, the parameter names and values are included in this block. Parameters within the specific block are positionally independent and are specified using a name defined construct of: *PARAMETER=value* in a comma separated list. The parameter names are the same as those for the corresponding TL1 command.

This field is null if the value in the *ccb* is one of the following: INIT-SYS, RESET, UPD-SYS, PLUGIN, or UNPLUG.

If the database change is the result of a (non-TL1) user interface command which contains parameters in this block, the equivalent TL1 parameter names and values are included in this block. The parameter names are the same as those for the corresponding TL1 command.

state_block State block. This is a position defined field. If a state change is being reported, the new state is included in this block. The valid parameters for the SLC-2000 system are the *pst* (primary state) and *sst* (secondary state). *ast* (associated state) is supported in Release 4. For definitions of states refer to AT&T 363-208-001, *SLC-2000 Access System User/Service Manual*.

EXAMPLE OUTPUT

```
ATT-SLC-2000 93-10-01 08:00:00
A 888 REPT DBCHG
  "TIME=07-59-20,DATE=93-10-01,SOURCE-123456r:
  ENT-CRS-STS3:m-1;c-2"
;
```

The following message is sent when the ENT-T0 command has been completed for line number 1 on CU number 1 on shelf number 1.

```
ATT-PF-2000 93-10-01 08:00:00
A 888 REPT DBCHG
  "TIME=07-59-20,DATE=93-10-01,ENT-T0:drop-1-1-1:
    5SCU69,FXO:IMP=600,BAL=15,XMTGN=3.25,RCVGN=2.50,
    SL=2,TD=YES,LSGS=LS,ohr=YES,rls=NO"
;
```

The following message is sent when CU number 1 on shelf number 1 is removed.

```
ATT-PF-2000 93-10-01 08:00:00
A 888 REPT DBCHG
  "TIME=07-59-20,DATE=93-10-01,UNPLUG:cu-1-1::OOS-MT,UEQ"
;
```

The following message is sent when Line Group 1 on shelf number 1 transitions from OOS to IS due to plug-in insertion.

ATT-PF-2000 93-10-01 08:00:00
A 888 REPT DBCHG
"TIME=07-59-20,DATE=93-10-01,PLUGIN:lgrp-1-1:::IS"
;

NAME

REPT EVT: Report Event

DESCRIPTION

REPT EVT messages are generated autonomously by the SLC-2000 system to report events (status conditions) that do not require alarm notifications.

If an event defaults to or is provisioned to have a nonalarm (NA) level, the occurrence of that event is reported in a REPT EVT message. This may include incoming low-speed facility failures and miscellaneous discrete environmental conditions as well as several other key status conditions. REPT EVT messages also occur when any such standing conditions clear.

OUTPUT FORMAT

```
sid date time
A atag REPT EVT modifier
  "[aid]:condtype,condeff,ocrdat,ocrtm,,[monval],
  [thlev][,tmper]:\"conddescr\"[: ,tblislt]"
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
A	This indicates the status message is sent autonomously.
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the SLC-2000 system. The SLC-2000 system uses only whole numbers from 001 through 999.

<i>modifier</i>	This is a message modifier to the REPT EVT message and has one of the following values:
COM	Common. This reports an event that is not an equipment or facility condition but applies to the whole SLC-2000 system. This is also used to report miscellaneous discrete environmental status conditions.
EC1	This reports a facility-related event at the electrical carrier signal level 1.
EQPT	This reports an equipment-related event.
OC3	This reports a facility-related event at the optical carrier signal level 3.
STS1	This reports a facility-related event at the synchronous transport signal level 1.
T1	This reports a facility-related event at the DS1 level.
T3	This reports a facility-related event at the DS3 level.
VT1	This reports a facility-related event at the virtual tributary signal level 1.5.
<i>aid</i>	Access identifier. This is the address of the equipment component or facility for which an event is being reported. The <i>aid</i> is null only if the modifier is COM. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>condtype</i>	Condition type. This has one of the values listed in Tables 3-13 and 3-14 at the end of this section.
<i>condeff</i>	Condition effect. This indicates the effect of the reported event on the condition of the SLC-2000 system and has one of the following values:
CL	Standing Condition Cleared.
SC	Standing Condition. This is a condition that is active for an extended period of time. If a REPT EVT message reports an event that results in a standing condition, then another REPT EVT message with a <i>condeff</i> = CL will be used to report when the standing condition no longer exists.
TC	Transient Condition. This is a condition that does not change the basic condition of the SLC-2000 system for an extended period of time. For example, a performance-monitoring (PM) threshold-crossing alert (TCA) is reported as a transient condition.
<i>ocrdat</i>	Occurrence date. This indicates the date of the event being reported and has the format MM-DD (month-day).

<i>ocrtm</i>	Occurrence time. This indicates the time of the event being reported and has the format HH-MM-SS (hours-minutes-seconds).
<i>monval</i>	Monitored value. For PM TCAs, this is the measured value of the parameter specified in <i>condtype</i> (=T- <i>montype</i>). Otherwise, this parameter is not reported.
<i>thlev</i>	Threshold level. If an incoming facility degradation or failure (or clear) is reported, the <i>thlev</i> value is the BER threshold level, in integer form, representing the closest negative power of 10 to the BER. For PM TCAs, this is the threshold level for the monitored parameter specified in <i>condtype</i> (=T- <i>montype</i>). Otherwise, this parameter is not reported.
<i>tmper</i>	Time period. For PM TCAs, this is the PM time interval. The values for this parameter are as follows: 15-MIN 15-minute interval (default value) 1-DAY daily interval Otherwise, this parameter is not reported.
<i>conddescr</i>	Condition description. This is the text description of the reported condition. If further explanation, including likely causes, of a reported condition is required, refer to Tables 3-9 and 3-10 at the end of this section. The descriptions of PM TCAs are self-explanatory.
<i>tblislt</i>	Trouble isolated. If a reported condition is isolated to the reported <i>aid</i> , the <i>tblislt</i> value is ISLTD to indicate that the <i>aid</i> identifies the circuit pack that should be replaced by craft to correct the reported condition. Otherwise, this parameter is not reported.

EXAMPLE OUTPUT

```

SITE7NE1 91-01-01 00:05:18
A 007 REPT EVT OC3
  "fn-c-1:T-OOF,TC,01-01,00-05-18,,,10,10,15-MIN:
  \"STS3 severely errored frame seconds (OOFs) - TCA\"
;

```

NAME

REPT PM: Report Performance Monitoring

DESCRIPTION

REPT PM messages are generated autonomously by the SLC-2000 system to report performance-monitoring (PM) data. The reports are output as specified in the SCHED-PMREPT TL1 command. The SCHED-PMREPT command establishes the schedule and PM data criteria for the REPT PM messages.

The information contained in a REPT PM message is effectively equivalent to a line in the response to a RTRV-PM command.

OUTPUT FORMAT

If there is no PM data to report, no PM report is output. That is, if no PM reports are scheduled, or if a PM report is scheduled but none of the PM data meets the criteria specified in the corresponding SCHED-PMREPT command, a REPT PM message is not output.

If there is PM data to report, the following report will be output:

```

sid date time
A atag REPT PM modifier
  "aid:montype,monval,[vldty],[locn],,tmper,
    [mondatt],[montm]"
    . . . . .
    . . . . .
    . . . . .
  "aid:montype,monval,[vldty],[locn],,tmper,
    [mondatt],[montm]"
;
```

Applicable output lines are ordered as follows:

1. by *aid* in order corresponding to the shelf architecture
2. by time intervals, starting with the current time interval
3. by applicable PM parameters per *aid*.

This is the same order of output as the RTRV-PM response.

REPT PM messages may be interrupted to output an autonomous REPT ALM or REPT EVT message or to simply fit a long report within an X.25 packet. When a long REPT PM message is interrupted, the message is interrupted at the end of a line. The last line output before the interruption is terminated with a ">", indicating a partial message. When an interrupted message is resumed, the network element repeats the message header lines then continues with the message.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier. This is the system name.												
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).												
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).												
<i>A</i>	This indicates that the message is sent autonomously.												
<i>atag</i>	Automatic tag. The <i>atag</i> is used for message sequencing. The number is incremented by one for each autonomous message sent by the SLC-2000 system. The SLC-2000 system uses whole numbers from 001 through 999.												
<i>modifier</i>	Modifier. This is the message modifier for the REPT PM message, and has one of the following values: <table> <tr> <td>EC1</td><td>This reports PM data at the electrical carrier signal level 1.</td></tr> <tr> <td>OC3</td><td>This reports PM data at the optical carrier signal level 3.</td></tr> <tr> <td>STS1</td><td>This reports PM data at the synchronous transport signal level 1.</td></tr> <tr> <td>T1</td><td>This reports PM data at the DS1 level.</td></tr> <tr> <td>T3</td><td>This reports PM data at the DS3 level.</td></tr> <tr> <td>VT1</td><td>This reports PM data at the virtual tributary signal level 1.5.</td></tr> </table>	EC1	This reports PM data at the electrical carrier signal level 1.	OC3	This reports PM data at the optical carrier signal level 3.	STS1	This reports PM data at the synchronous transport signal level 1.	T1	This reports PM data at the DS1 level.	T3	This reports PM data at the DS3 level.	VT1	This reports PM data at the virtual tributary signal level 1.5.
EC1	This reports PM data at the electrical carrier signal level 1.												
OC3	This reports PM data at the optical carrier signal level 3.												
STS1	This reports PM data at the synchronous transport signal level 1.												
T1	This reports PM data at the DS1 level.												
T3	This reports PM data at the DS3 level.												
VT1	This reports PM data at the virtual tributary signal level 1.5.												
<i>aid</i>	Access identifier. This is the address of the EC1, OC-3 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which PM data is being reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.												
<i>montype</i>	Monitored parameter type. This is the PM parameter type for which PM data is being reported. This has one of the values specified in Table 3-11 located at the end of this section.												
<i>monval</i>	Monitored value. This is the measured value of the parameter specified in <i>montype</i> .												

<i>vldty</i>	Validity indicator. This identifies the validity of the PM data and may have the value <i>PRTL</i> , to indicate that the data is partial (that is, accumulated over some portion of the reported time period <i>tmper</i>). This includes counts that overflow their registers, counts that are corrupt, and counts that are not available because of trouble conditions that cause PM to be suspended.
<i>locn</i>	Location. This parameter has the value <i>FEND</i> for far-end DS1 PM data <i>only</i> . For near-end PM data, <i>locn</i> is not reported.
<i>tmper</i>	Time period. This parameter has the value 15-MIN or 1-DAY.
<i>mondat</i>	Monitored date. This is the beginning date of the interval for which PM data is being reported. This parameter has the format MM-DD (month-day). If <i>mondat</i> is the current date, then <i>mondat</i> is not reported.
<i>montm</i>	Monitored time. This is the beginning time of the interval for which PM data is being reported. This parameter has the format HH-MM (hours-minutes). If the value of <i>tmper</i> is 1-DAY, <i>montm</i> is not reported.

EXAMPLE OUTPUT

```

ATT-SLC-2000 93-10-01 12:05:00
A 812 REPT PM T3
  "b:PYERR-L, 1,,,15-MIN,,11_45"
  "b:PYERR-L, 1,,,15-MIN,,11_30"
  "b:PYERR-L, 1,,,15-MIN,,11_15"
  "b:PYERR-L, 1,,,15-MIN,,11_00"
  ;

```

NAME

REPT SW: Report Switch

DESCRIPTION

REPT SW command messages are generated autonomously by the SLC-2000 system to report equipment (that is, circuit pack) protection switches for the SONET subsystem. Equipment protection switches associated with OC-3 line protection switches are *not* reported via this command.

OUTPUT FORMAT

```
IP ctag

    sid date time
A ctag REPT SW
    "actid,stbyid"
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
A	This indicates the message is sent autonomously.
<i>atag</i>	Automatic tag. This is used for message sequencing. The number is incremented by one for each autonomous message sent by the network element. The network element uses only whole numbers from 000 through 999.
<i>actid</i>	Active access identifier. This is the slot address of the <i>active</i> circuit pack. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot addresses.

stbyid Standby access identifier. This is the slot address of the *standby* circuit pack. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot addresses.

EXAMPLE OUTPUT

```
ATT-SLC-2000 93-11-26 16:44:49
A 123 REPT SW
  "fn-a-1,fn-a-2"
;
```

This page intentionally left blank.

NAME

ACT-USER: Activate User

INPUT FORMAT

ACT-USER:*tid:uid:ctag:pid;*

DESCRIPTION

The ACT-USER command is initiated to set up a session with the Network Element.

An active TL1 access login session is required at each NE in order to interact with that NE (including receiving autonomous message output as well as using TL1 commands).

A maximum of one active login session is allowed per Network Element, per access channel. Any subsequent login attempt while a session is still active is denied. The term "access channel" refers to an X.25 virtual circuit.

This command is available to all types of users. Network Element login security is always enabled.

When the Network Element receives an ACT-USER command, the given login ID will initiate a login session on the Network Element provided that:

- logins are enabled on the access port,
- a provisioned login ID and correct password are entered, and
- Network Element login security is enabled (for non-privileged users only).

Until a successful login attempt is complete for a given Network Element and virtual circuit, there is no communications (autonomous or command responses) outbound from the Network Element, except to DENY unsuccessful login attempts. No response will be provided for any command with an invalid syntax or parameters (other than the *uid* and *pid*), unless the same access channel has an active login session with the Gateway Network Element. In those cases only, some other invalid commands are denied by the GNE (refer to the RTRV-HDR ERROR RESPONSES section for details).

**NOTE:**

If the X.25 link to the GNE fails, all active X.25 logins are terminated without notice to the user. Similarly, all active logins to a remote Network Element are terminated if a communication failure occurs between the GNE and that remote Network Element, or if either the GNE, the targeted remote

Network Element or an intermediate Network Element is reset or initialized. Communication failures include OC3 and DCC failures, unless protected in rings, between the GNE and the targeted remote Network Element, also.

INPUT PARAMETERS

- tid* Target identifier. This is the name of the Network Element to which the command is addressed.
- uid* User identifier. This is the unique user login identifier for which the ACT-USER login command is intended.
- Valid *uid* values for the ACT-USER command are case-sensitive alphanumeric strings of 5 to 10 characters which have been previously provisioned as valid login IDs in the Network Element.
- Grouping and/or ranging of *uid* values for this command is not allowed.
- Three classes of users are allowed, as listed below in order of decreasing privilege:
- Privileged Users
 - General Users
 - Reports Only Users
- ctag* Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.
- pid* Private identifier. This required parameter is the confidential password authenticator for a the given *uid*. Valid *pid* values consist of case-sensitive strings of six to ten alphabetic, numeric and symbolic characters where at least two are non-alphabetic and at least one is symbolic (whitespace is ignored). Password strings are transmitted in unencrypted form in the ACT-USER command. Passwords are encrypted when stored in the Network Element, and are never transmitted from the Network Element.

OUTPUT FORMAT

If the login request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
"uid"
/* AT&T <system>
   <release>
   User Privilege Level: <privilege>
   AT&T - PROPRIETARY
   THIS SOFTWARE CONTAINS INFORMATION OF AT&T
   AND IS NOT TO BE DISCLOSED OR USED EXCEPT
   IN ACCORDANCE WITH APPLICABLE AGREEMENTS.

   NOTICE: THIS IS A PRIVATE COMPUTER SYSTEM.
   USE OF THIS SOFTWARE IS GOVERNED
   SOLELY AS EXPRESSLY AUTHORIZED IN THE
   RELEVANT AGREEMENT BETWEEN AT&T AND CUSTOMER.
   UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.

*/
;
```

The following string is used for the <system> value:
SLC-2000 Access System

The <release> string is of the form:

DLC Release x.y.z, SONET Release x.y.z

where x.y.z reflects the actual software release numbers of the two subsystems.

The <privilege> string will have one of the following values reflecting the user's privilege level:

PRIVILEGED

GENERAL

REPORTS

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, and *ctag* included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR. The remainder of the output parameter variables are described below.

uid User Identifier. This is included in the command by the OS and repeated by the Network Element as a confirmation that the given user identifier is successfully logged in.

lastlog This output field is null.

attempts This output field is null.

EXAMPLE INPUT/OUTPUT

No response message is transmitted except to convey that the login is granted (or denied). The following example shows a successful login session initiation attempt.

```
ACT-USER:ATT-PF-2000:PeterPan:123456::N*v*rL*d3;
```

```
ATT-PF-2000 93-10-26 16:42:11
M 123456 COMPLD
"PeterPan"
/* AT&T SLC-2000 Access System
   DLC Subsystem Release 3.22.10
   SONET Subsystem Release 6.2.1
      User Privilege Level: REPORTS
      AT&T - PROPRIETARY
      THIS SOFTWARE CONTAINS INFORMATION OF AT&T
      AND IS NOT TO BE DISCLOSED OR USED EXCEPT
      IN ACCORDANCE WITH APPLICABLE AGREEMENTS.

      NOTICE: THIS IS A PRIVATE COMPUTER SYSTEM.
      USE OF THIS SOFTWARE IS GOVERNED
      SOLELY AS EXPRESSLY AUTHORIZED IN THE
      RELEVANT AGREEMENT BETWEEN AT&T AND CUSTOMER.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.

  */
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the ACT-USER command, also.

For invalid login tries, the error response message is transmitted only after both *uid* and *pid* are provided by the session requester. The error response message does not indicate if the *uid*, *pid*, or both are invalid.

If the Network Element receives an ACT-USER command with an invalid *uid*, invalid *pid*, or both invalid entries, or if a login session is already active on the access channel, the following error response is returned:

```
sid date time
M ctag DENY
DENY
/* Login Failed */
;
```

If the Network Element receives an ACT-USER command for the same login session already active on the access channel, with the same *uid*, the same *pid*, but a different, recently changed privilege level the following error response is returned:

```
sid date time
M ctag DENY
PICC
/* Privilege, Illegal Command Code, original login privilege
active */
;
```

NAME

ALW-MSG: Allow Message

INPUT FORMAT

ALW-MSG-modifier.tid:[aid]:ctag[:,,];

DESCRIPTION

The ALW-MSG command is initiated by a user to resume transmission of autonomous messages from a SLC-2000 system if autonomous message reporting from that network element had been inhibited.

This command will allow users to resume transmission of autonomous messages, office alarms, and/or parallel telemetry from a network element. The SLC-2000 system reports all active alarm and status conditions to all users, depending upon OS type, when any one user resumes reporting of autonomous messages after they have been inhibited.

When autonomous message reporting to the user is resumed after having been inhibited, the network element reports messages in the following order:

1. autonomous message reporting is allowed in an autonomous REPT EVT message
2. autonomous REPT messages updating the user with the current alarm and status conditions of the network element.

If there are no active alarm or status conditions to report, the network element returns a normal completion response to the ALW-MSG command and reports that autonomous message reporting is allowed in an autonomous REPT EVT message.

INPUT PARAMETERS

<i>modifier</i>	Modifier. The value for this parameter must be ALL.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This value must be all or null, because the entire system is affected. The default is all.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the login request completes successfully, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If the *SLC-2000* system receives an *ALW-MSG* command from a user when transmission of all autonomous messages, office alarms, and/or parallel telemetry, had already been enabled, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, and *ctag* included in the normal completion response are specified in the *OUTPUT PARAMETERS* section for *RTRV-HDR*.

EXAMPLE INPUT/OUTPUT

```
ALW-MSG-ALL:ATT-SLC-2000::123xyz;  
  
IP 123xyz  
<  
ATT-SLC-2000 93-06-06,09:30:49  
M 123xyz COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **ALW-MSG** command, also.

If an **ALW-MSG** command is received with any command code modifier other than **ALL**, the following error response is returned:

```
sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, invalid MODIFIER */
;
```

If an **ALW-MSG** command is received with an invalid *aid* value, the following error response is returned:

```
sid date time
M  ctag DENY
   IIAC
   /* Input, Invalid Access identifier */
;
```


NAME

CANC-USER: Cancel User

INPUT FORMAT

CANC-USER: *tid:uid:ctag*,

DESCRIPTION

The **CANC-USER** command can be initiated to terminate a login session with the Network Element.

When the Network Element receives an **CANC-USER** command, the given login identifier will terminate a login session on the Network Element provided that:

- a provisioned login identifier is entered, and
- the login identifier is currently active on the access channel on which the command is received.

After the **CANC-USER** command successfully completes, an autonomous message is sent, via all access channel(s) provisioned to receive such messages and on which a login session is active, to report that the login session has been terminated.

This command is available to all users.

INPUT PARAMETERS

tid Target identifier. This is the name of the Network Element to which the command is addressed.

uid User identifier. This is the unique case sensitive user login identifier for which the **CANC-USER** logout command is intended.

The *uid* value that was used to initiate a login session, even if changed or deleted by a system administrator while the current login session is still active, is the *uid* value expected in the **CANC-USER** command to terminate the login session.

Grouping and/or ranging of *uid* values for this command is not allowed.

ctag Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the logout request completes successfully, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If the Network Element receives a valid **CANC-USER** command, but the addressed *uid* is not currently logged in on the access channel, the Network Element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

The following example shows a successful login session termination.

```
CANC-USER:ATT-PF-2000:PeterPan:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-10-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **CANC-USER** command, also.

NAME

DLT-CRS-rr: Delete Cross-connections

INPUT FORMAT

DLT-CRS-*modifier*:*tid*:*src_aid*,*dest_aid*:*ctag*;

The DLT-CRS-rr command messages can be initiated by a user to request the SLC-2000 system to take down STS-1 and VT1.5 cross-connections in a SLC-2000 system. The DLT-CRS-t0 command message is used to perform the same function for T0 cross-connections. The DLT-CRS-t0 command message is covered in its own manual page. Cross-connections are always two-way. A drop and continue or pass-through cross-connection can be established in the SLC-2000 system by setting the appropriate parameters at the command line.

Refer to the ENT-CRS-rr command pages for details on the restrictions on cross-connections for add/drop and path protected rings applications.

When the SLC-2000 system receives a DLT-CRS-rr command from the OS, the SLC-2000 system will take down a STS-1/VT-1.5 channel in the high speed OC3 line cross-connection according to the parameter settings in the command.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the DLT-CRS-rr command. This may have one of the following values: STS1 This specifies that an STS-1 cross-connection be taken down. VT1 This specifies that a VT-1.5 cross-connection be taken down.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>src_aid</i>	Source access identifier. This is the valid address of a STS-1 or VT1.5 channel in the high speed OC3 line or low speed port or channel of the SLC-2000 system. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The value all is not valid for this command.

desc_aid Destination access identifier. This is the valid address of a STS-1 or VT1.5 channel in the high speed OC3 line or low speed port or channel of the *SLC-2000* system. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The value *a11* is not valid for this command.

ctag Correlation tag. This is included in the command by the OS and is repeated by the *SLC-2000* system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

Refer to the **RTRV-HDR OUTPUT FORMAT** section. The requirements listed there apply to this command also.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR** command for an explanation of the output parameters.

EXAMPLE INPUT/OUTPUT

```
ENT-CRS-STSl:ATT-SLC-2000-3:m-2,b:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000-3 93-11-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the **RTRV-HDR** error responses.

The following error conditions are listed in the order and priority that the *SLC-2000* system checks for each condition.

If the *SLC-2000* system receives a *DLT-CRS-rr* command with a command code modifier other than *STS1* or *VT1* the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If the *SLC-2000* system receives an *DLT-CRS-rr* command without a *src_aid* or *dest_aid* value or with a *src_aid* or *dest_aid* value that is inconsistent with the *modifier* specified in the input command, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier, AID is
missing wrong or inconsistent with the modifier */
;
```

If the *SLC-2000* system receives an otherwise valid *DLT-CRS-rr* command for which the system does not support cross-connection between the *src_aid* and

dest_aid parameter values, then the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, cross connection
   not supported between the specified AIDs */
;
```

If the *SLC-2000* system receives an otherwise valid *DLT-CRS-rr* command but for which the cross-connection cannot be deleted because the cross-connect mode of the system is not currently set to *manual*, the following error response is returned to the user:

```
sid date time
M ctag DENY
  SNVS
/* Status, Not in Valid State, system currently
   provisioned for default cross-connections */
;
```

NAME

DLT-CRS-T0 : Delete a T0 cross-connection.

INPUT FORMAT

DLT-CRS-T0 : *tid*:*Address1*,*Address2*:*ctag*;

DESCRIPTION

This command is issued to the Network Element to delete a cross-connect between a VRT logical line or logical INA DS0 and a physical line or ITH link. Refer to AT&T 363-208-001, *SLC-2000 Access System User/Service Manual*, for a description of the DS0 cross-connection feature in the the *SLC-2000* system.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. The <i>tid</i> is a required parameter.
<i>Address1</i>	This is the address of the logical VRT line or the logical INA DS0 entity in the cross connect. This is a required parameter. In Release 3, this may be one of: { vrt dp-1-8 } { 1-96 }, inads0-1-28 } { 1-24 } } In Release 4, <i>Address1</i> may also be any valid logical TR303 VRT line: { v3dp-1-1536 } }
<i>Address2</i>	This is the address of the physical line entity in the cross connect. This is a required parameter. In Release 3, this may be one of: { drop-1-8 } { 1-24 } { 1-4 }, dtdp-1-8 } { 1,3,5,7,13,15,17,19 } { 1-6 } { 1-4 }, ithlink-1-2 } }
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associated the command and response messages. The <i>ctag</i> is a required parameter.

OUTPUT FORMAT

If the cross-connection is deleted by this command, the following response is returned to the user:

```
sid date time
ctag COMPLD
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements here apply to the DLT-CRS-T0 command also.

EXAMPLE INPUT/OUTPUT

```
DLT-CRS-T0:ATT-PF-2000:vrt dp-8-94,drop-1-1-4:124365;

IP 124365
<

ATT-PF-2000 93-07-11 13:01:11
M 124365 COMPLD
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The requirements here apply to the DLT-CRS-T0 command also.

If the SLC-2000 system receives a DLT-CRS-T0 command without an *Address1* or *Address2* value, or with an *Address1* or *Address2* that is not a valid logical or physical line supported by the SLC-2000 system, the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access identifier,
   AID is missing, wrong or inconsistent with the modifier */
;
```

If the DLC subsystem non-volatile memory for data storage has failed, this command is denied with the following response:

```
sid date time
M ctag DENY
SSTP
/* Status, Stopped,
   Data memory failed. */
;
```

If a software installation is in-progress, this command is denied with the following response:

```
sid date time
M ctag DENY
SSRE
/* Status, System Resources Exceeded,
   Software installation in-progress.
   Try again after installation is complete. */
;
```

If the cross-connection comment does not exist, the following denial message will be displayed:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State,
   The specified cross-connection does not exist */
;
```

NAME

DLT-T0: Delete a T0 line termination (on a channel unit).

INPUT FORMAT

DLT-T0:*tid:aid:ctag*;

DESCRIPTION

Return the provisioning information for a physical line to the default settings.

When a valid DLT-T0 command with a valid aid value is received, the system shall set all parameters for the line to null and shall set the primary service state to OOS-MA-UAS.

INPUT PARAMETERS

<i>tid</i>	Target Identifier. This is the name of the network element to which the command is addressed. The <i>tid</i> is a required parameter on the user interface.
<i>aid</i>	Access Identifier. This is the address of the Physical Line for which the provisioned values are to be cleared. Valid values are: { drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4} }
<i>ctag</i>	Correlation Tag. This must be included in the command and is repeated by system in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

In response to a valid DLT-T0 command, the following output shall be returned to the user regardless of the primary service state of the line prior to execution of the command:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements listed there apply here also.

EXAMPLE INPUT/OUTPUT

```
DLT-T0:ATT-PF-2000:drop-1-8-4:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR OUTPUT

Refer to the RTRV-HDR ERROR RESPONSES section. The requirements here apply to the DLT-T0 command also.

The following error messages apply to the DLT-T0 command:

If a DLT-T0 command is received with an aid that is not valid for the DLT-T0 command, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If an attempt is made to provision a fiber drop AID within a distribution shelf which is not provisioned for FITL distribution, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
the shelf for AID is not provisioned for
fiber distribution. */
;
```

If the DLC subsystem non-volatile memory for data storage has failed, this command is denied with the following response:

```
sid date time
M ctag DENY
SSTP
/* Status, Stopped,
   Data memory failed. */
;
```

If a software installation is in-progress, this command is denied with the following response:

```
sid date time
M ctag DENY
SSRE
/* Status, System Resources Exceeded,
   Software installation in-progress.
   Try again after installation is complete. */
;
```

If an attempt is made to provision a metallic drop AID within a distribution shelf which is provisioned for FITL distribution, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the shelf for AID is not provisioned for
   metallic distribution. */
;
```

If an attempt is made to provision a fiber drop AID with a channel number greater than the number of DS0s for which the supporting MSDT server is provisioned (e.g., attempt to ent-t0::dtdp-1-3-4-1 when dt-1-3 is provisioned to serve 12 lines), the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the DT server for AID is currently provisioned for a
   maximum of n lines. */
;
```

Note: *n* may be {0, 12, 24} (the current provisioned DT bandwidth.)

NAME

DLT-USER-SECU : Delete User Security

INPUT FORMAT

DLT-USER-SECU:*tid*:*uid*:*ctag*,

DESCRIPTION

The DLT-USER-SECU command is used by an appropriate administrator to delete the security parameters associated with a user. This is applicable when a user account is being closed. This command can not be executed by non-privileged users when the TL1 security feature is on. Privileged user accounts cannot be deleted.

INPUT PARAMETERS

tid Target identifier. This is the name of the network element to which the command is addressed.

uid This is the User Identifier of a user. Its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. Only a single *uid* is supported in the command.

ctag Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the Network Element fully complies with the delete user security request, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

```
DLT-USER-SECU:ATT-PF-2000:kjlee:123456;
```

```
IP 123456
```

```
<
```

```
ATT-PF-2000 93-10-26 16:42:11
```

```
M 123456 COMPLD
```

```
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the DLT-USER-SECU command, also.

If the Network Element receives a DLT-USER-SECU command with a non-existing *uid* (user identifier), the following error response is returned:

```
sid date time
```

```
M ctag DENY
```

```
IDNV
```

```
/* Input, Data Not Valid, invalid UID */
```

```
;
```

NAME

ED-DAT: Edit Date and Time

INPUT FORMAT

ED-DAT:*tid::ctag::date[,time]*;

DESCRIPTION

The ED-DAT command is initiated to request the SLC-2000 system to change its system date and time to a given value.



CAUTION:

Execution of this command may corrupt performance monitoring data.

The activation time of some pending commands may be skipped or repeated as a result of changing the system date or time of the network element. Appropriate actions should be taken to ensure the proper execution of these commands.

Delayed activation is not allowed for this command.

INPUT PARAMETERS

- tid* Target identifier. This is the name of the network element to which the command is addressed.
- ctag* Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
- date* Date. This is the requested date in the following format: YY-MM-DD, where YY is the last two digits of the year ranging from 00 to 99; MM is the month of the year ranging from 01 to 12; and DD is the day of the month ranging from 01 to 31.
- time* Time. This is the requested time in the following format: HH-MM-SS, where HH is the hour in a 24 hour format ranging from 00 to 23; MM is the minute ranging from 00 to 59; and SS is the second ranging from 00 to 59. If not specified, *time* remains the same.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, *ctag*, and *COMPLD* included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
ED-DAT:ATT-SLC-2000::123xyz:93-06-06,09-30-45;

IP 123xyz
<
ATT-SLC-2000 93-06-06,09:30:49
M 123xyz COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to this command, also.

If the *SLC-2000* system receives an *ED-DAT* command with an incorrectly formatted date or time, the following error response is returned:

```
sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid date or time specified */
;
```

The value of DD is also checked for sanity with MM (e.g. February 30 can not exist), and for sanity with YY for MM-DD equaling 02-29 for leap years. Also, values of HH $\geq$ 24, MM > 59, and/or SS > 59 are invalid. If an error of this type occurs, the following error response is returned:

```
sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid date or time specified */
;
```

NAME

ED-PID: Edit Private Identifier (Password)

INPUT FORMAT

ED-PID:*tid:uid:ctag::old_pid,new_pid;*

DESCRIPTION

The ED-PID command can be initiated to change a users' private identifier (PID), or password, on the Network Element.

When the Network Element receives an ED-PID command, the password associated with the given login identifier will be changed on the Network Element provided that:

- the login identifier is currently active on the access channel on which the command is received,
- the *old_pid* provided matches the current password for the login identifier, and
- the *new_pid* provided satisfies the password requirements of the network element.

This command is available to all users.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the Network Element to which the command is addressed.
<i>uid</i>	User identifier. This is the unique case-sensitive user login identifier for which the ED-PID login command is intended. Grouping and/or ranging of <i>uid</i> values for this command is not allowed.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.

old_pid Old private identifier (password). This is included in the command by the user and must exactly match the current PID for the login identifier.

new_pid New private identifier (password). This is included in the command by the user and is to become the new password for the login identifier. Valid *new_pid* values consist of case sensitive strings of six to ten alphabetic, numeric and symbolic characters where at least two characters are non-alphabetic and at least one is symbolic (whitespace is ignored). Password strings are transmitted in unencrypted form in the ED-PID command. Passwords are encrypted when stored in the Network Element, and are never transmitted from the Network Element.

The *new_pid* value must differ from the *old_pid* value by at least one character.

OUTPUT FORMAT

If the password change request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

The following example shows a successful password change operation.

```
ED-PID:ATT-PF-2000:PeterPan:123456::soup3r+,8_6oober;
```

```
IP 123456
```

```
<
```

```
ATT-PF-2000 93-10-26 16:42:11
```

```
M 123456 COMPLD
```

```
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the ED-PID command, also.

If the network element receives a ED-PID command with a login identifier specified by *uid* that is not currently logged in on the access channel over which the command is received, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
PIUI  
/* Privilege, Illegal User Identity, user ID not logged in */  
;
```

If the network element receives a ED-PID command with an *old_pid* value that does not match the currently provisioned *pid* for the associated user login identifier, the following error response is returned to the OS:


```
sid date time
M ctag DENY
  PIUI
  /* Privilege, Illegal User Identity, invalid OLD_PID */
;
```

If the network element receives a ED-PID command with a missing *new_pid*, or a *new_pid* that does not meet the the required attributes of a valid user login identifier password, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  PIUI
  /* Privilege, Illegal User Identity, invalid NEW_PID */
;
```

If the network element receives a ED-PID command with d *new_pid* value equal to the *old_pid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  PIUI
  /* Privilege, Illegal User Identity, NEW_PID same as OLD_PID
  */
;
```

NAME

ED-T0 : Adjust a physical line on a metallic channel shelf or in a distant terminal served by the *SLC-2000* system.

INPUT FORMAT

ED-T0:*tid:aid:ctag:: [CLEI] [,FunctionCode] [:spec_block]*;

DESCRIPTION

Adjust a physical line on a metallic channel shelf or in a distant terminal served by the *SLC-2000* system. This command is similar to the **ENT-T0** command. This command is required to support the "rearrange" (i.e. adjust) function.

INPUT PARAMETERS

<i>tid</i>	Target Identifier This is the name of the network element to which the command is addressed. The <i>tid</i> is an required parameter.
<i>aid</i>	Access Identifier. This is an address which identifies the Physical Line to be provisioned on the metallic channel shelf or in the distant terminal. Valid values are any Physical Line AID: { drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4} }
	There is no default.
<i>ctag</i>	Correlation Tag. This must be included in the command and is repeated by system in the response to allow the user to associate the command and response messages.
<i>CLEI</i>	<i>CLEI</i> is the first six digits of the CLEI code of the channel unit which will be used to equip the slot to provide the desired service. Allowable and default values are documented in the ENT-T0 command.

FunctionCode *FunctionCode* is explained in the "Function Codes" section of the ENT-T0 command manual pages.

spec_block The parameters in the *spec_block* are the same as those for the ENT-T0 command, and are likewise dependent upon the *FunctionCode*. These parameters are described in the "Definitions of Parameters" section of the ENT-T0 command manual pages.

OUTPUT FORMAT

If the system fully complies with the physical line provisioning request, the following output message is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements listed there apply here also.

EXAMPLE INPUT/OUTPUT

```
ED-T0:ATT-PF-2000:drop-8-24-1:123456:::IMP=900,BAL=1;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements here apply to the **ED-T0** command also.

In addition, the following error messages apply to the **ED-T0** command:

If an **ED-T0** command is received with the same parameter specified more than once, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
IISP  
/* Input, Invalid Syntax or Punctuation */  
;
```

If an **ED-T0** command is received with an aid that is not valid for the **ED-T0** command, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If an ED-T0 command is received with an invalid parameter value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   Invalid parameter_name */
;
```

Where *parameter_name* is the name of the parameter (as specified above in the INPUT FORMAT) for which an invalid entry was made.

If an attempt is made to provision a fiber drop AID within a distribution shelf which is not provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the shelf for AID is not provisioned for
   fiber distribution. */
;
```

If an attempt is made to provision a metallic drop AID within a distribution shelf which is provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the shelf for AID is not provisioned for
   metallic distribution. */
;
```

If an attempt is made to provision a fiber drop AID with a channel number greater than the number of DS0s for which the supporting MSDT server is provisioned (e.g., attempt to ent-t0::dtdp-1-3-4-1 when dt-1-3 is provisioned to serve 12 lines), the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the DT server for AID is currently provisioned for
   a maximum of n lines. */
;
```

Note: *n* may be {0, 12, 24} (the current provisioned DT bandwidth.)

If a valid CLEI code is entered but it cannot be supported on the line that is specified in the command, the following error message shall be generated:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   cannot support CLEI code CLEI_code for line AID */
;
```

If the ED-T0 command is received for a line which is in the OOS-MA-UAS state, the following error message shall be returned:

```
sid date time
M ctag DENY
SNVS
/* Status Not in Valid State, PST=OOS-MA-UAS */
;
```

NAME

ED-USER-SECU: Edit User Security

INPUT FORMAT

ED-USER-SECU:*tid:uid:ctag::[new_uid],[new_pid],[uap]*;

DESCRIPTION

The ED-USER-SECU command is used by an appropriate administrator to edit the security parameters associated with a user.

**NOTE:**

This command is available to privileged users only.

This command enables a privileged user to edit the login ID, password, and/or user privileges of any non-privileged user and any other privileged user.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>uid</i>	User identifier. This is the identifier of a user whose information is to be changed. Its valid values are a case-sensitive alphanumeric string of 1 to 10 characters.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>new_uid</i>	New User Identifier. The valid values are a case-sensitive alphanumeric string of 5 to 10 characters. If omitted in the input format, this parameter is not changed.
<i>new_pid</i>	New Password. The valid values are a case-sensitive alphanumeric string of 6 to 10 alphabetic, numeric and symbolic characters where at least two characters are non-alphabetic and at least one is symbolic (white space is ignored). If omitted in the input format, this parameter is not changed.
<i>uap</i>	User Access Privilege. This has one of the following values: general or reports-only . If omitted in the input format, this parameter is not changed.

OUTPUT FORMAT

If the network element fully complies with the command request, the following normal completion response is returned:

```
sid date time
M  ctag COMPLD
;
```

If the ED-USER-SECU command does not alter existing user security parameters, the network element provides a normal completion response.

If the user identified by the *uid* being changed by this command is currently logged into any network element when this command is executed, that user is disconnected and the network element responds to the user who entered the ED-USER-SECU with the completion message.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

```
ED-USER-SECU:ATT-PF-2000:kjlee:123456::ilf,pass12#,,general;

IP 123456
<

ATT-PF-2000 93-10-26 16:42:11
M 123456 COMPLD
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to this command, also.

If the network element receives an ED-USER-SECU command from a user trying to change his or her own *uid* (user identifier) and/or a *uap* value, the following error response is returned:

```
sid date time
M ctag DENY
PICC
/* Privilege, Illegal Command Code */
;
```

If the network element receives an ED-USER-SECU command with an invalid *uid* (user identifier) value, the following error response is returned:

```
sid date time
M ctag DENY
PIUI
/* Privilege, Illegal User Identity, invalid UID */
;
```

If the network element receives an ED-USER-SECU command with a *new_uid* (new user identifier) that matches an existing *uid* (user identifier), other than the one specified in the *uid* field, the following error response is returned:

```
sid date time
M ctag DENY
PIUI
/* Privilege, Illegal User Identity, duplicate NEW_UID */
;
```

If the network element receives an ED-USER-SECU command with an invalid *new_uid* (new user identifier) value, the following error response is returned:

```
sid date time
M ctag DENY
PIUI
/* Privilege, Illegal User Identity, invalid NEW_UID */
;
```

If the network element receives an ED-USER-SECU command with an invalid *new_pid* (password) value, the following error response is returned:

```
sid date time
M ctag DENY
PIUI
/* Privilege, Illegal User Identity, invalid NEW_PID */
;
```

If the network element receives an ED-USER-SECU command with a *uap* (user access privilege) other than **general** or **reports**, or if one **privileged** user tries to make another **privileged** user non-privileged, the following error response is returned:

```
sid date time
M ctag DENY
PIUC
/* Privileged, Illegal User Code, invalid UAP */
;
```

NAME

ENT-CRS: Enter Cross-Connection

INPUT FORMAT

ENT-CRS-modifier:tid:src_aid,dest_aid:ctag[:[cct]:
spec_block]];

DESCRIPTION

The ENT-CRS command can be initiated by a user to request the *SLC-2000* system to establish STS-1 or VT-1.5 cross-connections in a *SLC-2000* OC-3 system. The *SLC-2000* system may be configured for linear, add/drop, or ring applications. Cross-connections in the *SLC-2000* system are always two-way. A drop-and-continue or a pass-through cross-connection can be established in the *SLC-2000* by setting the appropriate parameters in the command line.

Each STS-1 or VT-1.5 channel in the high speed OC-3 line is always connected to *exactly one* of the following sets of destinations:

- a. none (that is, no cross-connection. This is the *SLC-2000* system original value for all cross-connections)
- b. a low-speed port (for two-way add/drop cross-connection)
- c. a low-speed channel in the SONET line terminating on a circuit pack in a low-speed slot (for two-way drop non-terminated cross-connection)
- d. the same numbered channel of the other OC-3 high speed line (for two-way pass through cross-connection in path-switched rings)
- e. the same numbered channel of the other OC-3 high speed line *and* one low speed port or channel (for drop and continue).

The established cross-connection will remain in effect until modified by another TL1 command or by an appropriate CIT command.

INPUT PARAMETERS

<i>modifier</i>	Modifier. This is the message modifier for the ENT-CRS command, and may have only one of the following values: STS1 This specifies that an STS-1 cross-connection be established. VT1 This specifies that a VT-1.5 cross-connection be established.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. This is a required parameter.
<i>src_aid</i>	Source access identifier. This is a required parameter and must address a valid STS-1 or VT-1.5 channel in the high speed OC-3 line or low-speed port or channel of the SLC-2000 system. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The address <code>all</code> is not valid for this command parameter.
<i>dest_aid</i>	Destination access identifier. This is a required parameter and must address a valid STS-1 or VT-1.5 channel in the high speed OC-3 line or low-speed port or channel of the SLC-2000 system. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The address <code>all</code> is not valid for this command parameter.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the SLC-2000 system in the response to allow the user to associate the command and response messages.

cct

Cross-connection type. This parameter specifies the type of cross-connection be requested. This parameter may be null or have one of the following values:

2WAY	This value is allowed only for linear systems. This requests a two-way add/drop cross-connection between the source and destination be established (this is the default value for linear systems).
2WAYPR	This value is allowed only for ring applications. This requests a two-way add/drop cross-connection between the source and destination in a path-switched ring be established (this is the default value for ring systems).
2WAYBR	This value is allowed only for ring applications. This requests a drop-and-continue cross-connection between the source and destination be established.

If the *cct* value is null, the default value is used.

spec_block Specific block. This parameter field is used for most basic capabilities of the ENT-CRS command. Parameters set within the specific block are positionally independent and are set using a construct of `PARAMETER=value` in a comma separated list. Furthermore, each parameter listed below shall appear only once within the specific ENT-CRS command.

For each of the parameters below there is listed one or more parameter values. The use of the term "null" in the descriptions below implies that the parameter does not appear in the command.

In the *SLC-2000* path-switched rings, the drop-and-continue cross-connection command will set up a number of cross-connections internal to the *SLC-2000* system necessary for the correct operation. These cross-connections are:

- a one-way pass-through cross-connection for the specified channel in the high speed OC-3 line of the chosen ring
- a one-way drop cross-connection from the same channel in the high speed OC-3 line of the two rings to the specified low speed port or channel
- a one-way add cross-connection between the specified low speed port or channel to the specified channel in the high speed OC-3 line of the other ring.

Since the drop-and-continue can be set up from either of the two rings, the user will be required to specify the ring to set up the drop-and-continue from. In the *SLC-2000* system OC-3 rings, the main-1 receive fiber has been designated to carry Ring 1 and the main-2 receive fiber has been designated to carry Ring 2.

It is worth noting that although the `RING` parameter is settable for each `VT1` path in an OC-3 system, due to hardware limitation, the value of the `RING` parameter set for the first `VT1` path will determine the drop-and-continue direction for all the other `VT1` paths in that OC-3 system. A conflict will result in an error condition.

The following parameter values may appear in the *spec_block*:

<code>RING</code>	If the <code>cct</code> is <code>2WAYBR</code> or <code>2WAYPR</code> , then this specific block parameter must be specified. For OC-3 ring applications, this parameter must have one of the following two values.
<code>M1</code>	Specifies that the cross-connection must be set up for Ring 1 to drop-and-continue.
<code>M2</code>	Specifies that the cross-connection must be set up for Ring 2 to drop-and-continue.

OUTPUT FORMAT

In the command request completes successfully, the following normal completion response is returned :

```
sid date time
ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR** .

EXAMPLE INPUT/OUTPUT

```
ENT-CRS-STSI:ATT-PF-2000-3:m-2,b:123456;

IP 123456
<

ATT-PF-2000-3 93-10-26 16:42:11
M 123456 COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The error responses listed there apply to the **ENT-CRS** command also.

If the network element receives a ENT-CRS command with the same parameter specified more than once, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation,
   parameter(s) multiply defined */
;
```

If the SLC-2000 OC-3 system receives an ENT-CRS command with a command code modifier other than STS1 or VT1, the following response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If a SLC-2000 system receives an ENT-CRS command without a *src_aid* or *dest_aid* value or with a *src_aid* or *dest_aid* value that does not identify either a single STS-1 or VT-1.5 channel in the high speed OC-3 line or a single low-speed port or channel, the following response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   AID is missing, wrong or inconsistent with the modifier */
;
```

If a SLC-2000 OC-3 system receives an ENT-CRS-VT1 command with either the *src_aid* or *dest_aid* value pointing to a VT1 channel of a STS1E CP while the corresponding STS1 port is in the NMON state, the following error response is returned to the user:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State, EC1 port is in OOS state */
;
```

If a linear *SLC-2000* system receives an ENT-CRS command with a *cct* value other than null or 2WAY, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid CCT */
;
```

If a ring *SLC-2000* system receives an ENT-CRS command with a *cct* value other than null, 2WAYPR, or 2WAYBR, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid CCT */
;
```

If a *SLC-2000* system ring receives an ENT-CRS command with a *cct* value set to 2WAYPR, but the source and destination AIDs represent two different high speed time slots of the ring, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, Pass-through grooming not allowed */
;
```

If a ring SLC-2000 system receives an ENT-CRS command with a *cct* value set to 2WAYBR but without the RING parameter set in the *spec_block*, the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   RING parameter must be set when CCT is 2WAYBR */
;
```

If a SLC-2000 ring system receives an ENT-CRS command with RING parameter in the *spec_block* with the *cct* set to a value other than 2WAYBR, the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   RING parameter is valid only when CCT is set to
   2WAYBR */
;
```

If a SLC-2000 OC-3 ring system receives an ENT-CRS-VT1 command with a *cct* set to 2WAY and with RING parameter in the *spec_block* whose value conflicts with the RING parameter value already set for another VT1 path, the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid RING */
;
```

If a SLC-2000 system receives an otherwise valid ENT-CRS command for which the system does not support cross-connection between the *src_aid* and *dest_aid* parameters values (for example, a and b in an OC-3 system; commonly known as hair pinning arrangement), the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   cross-connection not supported between the specified AIDs
*/
;
```

If a *SLC-2000* system receives an otherwise valid *ENT-CRS* command but for which, the *SLC-2000* system is not properly equipped, the following error response is returned to the user:

```
sid date time
M ctag DENY
  ENSI
  /* Equipage, shelf equipage does not allow requested
    cross connection */
;
```

If a *SLC-2000* system receives an otherwise valid *ENT-CRS* command but for which the cross-connection cannot be made because the addressed *src_aid* or *dest_aid* is already involved in an existing cross-connection, the following error response is returned to the user:

```
sid date time
M ctag DENY
  SACC
  /* Status, Already Cross Connected */
;
```

If a *SLC-2000* system receives an otherwise valid ENT-CRS command but for which the cross-connection cannot be made because the cross-connect mode of the system is not currently set to *manual*, the following error response is returned to the user:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State, system currently
   provisioned for default ccross-connections */
;
```


NAME

ENT-rr: Enter Attributes of a given transmission entity
(SLC-2000 SONET subsystem)

INPUT FORMAT

ENT-modifier:tid:aid:ctag{[::spec_block] |[::pst]};

The ENT-rr command messages can be initiated by an OS or OS users to provision parameter values for the valid address entered. The ENT-T0 command message performs the same function for the T0 parameter which is used for subscriber drops. The ENT-T0 command message is covered in its own manual page.

The provisioned values remain active until modified (for example, another TL1 ENT-rr command, or by a CIT command).

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the ENT-<i>rr</i> command. This is a required parameter and may have one of the following values:
T0	This is used for subscriber drops. The ENT-T0 command message is covered in its own manual page.
T1	This is for the DS1 level external interfaces.
T3	This is for the DS3 level external interfaces.
EC1	This is for the electrical STS1 level external interfaces.
OC3	This is for the optical OC3 level external interfaces.
STS1	This is for the dropped STS-1 channels in OC3 applications where 22F-type and 22D OLIU circuit packs are used.
VT1	This is for the dropped VT-1 channels in OC3 applications where 22F-type and 22D OLIU circuit packs are used.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the entity for which the current provisioned values are requested. The <i>aid</i> must reference a valid entity of the SLC-2000 system in order to be accepted. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The value a11 is not valid for this command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages. Valid values for <i>ctag</i> include strings of up to 6 characters comprised of identifiers (alphanumerics begin with a letter) or decimal numerals (a string of decimal digits with an optional nontrailing ".").

spec_block Specific block. This parameter field is used for most basic capabilities of the ENT-rr command. This parameter block is optional but is allowed only when the *pst* parameter is not specified. Parameters set within the specific block are positionally independent and are set using a name defined construct of: *PARAMETER=value*. The specific block shall have none or some of the following parameters set within it in a comma separated list. Furthermore, each parameter listed below shall appear at most once within the specific block for a single ENT-rr command. The parameters are listed in an alphabetic order.

For each of the parameters below there is listed one or more parameter values. Unless stated otherwise, for each sub-list of values, the first entry is the SLC-2000 system original value which is used unless overridden through TL1 or CIT command. If a parameter value does not appear in the *spec_block*, its value remains unchanged as a result of the ENT-rr command. The use of the word "null" in the descriptions below imply that the parameter does not appear or appears with no value (for example, AIS=,BPV=,) in the command.

AIS Alarm Indication Signal. This parameter is valid only when the *modifier* is T1 or T3. The AIS parameter is used to specify if DS1 or DS3 AIS should be inserted toward the optical fiber when DS1 or DS3 LOS from the DSX is encountered at the DS1 or DS3 port(s) addressed by the *aid*. When the *modifier* is T3, the values received by the SLC-2000 system in this parameter is used only if the LINECDE is CCHAN*. In this case of DS3, setting AIS=Y, also will make the SLC-2000 system insert DS3 AIS toward the DSX-3 when it enters the OC3 signal fail or STS path AIS state incoming from the fiber. This parameter shall be null or have one of the following values:

Y	Insert AIS. This is the original value for DS1s.
N	Do not insert AIS. This is the original value for DS3s.

When the *modifier* is T1, and BPV is set to Y, the AIS parameter value will be ignored, and the SLC-2000 system will internally set AIS=N.

* AIS is always inserted when the DS3 LINECDE is B3ZS.

BPV

DLCBPV to LOS indicator. This parameter is used to determine if incoming DS1 BiPolar Violations (BPV) threshold crossing will be translated to outgoing all zeros DS1 signal (LOS) for the DS1 ports addressed by the *aid*. This parameter is valid only when the *modifier* is T1 and consequently to SLC-2000 systems. This parameter shall be null or have one of the following values:

- N Do not send all zeroes. This is the original value.
- Y Setting this parameter to y permits the central office terminal of a digital loop carrier system (such as SLC 96 carrier system) to detect this all zeroes signal as loss of signal (LOS) and switch to the protection DS1 as it would have done if it had directly received the original BPVs.

CONCAT

This parameter is valid only when the *modifier* is OC3. This parameter is used to specify the concatenation mode of the OC3 line to be independent channels or an STS-3c channel. This parameter is valid only for linear OC3 releases where the STS-3c feature has been enabled and may be null or may have only one of the following values:

- disabled If the concatenation mode is disabled the channels in the OC3 line are independent.
- enabled If the concatenation mode is enabled, the three STS-1 channels recovered from the OC3 signal in the MAIN slots are passed as STS-3c signal to the FN-C where they are reconstructed back into an OC3 signal. Both MAIN and FN-C must be equipped before concatenation mode can be enabled. The proper cross connection must have been established prior to issuing this command. Those cross connections are $m-1 \leftrightarrow c-1$; $m-2 \leftrightarrow c-2$; $m-3 \leftrightarrow c-3$.

FMT

This parameter is used to specify the DS1 digital signal format incoming from the DSX-1 to the specified DS1 port(s). This parameter is valid only when the *modifier* is T1 and applies only to SLC-2000 systems and only if the specified DS1 port is equipped with a DS1 PM circuit pack. This parameter may be null or have one of the following values:

SF	Super Frame, supports near-end DS1 PM only.
ESF	Extended Super Frame, supports near-end and far-end DS1 PM.
ESFN	Extended Super Frame, supports near-end DS1 PM only.

For DS3, this parameter is used to specify the DS3 performance monitoring scheme to be used for signals incoming from the HS fiber to the specified DS3 port(s). This parameter is valid only if the *LINECODE* parameter is not set to CCHAN. This parameter may be null or have one of the following values:

PBIT	The DS3 PM report will display counts of SEFS as well as DS3 P-bit CV, ES, SES, and UAS. This is the default value.
FMBIT	The DS3 PM report will display counts of SEFS as well as DS3 adjusted F&M bit CV, ES, SES, and UAS.

The values specified by this **FMT** parameter take effect only if the DS1 PM mode has been enabled by setting the **PMMD** parameter to ON for the DS1 port specified by the *aid*.

KBYTE

This parameter is used only when the *modifier* is OC3. **KBYTE** specifies the usage of the K byte overhead for Synchronization Messages. Both the sending and receiving messages are affected. This parameter is valid on both linear and ring OC3 releases and may be null or may have only one of the following values:

enabled	If the KBYTE is enabled, proprietary synchronization messages are used.
disabled	If the KBYTE is disabled, proprietary synchronization messages are not used.

SLC-2000 Access System**TL1 Command/Response Message**

LINECDE	DS1 and DS3 Line Coding. When the <i>modifier</i> is T3, the <i>LINECDE</i> parameter is used in combination with the <i>AIS</i> and <i>PBIT</i> parameters to determine the SLC-2000 VMR mode*.	
	NOOVRD	This parameter value is allowed only when the <i>modifier</i> value is T1. Hence it applies only to SLC-2000 systems. This will allow the line coding provisioned by the switch setting on the DS1 circuit pack to be effective. This is the original value.
	AMI	This parameter value is allowed only when the <i>modifier</i> value is T1. It applies only to SLC-2000 systems. In order to monitor coding violations of the DS1 signal at the port(s) addressed by the <i>aid</i> other than bipolar violations, the <i>LIN-ECDE</i> parameter must be set to AMI. This will override the line coding provisioned by the switch setting on the DS1 circuit pack.
	B8ZS	This parameter value is allowed only when the <i>modifier</i> value is T1. It applies only to SLC-2000 systems. In order to operate the DS1 port(s) addressed by the <i>aid</i> monitoring bipolar violations, the <i>LINECDE</i> parameter must be set to B8ZS. This will override the line coding provisioned by the switch setting on the DS1 circuit pack.

* The allowed SLC-2000 VMR modes are *Violation Monitor and Removal* (the original value is VMR); *Violation Monitor only* (VM); *Clear Channel with DS3 AIS insertion* (CC w/ AIS); or *Clear Channel without DS3 AIS insertion* (CC w/o AIS).

B3ZS	This parameter value is allowed only when the <i>modifier</i> value is T3. In order to operate the DS3 port(s) addressed by the <i>aid</i> monitoring P-bit violations (either VMR or VM mode), the <i>LINECDE</i> parameter must be set to B3ZS. This is the original value for DS3s.
CCHAN	This parameter value is allowed only when the <i>modifier</i> value is T3. In order to operate the DS3 port(s) addressed by the <i>aid</i> in clear channel mode, (either CC w/ AIS or CC w/o AIS mode), the <i>LINECDE</i> parameter must be set to CCHAN.

NTFCNCDE Notification code. This parameter is used to set the alarm level of the entity failures serviced by the addressed (*aid*). This parameter is valid only when the *modifier* is T1, T3, or EC1. The *NTFCNCDE* parameter may be null or have one of the following values:

CR	Critical Alarm. This is the original value if the <i>modifier</i> value is T3, and EC1. It is not allowed when the <i>modifier</i> value is T1.
MJ	Major Alarm.
MN	Minor Alarm.
NA	Not alarmed. This is the original value if the <i>modifier</i> value is T1.

PBIT DS3 P-bit monitoring. This parameter is allowed only when the *modifier* is T3. The *PBIT* parameter is used in combination with the *LINECDE* and *AIS* parameters to determine the SLC-2000 system VMR mode. If the value of the parameter *LINECDE* is set to CCHAN, the values of this parameter *PBIT* will be ignored.

ON	In order to operate the DS3 port(s) addressed by the <i>aid</i> monitoring and removing P-bit violations (VMR), <i>PBIT</i> parameter must be set to ON. This is the original value.
OFF	In order to operate the DS3 port(s) addressed by the <i>aid</i> in monitoring P-bit violations (VM), the <i>PBIT</i> parameter must be set to OFF.

The following brief table illustrates the valid combinations of *LINECDE*, *AIS* and *PBIT* values used to set the four VMR modes of the SLC-2000 system.

SLC-2000 DS3 Port VMR Provisioning
(using ENT-rr)

VMR Mode	LINECDE	AIS	PBIT
VMR	B3ZS	Ignored	ON
VM	B3ZS	Ignored	OFF
CC w/ AIS	CCHAN	Y	Ignored
CC w/o AIS	CCHAN	N	Ignored

PMMD DS1 Performance Monitoring Mode. This parameter is allowed only when the *modifier* is T1 or T3. The *PMMD* parameter specifies if DS1 or DS3 performance monitoring must be enabled or not for the port addressed by the *aid*. This is allowed for DS1 or DS3 ports equipped with DS1 or DS3 performance monitoring circuit packs. This parameter may be null or have a one of the following values:

OFF PM turned off. This is the original value when the *modifier* is T1.

ON PM turned on. This is the original value when the *modifier* is T3.

If PM is turned on, then the expected digital signal format is specified by the *FMT* parameter.

SFTHR	Signal Failure threshold. This parameter is used to set the signal failure threshold in terms of bit error rate (BER) for the entities addressed by the <i>aid</i> . When the <i>modifier</i> is STS1 or VT1, this parameter only applies to dropped (as opposed to pass-through) signals. This parameter shall be null or have one of the following values:
0	This sets the path signal degrade protection switch threshold at a BER of 0 in path protection switched rings. This value is allowed only when the modifier is STS1 or VT1. Selecting this value for SFTHR effectively disables the path signal degrade protection switching.
-3	This sets the signal failure threshold at a BER of 10^{-3} . This is the original value for this parameter for DS3 and DS1 modifiers. This value is not valid for OC3, STS1 and VT1 modifiers and for EC1 modifier of an OC3 system.
-5	This sets the signal failure threshold at a BER of 10^{-5} . This value is allowed only when the modifier is OC3, STS1, VT1 or EC1.
-6	This sets the signal failure threshold at a BER of 10^{-6} . This is the original value for the T1, T3, EC1, OC3, STS1 and VT1 modifiers.
-7	This sets the signal failure threshold at a BER of 10^{-7} . This value is allowed only when the modifier is OC3, STS1, VT1, EC1, STS1 or VT1.
-8	This sets the signal failure threshold at a BER of 10^{-8} . This value is allowed only when the modifier is OC3, STS1, VT1 or EC1.
-9	This sets the signal failure threshold at a BER of 10^{-9} . This value is allowed only when the modifier is OC3, STS1 or EC1.
pst	Primary State. This parameter is used to set the primary state of the DS1, DS3, and EC1 low speed port(s) and STS1 and VT1 channel(s) addressed by the <i>aid</i> field. The SLC-2000 system does not support the setting of secondary states using the ENT-rr command. This optional parameter is allowed only when the <i>spec_block</i> parameter is not specified. When the STS1 port is set to be used in the electrical multiplexer application provisioning of port state for that port is not allowed. An STS1 port is in such an application when the HW setting of the corresponding STS1E CP in the OC3 system is High Speed or when the STS1 signal set for VT1 cross connection.

The *SLC-2000* system allows for user provisioning of two basic states: *AUTO* and *NMON*. When a *SLC-2000* system low speed port is provisioned in the *AUTO* state, it will automatically transition to the in-service (*IS*) state upon detection on the low speed port of a valid input. *AUTO* is the original primary state. When the *SLC-2000* system low speed port is provisioned in the *NMON* state, the monitoring of incoming signals is disabled. The port exits this state to the *AUTO* state through either another *ENT-rr* command or via the corresponding CIT command (for example, *SET-STATE-rr*).

oos-MA-AS Out of service, memory administration, assigned. This is the original *pst* state, and in the terminology of the *SLC-2000* SONET subsystem, is known as *AUTO*.

oos Out of service ("for Memory Administration" implied). This *pst* value will effectively place the *SLC-2000* system in the service state, known in the *SLC-2000* SONET subsystem terminology as *NMON*.

The *SLC-2000* SONET subsystem allows for user provisioning of 2 basic states: *AUTO* and *NMON*. When a *SLC-2000* system channel state is provisioned in the *AUTO* state, it will automatically transition to the in-service (*IS*) state upon detection on the channel of a valid non-AIS, non-LOP signal. *AUTO* is the original state for the *SLC-2000* system channels. When the *SLC-2000* system STS1 or VT1 channel is provisioned in the *NMON* state, the monitoring of incoming signals is disabled. The channel exits this state to the *AUTO* state through either another *ENT-rr* command or via the corresponding CIT command (eg., *SET-STATE-rr*).

oos-MA-AS Out of service, memory administration, assigned. This is the original *pst* state, and in the terminology of the *SLC-2000* system, is known as *AUTO*.

oos Out of service ("for Memory Administration" implied). This *pst* value will effectively place the addressed channel in the service state, known in the *SLC-2000* system terminology as *NMON*.

A (non-provisionable) third primary port/channel state is supported by the *SLC-2000* system, *IS* ("in service"). The *SLC-2000* system low speed ports/channels in the *AUTO* state will automatically transition to the *IS* state upon detecting a valid incoming signal.

Since all the provisionable values are specified through the *spec_block* and *pst* parameters, an *ENT-rr* command without *spec_block* and *pst* parameters will result in no action by the *SLC-2000* system.

OUTPUT FORMAT

In response to a valid ENT-*rr* command, the following output report is returned to the OS, sorted by alphanumeric order of the *aid* value:

```
sid date time  
M ctag COMPLD
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR command for an explanation of the output parameters.

EXAMPLE INPUT/OUTPUT

```
ENT-T3:ATT-SLC-2000:a:123456:::AIS=N,NTFCNCDE=MN,  
SFTHR=-3,LINECDE=CCHAN;
```

```
IP 123456  
<
```

```
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the ENT-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a **ENT-rr** command with both the *spec_block* and *pst* parameter, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, spec_block
   and pst cannot both be specified in one command */
;
```

If the SLC-2000 system receives a **ENT-rr** command with any extra (beyond the input format specifications listed above) null or non-null command parameter blocks, parameters, or termination characters, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

If a SLC-2000 system receives a ENT-*rr* command with a command code modifier other than T0, T1, T3, EC1, STS1, VT1, or OC3, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If a SLC-2000 system receives a ENT-*rr* command without an *aid* value or with an *aid* value that is invalid for the *modifier* provided, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
AID missing or inconsistent with modifier value */
;
```

If a SLC-2000 system receives a ENT-rr command with an otherwise valid *aid* value but for which the corresponding slot is equipped at all, the following error response is returned to the user:

```
sid date time
M ctag DENY
  ENEQ
  /* Equipage, Not Equipped */
;
```

If a SLC-2000 system receives a ENT-rr command with an otherwise valid *aid* value but for which the corresponding slot is equipped with an incompatible circuit pack, the following error response is returned to the user:

```
sid date time
M ctag DENY
  ENRI
  /* Equipage, Not equipped for Retrieving specified
    Information */
;
```

If a SLC-2000 system receives a ENT-rr command with the same parameter specified more than once, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IISP
  /* Input, Invalid Syntax or Punctuation, parameter(s)
    multiply defined */
;
```


If the SLC-2000 system receives a *ENT-rr* command with otherwise valid *spec_block* parameter values, but inconsistent with the *modifier* provided (as detailed in the following list), the following error response is returned to the user:

- setting DS3 parameter, *PBIT*, or DS3 parameter values *NTFCNCDE=CR*, *LINECDE=B3ZS* or *CCHAN*, in an *ENT-T1* command with a *modifier* other than *T3*,
- setting DS1 parameter, *BPV*, *FMT*, *PMMD* or DS1 parameter values *LINECDE=NOOVRD/AMI/B8ZS* in an *ENT-T1* command with a *modifier* other than *T1*,
- setting the *specific_block* parameters *KBYTE* when the *modifier* is not *OC3*,
- setting the *specific_block* parameter *CONCAT* when the *modifier* is not *OC3*
- setting the *specific_block* parameter *CONCAT* when the *modifier* is *OC3* but the *aid* is not *fn-c*,
- setting the *specific_block* parameter *APPLICATION* in on *OC3* system when the *modifier* is not *OC3*,
- setting *specific_block* parameters other than *SFTHR* when the *modifier* is *STS1* or *VT1*,
- setting the *PST* parameter when the *modifier* is *OC3*,
- setting *SFTHR* to -9 when the *modifier* is *VT1*,
- setting the *SFTHR* to 0 when the *modifier* is not *STS1* or *VT1*,
- setting *SFTHR=-3* when the *modifier* is *EC1* in an *OC3* system or when the *modifier* is *STS1*, *VT1*, *OC3*.

```

sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid,, parameter settings inconsistent
   with modifier */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *PBIT* value that is not supported, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid PBIT */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *FMT* value that is null or not supported by *SLC-2000*, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid DS1 FMT */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *FMT* value that is null or not supported by the *SLC-2000* system, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid DS1 FMT */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *PMMD* value that is not supported by the *SLC-2000* system, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid DS1 PMMD */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *modifier* of T1 or T3 and with a *SFTHR* value that is not supported by the *SLC-2000* system, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid DS1 SFTHR */
;
```

If a *SLC-2000* system receives a *ENT-rr* command with a *modifier* of *oc3* and with an *APPLICATION* value that is not supported by the *SLC-2000* system, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid APPLICATION */
;
```

NAME

ENT-CRS-T0: Create a cross-connection between a logical line and a physical line.

INPUT FORMAT

ENT-CRS-T0:*tid:Address1,Address2:ctag;*

DESCRIPTION

This command is used to create a cross-connection between a logical VRT line or logical INA DS0 and a physical line or ITH link. Refer to AT&T 363-208-001, SLC-2000 Access System User/Service Manual, DS0 cross-connection section.

INPUT PARAMETERS

<i>tid</i>	Target identifier.
<i>Address1</i>	This is the address of the logical VRT line or the logical INA DS0 to be cross-connected to a physical line or ITH link. There is no default. This may be one of: { vrtdp-{1-8}-{1-96}, inads0-{1-28}-{1-24} } In Release 4, <i>Address1</i> may also be any valid logical TR303 VRT line: { v3dp-1-{1-1536} }
<i>Address2</i>	This is the address of the physical line or ITH link to be cross-connected to a logical line. There is no default. This may be one of: { drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4}, ithlink-{1-2} }
<i>ctag</i>	Correlation tag.

OUTPUT FORMAT

In response to a valid ENT-CRS-T0 command, the following output report is returned to the user:

```
sid date time
ctag COMPLD
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements here apply to the ENT-CRS-T0 command also.

EXAMPLE INPUT/OUTPUT

```
ENT-CRS-T0:ATT-PF-2000:vrt dp-2-4,drop-6-2-3:123456;

IP 123456
<

ATT-PF-2000 93-07-11 13:01:11
M 123456 COMPLD
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The requirements here apply to the ENT-CRS-T0 command also.

The following error responses are listed in the order and priority that the SLC-2000 system checks for each condition.

If the *SLC-2000* system receives a *ENT-CRS-T0* command without an *Address1* or *Address2* value, or with an *Address1* or *Address2* that is not a valid logical or physical line supported by the *SLC-2000* system, the following error response is returned:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
    AID is missing, wrong or inconsistent with the modifier */
;
```

If the DLC subsystem non-volatile memory for data storage has failed, this command is denied with the following response:

```
sid date time
M ctag DENY
  SSTP
  /* Status, Stopped,
    Data memory failed. */
;
```

If a software installation is in-progress, this command is denied with the following response:

```
sid date time
M ctag DENY
  SSRE
  /* Status, System Resources Exceeded,
    Software installation in-progress.
    Try again after installation is complete. */
;
```

If the cross-connection request is for a checkerboarded (i.e. non-standard) cross-connection to a logical line on a TR-008 Mode 2 VRT, the following denial message will be displayed:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State,
   Invalid cross-connection request for a TR-008 Mode 2 VRT. */
;
```

If an attempt is made to cross-connect a fiber drop *AID* within a distribution shelf which is not provisioned for FITL distribution, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the shelf for AID is not provisioned for
   fiber distribution. */
;
```


If an attempt is made to cross-connect a metallic drop *AID* within a distribution shelf which is provisioned for FITL distribution, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the shelf for AID is not provisioned for
   metallic distribution. */
;
```

If an attempt is made to cross-connect a fiber drop *AID* with a channel number greater than the number of DS0s for which the supporting MSDT server is provisioned (e.g., attempt to ent-crs-t0::vrt dp-1-1, dtdp-1-3-4-1 when dt-1-3 is provisioned to serve 12 lines), the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the DT server for AID is currently provisioned
   for a maximum of n lines. */
;
```

Note: *n* may be {0, 12, 24} (the current provisioned DT bandwidth.)

If this command is invoked using addresses where active cross-connections already exist, (unless both addresses are in the same cross-connection), the following denial message will be displayed:

```
sid date time
M ctag DENY
SACC
/* Status, Already Cross-Connected,
Establishing new cross-connections requires that existing
cross-connections associated with these addresses must
be deleted first. */
;
```

If both addresses are in the same cross-connection, the command completes without any warning or error messages.

NAME

ENT-SYS: Set Network Element name and other system level parameters

INPUT FORMAT

ENT-SYS:[tid]:[aid]:ctag[::spec_block];

DESCRIPTION

The ENT-SYS command messages can be initiated by OS users to modify system attributes associated with that network element at the system level, but not associated with any particular facility or equipment unit. Only the attributes specified in the command will be changed; those attributes not in the command remain as before.

**NOTE:**

If security is enabled on any CIT, DCC or TL1 port on the network element, the system level parameters of this command are available only to the privileged users for all ports on the network element.

When a network element receives an ENT-SYS command from a user, the network element will modify its system level attributes with the received attributes if the received attributes are different from the currently effective attributes at the system.

If the command requests a change in the *gne* designation, the network element restarts its program. This action will erase all of the performance monitoring data and the history file, and reinitialize the date and time with the far end system. However, this command will be executed only when the entered command actually modifies the attributes at the network element. Restarting the program will also cause the network element to drop user links including the one through which this command is received. This will prevent the network element from sending a completion response back to the initiator of the command.

System level attributes remain in effect until modified (for example, by another execution of the TL1 command ENT-SYS or by the appropriate CIT command) or until overridden by system initialization.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. The <i>aid</i> value mst be either <i>system</i> or null. The default is <i>system</i> .
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages. Valid values for <i>ctag</i> include strings of up to 6 characters comprised of identifiers (alphanumerics begin with a letter) or decimal numerals (a string of decimal digits with an optional nontrailing "."). Specific parameter block. The system level attributes to be modified are specified inside the <i>spec_block</i> . Parameters within <i>spec_block</i> are specified using a <i>name=value,name=value,...</i> type construct with no constraints on the order of the arrangement of parameters. Constructs such as <i>name1=value1, name2=, name3=, name4=, name5=value5,...</i> are acceptable and in this example only the parameters <i>name1</i> and <i>name5</i> will be attempted to be changed at the NE. If the current value of the parameter <i>name1</i> is already <i>value1</i> in the above example, then <i>name1</i> will not be changed. For the ENT-SYS command, the <i>spec_block</i> may contain one or more of the following parameters:
<i>new_tid</i>	New target identifier. This is the new name of the network element to which the command is addressed.
<i>ds-ne</i>	Directory service network element (DS-NE). The <i>ds-ne</i> is the NE for OSI releases where a map listing all active nodes in the network is maintained.
<i>gne</i>	Gateway network element. The <i>gne</i> has a value of <i>yes</i> or <i>no</i> . The default paramter is <i>no</i> . The <i>gne</i> must be set to <i>yes</i> to enable the physical TL1/X.25 interface. When TL1 is used, only one network element in a subnetwork may be designated as the <i>gne</i> ; otherwise TL1 messages will be lost.

<code>crs</code>	Cross-connect mode. For the SONET subsystem this parameter may be set to <code>default</code> or <code>manual</code> . The <code>default</code> mode sets default cross-connections. Refer to AT&T 363-208-001, <i>SLC-2000 Access System User/Service Manual</i> , for a list of default and valid cross-connections. In the <code>manual</code> mode, all cross-connections are entered manually using the <code>ENT-CRS-STST1</code> , <code>ENT-CRS-VT1</code> , <code>DLT-CRS-STST1</code> , and <code>DLT-CRS-VT1</code> CIT commands. In ring applications, this parameter is set to <code>manual</code> and cannot be changed.
<code>dcc</code>	DCC mode used in the ring system. This parameter has the values <code>distinct</code> or <code>identical</code> .

If the *spec_block* is null, the currently effective attributes at the network element system prevail.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the command request, the following message is returned to the OS:

```
IP ctag
    sid date time
M ctag COMPLD
;
```



NOTE:

If the `ENT-SYS` command is valid and does not alter the existing system level attributes, the *SLC-2000* system will not deny the command. Instead the system will respond with the completion message.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the `OUTPUT PARAMETERS` section for `RTRV-HDR`.

EXAMPLE INPUT/OUTPUT

```
ENT-SYS:ATT-SLC-2000:SYSTEM:123456::::CRS=MAN;
```

```
IP 123456
```

```
1-BROAD-ST-CO 93-11-26 16:44:49  
M AbC123 COMPLD  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If a network element receives an ENT-SYS command with a *new_tid* value that is not valid, or a value that is the same as that for some other network element in that subnetwork, the following error response is returned:

```
sid date time  
M ctag DENY  
IDNV  
/* Input Data Not Valid, invalid NEW_TID */  
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *ds-ne* value other than *yes* or *no*, the following error message is returned:

```
sid date time
M ctag DENY
IDNV
/* Input Data Not Valid, invalid DS-NE */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *gne* value other than *yes* or *no*, the following error message is returned:

```
sid date time
M ctag DENY
IDNV
/* Input Data Not Valid, invalid GNE */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *gne* value that causes a "duplicate gne" condition in the subnetwork, the following error message is returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *crs* attribute that is invalid, the following error message is returned:

```
sid date time
M ctag DENY
  ICNV
/* Input, Command Not Valid, invalid spec_block parameter */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *crs* value other than manual or default, the following error message is returned:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid CRS */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *crs* value of default, while the current cross-connect mode at the network element is set to manual and cross-connections other than the default cross-connections existing in the system, the following error message is returned:

```
sid date time
M ctag DENY
  SNVS
/* Status, system Not in Valid State */
;
```


If the *SLC-2000* system receives an *ENT-SYS* command with an invalid *aid* value, the following error message is returned:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier */
;
```

If the *SLC-2000* system receives an *ENT-SYS* command with a *spec_block* parameter setting not currently supported, the following error message is returned:

```
sid date time
M ctag DENY
  IDNV
  /* Input, Command Not Valid, invalid spec_block parameter */
;
```

If a *SLC-2000* system receives an *ENT-SYS* command with an *aid* value that is invalid for a *SLC-2000* system, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier, invalid AID */
;
```

NAME

ENT-T0: Enter a T0 line termination (on a channel unit).

INPUT FORMAT

The input format is dependent upon the chosen values for the *CLEI* and *FunctionCode* parameters.

ENT-T0: *tid:aid:ctag::com_block:spec_block;*

DESCRIPTION

Provision a physical line on a metallic channel shelf or in a distant terminal served by the SLC-2000 system. The state model found in AT&T 363-208-001, SLC-2000 Access System User/Service Manual, describes the effects of this command on the state of a line.

INPUT PARAMETERS

<i>tid</i>	Target Identifier. This is the name of the network element to which the command is addressed. The <i>tid</i> is a required parameter.
<i>aid</i>	Access Identifier. This is an address which identifies the Physical Line to be provisioned on the metallic channel shelf or in the distant terminal. Valid values are any Physical Line AID: { drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4} } There is no default.
<i>ctag</i>	Correlation Tag. This must be included in the command and is repeated by system in the response to allow the user to associate the command and response messages.
<i>com_block</i>	Common block. This parameter field is used for returning the currently provisioned parameter values for the physical lines. Parameters within the common block are position dependent and are listed below in the order they appear.

<i>CLEI</i>	<i>CLEI</i> is the first six digits of the <i>CLEI</i> code of the channel unit which will be used to equip the slot to provide the desired service. Allowable values are { 5SCU69, 5SCU6A, 5SCU6E, 5SCU6F, 5SCU7D, 5SCU48, 5SC143, 5SC1JE, 5SC1HE, 5SCU38, 5SC133, 5SCU7C, 5SCU7B, 5SCUCD, SAC1AE, SAC1AH, SAC1BF, SAC1BG, Other }, where Other pertains to any channel unit besides the ones listed above. Other is the original value.
<i>FunctionCode</i>	<i>FunctionCode</i> is explained in the "Function Codes" section below.
<i>spec_block</i>	Specific block. This parameter field is used for returning the currently provisioned parameter values for the physical lines. Parameters within the specific block are positionally independent and are specified using a name defined construct of: <i>PARAMETER=value</i> in a comma separated list. The set of parameters returned is dependent upon the provisioned values of the <i>CLEI</i> and Function Codes. The system will return the parameters within the <i>spec_block</i> in the order shown in the Input Format. The parameters in this block are described below for each type of CU.

Function Codes

The following table shows the choices for the *FunctionCode* given a particular *CLEI* code. The default is the current value, unless the *CLEI* code for a Physical Line is changed, in which case the default choice is the emboldened entry from the following table.

CLEI Codes	Supported Function Codes
5SCU69, 5SCU6E, SAC1AH	FXO , DPT, TO
5SCU6A, 5SCU6F, SAC1AE	FXS , DPO, TO
5SCU7D, 5SCUCD	FX[S,T][1,2,3,5] , DX4[N,R] ETO4 TO4
5SCU7C, SAC1BF	FX[O,P][1,2,3,5] TD[O,S][A,B,C,D]
5SCU7B, SAC1BG	EM4[C,H] , PLR[1,2]
5SCU48, 5SC143	OCU
5SCU38, 5SC133	DS0A , DS0B
5SC1JE, 5SC1HE	BRI
Other	DFLT (Release 3) DFLT , LS, GS, RVT, LR, AC, NO, DATA, GO, LO, (Release 4)

The function code definitions are:

- AC Manual Ringdown.
- BRI Basic Rate Interface Transmission Extension for ISDN service.
- DATA AdTran Digital Data Service
- DFLT Default to equipped function (function not provisioned, circuit function is determined by current equipment). The function code for certain channel units can be derived from equipment, in addition to be explicitly specified. This includes POTS, multiparty, coin, frequency selective ringing, DID, Manual Ring-down, PLAR, and DC bypass pair or alarm channel units. This is the original value.
- DPO 2-Wire Dial-Pulse Originating
- DPT 2-Wire Dial-Pulse Terminating
- DS0A Single customer DS0 signal
- DS0B Multiple customer DS0 signal
- DX4N 4-Wire Duplex Duplex Signaling and Signaling Leads Normal.
- DX4R 4-Wire Duplex Duplex Signaling and Signaling Leads Reversed.
- EM4C E&M Signaling, Type I

EM4H	E&M Signaling, Type II
ETO4	4-Wire Equalized Transmission only - No DC Signaling
FX0	2-Wire Foreign Exchange - Office End
FX01	4-Wire Foreign Exchange - Office End with Loop-Start Signaling, Signaling Leads Normal, and No Toll Diversion
FX02	4-Wire Foreign Exchange - Office End with Loop-Start Signaling, Signaling Leads Reversed, and No Toll Diversion
FX03	4-Wire Foreign Exchange - Office End with Ground-Start Signaling, Signaling Leads Normal, and No Toll Diversion
FX05	4-Wire Foreign Exchange - Office End with Ground-Start Signaling, Signaling Leads Reversed, and No Toll Diversion
FXP1	4-Wire Foreign Exchange - Office End with Loop-Start Signaling, Signaling Leads Normal, and Toll Diversion
FXP2	4-Wire Foreign Exchange - Office End with Loop-Start Signaling, Signaling Leads Reversed, and Toll Diversion
FXP3	4-Wire Foreign Exchange - Office End with Ground-Start Signaling, Signaling Leads Normal, and Toll Diversion
FXP5	4-Wire Foreign Exchange - Office End with Ground-Start Signaling, Signaling Leads Reversed, and Toll Diversion
FXS	2-Wire Foreign Exchange - Station End
FXS1	4-Wire Foreign Exchange - Station End with Loop-Start Signaling, Signaling Leads Normal, and No Toll Diversion.
FXS2	4-Wire Foreign Exchange - Station End with Loop-Start Signaling, Signaling Leads Reversed, and No Toll Diversion.
FXS3	4-Wire Foreign Exchange - Station End with Ground-Start Signaling, Signaling Leads Normal, and No Toll Diversion.

FXS5	4-Wire Foreign Exchange - Station End with Ground-Start Signaling, Signaling Leads Reversed, and No Toll Diversion.
FXT1	4-Wire Foreign Exchange - Station End with Loop-Start Signaling, Signaling Leads Normal, and Toll Diversion.
FXT2	4-Wire Foreign Exchange - Station End with Loop-Start Signaling, Signaling Leads Reversed, and Toll Diversion.
FXT3	4-Wire Foreign Exchange - Station End with Ground-Start Signaling, Signaling Leads Normal, and Toll Diversion.
FXT5	4-Wire Foreign Exchange - Station End with Ground-Start Signaling, Signaling Leads Reversed, and Toll Diversion.
GO	Ground Start (Current Sink).
GS	Ground Start (Current Feed).
LO	Loop Start (Current Sink).
LR	Private Line Automatic Ringdown.
LS	Loop Start (Current Feed).
NO	Transmission Only.
OCU	Office Channel Unit dataport.
PLR1	PLR Signaling, Type I
PLR2	PLR Signaling, Type II
RVT	Loop Reverse Battery.
TDOA	4-State Tandem Signaling, Type II Signaling Leads Looped Through Carrier Toward Office
TDOB	4-State Tandem Signaling, Type I Signaling Leads Non-Looped Through Carrier Toward Office
TDOC	2-State Tandem Signaling, Type II Signaling Leads Looped

TDOD	2-State Tandem Signaling, Type I Signaling Leads Non-Looped
TDSA	4-State Tandem Signaling, Type II Signaling Leads Looped Through Carrier Toward Subscriber
TDSB	4-State Tandem Signaling, Type I Signaling Leads Non-Looped Through Carrier Toward Subscriber
TDSC	2-State Tandem Signaling, Type II Signaling Leads Looped
TDSD	2-State Tandem Signaling, Type I Signaling Leads Non-Looped
TO	2-Wire Transmission Only
TO4	4-Wire Transmission only - No DC Signaling

The ISDN function code (ISDN) is one additional function code that is supported by the system and may appear in `RTR-T0` reports in Release 4, but is not provisionable via the `ENT-T0` or `ED-T0` commands. The ISDN function code pertains to the ANSI U-DSL Interface which is supported with the AUA94 channel unit on TR-303 VRTs. ISDN lines can only be provisioned by the Local Digital Switch via the TR-303 EOC.

spec_block Parameters

The tables below indicate which *spec_block* parameters are entered based on the *CLEI* and *FunctionCode*. The apparatus codes of the units ("Card Type") are also provided for reference purposes.

The default choice for each parameter is the current value unless the *CLEI* and/or *FunctionCode* for a Physical Line are changed, in which case the "Default Value" is the default.

WORD abbreviations are shown in each table; these are not the TL1 keywords. The keyword is listed in the Input Parameter column to the left of the equals (=) sign (e.g. the keyword for TransmitGain is xmtgn).

Card Type: AUA92/AUA93
 CLEI: 5SC1JE/5SC1HE
 LTS: EB

FUNCTION CODE = BRI			
Input Parameter	WORD Abbreviation	Values	Default Value
svc=ISDN Channel Service	SVC	2B+D, B1+D, B2+D, D	2B+D
rls=Redlined	RLS	YES or NO	NO

Card Type: Any
 CLEI: Other
 LTS: Any

FUNCTION CODE = DFLT			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA25, AUA25B, AUA27, AUA51,
AUA53, AUA55, AUA57, AUA58,
AUA58B, AUA58C, AUA59, AUA150,
AUA151, AUA158, AUA158B, AUA159,
AUA159B, AUA179, SPQ400, SPQ440,
SPQ450

CLEI: Other

LTS: Any

FUNCTION CODE = LS*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA25, AUA25B, AUA51, AUA53,
AUA59, AUA150, AUA151, AUA159,
AUA159B, AUA179, SPQ440, SPQ450

CLEI: Other

LTS: Any

FUNCTION CODE = GS*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

SLC-2000 Access System**TL1 Command/Response Message****Card Type:** AUA56

CLEI: Other

LTS: Any

FUNCTION CODE = RVT*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA75

CLEI: Other

LTS: Any

FUNCTION CODE = LR*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA45/AUA45B

CLEI: Other

LTS: Any

FUNCTION CODE = AC*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

SLC-2000 Access System**TL1 Command/Response Message****Card Type:** MCU5205/MCU5405**CLEI:** Other**LTS:** Any

FUNCTION CODE = NO*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA200/AUA232**CLEI:** Other**LTS:** Any

FUNCTION CODE = DATA*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA32/AUA39/SPQ340**CLEI:** Other**LTS:** Any

FUNCTION CODE = GO*			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA32/AUA39/SPQ300/SPQ340

CLEI: Other

LTS: Any

FUNCTION CODE = LO *			
Input Parameter	WORD Abbreviation	Domain	Default Value
rls=Redlined	RLS	YES or NO	NO

* For Release 4 only. In Release 3.2, use FUNCTION CODE = DFLT for the listed card types.

Card Type: AUA42/AUA42B/AUA142/SPQ442

CLEI: 5SCU69/5SCU6E/5SCU69/SAC1AH

LTS: D

FUNCTION CODE = FXO			
Input Parameter	WORD Abbreviation	Domain	Default Value
imp=Impedance	IMP	600 or 900	900
bal=Balance	BAL	0 to 15 in steps of 1	3
xmtgn=TransmitGain	XMT(GN)	-1.0 to 6.75 in steps of 0.25	-1.0
rcvgn=ReceiveGain	RCV(GN)	-8.0 to 1.5 in steps of 0.25	-8.0
sl=Slope	SL	0 to 7 in steps of 1	0
td=TollDiversion*	TD	YES or NO	NO
lsgs=SignalingType	LS-GS	LS or GS	GS
oht=OnHookTransmission	OHT	YES or NO	NO
rls=Redlined	RLS	YES or NO	NO

* Toll Division (td) is not supported on TR8 VRTs

FUNCTION CODE = DPT or TO			
Input Parameter	WORD Abbreviation	Domain	Default Value
imp=Impedance	IMP	600 or 900	600
bal=Balance	BAL	0 to 15 in steps of 1	3
xmtgn=TransmitGain	XMT(GN)	-1.0 to 6.75 in steps of 0.25	-1.0
rcvgn=ReceiveGain	RCV(GN)	-8.0 to 1.5 in steps of 0.25	-8.0
sl=Slope	SL	0 to 7 in steps of 1	0
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA43/AUA43B/SPQ443
 CLEI: 5SCU6A/5SCU6F/SAC1AE
 LTS: D

FUNCTION CODE = FXS			
Input Parameter	WORD Abbreviation	Domain	Default Value
imp=Impedance	IMP	600 or 900	600
bal=Balance	BAL	0 to 15 in steps of 1	3
xmtgn=TransmitGain	XMT(GN)	-1.0 to 6.75 in steps of 0.25	-1.0
rcvgn=ReceiveGain	RCV(GN)	-8.0 to 1.5 in steps of 0.25	-8.0
sl=Slope	SL	0 to 7 in steps of 1	0
oht=OnHookTransmission	OHT	YES or NO	NO
rls=Redlined	RLS	YES or NO	NO
FUNCTION CODE = DPO, or TO			
Input Parameter	WORD Abbreviation	Domain	Default Value
imp=Impedance	IMP	600 or 900	600
bal=Balance	BAL	0 to 15 in steps of 1	3
xmtgn=TransmitGain	XMT(GN)	-1.0 to 6.75 in steps of 0.25	-1.0
rcvgn=ReceiveGain	RCV(GN)	-8.0 to 1.5 in steps of 0.25	-8.0
sl=Slope	SL	0 to 7 in steps of 1	0
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA41/AUA141
 CLEI: 5SCU7D/5SCU7D
 LTS: D

FUNCTION CODE = FXS[1, 2, 3, 5], FXT[1, 2, 3, 5], DX4N, DX4R			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
ln=Nonloaded/Loaded	L-N	L or N	N
sl=Slope	SL	0 to 15 in steps of 1	0
bw=Bandwidth	BW	0 to 15 in steps of 1	0
ht=Height	HT	0 to 15 in steps of 1	0
imp=Transmit and Receive Impedance	TRMT&RCV (IMP)	150, 600 or 1200	600
rls=Redlined	RLS	YES or NO	NO
FUNCTION CODE = ETO4			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
dBJ3=-7 dB (J3)	-7DB(J3)	WH or BK	BK
ln=Nonloaded/Loaded	L-N	L or N	N
sl=Slope	SL	0 to 15 in steps of 1	0
bw=Bandwidth	BW	0 to 15 in steps of 1	0
ht=Height	HT	0 to 15 in steps of 1	0
imp=Transmit and Receive Impedance	TRMT&RCV (IMP)	150, 600 or 1200	600
rls=Redlined	RLS	YES or NO	NO
FUNCTION CODE = TO4			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
dBt=-7 dB TRMT	-7DB TRMT	WH or BK	BK
dBr=-7 dB RCV	-7DB RCV	WH or BK	BK
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA41B

CLEI: 5SCUCD

LTS: D

FUNCTION CODE = FXS[1, 2, 3, 5], FXT[1, 2, 3, 5], DX4N, DX4R			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
ln=Nonloaded/Loaded	L-N	L or N	N
sl=Slope	SL	0 to 15 in steps of 1	0
bw=Bandwidth	BW	0 to 15 in steps of 1	0
ht=Height	HT	0 to 15 in steps of 1	0
imp=Transmit and Receive Impedance	TRMT&RCV (IMP)	150, 600 or 1200	600
rls=Redlined	RLS	YES or NO	NO
FUNCTION CODE = ETO4			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
dBJ3=-7 dB (J3)	-7DB(J3)	WH or BK	BK
ln=Nonloaded/Loaded	L-N	L or N	N
sl=Slope	SL	0 to 15 in steps of 1	0
bw=Bandwidth	BW	0 to 15 in steps of 1	0
ht=Height	HT	0 to 15 in steps of 1	0
imp=Transmit and Receive Impedance	TRMT&RCV (IMP)	150, 600 or 1200	600
sc=SealingCurrent	SC	YES or NO	YES
rls=Redlined	RLS	YES or NO	NO

FUNCTION CODE = TO4			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
dBt=-7 dB TRMT	-7DB TRMT	WH or BK	BK
dBrc=-7 dB RCV	-7DB RCV	WH or BK	BK
sc=SealingCurrent	SC	YES or NO	YES
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA44/SPQ444

CLEI: 5SCU7C/SAC1BF

LTS: D

FUNCTION CODE = FXO[1, 2, 3, 5], FXP[1, 2, 3, 5]			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 16.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 16.5 in steps of 0.1	16.5
ln=Nonloaded/Loaded	L-N	L or N	N
sl=Slope	SL	0 to 15 in steps of 1	0
bw=Bandwidth	BW	0 to 15 in steps of 1	0
ht=Height	HT	0 to 15 in steps of 1	0
imp=Transmit and Receive Impedance	TRMT&RCV (IMP)	150, 600 or 1200	600
rls=Redlined	RLS	YES or NO	NO
FUNCTION CODE = TDO[A, B, C, or D], TDS[A, B, C, or D]			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 11.6 in steps of 0.1	11.6
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA54/SPQ454

CLEI: 5SCU7B/SAC1BG

LTS: D

FUNCTION CODE = EM4C, EM4H, PLR1, PLR2			
Input Parameter	WORD Abbreviation	Values	Default Value
trmt=TRMT Attenuator	TRMT	0 to 25.5 in steps of 0.1	16.5
rcv=RCV Attenuator	RCV	0 to 25.5 in steps of 0.1	16.5
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA52/AUA152

CLEI: 5SCU48/5SCU48

LTS: D

FUNCTION CODE = OCU			
Input Parameter	WORD Abbreviation	Domain	Default Value
rate=Subscriber Data Rate	RATE	2.4, 4.8, 9.6, 56 kb/s	56
ec=Error Correction	EC	MVEC*, SCEC†, NONE	NONE
zc=All-Zero-Code Allowed	ZC	NO or YES	NO
scc=Secondary Channel Used	SCC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

* MVEC is not a valid option if the data rate is 56 kb/s.

† SCEC is not supported on TR8 Mode 2 VRTs.

Card Type: AUA52B

CLEI: 5SC143

LTS: D

FUNCTION CODE = OCU			
Input Parameter	WORD Abbreviation	Domain	Default Value
rate=Subscriber Data Rate	RATE	2.4, 4.8, 9.6, 19.2, 56 or 64 kb/s	56
ec=Error Correction	EC	MVEC*, SCEC†, NONE	NONE
zc=All-Zero-Code Allowed‡	ZC	NO or YES	NO
scc=Secondary Channel Used‡	SCC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

* MVEC is not a valid option if the data rate is 56 or 64 kb/s.
If MVEC is selected and the data rate is 19.2 kb/s, Single Timeslot Error Correction (STEC) will be employed by the system. STEC is 19.2 error correction.

† SCEC is not supported on TR8 Mode 2 VRTs.

‡ If RATE = 64 kb/s ZC and SCC must not be included in the input message. They are both automatically set to "YES." If included, an IISP error code is generated.

The AUA52B has a "Clear Channel" (CC) option switch. The system automatically overwrites this switch based on the provisioned data rate. The option is enabled when the data rate is set to 64 kb/s, and disabled for all other data rates.

Card Type: AUA34
 CLEI: 5SCU38
 LTS: D

FUNCTION CODE = DS0A			
Input Parameter	WORD Abbreviation	Domain	Default Value
ec=Error Correction	EC	MVEC*, SCEC, NONE	NONE
zc=All-Zero-Code Allowed	ZC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

* MVEC should not be used if the data rate is 56 kb/s.

FUNCTION CODE = DS0B			
Input Parameter	WORD Abbreviation	Domain	Default Value
ec=Error Correction	EC	SCEC, NONE	NONE
zc=All-Zero-Code Allowed	ZC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

Card Type: AUA34B

CLEI: 5SC133

LTS: D

FUNCTION CODE = DS0A			
Input Parameter	WORD Abbreviation	Domain	Default Value
ec=Error Correction	EC	MVEC*, SCEC†, NONE, 19.2EC‡	NONE
zc=All-Zero-Code Allowed§	ZC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

* MVEC should not be used if the data rate is 19.2, 56 or 64 kb/s.

† SCEC should not be used if the data rate is 19.2 kb/s.

‡ 19.2EC is Single Timeslot 19.2 kb/s Error Condition and should only be used for 19.2 kb/s service.

§ ZC should be set to "YES" if the data rate is 64 kb/s.

FUNCTION CODE = DS0B			
Input Parameter	WORD Abbreviation	Domain	Default Value
ec=Error Correction	EC	SCEC, NONE	NONE
zc=All-Zero-Code Allowed*	ZC	NO or YES	NO
rls=Redlined	RLS	YES or NO	NO

* ZC should be set to "YES" if the data rate is 64 kb/s.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the provisioning request, the following output message is returned to the user:

```
      sid date time
M  ctag COMPLD
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply here also. In addition, the following output parameters also apply to ENT-T0.

EXAMPLE INPUT/OUTPUT

To provision a line for an AUA42 channel unit:

```
ENT-T0:ATT-PF-2000:
drop-2-1-4:123456::5SCU69,FX0:IMP=900,BAL=1,XMTGN=2.0,
RCVGN=-1.5,SL=0,TD=NO,LSGS=LS,OHT=NO,r1s=YES;

IP 123456
<

      ATT-PF-2000 93-07-11 13:01:11
M  123456 COMPLD
;
```

To provision a line for a POTS-like channel unit (e.g. AUA58):

```
ENT-T0:ATT-PF-2000:drop-5-4-3:123456::OTHER,DFLT;  
  
IP 123456  
<  
  
    ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR OUTPUT

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements there apply to the ENT-T0 command also.

The following error responses are listed in the order and priority that the SLC-2000 system checks for each condition.

If an ENT-T0 command is received with the same parameter specified more than once, the following error response is returned to the OS:

```
    sid date time  
M ctag DENY  
IISP  
/* Input, Invalid Syntax or Punctuation */  
;
```


If an ENT-T0 command is received with an *aid* that is not valid for the ENT-T0 command, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If an ENT-T0 command is received with an invalid parameter value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   Invalid parameter_name */
;
```

Where *parameter_name* is the name of the parameter (as specified above in the INPUT FORMAT) for which an invalid entry was made.

If an attempt is made to provision a fiber drop AID within a distribution shelf which is not provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
    the shelf for AID is not provisioned for
    fiber distribution. */
;
```

If an attempt is made to provision a metallic drop AID within a distribution shelf which is provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
    the shelf for AID is not provisioned for
    metallic distribution. */
;
```

If an attempt is made to provision a fiber drop AID with a channel number greater than the number of DS0s for which the supporting MSDT server is provisioned (e.g., attempt to ent-t0::dtdp-1-3-4-1 when dt-1-3 is provisioned to serve 12 lines), the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
the DT server for AID is currently provisioned
for a maximum of n lines. */

;
```

Note: *n* may be {0, 12, 24} (the current provisioned DT bandwidth.)

If a valid CLEI code is entered but it cannot be supported on the line that is specified in the command, the following error message shall be generated:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
cannot support CLEI code CLEI_code for line AID */

;
```

If the ENT-T0 command is received for a line which is not in the OOS-MA-UAS state, the following error message shall be returned:

```
sid date time
M ctag DENY
SNVS
/* Status Not in Valid State, PST=pst */

;
```

(the current primary service is returned in the free form text (*pst*)).

NAME

ENT-USER-SECU: Enter User Security

INPUT FORMAT

ENT-USER-SECU:*tid:uid:ctag::pid,,uap[:]*;

DESCRIPTION

The ENT-USER-SECU command is used by an appropriate administrator to enter the security parameters associated with a user.



NOTE:

This command is available to privileged users only.

INPUT PARAMETERS

- tid* Target identifier. This is the name of the network element to which the command is addressed.
- uid* This is the User Identifier of a user. Its valid values are a case-sensitive alphanumeric string of 5 to 10 characters.
- ctag* Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.
- pid* Password. This is a case-sensitive string containing a minimum of 6 and a maximum of 10 alphabetic, numeric, and symbolic characters where at least two characters are non-alphabetic and at least one is symbolic (whitespace is ignored). In addition, commas (,), colons (:), and semicolons (;) are not allowed in the *pid* in order not to confuse with the TL1 delimiters.
- uap* User Access Privilege. This has one of the following values: **general** or **reports-only**. **Privileged** is not allowed for this parameter since privileged users cannot be created in the NE.

OUTPUT FORMAT

If the Network Element fully complies with the enter user security request, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
ENT-USER-SECU:ATT-PF-2000:kjlee:123456::pass12#,,general;  
  
IP 123456  
<  
  
ATT-PF-2000 93-10-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **ENT-USER-SECU** command, also.

If the Network Element receives an **ENT-USER-SECU** command from a user trying to enter his or her own *uid* (user identifier) and/or a *uap* value, the following error response is returned:

```
sid date time
M ctag DENY
PICC
/* Privilege, Illegal Command Code */
;
```

If the Network Element receives an ENT-USER-SECU command with an existing *uid* (user identifier) that is not that users' own *uid*, the following error response is returned:

```
sid date time
M ctag DENY
PIUI
/* Privilege, Illegal User Identity */
;
```

If the Network Element receives an ENT-USER-SECU command when it already has reached its maximum user logins (52 for the SLC-2000 system) the following error response is returned:

```
sid date time
M ctag DENY
SLEM
/* Status, List Exceeds Maximum */
;
```

If the Network Element receives an ENT-USER-SECU command with an invalid *uid* (user id) value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid UID */
;
```

If the Network Element receives an ENT-USER-SECU command with an invalid *pid* (password) value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid PID */
;
```

If the Network Element receives an ENT-USER-SECU command with an invalid *uap* (user access privilege) value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid UAP */
;
```

NAME

INH-MSG: Inhibit Message

INPUT FORMAT

INH-MSG-modifier:tid:[aid]:ctag[:,,];

DESCRIPTION

The INH-MSG command is initiated by a user to inhibit transmission of autonomous TL1 messages from the SLC-2000 system.

This command will allow users to inhibit transmission of autonomous messages, office alarms, and/or parallel telemetry. All new autonomous messages are inhibited. All autonomous messages that are in the queue prior to the normal completion of the INH-MSG command are reported.

**NOTE:**

This command is available to privileged users only for all TL1 ports.

When autonomous message reporting to the user is inhibited, the network element reports an abnormal status condition in an autonomous REPT EVT message. This is the last autonomous message that occurs before the INH-MSG command takes effect.

Although autonomous message reporting is inhibited, the network element continues to respond fully to all command messages.

INPUT PARAMETERS

<i>modifier</i>	Modifier. The value for this parameter must be ALL.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. The value must be all (default) or null.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If the network element receives an **INH-MSG** command from a user when transmission of all autonomous messages has already been inhibited, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, and *ctag* included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
INH-MSG-ALL:ATT-SLC-2000::123xyz;  
  
IP 123xyz  
<  
ATT-SLC-2000 93-06-06,09:30:49  
M 123xyz COMPLD  
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the INH-MSG command, also.

If an INH-MSG command is received with any command code modifier other than ALL, the following error response is returned:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid MODIFIER */
;
```

If an INH-MSG command is received with an invalid *aid* value, the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access identifier */
;
```

NAME

INIT-REG: Initialize Register (SONET subsystem only)

INPUT FORMAT

```
INIT-REG-ALL:tid:[aid]:ctag::,,tmper[,,];
```

DESCRIPTION

The INIT-REG command is initiated by a user to initialize all *current* day and/or all *current* 15-minute performance-monitoring (PM) storage registers in the SONET subsystem.

PM registers for previous day and previous 15-minute time periods are not affected by this command.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.						
<i>aid</i>	Access identifier. Because all current daily and/or 15-minute PM registers are initialized, the <i>aid</i> value must be <i>all</i> (default value) or null.						
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.						
<i>tmper</i>	Time period. This requests that PM registers for a specified time interval be initialized. This parameter may have one of the following values: <table><tr><td>15-MIN</td><td>This requests that 15-minute PM registers be initialized.</td></tr><tr><td>1-DAY</td><td>This requests that daily PM registers be initialized.</td></tr><tr><td>ALL</td><td>This requests that all PM registers be initialized.</td></tr></table>	15-MIN	This requests that 15-minute PM registers be initialized.	1-DAY	This requests that daily PM registers be initialized.	ALL	This requests that all PM registers be initialized.
15-MIN	This requests that 15-minute PM registers be initialized.						
1-DAY	This requests that daily PM registers be initialized.						
ALL	This requests that all PM registers be initialized.						

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the `OUTPUT PARAMETERS` section for `RTRV-HDR`.

EXAMPLE INPUT/OUTPUT

```
INIT-REG-ALL:ATT-PF-2000:all:123456::,,,,15-MIN;

IP 123456
<
ATT-PF-2000 93-06-06,09:30:49
M 123xyz COMPLD
;
```

ERROR RESPONSES

Refer to the `RTRV-HDR` error responses section. The error responses listed there apply to the `INIT-REG` command, also.

If an `INIT-REG` command is received with any command code modifier other than `ALL`, the following error response is returned:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid MODIFIER */
;
```

If an INIT-REG command is received with an invalid *aid* value (that is, anything other than *all* or *null*), the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access identifier */
;
```

If an INIT-REG command is received with an invalid *tmper* value (that is, anything other than *15-MIN*, *1-DAY*, or *all*), the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid TMPER */
;
```

NAME

INIT-SYS: Initialize System

INPUT FORMAT

INIT-SYS-ALL:tid:aid:ctag;

DESCRIPTION**CAUTION:**

Execution of this command may affect service.

The command INIT-SYS with the aid of all should NOT be used on an in-service system. It should only be used at the end of a system installation before system turnup. Execution of this command at any network element will also affect OS communication with that network element; all OS users logged into that network element will be logged out.

The INIT-SYS command initializes (resets) provisionable parameters in the SONET subsystem only to their default values. The time and date parameters are not affected by this command.

**NOTE:**

After entering the INIT-SYS command, the system will show transient DCC failures that are recorded in the Alarm and History reports. This is a normal, expected system behavior.

This command should be used with the all aid only at the end of system installation and before system turnup. To clear a system problem, the RESET command should be used from the network element native user interface, since it resets the system software without changing parameters.

**NOTE:**

This command is available to privileged users only.

**NOTE:**

This command does not affect the DLC subsystem.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This parameter determines what system parameters are to be initialized, and may have the following values: <i>sysctl</i> The address <i>sysctl</i> can be used after a system controller is replaced in an in-service system. It is the equivalent of pressing the UPD/INIT pushbutton within 10 seconds of processor startup sequence (while the CR LED on the user panel is flashing). This command restores the system level parameters in the SYSTCL to their default values. <i>all</i> This value is used only at the end of an installation before turning over the system. This ensures that all parameters in the SONET subsystem have the proper default values before any system-specific provisioning is done.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the login request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, and *ctag* included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
INIT-SYS-ALL:ATT-PF-2000:sysctl:123456;
```

```
IP 123456
```

```
<
```

```
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the INIT-SYS command, also.

If a SLC-2000 system receives an INIT-SYS command without an *aid* or with *aid* value other than *sysctl* or *all*, the following error response is returned:

```
sid date time
M  ctag DENY
  IIAC
/* Input, Invalid Access Identifier,
   AID is missing, wrong, or inconsistent with modifier */
;
```


NAME

OPR-ACO: Operate Alarm Cutoff

INPUT FORMAT

OPR-ACO-ALL:*tid*[:*aid*]:*ctag*;

DESCRIPTION

The `OPR-ACO` command is initiated to request the *SLC-2000* system to operate the alarm cutoff (ACO) to silence the audible office alarms. Alarms remain silent until a new alarm condition arises. The ACO function applies to all *SLC-2000* system network elements with the same site number (provisioned by hardware switch settings on the SYSCTL circuit pack).

If this command is executed while there is an active alarm condition in the system, it will:

- Silence active audible office alarms
- Light the ACO LED on the user panel
- Set the parallel telemetry ACO outputpoint point
- Clear all parallel telemetry outputs except the system ID and ACO outputs.

This command is equivalent to pushing the ACO button on the user panel or activating the TBOS ACO control point.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. Because the ACO function applies to the whole system, the <i>aid</i> value must be <code>all</code> (default) or null.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If the *SLC-2000* system receives a valid *OPR-ACO* command but no alarm condition exists or existing alarms have already been cut off by a previous *OPR-ACO* command, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
OPR-ACO:ATT-SLC-2000:all:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the OPR-ACO command, also.

If the SLC-2000 system receives an OPR-ACO command with a command code modifier other than ALL, the following error response is returned:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If the SLC-2000 system receives an OPR-ACO command with an invalid *aid* value (that is, anything other than ALL or null), the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

NAME

OPR-LPBK: Operate DS1 Low Speed Terminal Loopback

INPUT FORMAT

OPR-LPBK-rr:tid:aid:ctag[::];

DESCRIPTION**CAUTION:**

Execution of this command may affect service.

This command can be initiated by a user to request the network element to operate a manual terminal loopback at the specified low speed (LS) interface toward the high speed (HS) fiber interface. This command is used during pre-service testing of facilities and during fault diagnostics.

The OPR-LPBK-T1 command remains active until released (for example, by the TL1 command RLS-LPBK) or until overridden by a network element reset or initialization.

INPUT PARAMETERS

<i>rr</i>	This is a required modifier for the OPR-LPBK message, and may have only one of the following values:
<i>T1</i>	This requests a loopback on a DS1 low-speed interface toward the high-speed OC3 fiber.
<i>T3</i>	This requests a loopback on a DS3 low-speed interface toward the high-speed OC3 fiber.
<i>EC1</i>	This requests a loopback on a EC1 low-speed interface toward the high-speed OC3 fiber.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the low speed port for which the loopback is being requested. Refer to Tables 3-7 and 3-8 for a list of valid <i>aid</i> addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If the command request is successfully completed, the following message is returned to the OS:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT FORMAT** section. The parameters described in that section apply to this command also.

If the requested loopback command does not alter the existing loopback condition, the *SLC-2000* system will not deny the command, but will respond with a completion message.

EXAMPLE INPUT/OUTPUT

```
OPR-LPBK-T1:ATT-SLC-2000:A-1-1:123456;IP 123456
```

```
ATT-SLC-2000-3 93-11-26 16:42:27
```

```
M 123456 COMPLD
```

```
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the *SLC-2000* system checks for each condition.

If the *SLC-2000* system receives an *OPR-LPBK* command with a modifier other than those supported by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command NOT Valid, Invalid Modifier */
;
```

If the SLC-2000 system receives an OPR-LPBK command without an *aid* value or with an *aid* not supported by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   AID is missing, wrong or inconsistent with modifier */
;
```

If the SLC-2000 system receives an OPR-LPBK command with an otherwise valid *aid* value but for which the corresponding equipment is not present, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ENEQ
/* Equipage, Not Equipped */
;
```

If the SLC-2000 system receives an OPR-LPBK-T1 command with an otherwise valid *aid* value but the command cannot be completed by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed */
;
```

If the SLC-2000 system receives an OPR-LPBK-T1 command with a valid *aid* value but with a *lpbktype* parameter, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid */
;
```


NAME

OPR-PROTNSW: Operate Protection Switch

INPUT FORMAT

OPR-PROTNSW-modifier:[tid]:aid:ctag::sc[:dirn];

DESCRIPTION

OPR-PROTNSW commands can be initiated to request the SLC-2000 system to operate a manual or forced protection switch or to lockout or inhibit protection switching on a linear 1+1-protected OC3 line pair.

The forced, lockout and inhibit, but *not* manual, protection switching requests remain active until released (for example, by TL1 command RLS-PROTNSW, or CIT command **switch-line** with priority parameter value **reset** for linear OC3 line pairs) or overridden by a higher-priority protection switching request.

Manual protection switches remain in effect until overridden by another manual or higher-priority protection switching request (for example, by another TL1 command OPR-PROTNSW with an *sc* value of **MAN** or the CIT command **switch-line** for linear OC3 line pairs) or until overridden by automatic protection switching.

The SLC-2000 system provides *unidirectional* line protection switching. An OPR-PROTNSW-oc3 command affects only the selection of one of the addressed pair of *incoming* linear OC3 signals. It does not affect which of the pair of *transmitted* OC3 signals is selected by the far end.

INPUT PARAMETERS

<i>modifier</i>	This is a message modifier to the OPR-PROTNSW command and may have one of the following values:
oc3	This requests OC3 line protection switching.
STS1	This requests STS-1 line protection switching.
VT1	This requests VT1.5 line protection switching.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. If no <i>tid</i> is given, the command is interpreted to be addressed to the GNE.
<i>aid</i>	Access identifier. This is the address of the OC3 line pair for which protection switching is requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.

<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.								
<i>sc</i>	Switch command. This specifies the type of protection switching requested and must have one of the following values: <table><tr><td>INH</td><td>This requests that protection switching be inhibited, freezing the protection switching mechanism so that the current active line remains selected (until released) regardless of any subsequent failures.</td></tr><tr><td>LOCKOUT</td><td>This requests protection switching lockout, preventing selection of the protection line (until released). If the protection line is currently selected, service will be switched to the service line unless there is an existing inhibit protection switching request.</td></tr><tr><td>FRCD</td><td>This requests a forced protection switch. The standby line is selected unless there is an existing inhibit, lockout, or forced protection switching request.</td></tr><tr><td>MAN</td><td>This requests a manual protection switch. The standby line is selected provided the standby line is good and there are no existing protection switching requests.</td></tr></table>	INH	This requests that protection switching be inhibited, freezing the protection switching mechanism so that the current active line remains selected (until released) regardless of any subsequent failures.	LOCKOUT	This requests protection switching lockout, preventing selection of the protection line (until released). If the protection line is currently selected, service will be switched to the service line unless there is an existing inhibit protection switching request.	FRCD	This requests a forced protection switch. The standby line is selected unless there is an existing inhibit, lockout, or forced protection switching request.	MAN	This requests a manual protection switch. The standby line is selected provided the standby line is good and there are no existing protection switching requests.
INH	This requests that protection switching be inhibited, freezing the protection switching mechanism so that the current active line remains selected (until released) regardless of any subsequent failures.								
LOCKOUT	This requests protection switching lockout, preventing selection of the protection line (until released). If the protection line is currently selected, service will be switched to the service line unless there is an existing inhibit protection switching request.								
FRCD	This requests a forced protection switch. The standby line is selected unless there is an existing inhibit, lockout, or forced protection switching request.								
MAN	This requests a manual protection switch. The standby line is selected provided the standby line is good and there are no existing protection switching requests.								
<i>dirn</i>	Direction. This is the direction of the protection switching request and may be rcv or null only. If null, the default value rcv applies.								

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the protection switching request, the following normal completion response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
OPR-PROTNSW-OC3:SITE7NE1:fn-c:1015::MAN:RCV;  
  
IP 1015  
<  
  
SITE7NE1 70-01-01 01:16:34  
M 1015 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **OPR-PROTNSW** command also.

The following additional error conditions are listed in the order and priority that the **SLC-2000** system checks for each condition.

If the **SLC-2000** system receives an **OPR-PROTNSW** command with a command code modifier other than **OC3**, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
IICM  
/* Command code modifier must be OC3 */  
;
```

If the **SLC-2000** system receives an **OPR-PROTNSW** command without an *aid* value or with an *aid* value that is invalid for a **SLC-2000** system **OC3** line pair, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the SLC-2000 system receives an OPR-PROTNSW command with an invalid *sc* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, SC = INH, LOCKOUT, FRCD or MAN (no default)
*/
;
```

If the SLC-2000 system receives an OPR-PROTNSW command with an invalid *dirn* value (that is, anything other than RCV or null), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, DIRN = RCV or null (default DIRN = RCV) */
;
```

If the SLC-2000 system receives an OPR-PROTNSW command with any extra (beyond the specified input format) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

If the SLC-2000 system receives an OPR-PROTNSW command with an otherwise valid *aid* value but for which the corresponding slots are not equipped with compatible OC3 OLIU circuit packs (including *unprotected* equipage), the following error response is returned to the OS:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied, OLIUs not equipped */
;
```

If the SLC-2000 system receives an OPR-PROTNSW command with an otherwise valid *sc* value, but for which an equal (except *manual*) or higher-priority protection switching request already exists, (or in the case of a manual protection switch request, the standby line is failed), the command request is not performed and the following error response is returned to the OS:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied, equal or higher-priority
   switch request exists or standby failed */
;
```

NAME

OPR-SYNCNSW: Operate Synchronization Switch

INPUT FORMAT

OPR-SYNCNSW: [*tid*]::*ctag*::*sc*;

DESCRIPTION

OPR-SYNCNSW commands can be initiated to request the SLC-2000 system to operate a manual DS1 synchronization input reference protection switch or to inhibit DS1 synchronization input reference protection switching.

The inhibit, but *not* manual, protection switching requests remain active until released (for example, by TL1 command RLS-SYNCNSW or CIT command *switch-sync* with SyncFunction parameter value *reference* and priority parameter value *reset*).

Manual protection switches remain in effect until overridden by another manual protection switching request (for example, by another TL1 command OPR-SYNCNSW with *sc* value *MAN* or CIT command *switch-sync* with SyncFunction *reference*) or until overridden by automatic protection switching.

INPUT PARAMETERS

tid Target identifier. This is the name of the network element to which the command is addressed. If no *tid* is given, the command is interpreted to be addressed to the GNE.

ctag Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

sc Switch command. This specifies the type of protection switching requested and must have one of the following values:

INH This requests that protection switching be inhibited, freeing the protection switching mechanism so that the current active reference remains selected (until released) regardless of any subsequent failures.

MAN This requests a manual protection switch. The standby line is selected provided the standby line is good and protection switching is not inhibited.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the protection switching request, the following normal completion response is returned to the OS:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
OPR-SYNCNSW:SITE7NE1::1025::INH;
```

```
IP 1025
```

```
<
```

```
    SITE7NE1 70-01-01 03:36:44
```

```
M 1025 COMPLD
```

```
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **OPR-SYNCNSW** command also.

The following additional error conditions are listed in the order and priority that the **SLC-2000** system checks for each condition.

If the **SLC-2000** system receives an **OPR-SYNCNSW** command with a non-null command code modifier [including any extra hyphens (-)], the following error response is returned to the OS:

```
    sid date time
M  ctag DENY
  IICM
/* Invalid Command, SLC-2000 does not support
   Command = xxxxxxxxxxxxxxxxxx */
;
```

where **xxxxxxxxxxxxxxxxxxxx** is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

If the **SLC-2000** system receives an **OPR-SYNCNSW** command with a non-null *aid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  INUP
  /* Input, no AID value allowed */
;
```

If the SLC-2000 system receives an OPR-SYNCNSW command with an invalid *sc* value (that is, anything other than *INH* or *MAN*), the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIDT
  /* Invalid Input, SC (or SWITCHTO) = INH or MAN (no default) */
;
```

If the SLC-2000 system receives an OPR-SYNCNSW command with any extra (beyond the input format specification above) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIISP
  /* Input, Invalid Syntax or Punctuation */
;
```

If the SLC-2000 system receives an OPR-SYNCNSW command which is otherwise valid, but DS1 synchronization references are not equipped (including *unprotected* equipage), the following error response is returned to the OS:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied,
   DS1 synchronization references not equipped */
;
```

If the SLC-2000 system receives an OPR-SYNCNSW command with an otherwise valid *sc* value, but for which,

1. an equal (except *manual*) or higher-priority protection switching request (that is, an *inhibit*) exists,
2. or the standby reference is unavailable (that is, in the case of a manual protection switch request, the standby reference is failed),

the command request is not performed and the following error response is returned to the OS:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied, equal or higher-priority
   switch request exists or standby unavailable */
;
```

NAME

RLS-LPBK: Release Low Speed Terminal Loopback

INPUT FORMAT

RLS-LPBK-*rr*:tid:aid:ctag[::];

DESCRIPTION**CAUTION:**

Execution of this command may affect service.

This command can be initiated by a user to request the *SLC-2000* system to release a manual terminal loopback at the specified low speed (LS) interface toward the high speed (HS) fiber interface. This command is used during pre-service testing of facilities and during fault diagnostics.

When the *SLC-2000* system receives an **RLS-LPBK** command from the user, network element will release a terminal loopback toward the HS fiber on the specified LS interface.

INPUT PARAMETERS

<i>rr</i>	This is a required modifier for the RLS-LPBK message, and may have only one of the following values: - T1 This requests a loopback release on a DS1 low-speed interface toward the high-speed OC3 fiber. - T3 This requests a loopback release on a DS3 low-speed interface toward the high-speed OC3 fiber. - EC1 This requests a loopback release on a EC1 low-speed interface toward the high-speed OC3 fiber.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the low speed port for which the loopback release is being requested. Refer to Tables 3-7 and 3-8 for a list of valid <i>aid</i> addresses. The address <i>a11</i> is not permitted for this command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If the command request is successfully completed, the following message is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT FORMAT section. The parameters described in that section apply to this command also.

EXAMPLE OUTPUT

```
RLS-LPBK-T1:ATT-SLC-2000:A-1:123456::;  
IP 123456  
  
ATT-SLC-2000-3 93-11-26 16:42:27  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RLS-LPBK command with a modifier not supported by the network element, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
ICNV  
/* Input, Command Not Valid, invalid modifier */  
;
```

If the *SLC-2000* system receives a *RLS-LPBK* command without an *aid* value or with an *aid* not supported by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
    AID is missing, wrong or inconsistent with modifier */
;
```

If the *SLC-2000* system receives a *RLS-LPBK* command with an otherwise valid *aid* value but for which the corresponding equipment is not present, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENEQ
  /* Equipage, Not Equipped */
;
```


If the *SLC-2000* system receives a *RLS-LPBK* command with an otherwise valid *aid* value but the command could not be completed by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed */
;
```

NAME

RLS-PROTNSW: Release Protection Switch

INPUT FORMAT

RLS-PROTNSW-*modifier*:[*tid*]:*aid*:*ctag*[::*dirn*];

DESCRIPTION

RLS-PROTNSW commands can be initiated to request the SLC-2000 system to release (clear) any existing forced, lockout, or inhibit protection switching requests on the specified linear 1+1-protected OC3 line pair.

RLS-PROTNSW commands do *not* cause previous manual protection switching requests to revert [for example, a previous TL1 command OPR-PROTNSW with switch command (*sc*) value MAN or CIT command *switch-line* with priority parameter value *manual* for linear OC3 line pairs].

The SLC-2000 system provides *unidirectional* line protection switching. A RLS-PROTNSW-OC3 command affects only the addressed pair of *incoming* linear OC3 signals. It does not affect which of the pair of *transmitted* OC3 signals is selected by the far end.

INPUT PARAMETERS

<i>modifier</i>	This is a message modifier to the RLS-PROTNSW command.
<i>oc3</i>	This requests an OC3 line protection switching release.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. If no <i>tid</i> is given, the command is interpreted to be addressed to the GNE.
<i>aid</i>	Access identifier. This is the address of the OC3 line pair for which the protection switching release is requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
<i>dirn</i>	Direction. This is the direction of the protection switching release request and may be RCV or null only. If null, the default value RCV applies.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the protection switching release request, the following normal completion response is returned to the OS:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
M	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
RLS-PROTNSW-OC3:SITE7NE1:fn-c:1016::RCV;
```

```
IP 1016  
<
```

```
    SITE7NE1 70-01-01 02:26:44  
M 1016 COMPLD  
;
```

ERROR RESPONSES

Refer to the RTRV-HDR error responses section. The error responses listed there apply to the RLS-PROTNSW command also.

The following additional error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RLS-PROTNSW command with a command code modifier other than oc3, the following error response is returned to the OS:

```
    sid date time  
M ctag DENY  
IICM  
/* Command code modifier must be OC3 */  
;
```

If the SLC-2000 system receives a RLS-PROTNSW command without an *aid* value or with an *aid* value that is invalid for a SLC-2000 system OC3 line pair, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the *SLC-2000* system receives a *RLS-PROTNSW* command with an invalid *dirn* value (that is, anything other than *RCV* or null), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, DIRN = RCV or null (default DIRN = RCV) */
;
```

If the *SLC-2000* system receives a *RLS-PROTNSW* command with any extra (beyond the input format specification above) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

If the *SLC-2000* system receives a *RLS-PROTNSW* command with an otherwise valid *aid* value but for which the corresponding slots are not equipped with compatible OC3 OLIU circuit packs (including *unprotected* equipage), the following error response is returned to the OS:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied, OLIUs not equipped */
;
```

NAME

RLS-SYNCNSW: Release Synchronization Switch

INPUT FORMAT

RLS-SYNCNSW: [*tid*][:*ctag*,

DESCRIPTION

RLS-SYNCNSW commands can be initiated to request the SLC-2000 system to release (clear) an existing inhibit of DS1 synchronization input reference protection switching.

RLS-SYNCNSW commands do *not* cause previous manual DS1 synchronization reference protection switching requests to revert (for example, a previous TL1 command OPR-SYNCNSW with switch command *sc* value **MAN** or CIT command *switch-sync* with priority parameter value **manual**).

INPUT PARAMETERS

- tid* Target identifier. This is the name of the network element to which the command is addressed. If no *tid* is given, the command is interpreted to be addressed to the GNE.
- ctag* Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If the SLC-2000 system fully complies with the protection switching release request, the following normal completion response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
RLS-SYNCNSW:SITE7NE1::1026;  
  
IP 1026  
<  
  
SITE7NE1 70-01-01 03:39:55  
M 1026 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there apply to the **RLS-SYNCNSW** command, also.

The following additional error conditions are listed in the order and priority that the *SLC-2000* system checks for each condition.

If the *SLC-2000* system receives a **RLS-SYNCNSW** command with a non-null command code modifier [including any extra hyphens (-)], the following error response is returned to the OS:


```
sid date time
M ctag DENY
IICM
/* Invalid Command, SLC-2000 does not support
   Command = xxxxxxxxxxxxxxxxxx */
;
```

where xxxxxxxxxxxxxxxxxx is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

If the SLC-2000 system receives a RLS-SYNCNSW command with a non-null aid value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
INUP
/* Input, no AID value allowed */
;
```

If the SLC-2000 system receives a RLS-SYNCNSW command with any extra (beyond the input format specification above) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

NAME

RTRV-ALM: Retrieve Alarm

INPUT FORMAT

RTRV-ALM[-modifier]:[tid]:[aid]:ctag[:ntfcncde];

DESCRIPTION

RTRV-ALM commands can be initiated to retrieve all active alarm conditions from the SLC-2000 system. This command retrieves all active alarm conditions pertaining to the addressed the SLC-2000 system in a line-by-line format, similar to the autonomous messages used to report alarm conditions when they occur.

Any alarm condition reported by an autonomous REPT ALM or REPT ALM ENV message, which is active when a RTRV-ALM command is received, is included in the RTRV-ALM response.

INPUT PARAMETERS

<i>modifier</i>	This is a message modifier to the RTRV-ALM command and may have one of the following values:
ALL	This requests all alarm conditions. This is the default.
COM	Common. This requests all alarm conditions that are not specifically equipment- or facility-related conditions but apply to the whole the SLC-2000 system shelf.
EC1	This requests facility-related alarm conditions at the electrical carrier signal level 1.
EQPT	This requests equipment-related alarm conditions.
OC3	This requests facility-related alarm conditions at the optical carrier signal level 3.
STS1	This requests facility-related alarm conditions at the synchronous transport signal level 1.
T1	This requests facility-related alarm conditions at the DS1 level.
T3	This requests facility-related alarm conditions at the DS3 level.
VT1	This requests facility-related alarm conditions at the virtual tributary signal level 1.5.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. If no <i>tid</i> is given, the command is interpreted to be addressed to the GNE.
<i>aid</i>	Access identifier. This is the address of the slot for which the current alarm conditions are requested. If the command code modifier is COM, ALL, null, or other, or if an <i>aid</i> value is invalid, omitted, or conflicts with the command code modifier, the SLC-2000 system responds to the OS without limiting the response based on the input <i>aid</i> , if any. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot AID addresses.

ctag Correlation tag. This is included in the command by the OS and is repeated by the *SLC-2000* system in the response to allow the OS to associate the command and response messages.

ntfncode Notification code. This is the alarm level for which the current alarms are requested, and it may have one of the following values:

CR Critical alarm

MJ Major alarm

MN Minor alarm.

If the *ntfncode* is valid, the *SLC-2000* system's response to the OS is limited to the specified notification code. If no notification code is specified or if the notification code is not valid, the *SLC-2000* system's response includes all alarm conditions.

Additional input parameters (*condtype*, *srveff*, *locn*, *dirn*, and *tmper*) may be included in the command request. However, the *SLC-2000* system responds to the OS without limiting the response based in these input parameters.

OUTPUT FORMAT

If there are no conditions to report, the following response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

If there are conditions to report, the following output report is returned to the OS:

```

sid date time
M ctag COMPLD
  "[aid],aidtype:ntfcncde,condtype,srveff,ocrdat,ocrtm:
  \"conddescr\"[: ,tblislt] "
  .
  .
  .
  .
  .
  .
  .
  .
  "[aid],aidtype:ntfcncde,condtype,srveff,ocrdat,ocrtm:
  \"conddescr\"[: ,tblislt] "
;

```

SONET subsystem conditions are listed first, followed by DLC subsystem conditions. Applicable output lines are ordered as follows:

1. By alarm severity level, greatest to least.
2. By date and time, with the most recent listed first.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
M	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.
<i>aid</i>	Access identifier. This is the address of the equipment component or facility for which an alarm condition is being reported. The <i>aid</i> is set to null only if the AIDTYPE is com. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.

<i>aidtype</i>	Access identifier type. This has one of the following values:	
	COM	Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 shelf.
	EC1	This reports a facility-related condition at the electrical carrier signal level 1.
	EQPT	This reports an equipment-related condition.
	OC3	This reports a facility-related condition at the optical carrier signal level 3.
	STS1	This reports a facility-related condition at the synchronous transport signal level 1.
	T1	This reports a facility-related condition at the DS1 level.
	T3	This reports a facility-related condition at the DS3 level.
	VT1	This reports a facility-related condition at the virtual tributary signal level 1.5.
	The <i>aidtype</i> always matches the second modifier (except if the modifier is "ALL").	
<i>ntfncode</i>	Notification code. This is the alarm level and has one of the following values:	
	CR	Critical alarm
	MJ	Major alarm
	MN	Minor alarm
<i>condtype</i>	Condition type (or Alarm type). The values for this parameter are listed in Tables 3-13 and 3-14 at the end of this section.	
<i>srveff</i>	Service effect. This indicates the effect of the reported alarm on service. This parameter has one of the following values:	
	SA	Service-affecting alarm condition.
	NSA	Non-service-affecting alarm condition.
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).	
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).	

conddescr Condition description (or Alarm message). This is the text description of the reported condition. If further explanation, including likely causes, of a reported condition is required, refer to Tables 3-9 and 3-10 at the end of this section.

tblislt Trouble isolated. If a reported condition is isolated to the reported *aid*, the *tblislt* value is *ISLTD* to indicate that the *aid* identifies the circuit pack that should be replaced by craft to correct the reported condition. If the reported condition is a circuit pack link alarm, the value is *NIMAN* to indicate that the fault has to be manually isolated and that the *aid* field identifies the suspected units. Otherwise, this parameter is not reported.

EXAMPLE INPUT/OUTPUT

```
RTRV-ALM-ALL:SITE7NE1::107;

IP 107
<

SITE7NE1 91-01-01 01:04:47
M 107 COMPLD
  "tg-2,EQPT:MN,SYNCCLK,NSA,01-01,01-02-28:
  \"CP removed\":,ISLTD"
  "fn-b-2,EQPT:MN,T3TERM,NSA,01-01,01-02-20:
  \"CP removed\":,ISLTD"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The error responses listed there apply to the **RTRV-ALM** command also.

NAME

RTRV-ALM-ENV: Retrieve Alarm Environment

INPUT FORMAT

RTRV-ALM-ENV:tid:[aid]:ctag:[ntfcncde][,almtype];

DESCRIPTION

The RTRV-ALM-ENV command messages can be initiated by OS users to retrieve active environmental alarm conditions from the network element (NE). This command retrieves active environmental alarm conditions pertaining to the addressed network element in a line-by-line format, similar to the autonomous messages used to report environmental alarm conditions when they occur.

Any alarm condition reported by an autonomous REPT ALM ENV message, which is active when a RTRV-ALM-ENV command is received, is included in the RTRV-ALM-ENV response.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.						
<i>aid</i>	Access identifier. This is the address of the environmental point(s) (for example, <i>env-1</i> or <i>env-all</i>) for which the current alarm conditions are requested. Refer to Tables 3-7 and 3-8 for a list of valid addresses. The <i>aid</i> value may also be <i>all</i> or <i>null</i> (each of which is effectively equivalent to <i>env-all</i>).						
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.						
<i>ntfncode</i>	Notification code. This is the alarm level for which the current environmental alarms are requested, and it may have one of the following values: <table><tr><td>CR</td><td>Critical alarm</td></tr><tr><td>MJ</td><td>Major alarm</td></tr><tr><td>MN</td><td>Minor alarm.</td></tr></table> The default is to retrieve all <i>ntfncode</i> values.	CR	Critical alarm	MJ	Major alarm	MN	Minor alarm.
CR	Critical alarm						
MJ	Major alarm						
MN	Minor alarm.						
<i>almtyp</i>	Alarm type. This is the environmental alarm type for which the current environmental alarms are requested. Because all environmental alarms have the same alarm type, the only valid values are <i>MISC</i> (miscellaneous) or <i>null</i> . The default is <i>MISC</i> .						

OUTPUT FORMAT

If there are no environmental alarms to report, the following response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If there are environmental alarms to report, the following output report is returned:

```

sid date time
M ctag COMPLD
  "aid:ntfcncde,almttype,ocrdat,ocrtm,\"almmsg\" "
    .      .      .      .      .      .
    .      .      .      .      .      .
  "aid:ntfcncde,almttype,ocrdat,ocrtm,\"almmsg\" "
;

```

Applicable output lines are ordered as follows:

1. By alarm severity level, greatest to least.
2. By date and time, with the most recent listed first.

OUTPUT PARAMETERS

<i>aid</i>	Access identifier. This is the address of the environmental alarm point being reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid environmental input addresses.						
<i>ntfcncde</i>	This is the alarm level and has one of the following values: <table> <tr> <td>CR</td><td>Critical alarm</td></tr> <tr> <td>MJ</td><td>Major alarm</td></tr> <tr> <td>MN</td><td>Minor alarm</td></tr> </table>	CR	Critical alarm	MJ	Major alarm	MN	Minor alarm
CR	Critical alarm						
MJ	Major alarm						
MN	Minor alarm						
<i>almttype</i>	Alarm type. The value of this parameter is MISC.						
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).						
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).						
<i>almmsg</i>	This is the text description of the reported condition. (The default is environmentn.) Refer to Tables 3-9 and 3-10 at the end of this section for an explanation of alarm conditions.						

EXAMPLE OUTPUT

```
RTRV-ALM-ENV:ATT-SLC-2000:all:123456::MN;  
  
IP 123456  
  
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "env-1:MN,MISC,10-26,16-30-00,\"opendoor\""  
  "env-3:MN,MISC,10-26,16-20-00,\"environment3\""  
;
```

ERROR RESPONSES

Refer to the non-message-specific error responses listed in the RTRV-HDR error responses.

If the *SLC-2000* system receives a *RTRV-ALM-ENV* command with an invalid *aid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the *SLC-2000* system receives a *RTRV-ALM-ENV* command with an invalid *ntfcncde* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, Invalid NTFCNCDE */
;
```

If the SLC-2000 system receives a RTRV-ALM-ENV command with an invalid *almtype* value (that is, anything other than MISC or null), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, Invalid ALMTYPE */
;
```

NAME

RTRV-AO: Retrieve Autonomous Output

INPUT FORMAT

RTRV-AO:tid:[aid]:ctag[:::spec_block];

DESCRIPTION

The RTRV-AO command is used to request the SLC-2000 system to send copies of autonomous TL1 messages.

The content of the response to the RTRV-AO command depends on the OS type assigned to the access channel (for example, the X.25 virtual circuit) over which the command is received. The output is limited to the autonomous TL1 messages that are assigned to the same OS type.

The SLC-2000 system saves autonomous TL1 messages in a separate file for each OS type, so the response to this command is retrieved from the file from the *same OS type only* that the command request came in on.

Copies of autonomous TL1 messages available for retrieval include those actually reported to the user as well as those that may not have reached the user due to external or internal conditions.

The SLC-2000 system saves a copy of each autonomous TL1 message to which an *atag* value is assigned per OS type. Whenever an *atag* sequence is reset for an OS type (for example, due to a system initialization or processor reset), the RTRV-AO log file for that OS type is cleared.

The SLC-2000 system saves copies of the 50 most recent autonomous TL1 messages for the *memory administration* OS type.

The SLC-2000 system saves copies of the 35 most recent autonomous TL1 messages for the *other-1* OS type.

The SLC-2000 system saves copies of the 10 most recent autonomous TL1 messages for the *maintenance* OS type.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>uid</i>	Access identifier. Because the RTRV-AO log file is not filtered by the <i>aid</i> , the value must be <i>all</i> (default) or <i>null</i> .
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>spec_block</i>	The parameters included within the specific block are positionally independent and are specified using a name-defined construct of: <i>PARAMETER=value</i> . The specific block may have one, both or none of the following parameters specified within it in a comma-separated list. Furthermore, each parameter listed below can appear at most once within the specific block for a single RTRV-AO command. The use of the word "null" in the descriptions below imply that the parameter does not appear or appears with no value. (for example, <i>ATAGSEQ=,MSGTYPE=</i>) in the command. Valid parameters are:

ATAGSEQ Automatic tag sequence. This is the three-digit *atag* value of the autonomous TL1 messages requested. For example, *ATAGSEQ=010* specifies single *atag* value 010. Two *atag* values may be specified by using an "&" (ampersand), for example, "*ATAGSEQ=010&20*" specifies *atag* values 010 and 020.

A range of *atag* values may be also specified by using "&&" (double ampersands), for example, *ATAGSEQ=10&&20* specifies *atag* values 010, 011, 012, ..., 020.

The network element's response to *ATAGSEQ=001&&001* is the same as for *ATAGSEQ=001* (or *ATAGSEQ=001&001*); that is, to retrieve just *one* copy of the autonomous TL1 message with an *atag* of 001. A wrap-around range of *atag* values may also be specified by using && (double ampersands), for example, *ATAGSEQ=998&&2* specifies *atag* values 998, 999, 000, 001 and 002. Combinations of single ampersands (&) and double ampersands (&&) are not allowed in the same *ATAGSEQ* parameter specification.

If multiple or a range of *atag* values are specified by *ATAGSEQ*, but *some* of the *atag* values are not available in the network element's RTRV-AO log file, the network element responds with the *atag* values that *are* available within the specified *ATAGSEQ*. If no *ATAGSEQ* is specified (null), the response is not limited based on *atag* value.

MSGTYPE Message type. This is the type of autonomous messages requested. (For example, "MSGTYPE=DBCHG" requests all REPT DBCHG autonomous messages.) This parameter may be null or have one of the following values:

ALM	Report alarm (including Report Alarm Environment)
COND	Report condition
EVENT	Report event
DBCHG	Report database change
PM	Report performance monitoring
SW	Report switch

If no **MSGTYPE** is specified (null), the response is not limited by the type of autonomous messages.

OUTPUT FORMAT

If there are no autonomous messages to report, the normal completion response is returned to the OS. If the input *ATAGSEQ* *atag* or **MSGTYPE** values do not match any *atag* values or message types, respectively, in the network element's RTRV-AO log file, the network element provides a normal completion response.

If the network element has autonomous messages to report, the following normal completion response is returned:

```

    sid date time
M  ctag COMPLD
/*
complete autonomous messages, but no termination indicator (;)
*/
;

```

If there is more than one autonomous message to report, the autonomous messages are output in ascending (chronological) order by their *atag* values. The *order* of output is independent of the *order* of input of the ATAGSEQ *atag* values.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

```

RTRV-AO:ATT-SLC-2000::123456:::ATAGSEQ=10&11;

IP 123456
<

ATT-SLC-2000 93-10-26 10:42:11
M 123456 COMPLD
/*

ATT-SLC-2000 93-10-26 10:24:11
* 010 REPT ALM EQPT
  "tg-1:MN,SYNCLK,NSA,10-25,10-30-00:
  \"TGS CP failed\":,ISLTD"

ATT-SLC-2000 93-10-25 10:30:03
A 011 REPT SW
  "tg-1,tg-2"
*/
;

```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the RTRV-AO command, also.

If the SLC-2000 system receives a RTRV-AO command with a non-null command code modifier (including any extra hyphens), the following error response is returned:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid,
   network element does not support command = xxxxxxxxxxxxxxxx
*/
;
```

If the SLC-2000 system receives a RTRV-AO command with an invalid *aid* value (that is, anything other than *a11* or *null*), the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the SLC-2000 system receives a RTRV-AO command with the same parameter specified more than once, the following error response is returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation,
   parameter(s) multiply defined */
;
```

If the SLC-2000 system receives a RTRV-AO command with an invalid ATAGSEQ value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid ATAGSEQ */
;
```

Invalid ATAGSEQ values include:

1. *atag* values greater than 3 integers,
2. any entries other than integers and ampersands (&),
3. ampersand(s) not preceded and followed by *atag* values.

If the *SLC-2000* system receives a RTRV-AO command with an invalid MSGTYPE value (that is, an autonomous TL1 message type that the *SLC-2000* system doesn't support), the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid MSGTYPE */
;
```

NAME

RTRV-ATTR-*rr*: Retrieve Attribute

INPUT FORMAT

RTRV-ATTR-*modifier*:*tid*[:*aid*]:*tag*[::,,,:];

DESCRIPTION

The RTRV-ATTR-*rr* command messages can be initiated by an OS or OS users to request the SLC-2000 system to retrieve the notification code associated with incoming signal failure events.

This command also determined whether the event notification is alarmed (reported via the REPORT ALARM command) or not alarmed (reported via the REPORT EVENT command).

A no-report option for this command is also available.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the RTRV-ATTR- <i>rr</i> message and may have one of the following values:
ALL	This requests attributes for all of the following facility types.
EC1	This requests attributes for the electrical carrier signal level 1.
T1	This requests attributes for the DS1 level.
T3	This requests attributes for the DS3 level.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the facility for which the attributes are requested. The value may be all (default value) or null. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>tag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If there are no attributes to report, the following message is returned to the OS:

```
sid date time  
  
M ctag COMPLD  
;
```

If there are attributes to report, the following output is returned:

```
sid date time  
  
M ctag COMPLD  
"aid,aidtype:ntfcncde,, locn, dirn"  
  .      .      .      .      .  
  .      .      .      .      .  
  .      .      .      .      .  
"aid,aidtype:ntfcncde,, locn, dirn"  
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.								
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).								
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).								
<i>M</i>	This indicates the output message is generated in response to a manual command.								
<i>ctag</i>	Correlation tag. This is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.								
COMPLD	This indicates that the command has been completed.								
<i>aid</i>	Access identifier. This is the address of the facility for which the attributes are requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.								
<i>aidtype</i>	Access identifier type. This has one of the following values: <table> <tr> <td>EC1</td><td>This reports attributes for the electrical carrier signal level 1.</td></tr> <tr> <td>T1</td><td>This reports attributes for the DS3 level.</td></tr> <tr> <td>T3</td><td>This reports attributes for the DS3 level.</td></tr> </table>	EC1	This reports attributes for the electrical carrier signal level 1.	T1	This reports attributes for the DS3 level.	T3	This reports attributes for the DS3 level.		
EC1	This reports attributes for the electrical carrier signal level 1.								
T1	This reports attributes for the DS3 level.								
T3	This reports attributes for the DS3 level.								
<i>ntfcncde</i>	Notification code. This is the alarm level associated with the addresses facility and has one of the following values: <table> <tr> <td>CR</td><td>Critical alarm</td></tr> <tr> <td>MJ</td><td>Major alarm</td></tr> <tr> <td>MN</td><td>Minor alarm</td></tr> <tr> <td>NA</td><td>Not alarmed.</td></tr> </table>	CR	Critical alarm	MJ	Major alarm	MN	Minor alarm	NA	Not alarmed.
CR	Critical alarm								
MJ	Major alarm								
MN	Minor alarm								
NA	Not alarmed.								
<i>locn</i>	Location. This parameter always has the value NEND.								
<i>dirn</i>	Direction. This parameter always has the value RCV.								

EXAMPLE OUTPUT

```
RTRV-ATTR-T3:ATT-SLC-2000:a:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000 93-11-26 16:54:21  
M 123456 COMPLD  
"a,T3:CR,,NEND,RCV"  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives an RTRV-ATTR-*rr* command with an invalid command modifier, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
ICNV  
/* Input, Command Not Valid, invalid modifier */  
;
```

If the SLC-2000 system receives an RTRV-ATTR-*rr* command with an invalid *aid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier */
;
```

If the SLC-2000 system receives an RTRV-ATTR-*rr* command with a valid *aid* value but the network element does not have equipment in any of the addressed slots, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENEQ
  /* Equipage, Not Equipped */
;
```

If the SLC-2000 system receives an RTRV-ATTR-*rr* command with a valid *aid* value but the network element is equipped with the wrong type of circuit pack, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENRI
  /* Equipage, Not Equipped for Retrieving specified
    Information */
;
```

NAME

RTRV-ATTR-ENV: Retrieve Environmental Attributes

INPUT FORMAT

RTRV-ATTR-ENV:tid:aid:ctag[::];

DESCRIPTION

The RTRV-ATTR-ENV command messages can be initiated by an OS or OS users to retrieve the environmental alarm/status point attributes, notification code (alarm level), alarm type (condition type), and alarm message (condition description) from the Network Element.

Because environmental input points are only supported at remote (RT) Network Elements, this command is only allowed at Network Elements with the CO/RT select switch set to "RT". Refer to the "TL1-Related Provisioning" paragraph presented earlier in this section.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the environmental points for which the attributes are requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If the network element fully complies with the command request, the following normal completion response is returned to the OS:

```
sid date time
M ctag COMPLD
"aid:ntfcncde:almtype,"\almmsg\" "
. . . . .
. . . . .
"aid:ntfcncde:almtype,"\almmsg\" "
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.								
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).								
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).								
<i>M</i>	This indicates the output message is generated in response to a manual command.								
<i>ctag</i>	Correlation tag. This is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.								
COMPLD	This indicates that the command has been completed.								
<i>aid</i>	Access identifier. This is the address of the environmental point for which the attributes are reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.								
<i>ntfcncde</i>	Notification code. This is the alarm level associated with the addresses facility and has one of the following values: <table> <tr> <td>CR</td><td>Critical alarm</td></tr> <tr> <td>MJ</td><td>Major alarm</td></tr> <tr> <td>MN</td><td>Minor alarm</td></tr> <tr> <td>NA</td><td>Not alarmed.</td></tr> </table>	CR	Critical alarm	MJ	Major alarm	MN	Minor alarm	NA	Not alarmed.
CR	Critical alarm								
MJ	Major alarm								
MN	Minor alarm								
NA	Not alarmed.								
<i>almtype</i>	Alarm type. This is the TL1 alarm type, also referred to as the TL1 condition type, associated with the addressed environmental point. The network element accepts any alarm type value consisting of 1 - 10 alphanumeric characters and/or dashes.								
<i>almsg</i>	Alarm message. This is the condition description associated with the addressed environmental point. The description is an alphanumeric string, upper- and lower-case characters with no spaces, up to 26 characters. The description is enclosed within a pair of escaped quotes (\"). Refer to Tables 3-9 and 3-10 at the end of this section.								

EXAMPLE OUTPUT

```
RTRV-ATTR-ENV:ATT-PF-2000:env-10:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "env-10:MJ,HITEMP,\"HighTemperature\""  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives an RTRV-ATTR-ENV command but the network element does not have the CO/RT select switch set to RT, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
ENRI  
/* Equipage, Not equipped for Retrieving specified  
  Information */  
;
```

If the *SLC-2000* system receives an *RTRV-ATTR-ENV* command with an invalid *aid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

NAME

RTRV-COND: Retrieve Condition

INPUT FORMAT

RTRV-COND [-modifier]:[tid]:[aid]:ctag,

DESCRIPTION

RTRV-COND commands can be initiated to retrieve all active status conditions from the *SLC-2000* system. This command retrieves all active status conditions pertaining to the addressed *SLC-2000* system in a line-by-line format, similar to the autonomous messages used to report status conditions when they occur.

Any status condition reported by an autonomous REPT EVT message, which is active when a RTRV-COND command is received, is included in the RTRV-COND response.

INPUT PARAMETERS

<i>modifier</i>	This is a message modifier to the RTRV-COND command and may have one of the following values:
ALL	This requests all status conditions. This is the default.
COM	Common. This requests all status conditions that are not specifically equipment- or facility-related conditions but apply to the whole SLC-2000 shelf.
EC1	This requests facility-related status condition at the electrical carrier signal level 1.
EQPT	This requests equipment-related status conditions.
OC3	This requests facility-related status conditions at the optical carrier signal level 3.
STS1	This requests facility-related status conditions at the synchronous transport signal level 1.
T1	This requests facility-related status conditions at the DS1 level.
T3	This requests facility-related status conditions at the DS3 level.
VT1	This requests facility-related status conditions at the virtual tributary signal level 1.5.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. If no <i>tid</i> is given, the command is interpreted to be addressed to the GNE.
<i>aid</i>	Access identifier. This is the address of the slot for which the current status conditions are requested. If the command code modifier is COM, ALL, null, or other, or if an <i>aid</i> value is invalid, omitted, or conflicts with the command code modifier, the SLC-2000 system responds to the OS without limiting the response based on the input <i>aid</i> , if any. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot AID addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

Additional input parameters [*condtype* (or *typereq* per TR-NWT-000833, Issue 4), *locn*, *dirn*, and *tmper*] may be included in the command request. However, the SLC-2000 system responds to the OS without limiting the response based in these input parameters.

OUTPUT FORMAT

If there are no status conditions to report, the following response is returned to the OS:

```

sid date time
M ctag COMPLD
;
```

If there are conditions to report, the following output report is returned to the OS:

```

sid date time
M ctag COMPLD
" [aid], aidtype:ntfcncde, condtype, srveff, ocrdat, ocrtm, , , ,
  \"conddescr\" "
. . . . .
. . . . .
. . . . .

" [aid], aidtype:ntfcncde, condtype, srveff, ocrdat, ocrtm, , , ,
  \"conddescr\" "
;
```

Applicable output lines are ordered by date and time, with the most recent listed first.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.																
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).																
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).																
<i>M</i>	This indicates the output message is generated in response to a manual command.																
<i>ctag</i>	Correlation tag. This is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.																
COMPLD	This indicates that the command has been completed.																
<i>aid</i>	Access identifier. This is the address of the equipment component or facility for which a status condition is being reported. The <i>aid</i> is set to null only if AIDTYPE is COM. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.																
<i>aidtype</i>	Access identifier type. This has one of the following values: <table> <tr> <td>COM</td><td>Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system shelf.</td></tr> <tr> <td>EC1</td><td>This reports a facility-related condition at the electrical carrier signal level 1.</td></tr> <tr> <td>EQPT</td><td>This reports an equipment-related condition.</td></tr> <tr> <td>OC3</td><td>This reports a facility-related condition at the optical carrier signal level 3.</td></tr> <tr> <td>STS1</td><td>This reports a facility-related condition at the synchronous transport signal level 1.</td></tr> <tr> <td>T1</td><td>This reports a facility-related condition at the DS1 level.</td></tr> <tr> <td>T3</td><td>This reports a facility-related condition at the DS3 level.</td></tr> <tr> <td>VT1</td><td>This reports a facility-related condition at the virtual tributary signal level 1.5.</td></tr> </table> The <i>aidtype</i> always matches the second modifier (except if the modifier is "ALL").	COM	Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system shelf.	EC1	This reports a facility-related condition at the electrical carrier signal level 1.	EQPT	This reports an equipment-related condition.	OC3	This reports a facility-related condition at the optical carrier signal level 3.	STS1	This reports a facility-related condition at the synchronous transport signal level 1.	T1	This reports a facility-related condition at the DS1 level.	T3	This reports a facility-related condition at the DS3 level.	VT1	This reports a facility-related condition at the virtual tributary signal level 1.5.
COM	Common. This reports a condition that is not an equipment or facility condition but applies to the whole SLC-2000 system shelf.																
EC1	This reports a facility-related condition at the electrical carrier signal level 1.																
EQPT	This reports an equipment-related condition.																
OC3	This reports a facility-related condition at the optical carrier signal level 3.																
STS1	This reports a facility-related condition at the synchronous transport signal level 1.																
T1	This reports a facility-related condition at the DS1 level.																
T3	This reports a facility-related condition at the DS3 level.																
VT1	This reports a facility-related condition at the virtual tributary signal level 1.5.																
<i>ntfcnnde</i>	Notification code. This parameter value is always NA (not alarmed) for status conditions.																

<i>condtype</i>	Condition type [or condition type reported (<i>typerep</i>) per TR-NWT-000833, Issue 4]. The values for this parameter are listed in Tables 3-13 and 3-14 at the end of this section.
<i>srveff</i>	Service effect. This indicates the effect of the reported condition on service. This parameter value is always NSA (non-service-affecting) for status conditions.
<i>ocrdat</i>	Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).
<i>ocrtm</i>	Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).
<i>conddescr</i>	Condition description. This is the text description of the reported condition. If further explanation, including likely causes, of a reported condition is required, refer to Tables 3-9 and 3-10 at the end of this section.

EXAMPLE INPUT/OUTPUT

The *aid* values in the following example are SLC-2000 system example *aid* values:

```
RTRV-COND-ALL:SITE7NE1::108;

IP 107
<

SITE7NE1 91-01-01 01:05:48
M 108 COMPLD
"env-1,COM:NA,MISC,NSA,01-01,01-03-29,,,,\"environment1\"
"main-1,OC3:NA,FERF,NSA,01-01,01-01-10,,,,\"inc. OC3 FERG\"
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the RTRV-COND command also.

NAME

RTRV-CRS-*rr*: Retrieve SONET subsystem cross-connections

INPUT FORMAT

RTRV-CRS-*modifier:tid:aid1:ctag*,

DESCRIPTION

The RTRV-CRS-*rr* command messages can be initiated by a user to request the SLC-2000 system to retrieve STS-1 or VT1.5 cross-connections in a SLC-2000 SONET subsystem. Cross-connections are always two-way. A drop and continue or pass-through cross-connection can be established in the SLC-2000 system by setting the appropriate parameters at the command line.

Refer to the ENT-CRS-*rr* command description for details on the restrictions on cross-connections in the SLC-2000 system add/drop application for path protection switched rings.

When the SLC-2000 system receives an RTRV-CRS-*rr* command from the OS, the SLC-2000 system will retrieve a STS-1/VT-1.5 channel in the high speed OC3 line cross-connection(s) according to the parameter settings in the command.

T0 cross-connects are discussed in the RTRV-CRS-*T0* command manual page.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the RTRV-CRS- <i>rr</i> command. This is a required parameter and may have one of the following values:
<i>sts1</i>	This specifies an STS-1 cross-connection to be retrieved.
<i>vt1</i>	This specifies a VT1.5 cross-connection to be retrieved.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.

<i>aid</i>	Access identifier. This is the valid address of a STS-1 or VT1.5 channel in the high speed OC3 line or low speed port or channel of the <i>SLC-2000</i> system. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses. The value <i>a11</i> may be used.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the retrieve cross-connection request, the following output message is returned to the user:

```

sid date time
M ctag COMPLD
  "src_aid,dest_aid::cct[:ring={m1,m2}]"
;
```

OUTPUT PARAMETERS

Refer to the *RTRV-HDR* command for an explanation of the *sid*, *date*, *date*, *time*, *M*, *ctag*, and *COMPLD* parameters. In addition, the following parameters are included in the output format:

<i>src_aid</i>	Source access identifier. This is the <i>AID</i> of the STS-1/VT-1.5 line channel or low speed port or channel specified in the <i>RTRV-CRS-rr</i> command.
<i>dest_aid</i>	Destination access identifier. This is the destination address of the STS-1/VT-1.5 channel in the high speed OC3 line or low speed port or channel that is cross connected to the <i>src_aid</i> .

<i>cct</i>	Cross-connection type. This parameter specifies the type of cross-connection for the <i>SLC-2000</i> system and has one of the following values:	
	2WAY	This value is returned only by the linear systems. This specifies a two-way cross-connection between the source and destination.
	2WAYPR	This value is returned only by the ring systems. This specifies a two-way, add/drop cross-connection between the source and destination in a path switched ring.
	2WAYBR	This value is returned only by the ring systems. This specifies a drop and continue cross-connection between the source and destination in a path switched ring.
<i>RING</i>	If the <i>cct</i> is 2WAYBR , then this parameter is specified. It must have one of the following two values:	
	M1	Ring 1
	M2	Ring 2
	If the <i>cct</i> is 2WAYBR , then this parameter is specified. It must have one of the following values:	
	MB1	Ring 1
	MB2	Ring 2

EXAMPLE INPUT/OUTPUT

```

rtrv-crs-stsl:ATT-SLC-2000-3:m-2:123456;

IP 123456
<

ATT-SLC-2000-3 93-11-26 16:42:11
M 123456 COMPLD
  "m-2,b::2WAY"
;

```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-CRS-HDR error responses.

The following error conditions are listed in the order and priority that the *SLC-2000* system checks for each condition.

If the *SLC-2000* system receives a *RTRV-CRS-rr* command with a command code modifier other than *T0*, *STS1* or *VT1* the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```


If the *SLC-2000* system receives an *RTRV-CRS-rr* command with an *aid* that is incorrect or not supported by the system, following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier, AID is
   missing wrong or inconsistent with the modifier */
;
```

If a *SLC-2000* system receives an *RTRV-CRS-VT1* command with either the *src_aid* or *dest_aid* value pointing to a VT1 channel of a STS1E CP while the corresponding STS1 port is in the *NMON* state, the following error response is returned to the user:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State, EC1 port is in OOS state */
;
```

If a linear *SLC-2000* system receives an *RTRV-CRS-rr* command with a *cct* value other than null or *2WAY*, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid CCT */
;
```

If a ring *SLC-2000* system receives an *RTRV-CRS-rr* command with a *cct* value other than null, *2WAYBR*, or *2WAYBR*, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid CCT */
;
```

If a ring *SLC-2000* system receives an *RTRV-CRS-rr* command with a *cct* value set to *2WAYPR*, but the source and destination addresses represent two different HS time slots of the ring, the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, Pass-through grooming not allowed */
;
```

The term *Pass-through grooming* refers to cross-connecting a timeslot of a ring received at a ring node to a different timeslot of the same ring in the transmit direction of the same ring node. For example, cross-connecting the VT, $m-1-1-1$ to anything other than $m-1-1-1$ will be considered pass-through grooming, but cross-connecting the VT $m-1-1-1$ to $m-1-1-1$ will not be considered pass-through cross-connection.

If a ring *SLC-2000* system receives an *RTRV-CRS-rr* command with a *cct* value set to *2WAYBR* but without the *RING* parameter set in the *spec-block*, the following error response is returned to the user:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
   RING parameter must be set when CCT is 2WAYBR */
;
```

If a SLC-2000 ring system receives an RTRV-CRS-rr command with RING parameter in the *spec_block* with the *cct* set to a value other than 2WAYBR, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
  /* Input, Data Not Valid,
    RING parameter is valid only when CCT is 2WAYBR */
;
```

If a SLC-2000 ring system receives an RTRV-CRS-VT1 command with the *cct* set to 2WAYBR and with RING parameter in the *spec_block* whose value conflicts with the RING parameter value already set for another VT1 path, the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
  /* Input, Data Not Valid, invalid RING */
;
```

If the SLC-2000 system receives an otherwise valid RTRV-CRS-rr command for which the system does not support cross-connection between the *src_aid* and *dest_aid* parameters values (for example, a and b in an OC3 system -

commonly known as a hair-pinning arrangement), then the following error response is returned to the user:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, cross connection
   not supported between the specified AIDs */
;
```

If the *SLC-2000* system receives an otherwise valid *RTRV-CRS-rr* command but for which, the *SLC-2000* system is not properly equipped, the following error response is returned to the user:

```
sid date time
M ctag DENY
  ENSI
/* Equipage, shelf equipage does not allow requested
   cross connection */
;
```

If the *SLC-2000* system receives an otherwise valid *RTRV-CRS-rr* command but for which, the cross-connection cannot be made because the addressed

src_aid or *dest_aid* is already involved in an existing cross-connection, the following error response is returned to the user:

```
sid date time
M ctag DENY
  SACC
  /* Status, Already Cross Connected */
;
```

If the SLC-2000 system receives an otherwise valid RTRV-CRS-rr command but for which the cross-connection cannot be made because the cross-connect mode of the system is not currently set to *manual*, the following error response is returned to the user:

```
sid date time
M ctag DENY
  SNVS
  /* Status, Not in Valid State, system currently
    provisioned for default cross-connections */
;
```

NAME

RTRV-CRS-T0 : Retrieve cross-connections between logical VRT lines or logical INA DS0s and physical lines.

INPUT FORMAT

RTRV-CRS-T0:*tid*:*Address*:*ctag*;

DESCRIPTION

This command is used to retrieve a list of cross-connections between logical lines and physical lines (or ITH links).

INPUT PARAMETERS

<i>tid</i>	Target identifier.
<i>Address</i>	This is the address of the logical VRT line, the logical INA DS0, the physical line entity, or the ITH link in the cross-connection. There is no default. This may be one of: { all, vrtdp-{1-8}-{1-96}, inads0-{1-28}-{1-24}, drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4}, ithlink-{1-2} } In Release 4, <i>Address</i> may also be any valid logical TR303 VRT line: { v3dp-1-{1-1536} }
<i>ctag</i>	Correlation tag.

OUTPUT FORMAT

If *all* or a logical line AID is entered, cross-connections are output in the following order:

1. All cross-connections between logical VRT lines and physical lines starting with the lowest numbered line on the lowest numbered VRT containing a DS0 cross-connect to the highest numbered line on the highest numbered VRT containing a DS0 cross-connect.

2. All cross-connections between INA DS0s and physical lines, starting with the lowest numbered DS0 on the lowest numbered INA digroup with a cross-connection, to the highest numbered INA DS0 on the highest numbered INA digroup with a cross-connection,

If physical line or ITH link AID is entered, the cross-connections in the output are sorted according to the physical line or ITH link AIDs.

If the system fully complies with the request, the following report is returned with one entry for each cross-connection:

```
sid date time
M ctag COMPLD
  "Address1,Address2"...
  "Address1,Address2"
;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements listed there apply to the RTRV-CRS-T0 command also. In addition, the following output parameters also apply to RTRV-CRS-T0.

- Address1* This is the address of the logical VRT line or the logical INA DS0. See ENT-CRS-T0 for valid values.
- Address2* This is the address of the physical line. See ENT-CRS-T0 for valid values.

EXAMPLE INPUT/OUTPUT

```
RTRV-CRS-T0:ATT-PF-2000:vrt dp-2-4:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
  "vrt dp-2-4,drop-6-2-3"  
;
```

ERROR OUTPUT

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements here apply to the **RTRV-CRS-T0** command also. The following error responses are listed in the order and priority that the **SLC-2000** system checks for each condition.

If the **SLC-2000** system receives a **RTRV-CRS-T0** command without an Address, or with an Address that is not a valid logical or physical line supported by the **SLC-2000** system, the following error response is returned:

```
sid date time  
M ctag DENY  
  IIAC  
  /* Input, Invalid Access Identifier,  
    AID is missing, wrong or inconsistent with the modifier */  
;
```

If a single AID is entered (e.g. not a11), and the AID is not part of an existing cross-connection, the following denial message will be displayed:

```
sid date time
M ctag DENY
SNVS
/* Status, Not in Valid State,
   The specified cross-connection does not exist */
;
```

NAME

RTRV-EQPT: Retrieve Equipment

INPUT FORMAT

RTRV-EQPT:*tid:aid:ctag*;

DESCRIPTION

The RTRV-EQPT command is initiated to request the SLC-2000 system to retrieve the circuit pack and version number information for one or more slots. Inventory information for the ARM and MDS shelves is also available through this command.

**NOTE:**

For Release 4: Inventory information is not available on the SPQ808 MSDT server. MSDT inventory data is available when the SPQ808B is used.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the slot or shelf address whose equipage is to be reported. The address <i>a11</i> may be used. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot <i>aid</i> addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```

    sid date time
M   ctag COMPLD
    "aid:::spec_block"
    . . . .
    . . . .
    "aid:::spec_block"
;

```

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, *ctag*, and *COMPLD* included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. In addition, the following parameters are used in the **RTRV-EQPT** command:

<i>aid</i>	Access identifier. This is the address of the slot for which equipage is being reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid slot <i>aid</i> addresses.
<i>spec_block</i>	Specific block. This parameter field is used for returning the current equipage information for the slot. Parameters within the specific block are positionally independent and are specified using a name defined construct of: <i>PARAMETER=value</i> in a comma separated list. The <i>SLC-2000</i> system will return the parameter within the <i>spec_block</i> in the following order: TYPE , APP , SSN , CLEI , ECI , SLN , VRSN , and PID . The parameters are:
TYPE	This is the mnemonic name that identifies the general type function provided by the circuit pack. For example, Optical Line Interface Units are all named OLIU .
APP	This is the apparatus code and it uniquely identifies the specific function provided by the circuit pack. Circuit packs with different APP are not interchangeable, even if they have the same name.

For shelves, this field contains the Equipment Code (J-Code).

SSN

This is the series number and it is used to indicate interchangeability among the circuit packs with the same circuit pack type and apparatus code, but different manufacturing versions. In general, a circuit pack can be replaced by another pack that has the same apparatus code and the same or later series number.

Note that the series number normally includes a colon (:). Since the colon is used as a TL1 field separator, a dash (-) is used instead.

For shelves, this field contains the Equipment Code List Number.

CLEI

CLEI is the 10-character code identifying each circuit pack.

ECI

The Equipment Catalog Item is a 6-character code identifying each circuit pack. This code corresponds to the bar-code label on the face-plate of the circuit pack, and is uniquely equivalent to *CLEI*.

SLN	This is the serial number and it is a 12-character code uniquely identifying each circuit pack and indicating the date and place of manufacture.
VRSN	The program version is the version of the software currently stored in the circuit pack.
	This parameter only applies to the SYSCTL, OHCTL, and PDC circuit packs.
DLCVRSN	DLC program version. This parameter only applies to the SMU and is the version of the DLC software currently stored in the SMU.
TSTVRSN	TST program version. This parameter only applies to the SMU and is the version of the TEST (ITH) software currently stored in the SMU. Currently, this is always equal to <i>none</i> since no TST software is stored on the SMU.
SNTVRSN	SNT program version. This parameter only applies to the SMU and is the version of the SONET software currently stored in the SMU. Currently, this is always equal to <i>none</i> since no SNT software is stored on the SMU.
EQPTCDE	The program Equipment Code of the software currently stored in the circuit pack. This is a "J-Code" number and only applies to the PDC.
DLCCDE	DLC program Equipment Code. This parameter only applies to the SMU and is the "J-Code" of the DLC software currently stored in the SMU.
TSTCDE	TST program Equipment Code. This parameter only applies to the SMU and is the "J-Code" of the TST software currently stored in the SMU. Currently, this is always equal to <i>none</i> since no TST software is stored on the SMU.
PID	The program identification code identifies the version of the firmware on one or more socketed devices on the circuit pack.

*

COMMON LANGUAGE is a registered trademark and CLEI, CLLI, and CLFI are trademarks of Bell Communications Research, Inc.

The network element will include in its response equipage information on only equipped slots. The network element will successfully complete the `RTRV-EQPT` command and return a `COMPLD` even if the `aid` in the command points to slot(s) that is/are not equipped.

For older channel units, incomplete `CLEI` code information is available (only two to six of the most significant digits are readable.) For these units, a 10-character code is returned which is a partial `CLEI` code with an `x` in each undetermined character.

For the `SLC-2000` DLC subsystem, if a circuit pack is not readable, the `CLEI` is equal to *Unreadable*, the `TYPE` is equal to the type of CP that was previously readable in that slot (if available in the system RAM, otherwise it is equal to a question mark), and all other parameters are equal to question marks (?).

Question marks (?) are used in the parameter value fields to indicate that the information is unknown.

The following apply to SONET subsystem circuit packs:

- If an incorrect circuit pack is inserted in a slot, the response from the network element will show the expected circuit pack for that slot and indicate that the current pack does not match inventory. In this case the `CLEI` field will be set to *illegal CP type* for that slot.
- If a faulty circuit pack with unreadable version recognition information is placed in the slot, the report indicates that the circuit pack is failed and version information is unrecognizable. In this case the `CLEI` field will be set to *CP failed version information unrecognizable*.
- If the system cannot report complete version information for a circuit pack because of a field upgrade, then the information that may be incorrect is followed by a "?".
- If the system cannot report complete information for a circuit pack since the low speed circuit pack never received power prior to removal, then the `TYPE` field will be set to "?" and the `CLEI` field will be set to *CP not powered version information unavailable*.
- If the system cannot report complete information for a circuit pack since the low speed DS1 circuit pack does not have a MXRVO or STS1E-HS circuit pack in the corresponding function slot, then the `CLEI` field will be set to *CP not allowed - equipped*.
- If the system cannot report complete information for a circuit pack since the low speed circuit DS1 circuit pack has never been powered, then the `TYPE` field will be set to "?" and the `CLEI` field will be set to *CP not powered version information unavailable*.

- If the system cannot report complete information for a circuit pack since the low speed circuit DS1 circuit pack is present but not currently powered, but was once powered, then the **TYPE** field will be set to the expected circuit pack type and the **CLEI** field will be set to *CP not powered version information unavailable*.
- If the system cannot report the information for a slot that is equipped with a legal pack type but the actual pack type and the data base do not match, then **TYPE** field will be set to the expected circuit pack type and the **CLEI** field will be set to *installed CP (act name) does not match inventory*.

When the *aid* of the slot input command is SYSCTL, the network element will return the equipage information for both the SYSCTL and OHCTL.

Software version information is included to the SYSCTL, OHCTL and PDC circuit packs. In addition, the DLC software version stored on the SMU is reported. Version information on other downloadable units in the system (e.g. TSI, MDC, VTU) is not reported since it is the same version as that on the PDC when the SMU is enabled (normal operating condition.)

EXAMPLE INPUT/OUTPUT

```
RTRV-EQPT:ATT-SLC-2000:all:123456;
IP 123456
"tg-1:::TYPE=TGS,APP=BBF2B,SSN=S1-1,
  CLEI=SNPQAJCAAA,ECI=680153,
  SLN=2MV09625458,PID=AEKCG"
"tg-2:::TYPE=TGS,APP=BBF2B,SSN=S1-1,
  CLEI=SNPQAJCAAA,ECI=680453,
  SLN=2MV09625458,PID=AEKCG"

"main-1:::TYPE=OLI,APP=22F,SSN=S1-2,
  CLEI=FNUMG00CAB,ECI=680085,
  SLN=93MV08570294"

"main-2:::TYPE=OLI,APP=22F,SSN=S1-2,
  CLEI=FNUMG00CAB,ECI=680934,
  SLN=92MV08576693"

. . . . .
. . . . .
. . . . .
;
```


ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to this command, also.

If the SLC-2000 system receives an RTRV-EQPT command with an otherwise valid set of input parameter values but the command could not be completed by the network element, the following error response is returned to the user:

```
sid date time
M ctag DENY
SROF
/* Status, Request Operation Failed,*/
;
```

If the SLC-2000 system receives an RTRV-EQPT command without an *aid* or with an invalid *aid*, the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   AID is missing, wrong, or inconsistent with modifier */
;
```

If the SLC-2000 system receives an RTRV-EQPT command with an *aid* that points to a slot that is not equipped and the *aid* is not equal to "all", the following error response is returned:

```
sid date time
M ctag DENY
  ENEQ
/* Equipage, Not Equipped */
;
```

NAME

RTRV-HDR: Retrieve Header

INPUT FORMAT

RTRV-HDR:[*tid*][:*ctag*,

DESCRIPTION

RTRV-HDR commands request that *SLC-2000* system return a normal completion response. The OS or OS user may use this as a "keep-alive" signal.

INPUT PARAMETERS

tid Target identifier. This is the name of the network element to which the command is addressed. If no *tid* is given, the command is interpreted to be addressed to the GNE.

ctag Correlation tag. This is included in the command by the OS and is repeated by the *SLC-2000* system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

After receiving this command, the following normal completion response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
RTRV-HDR:ATT-PF-2000::123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-10-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition. These error conditions are not unique to the RTRV-HDR command but may apply to any TL1 command received by the SLC-2000 system.

If a GNE SLC-2000 system receives a command but

1. its buffer is full, or,
2. it is undergoing initialization, or
3. TL1 command processing is terminated *before any* of that command response is put in the TL1 command/response *output* buffer, or,
4. when OSI is supported on the DCC and the GNE can not establish an OSI association with the addressed remote network element,

instead of returning an in-progress (IP) acknowledgement, the following repeat later acknowledgement is returned to the OS:

```
RL ctag  
<
```

If a GNE *SLC-2000* system receives a command but cannot parse the command for at least 3 colons (:), and no more than the maximum number of colons allowed for any supported TL1 command, before the TL1 end-of-message semicolon (;), the following error response is returned to the OS, using the *sid* value of the GNE *SLC-2000* system:

```
sid date time  
M ctag DENY  
IISP  
/* Input, Invalid Syntax of Punctuation */  
;
```

If a GNE *SLC-2000* system receives a command but cannot parse the command for a *tid* value (a null *tid* value is acceptable), the following error response is returned to the OS, using the *sid* value of the GNE *SLC-2000* system:

```
sid date time
M ctag DENY
IICM
/* Invalid Command, SLC-2000 does not support Command =
  xxxxxxxxxxxxxxxxxx */
;
```

where xxxxxxxxxxxxxxxxxx is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

If a GNE *SLC-2000* system receives a command with a syntactically incorrect *tid* value, the following error response is returned to the OS, using the *sid* value of the GNE *SLC-2000* system:

```
sid date time
M ctag DENY
IITA
/* Invalid TID, unallowed characters or too long */
;
```

If a GNE *SLC-2000* system receives a command but cannot recognize a valid *ctag* value, the following error response is returned to the OS, using the *sid* value of the addressed *SLC-2000* system:

```
sid date time
M 0 DENY
I ICT
/* Input, Invalid Correlation Tag (CTAG) */
;
```

If a GNE *SLC-2000* system receives a command with an unknown *tid* value (a *tid* value that does not exist in the GNE's subnetwork), the following error response is returned to the OS, using the *sid* value of the GNE *SLC-2000* system:

```
sid date time
M ctag DENY
I IITA
/* Unknown TID */
;
```

If a GNE *SLC-2000* system receives a command with valid *tid* and *ctag* values but the addressed remote *SLC-2000* system is temporarily unable to communicate with the GNE *SLC-2000* system, no error response is returned to the OS. The *SLC-2000* system is compatible with Bellcore's NMA OS which interprets any response (even an acknowledgement) to a RTRV-HDR command as a keep-alive signal.

If the *SLC-2000* system receives a TL1 command other than those supported per the introduction to this section, the following error response is returned to the OS, using the *sid* value of the addressed *SLC-2000* system:

```
sid date time
M ctag DENY
IICM
/* Invalid Command, SLC-2000 does not support Command =
xxxxxxxxxxxxxxxx */
;
```

where *xxxxxxxxxxxxxxxx* is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

For *SLC-2000* system OC3, if a GNE *SLC-2000* system times out awaiting the response to a command addressed to another *SLC-2000* system in the GNE's subnetwork, the following error response is returned to the OS, using the *sid* value of the addressed *SLC-2000* system:

```
sid date time
M ctag DENY
SDNR
/* Command Timed Out */
;
```

If the *SLC-2000* system receives any TL1 command (except *RTRV-PM*) for which it is unable to process and/or complete the request due to internal system

processing problems, the following error response is returned to the OS, using the *sid* value of the addressed SLC-2000 system:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed */
;
```

Whenever the SYSCTL/PDC is failed, a COMPLD or DENY response maybe returned and the following free form text will be included in the response:

```
/* WARNING: This command may not have fully completed
             due to SYSCTL/PDC link failure. */
;
```

Whenever the software on the SYSCTL is incompatible with the PDC software, a COMPLD or DENY response may be returned and the following free form text will be included in the response:

```
/* WARNING: This command may not have fully completed  
            due to SYSCTL/PDC software. */  
;
```

Whenever the SYSCTL/PDC link is temporarily unavailable, a COMPLD or DENY response may be returned and the following free form text will be included in the response:

```
/* WARNING: This command may not have fully completed  
            due to SYSCTL/PDC link unavailability. */  
;
```

NAME

RTRV-MAP: Retrieve Map

INPUT FORMAT

RTRV-MAP:*tid*::*ctag*[::];

DESCRIPTION

The RTRV-MAP command is initiated to request the SLC-2000 system to retrieve the topological map of the SONET subnetwork, including a list of the systems in the subnetwork, their connectivity to the local system, and the communication status to each system.

When the SLC-2000 system receives an RTRV-MAP command from the user, network element will display the subnetwork topology, connectivity of the systems in the addressed subnetwork and the communication status.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
"::::spec_block"
. . .
. . .
. . .
"::::spec_block"
;
```

OUTPUT PARAMETERS

The output parameters *sid*, *date*, *time*, *ctag*, and *COMPLD* included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. In addition the following parameter is used in the **RTRV-MAP** command:

spec_block Specific block. This parameter field is used for returning the current equipage information for the slot. Parameters within the specific block are positionally independent and are specified using a name defined construct of: *PARAMETER=value* in a comma separated list. The *SLC-2000* system will return the parameter within the *spec_block* in the following order: **TID**, **CONNECTION**, **NEIGHBOR**, **DCCSTATUS**, and **GNE**. The parameters are:

TID	This field contains the target identifier of another system in the subnetwork.
CONNECTION	This field indicates the address of the OC3 lines through which the local system is connected to the system identified in the TID field. This field is not included for the local system in the output report.
NEIGHBOR	This field has the values of Yes or No and indicates whether the identified system is an immediate neighbor. An immediate neighbor is a system directly connected to the other end of an optical span terminated on the local system.
DCCSTATUS	This field has the values of Good or Failed and indicates the status of the Data Communications Channel from the local system. This field can be omitted from the output report if the DCCSTATUS is Good for the identified systems.
GNE	This field has the values of Yes or No and indicates whether system identified by the TID field is serving at the TL1 Gateway Network Element (GNE). This field can be omitted for systems in the subnetwork that are not serving as GNEs . To avoid alarms, only one system in a subnetwork should be designated as the GNE .

The topmost entry in the output report represents the local system; that is, the node at which the command is entered.

EXAMPLE INPUT/OUTPUT

```
RTRV-MAP:ATT-SLC-2000::123456;
```

```
IP 123456
```

```
"TID=local_system, GNE=y"
```

```
"TID=Site7NE1, CONNECTION=main-1, NEIGHBOR=yes"
```

```
"TID=Site3NE1, CONNECTION=main-2, NEIGHBOR=yes"
```

```
"TID=Site4NE1, CONNECTION=main-2, NEIGHBOR=no"
```

```
"TID=Site6NE1, CONNECTION=main-1, NEIGHBOR=no"
```

```
"TID=Site2NE1, CONNECTION=fn-c, NEIGHBOR=no, DCCSTATUS=failed"
```

```
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to this command, also.

If the SLC-2000 system receives a RTRV-MAP command with an otherwise valid set of input parameter values but the command could not be completed by the network element, the following error response is returned to the user:

```
sid date time  
M ctag DENY  
SROF  
/* Status, Request Operation Failed,*/  
;
```

NAME

RTRV-PM: Retrieve-Performance Monitoring (SONET subsystem only)

INPUT FORMAT

*RTRV-PM-modifier:[tid]:aid:ctag:[montype],[monlev],
[locn],[dirn],tmper,[mondatt][,montm];*

DESCRIPTION

RTRV-PM commands can be initiated to request the SLC-2000 system to send the current and/or historical performance-monitoring (PM) data associated with one or more facilities.

**NOTE:**

The use of RTRV-PM[-ALL] with *aid* = ALL, *monlev* = 0-UP, *locn* = NEND or null, *tmper* = 15-MIN, and *montm* = ALL is discouraged, especially for slow X.25 baud rates, due to the large volume of PM data available.

If *multiple* RTRV-PM[-ALL] commands, each requesting a large volume of PM data, are requested from the same SLC-2000 system subnetwork with a slow X.25 baud rate, some of the command responses may time out and not complete.

INPUT PARAMETERS

<i>modifier</i>	This is the command code modifier and must have one of the following values:
ALL	This requests PM data for all of the following valid facility types. If the command code modifier is ALL, the response to the OS is limited based on the subsequent input parameter values.
EC1	This requests PM data at the electrical carrier signal level 1.
OC3	This requests PM data at the optical carrier signal level 3.
STS1	This requests PM data at the synchronous transport signal level 1.
T1	This requests PM data at the DS1 level.
T3	This requests PM data at the DS3 level.
VT1	This requests PM data at the virtual tributary signal level 1.5.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed. If no <i>tid</i> is given, the command is interpreted to be addressed to the GNE.
<i>aid</i>	Access identifier. This is the address of the EC1, OC3 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which the PM data is requested. If the <i>aid</i> value is invalid, omitted, or conflicts with the command code modifier, an error response is returned to the OS. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

<i>montype</i>	Monitored parameter type. This is the PM parameter type for which PM data is requested. If the <i>montype</i> value is supported but conflicts with the command code modifier, an error response is returned to the OS. The default is for all applicable (based on the <i>modifier</i>) <i>montype</i> values to be retrieved. Refer to Table 3-11 at the end of this section for a list of valid values.						
<i>monlev</i>	Monitored level. This has the format LEV-DIRN. The LEV value may be a decimal numeral. DIRN may have one of the following values: <table> <tr> <td>DN</td><td>This requests PM data with <i>monval</i> values equal to or less than the value of LEV.</td></tr> <tr> <td>UP</td><td>This requests PM data with <i>monval</i> values equal to or greater than the value of LEV.</td></tr> </table> The default is 1-UP.	DN	This requests PM data with <i>monval</i> values equal to or less than the value of LEV.	UP	This requests PM data with <i>monval</i> values equal to or greater than the value of LEV.		
DN	This requests PM data with <i>monval</i> values equal to or less than the value of LEV.						
UP	This requests PM data with <i>monval</i> values equal to or greater than the value of LEV.						
<i>locn</i>	Location. This requests PM data for a specified location and may have one of the following values: <table> <tr> <td>FEND</td><td>This requests far-end PM data.</td></tr> <tr> <td>NEND</td><td>This requests near-end PM data.</td></tr> </table> The default is FEND (if applicable) and NEND.	FEND	This requests far-end PM data.	NEND	This requests near-end PM data.		
FEND	This requests far-end PM data.						
NEND	This requests near-end PM data.						
<i>dirn</i>	Direction. This parameter is validated for one of the following values although it does not affect the requested PM data because it is really not applicable. All SLC-2000 system PM data is based on the receive direction: <table> <tr> <td>AZ</td><td>This requests PM data for location A-to-Z (TR-833, Issue 3).</td></tr> <tr> <td>NA</td><td>This requests PM data for which the direction is not applicable (TR-833, Issue 4).</td></tr> <tr> <td>RCV</td><td>This requests PM data for the receive direction (TR-833, Issue 4).</td></tr> </table> The default is RCV (which is effectively equivalent to AZ or NA).	AZ	This requests PM data for location A-to-Z (TR-833, Issue 3).	NA	This requests PM data for which the direction is not applicable (TR-833, Issue 4).	RCV	This requests PM data for the receive direction (TR-833, Issue 4).
AZ	This requests PM data for location A-to-Z (TR-833, Issue 3).						
NA	This requests PM data for which the direction is not applicable (TR-833, Issue 4).						
RCV	This requests PM data for the receive direction (TR-833, Issue 4).						

<i>tmper</i>	Time period. This requests PM data for a specified time interval. This parameter may have one of the following values: 15-MIN This requests PM data in 15-minute intervals. 1-DAY This requests daily PM data. If the <i>tmper</i> value is supported but conflicts with the command code modifier, for example, RTRV-PM-T1 with a <i>tmper</i> value of 15-MIN, an error response is returned to the OS.
<i>mondatt</i>	Monitored date. This requests the beginning date of the interval for which the PM data is to be reported. This has the format MM-DD (month-day). The default is the current date.
<i>montm</i>	Monitored time. This requests the beginning time of the interval for which the PM data is to be reported. This parameter has the format HH:MM (hours:minutes). The default is the beginning time of the current 15-MIN interval. If <i>tmper</i> is 1-DAY, <i>montm</i> is ignored. If <i>tmper</i> is 15-MIN and <i>montm</i> is a number not evenly divisible by 15, an error response is returned to the OS. The following example illustrates the exception to the above rule. If the SLC-2000 system's time is reset at 3:11 P.M., the first SLC-2000 system PM bin time stamp would be 3:11 P.M. That PM data would be included in response to a RTRV-PM command with a <i>montm</i> value of 15-11 or 15-00.

Table 3-6 specifies the PM data output based on the input values of *tmper*, *mondatt*, and *montm* parameters. The term "other" is used to refer to any input value that is not covered by another entry for the subject parameter. The term "any" is used to refer to any input value, including "other" and null (no value), for the subject parameter.

Table 3-6. RTRV-PM Output Data Relating to Time/Date Input Parameters

tmper	mondatt	montm	Output PM Data
15-MIN	ALL	ALL	15-min. data from present time to 8 hours earlier than present time.†
15-MIN	current day or null	ALL	15-min. data from present time to previous midnight or 8 hours earlier than present time, whichever is more recent.†
15-MIN	previous day	ALL	15-min. data from previous midnight to 8 hours earlier than present time.† If present time is later than 8:15 A.M., return error response.
15-MIN	ALL or current day or null	null	Single 15-min. interval of current data
15-MIN	previous day	null	return error response
15-MIN	previous day, current day, or null, or ALL	effective value of <i>mondatt</i> and <i>montm</i> within 8 hours before current time.	Single 15-min. interval of data beginning at <i>mondatt</i> and <i>montm</i> .
15-MIN	previous day, current day, or null, or ALL	effective value of <i>mondatt</i> and <i>montm</i> more than 8.25 hours before current time, or other	return error response
15-MIN	other	any	return error response
1-DAY	ALL	any	current and previous 1-day data
1-DAY	current day or null	any	current 1-day data
1-DAY	previous day	any	previous 1-day data
1-DAY	other	any	return error response
null or other	any	any	return error response

† Except, if a RTRV-PM-ALL command is not further limited by some other input parameters, an error response is returned to the OS.

If the other input parameter values are valid, and at least *some* of the requested PM data is available, when the value of *mondat* and/or *montm* is *ALL*, the SLC-2000 system responds with PM data for the available time periods only. If the input parameter values are valid, but *none* of the requested PM data is available (for example, because the system just started operating), an error response is returned to the OS.

If only *some* of the requested PM data is available due to equipage and provisioning, the SLC-2000 system responds with available PM data only. If *none* of the requested PM data is available due to equipage or provisioning, an error response is returned to the OS.

OUTPUT FORMAT

If there is no PM data to report, the following response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

If there is PM data to report, the following output report is returned to the OS:

```
sid date time
M ctag COMPLD
  "aid,aidtype:montype,monval,[vldty],[locn],,tmper,
    [mondat][,montm]"
    .
    .
    .
    .
  "aid,aidtype:montype,monval,[vldty],[locn],,tmper,
    [mondat][,montm]"
;
```

Applicable output lines are ordered as follows:

1. By *aid* in order corresponding to the shelf architecture (main OC3 line slots, function units, and low-speed channels).
2. By requested time intervals, starting with the current time interval.
3. By applicable PM parameters per *aid*.

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.												
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).												
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).												
<i>M</i>	This indicates the output message is generated in response to a manual command.												
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.												
COMPLD	This indicates that the command has been completed.												
<i>aid</i>	Access identifier. This is the address of the EC1, OC3, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which the PM data is being reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.												
<i>aidtype</i>	Access identifier type. This has one of the following values: <table border="0"> <tr> <td>EC1</td><td>This reports PM data at the electrical carrier signal level 1.</td></tr> <tr> <td>OC3</td><td>This reports PM data at the optical carrier signal level 3.</td></tr> <tr> <td>STS1</td><td>This reports PM data at the synchronous transport signal level 1.</td></tr> <tr> <td>T1</td><td>This requests PM data at the DS1 level.</td></tr> <tr> <td>T3</td><td>This reports PM data at the DS3 level.</td></tr> <tr> <td>VT1</td><td>This reports PM data at the virtual tributary signal level 1.5.</td></tr> </table>	EC1	This reports PM data at the electrical carrier signal level 1.	OC3	This reports PM data at the optical carrier signal level 3.	STS1	This reports PM data at the synchronous transport signal level 1.	T1	This requests PM data at the DS1 level.	T3	This reports PM data at the DS3 level.	VT1	This reports PM data at the virtual tributary signal level 1.5.
EC1	This reports PM data at the electrical carrier signal level 1.												
OC3	This reports PM data at the optical carrier signal level 3.												
STS1	This reports PM data at the synchronous transport signal level 1.												
T1	This requests PM data at the DS1 level.												
T3	This reports PM data at the DS3 level.												
VT1	This reports PM data at the virtual tributary signal level 1.5.												
<i>montype</i>	Monitored parameter type. This has one of the values specified in Table 3-11 located at the end of this section.												

<i>monval</i>	Monitored value. This contains the measured value of the parameter specified in <i>montype</i> . If the value of <i>monval</i> is 0, the <i>monval</i> is still included in the response.
<i>vldty</i>	Validity indicator. This identifies the validity of the PM data.
	PRTL Data is partial, accumulated over some portion of the requested time period (<i>tmper</i>). This includes counts that overflow their registers, counts that are corrupt, and for the SLC-2000 system counts that are not available because of trouble conditions that cause PM to be suspended.
	If the validity indicator is null, the data is valid.
<i>locn</i>	Location. This parameter has the value FEND for <i>far-end</i> DS1 PM data only. For <i>near-end</i> PM data, <i>locn</i> is not reported.
<i>tmper</i>	Time period. This parameter has the value 15-MIN or 1-DAY.
<i>mondatt</i>	Monitored date. This is the beginning date of the interval for which PM data is reported. This parameter has the format MM-DD (month-day). If <i>mondatt</i> is the current date, <i>mondatt</i> is not reported.
<i>monttm</i>	Monitored time. This is the beginning time of the interval for which the PM data is reported. This parameter has the format HH-MM (hours-minutes). If the value of <i>tmper</i> is 1-DAY, <i>monttm</i> is not reported.

EXAMPLE INPUT/OUTPUT

The *aid* value in the following example is a SLC-2000 system example *aid* value:

```
RTRV-PM-T3:SITE7NE1:b:1011::PYERR-L,,,15-MIN,,01-15;

IP 1011
<

SITE7NE1 70-01-01 01:16:34
M 1011 COMPLD
"b,T3:PYERR-L,1,PRTL,,,15-MIN,,01-15"
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the RTRV-PM command, also.

The following additional error conditions are listed in the order and priority that SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RTRV-PM command with a command code modifier which is supported but the applicable feature package option is "off," the following error response is returned to the OS:

```
sid date time
M ctag DENY
IICM
/* feature option not enabled */
;
```

If the SLC-2000 system receives a RTRV-PM command with a command code modifier other than those listed as allowable for the input parameter *modifier*, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IICM
/* Command code modifier must be STS1, OC3, T3 or ALL */
;
```

If the SLC-2000 system receives a RTRV-PM command without an *aid* value, or an *aid* value that is invalid, that conflicts with the command code modifier, or for

which the provisioning or equipage do not support the requested PM data, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIAC
/* Input, Invalid Access Identifier */
;
```

If the *SLC-2000* system receives a *RTRV-PM* command with a *montype* value that is not supported by the *SLC-2000* system (refer to Table 3-11 at the end of this section), the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIDT
/* Invalid Input, MONTYPE value not valid */
;
```

If *SLC-2000* system receives a *RTRV-PM* command with a *montype* value that conflicts with the command code modifier, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, MONTYPE value not valid for input
   command code modifier */
;
```

If the SLC-2000 system receives a RTRV-PM command with a *monlev* value that is not supported by the SLC-2000 system, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, MONLEV value not valid */
;
```

If the SLC-2000 system receives a RTRV-PM command with an invalid *locn* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, LOCN = NEND or null */
;
```


If the SLC-2000 system receives a RTRV-PM command with an invalid *locn* value or a *locn* value that conflicts with the command code modifier, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, LOCN = NEND, FEND (T1 only) or null */
;
```

If the SLC-2000 system receives a RTRV-PM command with an invalid *dirn* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, DIRN = AZ, NA, RCV or null */
;
```

If the SLC-2000 system receives a RTRV-PM command with a *tmper* value other than 15-MIN or 1-DAY, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, TMPER = 15-MIN or 1-DAY only */
;
```

If the SLC-2000 system receives a RTRV-PM command with a *tmper* value that conflicts with the command code modifier (for example, RTRV-PM-T1 with a *tmper* value of 15-MIN in SLC-2000 system OC3), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, TMPER = 15-MIN not valid for RTRV-PM-T1 */
;
```

If the SLC-2000 system receives a RTRV-PM[-ALL] command that effectively requests all (near-end, or near-end and far-end) 15-minute PM data for all of a facility or signal type, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IICM
/* Invalid Command, requested PM data must be limited further
*/
;
```

If the SLC-2000 system receives a RTRV-PM command with a *mondat* value that is not supported by the SLC-2000 system (refer to Table 3-6), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, MONDAT value not valid */
;
```

If the SLC-2000 system receives a RTRV-PM command with a *tmper* value of 15-MIN and the value of *montm* is a number that is not evenly divisible by 15 (unless, due to a SLC-2000 system time reset, the *tmper* value exactly matches an actual time stamp of a PM bin), or an invalid *montm* value (refer to Table 3-6), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIDT
/* Invalid Input, MONTM value not valid */
;
```

If the *SLC-2000* system receives a *RTRV-PM* command with valid input parameter values but addressing a facility that is not equipped to support the requested PM data, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ENPM
/* Equipage, not equipped for requested PM */
;
```

If the *SLC-2000* system receives a *RTRV-PM* command with valid input parameters, but addressing a facility that is not provisioned to support the requested PM data, the following error response is returned to the OS:

```
sid date time
M ctag DENY
SROF
/* Status, not provisioned for requested PM */
;
```

If the SLC-2000 system receives a RTRV-PM command with valid input parameter values, but *none* of the requested PM data is available (for example, because the system just started operating), the following error response is returned to the OS:

```
sid date time
M ctag DENY
SDNR
/* Status, Data Not Ready, none of requested PM data
   is available */
;
```

If the SLC-2000 system receives a RTRV-PM command with any extra (beyond the input format specification above) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

NAME

RTRV-PMSCHED-rr: Retrieve Performance Monitoring Scheduling

INPUT FORMAT

RTRV-PMSCHED-modifier:tid:[aid]:ctag;

The RTRV-PMSCHED-rr command messages can be initiated to retrieve active performance-monitoring (PM) report schedules from the Network Element. The active PM report schedules are those previously specified in SCHED-PMREPT commands.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the RTRV-PMSCHED-rr message and may have one of the following values:
ALL	This requests all PM report schedules.
EC1	This requests PM report schedules for electrical carrier signal level 1.
OC3	This requests PM report schedules for optical carrier signal level 3.
STS1	This requests PM report schedules for synchronous transport signal level 1.
T1	This requests PM report schedules for DS1 level.
T3	This requests PM report schedules for DS3 level.
VT1	This requests PM report schedules for virtual tributary signal level 1.5.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the channel or port for which the PM report schedule is requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

OUTPUT FORMAT

If there aren't any PM report schedules to report, the following normal completion response is returned:

```

      sid date time
M  ctag COMPLD
;
```

If there are PM report schedules to report, the following output report is returned:

```

      sid date time
M  ctag COMPLD
    "aid,aidtype:reptinvl,reptdat,repttm,[numinvl],
    [montype],monlev,[locn],dirn,tmper,
    tmofst[,inhmode]"
    . . . . .
    . . . . .
    "aid,aidtype:reptinvl,reptdat,repttm,[numinvl],
    [montype],monlev,[locn],dirn,tmper,
    tmofst[,inhmode]"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. The remaining output parameters are described below.

<i>aid</i>	Access identifier. This is the address of the EC1 or OC3 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which the PM report schedule is reported. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.												
<i>aidtype</i>	Access identifier type. This has one of the following values: <table> <tr> <td>EC1</td><td>This reports PM report schedules for electrical carrier signal level 1.</td></tr> <tr> <td>OC3</td><td>This reports PM report schedules for optical carrier signal level 3.</td></tr> <tr> <td>STS1</td><td>This reports PM report schedules for synchronous transport signal level 1.</td></tr> <tr> <td>T1</td><td>This reports PM report schedules for DS1 level.</td></tr> <tr> <td>T3</td><td>This reports PM report schedules for DS3 level.</td></tr> <tr> <td>VT1</td><td>This reports PM report schedules for virtual tributary signal level 1.5.</td></tr> </table>	EC1	This reports PM report schedules for electrical carrier signal level 1.	OC3	This reports PM report schedules for optical carrier signal level 3.	STS1	This reports PM report schedules for synchronous transport signal level 1.	T1	This reports PM report schedules for DS1 level.	T3	This reports PM report schedules for DS3 level.	VT1	This reports PM report schedules for virtual tributary signal level 1.5.
EC1	This reports PM report schedules for electrical carrier signal level 1.												
OC3	This reports PM report schedules for optical carrier signal level 3.												
STS1	This reports PM report schedules for synchronous transport signal level 1.												
T1	This reports PM report schedules for DS1 level.												
T3	This reports PM report schedules for DS3 level.												
VT1	This reports PM report schedules for virtual tributary signal level 1.5.												
<i>reptinvl</i>	Report interval. This specifies how often the scheduled PM report is generated and has one of the following values: <table> <tr> <td>15-MIN</td><td>This indicates the PM report is scheduled to be generated every 15 minutes.</td></tr> <tr> <td>{1-24}-HR</td><td>This specifies the PM report is scheduled to be generated every 1 to 24 hours.</td></tr> <tr> <td>1-DAY</td><td>This specifies the PM report is scheduled to be generated every 1 day.</td></tr> </table>	15-MIN	This indicates the PM report is scheduled to be generated every 15 minutes.	{1-24}-HR	This specifies the PM report is scheduled to be generated every 1 to 24 hours.	1-DAY	This specifies the PM report is scheduled to be generated every 1 day.						
15-MIN	This indicates the PM report is scheduled to be generated every 15 minutes.												
{1-24}-HR	This specifies the PM report is scheduled to be generated every 1 to 24 hours.												
1-DAY	This specifies the PM report is scheduled to be generated every 1 day.												
<i>reptdat</i>	Report date. This specifies the date for the <i>next</i> PM report (REPT PM). This has the format MM-DD (month-day), where MM ranges from 1 to 12 and DD ranges from 1 to 31.												
<i>repttm</i>	Report time. This specifies the time of day for the <i>next</i> PM report (REPT PM). This has the format HH-MM (hours-minutes), where HH ranges from 0 to 23 and MM ranges from 0 to 59.												
<i>numinvl</i>	Number of reports intervals. This specifies the number of PM reports (REPT PM) <i>remaining</i> to be generated. If PM reporting is scheduled to continue indefinitely, <i>numinvl</i> is null.												

<i>montype</i>	Monitored parameter type. This is the PM parameter type for which reporting is scheduled. The default is for all applicable (based on the <i>aidtype</i>) <i>montype</i> values to be reported. Refer to Table 3-11 at the end of this section for a list of valid values.				
<i>monlev</i>	Monitored level. This has the format LEV-DIRN. The LEV value is a decimal numeral. DIRN has one of the following values: <table> <tr> <td>DN</td><td>This indicates PM data is reported for <i>monval</i> values equal to or less than the value of LEV.</td></tr> <tr> <td>UP</td><td>This indicates PM data is reported for <i>monval</i> values equal to or greater than the value of LEV.</td></tr> </table>	DN	This indicates PM data is reported for <i>monval</i> values equal to or less than the value of LEV.	UP	This indicates PM data is reported for <i>monval</i> values equal to or greater than the value of LEV.
DN	This indicates PM data is reported for <i>monval</i> values equal to or less than the value of LEV.				
UP	This indicates PM data is reported for <i>monval</i> values equal to or greater than the value of LEV.				
<i>locn</i>	Location. This indicates PM data is reported for a specified location and has one of the following values: <table> <tr> <td>FEND</td><td>This reports far-end PM data.</td></tr> <tr> <td>NEND</td><td>This reports near-end PM data.</td></tr> </table> If PM reporting is scheduled for <i>both</i> FEND (if applicable) and NEND, <i>locn</i> is null.	FEND	This reports far-end PM data.	NEND	This reports near-end PM data.
FEND	This reports far-end PM data.				
NEND	This reports near-end PM data.				
<i>dirn</i>	Direction. This parameter always has the value NA (not applicable).				
<i>tmper</i>	Time period. This reports PM data for the specified time interval. This parameter has one of the following values: <table> <tr> <td>15-MIN</td><td>This reports PM data in 15-minute intervals.</td></tr> <tr> <td>1-DAY</td><td>This reports daily PM data.</td></tr> </table>	15-MIN	This reports PM data in 15-minute intervals.	1-DAY	This reports daily PM data.
15-MIN	This reports PM data in 15-minute intervals.				
1-DAY	This reports daily PM data.				
<i>tmofst</i>	Time offset. This parameter specifies the start time of the time period (<i>tmper</i>) for which PM data is reported, by subtracting the <i>tmofst</i> from the time of the most recently completed time period (<i>tmper</i>). This has the format DD-HH-MM (day-hours-minutes). If <i>tmper</i> = 1-DAY, allowable values of <i>tmofst</i> are 0-0-0 and 1-0-0 only. If <i>tmper</i> = 15-MIN, allowable values of <i>tmofst</i> are 0-{0-7}-{0,15,30,45} and 0-8-0. If the <i>tmofst</i> is 0-0-0, the Network Element reports the PM data accumulated during the <i>current</i> time period (<i>tmper</i>). The SLC-2000 system supports parameter grouping, with single ampersands (&), of non-null <i>tmofst</i> values to indicate PM reports scheduled at intervals (<i>reptinvl</i>) greater than 15 minutes that still include all 15-minute PM data accumulated during the report interval (<i>reptinvl</i>).				
<i>inhmode</i>	Inhibit mode. This indicates if the scheduled PM report is currently inhibited by an INH-MSG command. This parameter is null (default = ALW (allowed)) unless PM reporting is inhibited, in which case, <i>inhmode</i> = INH.				

EXAMPLE INPUT/OUTPUT

```
RTRV-PMSCHED-T3:ATT-PF-2000:b:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "b,T3:1-HR,10-26,17-05,1,PYERR-L,1-UP,NEND,NA,15-MIN,  
    0-1-0&0-0-45&0-0-30&0-0-15"  
;
```

ERROR RESPONSES

Refer also to the non-message-specific **ERROR RESPONSES** listed in the RTRV-PMSCHED-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RTRV-PMSCHED-rr command with a command code modifier which is supported but the applicable feature package option is "off", the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
ICNV  
/* Input, Command Not Valid, feature option not enabled */  
;
```

If a *SLC-2000* system receives a *RTRV-PMSCHED-rr* command with a command code modifier other than those listed, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ICNV
  /* Input, Command Not Valid, invalid modifier */
;
```

If a *SLC-2000* system receives a *RTRV-PMSCHED-rr* command with an *aid* value that is invalid, omitted (except when *modifier* = *ALL*), or that conflicts with the command code modifier, the following error response is returned:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
;
```

NAME

RTRV-rr: Retrieve Attributes of a given transmission entity
(SONET subsystem)

INPUT FORMAT

RTRV-modifier:tid:aid:ctag;

DESCRIPTION

The **RTRV-rr** command messages can be initiated by an OS or OS users to retrieve the current provisioned parameter values of a **SLC-2000** system. This command retrieves all parameter settings that are provisionable via the **ENT-rr** command pertaining to the addressed **SLC-2000** system, reported one line per entity. The **RTRV-T0** command message performs the same function for the **T0** parameter. The **RTRV-T0** command message is covered in its own manual page.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the RTRV-rr message and may have one of the following values:
T1	This is for the DS1 level external interfaces.
T3	This is for the DS3 level external interfaces.
EC1	This is for the electrical STS1 level external interfaces.
OC3	This is for the optical OC3 level external interfaces.
STS1	This is for the dropped STS-1 channels in OC3 applications where 22F-type and 22D OLIU circuit packs are used.
VT1	This is for the dropped VT-1 channels in OC3 applications where 22F-type and 22D OLIU circuit packs are used.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.

<i>aid</i>	Access identifier. This is the address of the entity for which the current provisioned values are requested. The <i>aid</i> must reference a valid entity of the <i>SLC-2000</i> system in order to be accepted. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the <i>SLC-2000</i> system in the response to allow the OS to associate the command and response messages. Valid values for <i>ctag</i> include strings of up to 6 characters comprised of identifiers (alphanumerics begin with a letter) or decimal numerals (a string of decimal digits with an optional nontrailing ".").

OUTPUT FORMAT

In response to a valid *RTRV-rr* command, the following output report is returned to the OS, sorted by alphanumeric order of the *aid* value:

```
sid date time
M ctag COMPLD
  "aid:::spec_block:pst"
    .      .      .      .
    .      .      .      .
    .      .      .      .
  "aid:::spec_block:pst"
;
```

OUTPUT PARAMETERS

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name.
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
<i>COMPLD</i>	This indicates that the command has been completed.
<i>aid</i>	Access identifier. This is the address of the entity for which a status condition is being reported.

spec_block Specific block. This parameter field is used for returning the currently provisioned parameter values for the entities requested. Parameters within the specific block are positionally independent and are specified using a name defined construct of: *PARAMETER=value* in a comma separated list. The parameters are listed and explained below in an alphabetic order. It should be noted, however, that the SLC-2000 system will return the parameter within the *spec_block* in the following orders if the LINECDE is *CCHAN**:

Parameter Order	Modifier
LINECDE AIS PBIT NTFCNCDE SFTHR	T3
LINECDE NTFCNCDE AIS SFTHR BPR PMMD	T1
CPMODE NTFCNCDE SFTHR	EC1

In this case of DS3, setting AIS=Y, also will make the SLC-2000 system insert DS3 AIS toward the DSX-3 when it enters the OC3 signal fail or STS path AIS state incoming from the fiber. This parameter has one of the following values:

Y	Insert AIS.
N	Do not insert AIS.

* AIS is always inserted when the DS3 LINECDE is B3ZS.

BPV	DLCBPV to LOS indicator. This parameter is reported to specify if the BiPolar Violations (BPV) threshold crossing of the DS1 signal incoming from the DSX-1 is being translated to outgoing all zeros DS1 signal (LOS) toward the DSX-1 for the DS1 port(s) addressed by the <i>aid</i>. This parameter is reported only when the <i>modifier</i> is T1 and consequently only by SLC-2000 systems. This parameter has one of the following values:
N	Do not send all zeroes.
Y	This permits the central office terminal of a digital loop carrier system (such as SLC 96 carrier system) to detect this all zeroes signal as loss of signal (LOS) and switch to the protection DS1 as it would have done if it had directly received the original BPVs.
CONCAT	This parameter is returned only when the <i>modifier</i> is OC3. This parameter is used to specify the concatenation mode of the OC3 line from MAIN to FN-C in an OC3 system to be independent channels or an STS-3c channel. This parameter is valid only for linear OC3 releases where the STS-3c feature has been enabled and will have one of the following values:
disabled	If the concatenation mode is disabled the channels in the OC3 line are independent.
enabled	If the concatenation mode is enabled ■ in the case of an OC3 system, the three STS-1 channels recovered from the OC3 signal in the MAIN slots are passed as STS-3c signal to the FN-C where they are reconstructed back into an OC3 signal. Both MAIN and FN-C must be equipped before concatenation mode can be enabled.
CPMODE	This parameter is reported only with the <i>modifier</i> EC1 by the OC3 linear system. This will have one of the following values: High Speed Means that the STS1E CP is in HS mode. Low Speed Means that the STS1E CP is in LS mode.

FMT

This parameter is reported to specify the DS1 digital signal format incoming from the DSX-1 to the specified DS1 port(s). This parameter is reported only when the *modifier* is T1 and consequently by the SLC-2000 systems and only if the corresponding DS1 port is equipped with a DS1 PM Circuit Pack. This parameter has one of the following values:

- SF** Super Frame, supports near-end DS1 PM only.
- ESF** Extended Super Frame, supports near-end and far-end DS1 PM.
- ESFN** Extended Super Frame, supports near-end DS1 PM only.

The values specified by this **FMT** parameter is in effect only if the DS1 PM mode has been enabled by setting the **PMMD** parameter to ON for the DS1 port specified by the *aid*.

KBYTE

This parameter is returned only when the *modifier* is OC3. **KBYTE** specifies the usage of the K byte overhead for Synchronization Messages. Both the sending and receiving messages are affected. This parameter is valid on both linear and ring OC3 releases and will have only one of the following values:

- enabled** If the **KBYTE** is enabled, proprietary synchronization messages are used.
- disabled** If the **KBYTE** is disabled, proprietary synchronization messages are not used.

LINECDE	DS1 and DS3 Line Coding. When the <i>modifier</i> is T3, the <i>LINECDE</i> parameter is used in combination with the <i>AIS</i> and <i>PBIT</i> parameters to determine the <i>SLC-2000</i> system VMR mode.
AMI	The <i>LINECDE</i> can have the value of AMI only when the <i>modifier</i> value is T1. Hence it is reported by only <i>SLC-2000</i> systems. In order to operate the DS1 port(s) addressed by the <i>aid</i> monitoring coding violations other than bipolar violations, the <i>LINECDE</i> parameter would be reported as AMI.
B8ZS	The <i>LINECDE</i> can have the value of B8ZS only when the <i>modifier</i> value is T1. Hence it is reported only by <i>SLC-2000</i> systems. In order to operate the DS1 port(s) addressed by the <i>aid</i> monitoring bipolar violations, the <i>LINECDE</i> parameter would be reported as B8ZS.
B3ZS	The <i>LINECDE</i> can have the value of B3ZS only when the <i>modifier</i> value is T3. When the port addressed by the <i>aid</i> specified in the input command is currently operating in VM or VMR mode, the <i>LINECDE</i> will be returned as B3ZS.
CCHAN	The <i>LINECDE</i> can have the value of CCHAN only when the <i>modifier</i> value is T3. When the port addressed by the <i>aid</i> is currently operating in the clear channel mode, (either CC w/ AIS or CC w/o AIS mode), the <i>LINECDE</i> parameter is returned with its value set to CCHAN.

When the *modifier* is T1, if the value of the *LINECDE* being returned is that set in the Hardware then the value will be appended with the character string of (HW) (for example, *LINECDE*=AMI(HW)).

Similarly, when the *modifier* is T1, if the value of the *LINECDE* being returned is an overridden value then the value will be appended with the character string of (OVERRIDE) (for example, *LINECDE*=B8ZS(OVERRIDE)).

* The allowed *SLC-2000* VMR modes are *Violation Monitor and Removal* (the original value is VMR); *Violation Monitor only* (VM); *Clear Channel with DS3 AIS insertion* (CC w/ AIS); or *Clear Channel without DS3 AIS insertion* (CC w/o AIS).

NTFCNCDE Notification code. The **NTFCNCDE** parameter is reported to specify if the the alarm level of DS1 or DS3 facility failures serviced by the addressed (*aid*) DS1 or DS3 port(s). The **NTFCNCDE** parameter has one of the following values:

CR Critical Alarm.

MJ Major Alarm.

MN Minor Alarm.

NA Not alarmed.

OPTPWR Optical Power Level setting in the HW. This parameter is reported only when the *modifier* is OC3. The current setting of the optical power switch on the OLIU circuit pack in the slot addressed by the *aid* in the input command. This parameter has one of the following values:

high High optical power

low Low optical power

- A hyphen indicates that optical power is not settable by switches on the OLIU circuit pack.

PBIT DS3 P-bit monitoring. This parameter is reported only when the *modifier* is T3. The **PBIT** parameter is used in combination with the **LINECDE** and **AIS** parameters to report the SLC-2000 system VMR mode. If the value of the parameter **LINECDE** is reported to be CCHAN, this parameter **PBIT** will not be reported.

ON When the mode of the DS3 port(s) addressed by the *aid* monitoring and removing P-bit violations (VMR), **PBIT** parameter shall be set to **ON**.

OFF When the mode of the DS3 port(s) addressed by the *aid* in monitoring P-bit violations (VM), the **PBIT** parameter shall be set to **OFF**.

The following brief table illustrates the valid combinations of **LINECDE**, **AIS** and **PBIT** values used to report the four VMR modes of the SLC-2000 system.

SLC-2000 DS3 Port VMR Mode Specification

(for RTRV-rr)

VMR Mode	LINECDE	AIS	PBIT
VMR	B3ZS	Not Returned	ON
VM	B3ZS	Not Returned	OFF
CC w/ AIS	CCHAN	Y	Not Returned
CC w/o AIS	CCHAN	N	Not Returned

PMMD

DS1 performance monitoring mode. This parameter is reported only when the *modifier* is T1. The *PMMD* parameter is reported to specify if DS1 PM mode has been enabled or not for the DS1 port(s) addressed by the *aid* and is allowed for DS1 port(s). This parameter will have a one of the following values:

OFF DS1 PM turned off. This is the original value.

ON DS1 PM turned on.

If the DS1 PM is ON, then the expected DS1 digital signal format is specified by the *FMT* parameter.

SFTHR	Signal Failure threshold. This parameter is reported to specify the signal failure threshold in terms of bit error rate (BER) for the DS1 or DS3 port(s) addressed by the <i>aid</i> . This parameter shall have values of 0 through -9 depending upon the <i>modifier</i> in the input command and its setting at the shelf.
<i>pst</i>	Primary State. This parameter is reported to specify the primary state of the DS1 and DS3 port(s) and STS1 and VT1 dropped channels addressed by the <i>aid</i> field. The <i>SLC-2000</i> system allows for user provisioning of 2 basic states: <i>AUTO</i> and <i>NMON</i>. When a <i>SLC-2000</i> system low speed port/channel is provisioned in the <i>AUTO</i> state, it will automatically transition to the in-service (<i>IS</i>) state upon detection on the low speed port/channel of a valid signal. When the <i>SLC-2000</i> system low speed port/channel is provisioned in the <i>NMON</i> state, the monitoring of incoming signals is disabled. The port/channel exits this state to the <i>AUTO</i> state through either another <i>ENT-rr</i> command or via the corresponding <i>CIT</i> command (for example, <i>SET-STATE-rr</i>).
<i>IS</i>	In Service. This specifies that the low-speed port/channel addressed by the <i>aid</i> is in the in-service state.
<i>OOS-MA-AS</i>	Out of service, memory administration, assigned. In the terminology of the <i>SLC-2000</i> SONET subsystem, this state is known as <i>AUTO</i> .
<i>OOS</i>	Out of service (" <i>for Memory Administration</i> " implied). In the terminology of the <i>SLC-2000</i> SONET subsystem this state is known as <i>NMON</i> .

EXAMPLE INPUT/OUTPUT

```
RTRV-T3:ATT-SLC-2000:a:123456;
```

```
IP 123456
<
```

```
ATT-SLC-2000 93-10-26 16:42:11
M 123456 COMPLD
"a::LINECDE=B3ZS,PBIT=ON,NTFCNCDE=CR,SFTHR=-6:IS"
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the RTRV-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RTRV-*rr* command with any extra (beyond the input format specifications listed above) null or non-null command parameter blocks, parameters, or termination characters, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation */
;
```

If a SLC-2000 system receives a RTRV-*rr* command with a command code modifier other than T1, T3, EC1, VT1, or OC3, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If a *SLC-2000* system receives a *RTRV-rr* command without an *aid* value or with an *aid* value that is invalid for the *modifier* provided, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   AID missing or inconsistent with modifier value */
;
```

If a *SLC-2000* system receives a *RTRV-rr* command with an otherwise valid *aid* value but for which the corresponding slot is equipped at all, the following error response is returned to the user:

```
sid date time
M ctag DENY
ENEQ
/* Equipage, Not Equipped */
;
```

If a SLC-2000 system receives a RTRV-rr command with an otherwise valid *aid* value but for which the corresponding slot is equipped with an incompatible circuit pack, the following error response is returned to the user:

```
sid date time
M ctag DENY
ENRI
/* Equipage, Not equipped for Retrieving specified
   Information */
;
```


NAME

RTRV-SYS: Retrieve Network Element name and system level parameters.

INPUT FORMAT

RTRV-SYS:*tid*::*ctag*;

DESCRIPTION

The RTRV-SYS command messages can be initiated by OS users to retrieve network element (NE) attributes associated with that network element at the system level that are currently in effect but not associated with any particular facility or equipment unit.

The system level attributes are those attributes provisioned by the *set-ne* CIT command or set by switches on the SYSCTL and OHCTL circuit packs.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages. Valid values for <i>ctag</i> include strings of up to 6 characters comprised of identifiers (alphanumerics begin with a letter) or decimal numerals (a string of decimal digits with an optional nontrailing ".").

OUTPUT FORMAT

If there is system information to report, the following output report is returned to the OS:

```
IP ctag
<

    sid date time
M  ctag COMPLD
    "tid=system_name (override), gne=x, crs=x,"
    "gne_address=x, site=n (hw), NE=n(hw),"
    "shelf=n (hw), co/rt_selector=x(hw), tbos_display=n (hw),"
    "tbos_backup=n(hw), tbos_remote_reporting=x (hw),"
    "baud_cit-1=n(hw), baud_cit-2=n (hw),"
    "osi_setting_dcc-m=x(hw), osi_setting_dcc-a=x (hw),"
    "pmn=MN(hw), dcc=distinct"

;
```

OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements listed there apply to the RTRV-STATE-EQPT command also. In addition, the following output parameters also apply to RTRV-STATE-EQPT.

<i>sid</i>	Source identifier (or Target identifier, <i>tid</i>). This is the system name. The default value for <i>tid</i> is that set by the site and NE switches and is a string of the form "SiteNEN".
<i>date</i>	Date output message is generated. This has the format YY-MM-DD (year-month-day).
<i>time</i>	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
<i>M</i>	This indicates the output message is generated in response to a manual command.
<i>ctag</i>	Correlation tag. this is included in the command by the OS and repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
<i>COMPLD</i>	This indicates that the command has been completed.

<i>tid</i>	Target Identifier. This is the system name. the default value for <i>tid</i> is that set by the site and NE switches and is a string of the form SitemNEn. The initial value for SitemNEn. The initial value for <i>tid</i> is ATT-SLC-2000.
<i>nid</i>	Node identifier. The <i>nid</i> is the self-healing ring address of the NE. <i>nid</i> is an integer with a range of 0-15.
<i>dsne</i>	The <i>dsne</i> indicates whether or not the network element identified by the <i>tid</i> is serving as the Directory Service-Network Element in a self healing ring or subnetwork.
<i>gne</i>	Gateway network element. This indicates whether this system is a gateway network element (GNE), providing a direct TL1 interface. It has a value of <i>yes</i> or <i>no</i> .
<i>crs</i>	Cross connect mode. This indicates whether the system is provisioned with default cross connections or manual cross connections. It has a value of <i>default</i> or <i>manual</i> . In ring applications, it always has a value of <i>manual</i> .
<i>gne_address</i>	Gateway network element address. This is the TID of the GNE in the subnetwork. It is reported when a network element in the subnetwork is set as the GNE.
<i>site</i>	Site is the site address.
<i>ne</i>	NE is the network element address.
<i>shelf</i>	Shelf is the shelf address. It identifies the physical position of the shelf in a bay.
<i>co/rt_selector</i>	Two types of TBOS displays are provided to support central office and remote terminal applications. The <i>co/rt_selector</i> identifies either a central office (co) shelf or a remote terminal (rt) shelf to control the TBOS display formats and operation of the miscellaneous discrete points and fan control relays.
<i>tbos_display</i>	Display is the TBOS display number (1-8). This number identifies the TBOS display associated with a shelf and determines the TBOS poll to which a SLC-2000 system will respond.
<i>tbos_backup</i>	When multiple CO SLC-2000 systems are connected to the same TBOS link, hardware switch setting on the SYSCTL circuit pack are used to provision a backup function. The TBOS backup function assures that each SLC-2000 system on the TBOS link is polled for its TBOS display even if one or more of the SLC-2000 systems fails to respond to the telemetry remote when polled. Backup switch setting may be set to the following values: <i>normal</i> , <i>primary</i> , <i>secondary</i> , and <i>no tbos link</i> .

<i>tbos_remote_reporting</i>	This parameter has the possible value of <i>enabled</i> and <i>disabled</i> . When the TBOS remote reporting switch is set to <i>enabled</i> , the shelf will report all of its status and alarm conditions to other shelves via the SONET DCC. When the TBOS remote reporting switch is set to <i>disabled</i> , the shelf will not report its status and alarm conditions to other shelves. The <i>disabled</i> option is used when there are more than 8 SLC-2000 system shelves in a SONET subnetwork.
<i>baud_cit-1</i> , <i>baud_cit-2</i>	Baud Craft Interface Terminal 1, Baud Craft Interface Terminal 2. These two entries in the report indicate the data rate settings of the front and rear access craft interface terminal ports. The possible values are 300, 1200, 2400, 4800, 9600, and 19200.
<i>osi_setting_dcc-m</i> , <i>osi_setting_dcc-a</i>	Data Communications Channel Settings. DCC UseSide/Network-Side are hardware switch settings on the OHCTL circuit pack to identify the role of each DCC in the Network Element. This identification is needed for OSI communications and is required for all nodes in the subnetwork. To avoid alarms, only one end of a span may be designated as the User Side and only one end of a span may be designated as the Network Side.
<i>pmn</i>	Power Minor alarm. This is the office alarm level to be raised during a power minor alarm condition. The level (<i>MJ</i> or <i>MN</i>) is set by an option switch on SYSCTL circuit pack.
<i>dcc</i>	DCC mode used in this ring system. This parameter can have the values of <i>distinct</i> or <i>identical</i> .

EXAMPLE INPUT/OUTPUT

```
RTRV-SYS:ATT-PF-2000::123456;
```

```
IP 123456
<
```

```
ATT-PF-2000 93-10-26 16:42:11
M 123456 COMPLD
"tid=ATT-PF-2000 (override),gne=yes, crs=manual,"
"gne_address=ATT-PF-2000, site=1 (hw),ne=4(hw),"
"shelf=3 (hw),co/rt_selector=co(hw), tbos_display=3 (hw),"
"tbos_backup=primary (hw),
  tbos_remote_reporting=enabled (hw),"
"baud_cit-1=4800, baud_cit-2=9600,"
"osi_setting_dcc-m=networkside (hw),
  osi_setting_dcc-a=userside (hw),"
"pm n=MN(hw)"
;
```

ERROR RESPONSES

Refer to the non-message-specific error responses listed in the RTRV-HDR error responses.

NAME

RTRV-STATE-VEQPT: Retrieve the state of virtual entities.

INPUT FORMAT

RTRV-STATE-VEQPT:*tid*:*[Address]*:*ctag*;

DESCRIPTION

This command is used to retrieve the state of the TR8 digroups, INA DS1s, and Line Groups.

In Release 4, this command also gets the state of the TR303 VRT.

INPUT PARAMETERS

<i>tid</i>	Target identifier.
<i>Address</i>	This is the address of the TR8 digroup. The default is <i>a11</i> . This may be one of: { <i>all</i> , <i>dgr</i> {1-8}{a-d}, <i>ina</i> {1-28}, <i>lgrp</i> {1-8} } In Release 4, V303-1 is also valid.
<i>ctag</i>	Correlation tag.

OUTPUT FORMAT

If the system fully complies with the request, the following report is returned with one entry for each entity:

```
sid date time
M ctag COMPLD
  "aid::pst"...
  "aid::pst"
;
```

If the AID = *a11*, TR8 digroups are listed, followed by line groups, followed by INA DS1s.

In Release 4, the TR303 VRT is listed first.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **RTRV-STATE-EQPT** command also. In addition, the following output parameters also apply to **RTRV-STATE-EQPT**.

aid	This is the address of the entity.
pst	Primary Service state of the entity. This may be one of:
is	In-Service.
oos	Out-of-Service.

EXAMPLE INPUT/OUTPUT

```
RTRV-STATE-VEQPT:ATT-PF-2000:ina-1:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
"ina-1:::IS"  
;
```

ERROR OUTPUT

Refer to the RTRV-HDR ERROR RESPONSES section. The requirements here apply to the RTRV-STATE-VEQPT command also.

If a RTRV-STATE-VEQPT command is received with an aid that is not valid for this message, the following error response is returned to the user:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```


NAME

RTRV-T0 : Retrieve provisioning and state information for Physical Lines on the metallic channel shelf or in a distant terminal served by the **SLC-2000** system.

INPUT FORMAT

RTRV-T0:*tid:aid:ctag*;

DESCRIPTION

Retrieve provisioning and state information for Physical Lines on the metallic channel shelf or in a distant terminal served by the **SLC-2000** system.

INPUT PARAMETERS

<i>tid</i>	Target Identifier This is the name of the network element to which the command is addressed. The <i>tid</i> is a required parameter.
<i>aid</i>	Access Identifier. This is the address of the Physical Line to be retrieved. Valid values are: { all, drop-{1-8}-{1-24}-{1-4}, dtdp-{1-8}-{1,3,5,7,13,15,17,19}-{1-6}-{1-4} }
<i>ctag</i>	There is no default. Correlation Tag. This must be included in the command and is repeated by system in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

In response to a valid **RTRV-T0** command, the following output report shall be returned to the user, sorted by alphanumeric order of the *aid* value (similar to the CIT output). Only information on lines that are not in the OOS-MA-UAS state is returned.

Following is a sample output from the system in response to the incoming **RTRV-T0** command from the user.

```

sid date time
M ctag COMPLD
  "aid:com_block:spec_block:pst,sst,ast"...
  "aid:com_block:spec_block:pst,sst,ast"
;

```

DESCRIPTION OF OUTPUT PARAMETERS

Refer to the RTRV-HDR OUTPUT PARAMETERS section. The requirements listed there apply here also. In addition, the following output parameters also apply to RTRV-T0.

<i>aid</i>	Access Identifier. This is the line address of the physical line for which data is being retrieved.
<i>com_block</i>	Common block. This parameter field is used for returning the currently provisioned parameter values from the common block of the ENT-T0 command for the physical lines. Parameters within the common block are position dependent and are listed below in the order they appear.
<i>CLEI</i>	This is the provisioned CLEI code for the physical line. Valid values are listed in the ENT-T0 command.
<i>Function Code</i>	This is the provisioned Function code for the physical line. Valid values are listed in the ENT-T0 command.
<i>spec_block</i>	Specific block. This parameter field is used for returning the currently provisioned parameter values for the physical lines. Parameters within the specific block are positionally independent and are specified using a name defined construct of: PARAMETER=value in a comma separated list. The set of parameters returned is dependent upon the provisioned values of the CLEI and Function codes. The parameters are listed and explained in the ENT-T0 command. The system will return the parameters within the <i>spec_block</i> in the order shown in the <i>spec_block</i> parameter tables of the ENT-T0 manual page.

pst

This parameter is reported to specify the Primary Service State of the physical line addressed by the *aid* field.

Possible values are:

IS In-service.

OOS-MA-AS The line termination is out-of-service but is assigned (provisioned). The secondary state provides the reason for being out-of-service.

OOS-MA-UAS The line termination is out-of-service since it is unassigned (not provisioned).

OOS-MT The line termination is out-of-service due to a maintenance condition. The secondary state may provide the reason for being out-of-service.

sst

This parameter is reported to specify the Secondary Service State of the physical line addressed by the *aid* field.

Possible values in Release 3.2 are:

For a primary state of OOS-MA-AS: { UEQ, MEA }

For a primary state of OOS-MA-UAS: { UEQ }

For a primary state of OOS-MT:
{ UEQ, MEA, FLT, TS, FLT&TS }

Possible values in Release 4 are:

For a primary state of IS: { ANR }

For a primary state of OOS-MA-AS:
{{UEQ | MEA}, {SWTCH}}

For a primary state of OOS-MA-UAS: { UEQ }

For a primary state of OOS-MT:
{{UEQ | MEA | {FLT,TS}}, {FLT | SWTCH}}

These states are defined as follows:

ANR	Loss of ringing capability or the line fails partially but is still in service (i.e., calls can be originated and terminated).
FLT	The line fails so severely that it is considered to be out-of-service (i.e., calls can neither be originated nor terminated). Stuck CU test relay is an example of such a failure.
MEA	The channel unit which serves the line termination does not match the provisioned CLEI code.
SWTCH	The line object has been manually removed from service by the switch (LDS).
TS	The line termination is under test.
UEQ	The channel unit which serves the line termination is not equipped.

If more than one secondary state applies, the ampersand is used as a grouping character (e.g. FLT&TS).

ast This parameter is reported to specify the Associated Service State of the physical line addressed by the *aid* field. It is only supported in Release 4.

Possible values are:

FEF	The MDC and/or PTU associated with the CU are/ is missing.
TS31	The line termination is under test (only applies when <i>pst</i> = <i>IS</i>).

AT&T 363-208-001, *SLC[®]-2000 Access System User Service Manual*, contains the state definitions for the SLC-2000 system.

EXAMPLE INPUT/OUTPUT

The example below shows the response to a query of the OS concerning physical line drop-1-1-1:

```
RTRV-T0:ATT-SLC-2000:drop-1-1-1:123456;
```

```
IP 123456
```

```
<
```

```
ATT-SLC-2000 93-10-26 16:42:11
```

```
M 123456 COMPLD
```

```
"drop-1-1-1:5SCU69,DPT:IMP=600,BAL=3,XMTGN=-1.0,  
RCVGN=-8.0,SL=0,RLS=YES:IS"
```

```
;
```

The example below shows the response to a query of the OS concerning physical line drop-1-2-1 which is provisioned but unequipped:

```
RTRV-T0:ATT-SLC-2000:drop-1-2-1:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "drop-1-2-1:OTHER,DFLT:RLS=NO:OOS-MA-UAS,UEQ"  
;
```

The example below shows the response of a Release 4 system to a query of the OS concerning physical line drop-2-3-1 which is provisioned but there is a mismatch and a common unit missing in the MDS:

```
RTRV-T0:ATT-SLC-2000:drop-2-3-1:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "drop-2-3-1:OTHER,DFLT:RLS=NO:OOS-MA-UAS,MEA,FEF"  
;
```

The example below shows the response to a query of the OS concerning physical line drop-1-5-1 which has a fault, and is under test:

```
RTRV-T0:ATT-SLC-2000:drop-1-5-1:123456;  
  
IP 123456  
<  
  
ATT-SLC-2000 93-10-26 16:42:11  
M 123456 COMPLD  
  "drop-1-5-1:OTHER,DFLT:RLS=NO:OOS-MT,FLT&TS"  
;
```

ERROR OUTPUT

Refer to the RTRV-HDR ERROR RESPONSES section. The requirements here apply to the RTRV-T0 command also.

The following error responses are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a RTRV-T0 command with an *aid* value that is invalid for the command the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If a fiber drop *aid* is specified within a distribution shelf which is not provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
the shelf for AID is not provisioned for
fiber distribution. */
;
```

If a metallic drop aid is specified within a distribution shelf which is provisioned for FITL distribution, the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
the shelf for AID is not provisioned for
metallic distribution. */
;
```


If a fiber drop aid is specified with a channel number greater than the number of DSOs for which the supporting MSDT server is provisioned (i.e., attempt to RTRV-T0::dtdp-1-3-4-1 when dt-1-3 is provisioned to serve 12 lines), the following message shall be provided:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier,
   the DT server for AID is currently
   provisioned for a maximum of n lines. */
;
```

Note: *n* may be {0, 12, 24} (current provisioned DT bandwidth.)

If the RTRV-T0 command is received for a line which is in the OOS-MA-UAS state, the following error message shall be returned:

```
sid date time
M ctag DENY
SNVS
/* Status Not in Valid State, PST=OOS-MA-UAS */
;
```

NAME

RTRV-USER-SECU: Retrieve User Security

INPUT FORMAT

RTRV-USER-SECU:*tid*[:*uid*]:*ctag*;

DESCRIPTION

The RTRV-USER-SECU command is used by an appropriate administrator to retrieve the security parameters associated with a user, except for the user's password, which cannot be retrieved.

**NOTE:**

This command is available to privileged users only.

INPUT PARAMETERS

- tid* Target identifier. This is the name of the network element to which the command is addressed.
- uid* This is the User Identifier of a user. Its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. Only a single *uid* or a null value meaning ALL is supported in this command.
- ctag* Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the Network Element has logins to report, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
  "uid:,uap"
;
```

If the Network Element receives a RTRV-USER-SECU with a null value for *uid*, it returns all the user accounts with privileged users first, followed by general users, then reports-only users.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

uap User Access Privilege. It takes one of the following values: *privileged*, *general* or *reports-only*.

EXAMPLE INPUT/OUTPUT

```
RTRV-USER-SECU:ATT-PF-2000:kjlee:123456;

IP 123456
<

ATT-PF-2000 93-10-26 16:42:11
M 123456 COMPLD
  "kjlee:,general"
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the RTRV-USER-SECU command, also.

If the Network Element receives a RTRV-USER-SECU command with a non-existing or invalid *uid*, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid UID */
;
```

NAME

SCHED-PMREPT-rr: Schedule Performance Monitoring Report

INPUT FORMAT

```
SCHED-PMREPT-modifier:tid:aid:ctag:[reptinvl],[reptstatm],
[numrept],[montype],[monlev],[locn],[dirn],tmper[,tmofst];
```

DESCRIPTION

The SCHED-PMREPT-rr command messages can be initiated to request the SLC-2000 system to schedule or delete the schedule for autonomous performance-monitoring (PM) reports.

Based on the scheduled PM reports, the SLC-2000 system outputs autonomous REPT PM messages.



NOTE:

Users should *avoid* scheduling daily reports to start just *before* or *at* mid-night. The time a SCHED-PMREPT command is sent may vary slightly from the time the command is received, processed, and output by the network element. The network element stores only the current and previous day's *daily* PM data.

The SLC-2000 system supports up to a maximum of 100 active scheduled PM reports, counting every *aid* as many times as it's scheduled (*aid* values that include *a11* are counted multiple times). For example, a DS1 PM report schedule for *aid c-a11* counts as 28 active scheduled PM reports, independent of how many DS1 circuit packs are actually equipped.

The SLC-2000 system accepts each SCHED-PMREPT as a request for a different scheduled PM report unless two requests are *exact* duplicates. For example (for SLC-2000 OC3), a SCHED-PMREPT-T1 with *aid = c-1-1*, and another SCHED-PMREPT-T1 with *aid = c-1-a11*, are both accepted as different scheduled PM reports even if all other input parameter values (except *ctag*) are the same. In this case, the second report would include a superset of the PM data in the first report, but both requests would be accepted, and each report would be output in separate REPT PM messages. Similarly, as specified later in the *numrept* parameter description, to delete an active scheduled PM report, the input *aid* value must match exactly.

The SLC-2000 system limits the potential volume of PM data that can be scheduled to be reported within any hour to 3600 lines/hour. The network element

checks ahead 30 days to determine if the 3600 lines/hour maximum would be exceeded.

INPUT PARAMETERS

<i>modifier</i>	This is the command code modifier and must have one of the following values:
EC1	This schedules electrical carrier signal level 1 PM reports.
OC3	This schedules optical carrier signal level 3 PM reports.
STS1	This schedules synchronous transport signal level 1 PM reports.
T1	This schedules DS1 level PM reports.
T3	This schedules DS3 level PM reports.
VT1	This schedules virtual tributary signal level 1.5 PM reports
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the EC1 or OC3 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which a scheduled PM report is requested. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>reptinvl</i>	Report interval. This specifies how often the scheduled PM report is to be generated and may have one of the following values:
15-MIN	This schedules the PM report to be generated every 15 minutes (for <i>tmper</i> = 15-MIN only).
{1-24}-HR	This schedules the PM report to be generated every 1 to 24 hours.
1-DAY	This schedules the PM report to be generated every 1 day (for <i>tmper</i> = 1-DAY only).

reptstatm Report start time. This specifies the time of the first autonomous PM report (REPT PM). This has the format HH-MM (hours-minutes), where HH ranges from 0 to 23 and MM ranges from 0 to 59.

If the *reptstatm* value is already past for the current day, the network element interprets the *reptstatm* value to be for the next day. The default is the current time of day, in which case, the SLC-2000 system immediately outputs the first autonomous PM report (REPT PM).

numrept Number of reports. This specifies the number of autonomous PM reports (REPT PM) to be generated and may be null or have a numeric value ranging from 0 to 96. If *numrept* is null (default), the network element activates the PM report schedule indefinitely, that is, until the schedule deleted by a subsequent SCHED-PMREPT or a processor reset results in the deletion of all PM report schedules.

If *numrept* is 0, the network element deletes any previous PM report schedule(s) that match based on all other input parameter values (except *ctag*).

montype Monitored parameter type. This is the PM parameter type for which reporting is being scheduled. The default is for all applicable (based on the *modifier*) *montype* values to be reported. Refer to Table 3-11 at the end of this section for a list of valid values.

monlev Monitored level. This has the format LEV-DIRN. The LEV value may be a decimal numeral. DIRN may have one of the following values:

DN This requests PM data be reported for *monval* values equal to or less than the value of LEV.

UP This requests PM data be reported for *monval* values equal to or greater than the value of LEV.

The default is 1-UP. The supported decimal numeral values of LEV are the same as for the network element's *monlev* parameter in the TL1 RTRV-PM command. The SLC-2000 system supports up to 7 digits to be consistent with the maximum PM data counts in the SLC-2000 system. LI *locn* Location. This requests PM data be reported for a specified location and may have one of the following values:

FEND This requests far-end PM data.

NEND This requests near-end PM data.

The default is FEND (if applicable) and NEND.

dirn Direction. This parameter is validated for one of the following values although it does not affect the reported PM data because it is really not applicable. All network element PM data is based on the receive direction.

AZ This requests PM data for location A-to-Z.

NA This requests PM data for which the direction is not applicable.

RCV This requests PM data for the receive direction. The default is *RCV* (which is effectively equivalent to *AZ* or *NA*).

tmper Time period. This requests PM data for a specified time interval. This parameter must have one of the following values:

15-MIN This requests PM data in 15-minute intervals.

1-DAY This requests daily PM data.

tmofst Time offset. This parameter specifies the start time of the time period (*tmper*) for which PM data is to be reported, by subtracting the *tmofst* from the time of the most recently completed time period (*tmper*). This has the format DD-HH-MM (day-hours-minutes). If *tmper* = *1-DAY*, allowable values of *tmofst* are 0-0-0 and 1-0-0 only. If *tmper* = *15-MIN*, allowable values of *tmofst* are 0-{0-7}-{0,15,30,45} and 0-8-0.

In the specific case of *tmofst* = 0-0-0, the network element reports the PM data accumulated during the *current* time period (*tmper*). If *tmofst* is null, the default is to report PM data for the most recently *completed* time period (*tmper*) interval. That is, if *tmper* = *15-MIN*, the *tmofst* default is 0-0-15. If *tmper* = *1-DAY*, the *tmofst* default is 1-0-0.

The network element supports parameter grouping, with single ampersands (&), of non-null *tmofst* values to allow PM reports to be scheduled at intervals (*reptinvl*) greater than 15 minutes and still include all 15-minute PM data accumulated during the report interval (*reptinvl*).



NOTE:

If *any* of the *tmofst* values is not valid, the network element denies the whole command.

OUTPUT FORMAT

If the *SLC-2000* system fully complies with the command request, the following normal completion response is returned:


```

    sid date time
M  ctag COMPLD
;

```

If the network element receives a valid SCHED-PMREPT command with a *numrept* value of 0 (to delete a PM schedule) but no active PM schedules match based on the other input parameter values, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

```

SCHED-PMREPT-T3:ATT-PF-2000:b:123456:1-HR,12-05,1,
PYERR-L,1-UP,NEND,NA,15-MIN,
0-1-0&0-0-45&0-0-30&0-0-15;

IP 123456
<

    ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
;

```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the SCHED-PMREPT-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the SLC-2000 system receives a SCHED-PMREPT-rr command with a command code modifier which is supported but the applicable feature package option is "off", the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, feature option not enabled */
;
```

If a SLC-2000 system receives a SCHED-PMREPT-rr command with a command code modifier other than those listed, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If a SLC-2000 system receives a SCHED-PMREPT-rr command without an *aid* value, an *aid* value that is invalid, or that conflicts with the command code modifier, the following error response is returned:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier,
;

```

If a SLC-2000 system receives a SCHED-PMREPT command with an invalid *reptinvl* value, or a *reptinvl* value that conflicts with the *tmper* value, the following error response is returned:

```
sid date time
M ctag DENY
  IDNV
  /* Input, Data Not Valid, invalid REPTINVL */
;

```

Invalid *reptinvl* values include:

1. out of range values
2. 15-MIN when *tmper* is 1-DAY
3. 1-DAY when *tmper* is 15-MIN.

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *reptstatm* value, the following error response is returned:

```

sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid REPTSTATM */
;

```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *numrept* value, the following error response is returned:

```

sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid NUMREPT */
;

```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with a *montype* value that is not supported by the network element or a *montype* value that conflicts with the command code modifier, the following error response is returned:

```

sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid MONTYPE */
;

```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *monlev* value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid MONLEV */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *locn* value, or a *locn* value that conflicts with the command code modifier, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid LOCN */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *dirn* value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid DIRN */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *tmper* value (that is, anything other than *15-MIN* or *1-DAY*) or a *tmper* value that conflicts with the command code modifier (for example, *SCHED-PMREPT-T1* with a *tmper* value of *15-MIN* in *SLC-2000 OC3*), the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid TMPER */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command with an invalid *tmofst* value, or a *tmofst* value that conflicts with the *tmper* value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid TMOFST */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command that exactly matches all input parameter values (except *ctag*) of a previous *SCHED-PMREPT* whose schedule is still active, the following error response is returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed,
   duplicate scheduled PM reports */
;
```

If the *SLC-2000* system receives a *SCHED-PMREPT* command that would exceed the network element's maximum number of scheduled PM reports or maximum PM data volume to be reported, the following error response is returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed,
   too many scheduled PM reports */
;
```

NAME

SET-ATTR-rr: Set Attribute

INPUT FORMAT

SET-ATTR-modifier:tid:aid:ctag[::ntfcncde][,,,];

DESCRIPTION

The SET-ATTR-rr command messages can be initiated by an OS or OS users to instruct the SLC-2000 system to set the notification code associated with incoming signal failure events.

This command determines whether the event notification is alarmed (reported via the REPT ALM command) or not alarmed (reported via the REPT EVT command).

For incoming DS1 signals, failure events are:

- incoming (from DSX) DS1 LOS
- incoming (from DSX) DS1 LOS

For incoming DS3 signals, failure events are:

- incoming (from DSX) DS3 LOS
- incoming (from DSX) DS3 sig fail

For incoming EC1 signals, failure events are:

- incoming EC1 line AIS
- incoming EC1 LOF
- incoming EC1 LOS
- incoming EC1 sig degrade (BER)
- incoming EC1 sig failed (BER)
- incoming STS1 LOP EC1.

Refer to Tables 3-7 and 3-8 at the end of this section for more explanation.

INPUT PARAMETERS

<i>modifier</i>	This is the message modifier for the SET-ATTR-rr message and must have one of the following values:
EC1	This sets attributes for the electrical carrier signal level 1.
T1	This sets attributes for the DS1 level.
T3	This sets attributes for the DS3 level.
<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the facility for which the attribute is to be set. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.
<i>ntfncode</i>	Notification code. This is the alarm level for an incoming signal failure event and has one of the following values:
CR	Critical alarm
MJ	Major alarm
MN	Minor alarm
NA	Not alarmed
	For DS3s and EC1s, a null value defaults to CR. For DS1s, a null value defaults to NA.

OUTPUT FORMAT

If the SLC-2000 system complies with the command request, the following message is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

If the *SLC-2000* system receives a valid *SET-ATTR* command, but the command does not alter the existing alarm attributes, the *SLC-2000* system provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for *RTRV-HDR*.

EXAMPLE INPUT/OUTPUT

```
SET-ATTR-T3:ATT-SLC-2000:1s-1-5a-2:123456::CR;  
  
IP 123456  
<  
  
ATT-SLC-2000-3 93-11-26 16:54:21  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the *SET-HDR* error responses.

The following error conditions are listed in the order and priority that the *SLC-2000* system checks for each condition.

If a SLC-2000 system receives a SET-ATTR-rr command with an invalid command modifier, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If a SLC-2000 system receives a SET-ATTR-rr command with an invalid aid value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IIAC
/* Input, Invalid Access Identifier */
;
```

If a SLC-2000 system receives a SET-ATTR-rr command with an invalid ntfcncde value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid NTFCNCDE */
;
```

If a SLC-2000 system receives a SET-ATTR-rr command with a valid *aid* value but the network element is not equipped with any equipment in the slot, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENEQ
  /* Equipage, Not Equipped */
;
```

If a SLC-2000 system receives a SET-ATTR-rr command with a valid *aid* value but the network element is equipped with the wrong type of circuit pack, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENSI
  /* Equipage, Not equipped for Setting specified Information */
;
```

NAME

SET-ATTR-ENV: Set Environmental Attributes

INPUT FORMAT

```
SET-ATTR-ENV:tid:aid:ctag[:ntfcncde],almtype][,almmsg];
```

DESCRIPTION

The SET-ATTR-ENV command messages can be initiated by an OS or OS users to set the notification code (alarm level), alarm type (condition type), and/or alarm message (condition description) associated with environmental alarm and status points.

Because environmental input points are only supported at remote (RT) Network Elements, this command is only allowed at Network Elements with the CO/RT select switch set to "RT". Refer to the "TL1-Related Provisioning" paragraph presented earlier in this section.

Environmental *alarm* conditions are reported by TL1 autonomous REPT ALM ENV messages. Environmental *status* conditions are reported by TL1 autonomous REPT EVT COM messages and periodically via REPT COND. The provisioned notification code, alarm type, and alarm message are included in the TL1 messages reporting the occurrence of an environmental condition.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the address of the environmental points to be provisioned. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the OS and is repeated by the SLC-2000 system in the response to allow the OS to associate the command and response messages.

ntfcncde Notification code. This is the alarm level to be associated with the addressed environmental point, and may have one of the following values:

CR	Critical alarm
MJ	Major alarm
MN	Minor alarm
NA	Not alarmed.

The *ntfcncde* default is **MN**, but the default value only applies if the *almtype* and *almmsg* input values are also null.

almtype Alarm type. This is the TL1 alarm type, also referred to as the TL1 condition type, to be associated with the addressed environmental point. The Network Element accepts any alarm type value consisting of 1 - 10 alphanumeric characters and/or dashes.

The alarm type value only appears in TL1 messages, thus this parameter does not affect any other aspects of the Network Element's operation.

almmsg Alarm message. This is the condition description to be associated with the addressed environmental point. The description may be an alphanumeric string, upper- and lower-case characters with no spaces, up to 26 characters. The description must be enclosed within a pair of quotes (" ").

The *almmsg* default is **environmentn**, but the default value only applies if the *ntfcncde* and *almtype* input values are also null. In the particular case of environmental point 15, the default is **externalMinor**. Refer to Tables 3-9 and 3-10 at the end of this section.

OUTPUT FORMAT

If the network element fully complies with the command request, the following

normal completion response is returned to the OS:

```
sid date time
M ctag COMPLD
;
```

If the Network Element receives a valid SET-ATTR-ENV command, but the command does not alter the existing alarm attributes, the Network Element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR command.

EXAMPLE OUTPUT

```
SET-ATTR-ENV:ATT-SLC-2000:
env-10:123456::MJ,HITEMP,"HighTemperature";

IP 123456
<

ATT-SLC-2000 93-10-26 16:42:11
M 123456 COMPLD
;
```

ERROR RESPONSES

Refer also to the non-message-specific error responses listed in the SET-HDR error responses.

The following error conditions are listed in the order and priority that the SLC-2000 system checks for each condition.

If the *SLC-2000* system receives a *SET-ATTR-ENV* command but the network element does not have the CO/RT select switch set to RT, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ENRI
/* Equipage, Not equipped for Retrieving specified
   Information */
;
```

If the *SLC-2000* system receives an *SET-ATTR-ENV* command with an invalid *aid* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the *SLC-2000* system receives an *SET-ATTR-ENV* command with an invalid *ntfcncde* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid NTFCNCDE */
;
```


If the *SLC-2000* system receives an *SET-ATTR-ENV* command with an invalid *almtyp*e value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid ALMTYPE */
;
```

If the *SLC-2000* system receives an *SET-ATTR-ENV* command with an invalid *almmsg* value, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid ALMSG */
;
```

NAME

SET-SID: Set the Target/Source identification

INPUT FORMAT

SET-SID:*tid::ctag::sid*;

DESCRIPTION

The SET-SID command can be initiated by a user to change the target/source identification of the network element. When the network element receives this, it will update the target/source identifier as requested.

**NOTE:**

If security is enabled on any CIT or DCC port on a shelf, then this command is available to privileged users only.

The target/source identifier remains active until changed (for example, by the TL1 command SET-SID command again or by the appropriate CIT command) or until overridden by a reset or initialization.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the Network Element to which the command is addressed.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the Network Element in the response to allow the user to associate the command and response messages.
<i>sid</i>	Target identifier. This is the new name of the network element to which the command is addressed.

For proper operation of the TL1 interfaces, the *sid* must be unique for each network element within a subnetwork.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time  
M ctag COMPLD  
;
```

If the requested SET-SID command does not alter the existing condition, the network element will not DENY the command. Instead the network element will respond with a normal completion message.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR.

EXAMPLE INPUT/OUTPUT

```
SET-SID:ATT-PF-2000::123456::ATT-SLC-2000;  
  
IP 123456  
<  
  
ATT-SLC-2000-3 93-11-26 16:54:21  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the SET-SID command, also.

If the *SLC-2000* system receives a *SET-SID* command with an otherwise valid set of input parameters but the *sid* parameter specified in the command is exactly the same as the *sid* for some other network element in the subnetwork, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid SID */
;
```

If the *SLC-2000* system receives a *SET-SID* command with an otherwise valid set of input parameter values but the *sid* parameter specified in the command is syntactically incorrect, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid SID */
;
```

If the SLC-2000 system receives a SET-SID command without the *sid* parameter, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid SID */
;
```

If the SLC-2000 system receives a SET-SID command with an otherwise valid set of input parameter values, but the command could not be completed by the network element, the following error response is returned to the OS:

```
sid date time
M ctag DENY
SROF
/* Status, Request Operation Failed */
;
```

NAME

SW-TOPROTN: Switch To Protection (SONET subsystem only)

INPUT FORMAT

SW-TOPROTN-EQPT:*tid:aid:ctag:mode[,dirn]*;

DESCRIPTION

The SW-TOPROTN command can be initiated by a user to instruct the SLC-2000 system to perform an equipment (circuit pack) protection switch on low speed (DS1 or VTU) transmission, function units, or synchronization circuit packs. Both revertive and nonrevertive protection switches are included. This command is *not* used to switch OLIU circuit packs to protection.

When the network element receives a SW-TOPROTN command with an address indicating a low speed transmission *service* circuit pack slot, a low speed hardware switch is operated with the following *modes* (in priority order): *lockout*, *forced switch*, or *normal* (manual) switch.

When the network element receives a SW-TOPROTN command with an address indicating a low speed transmission *protection* circuit pack slot, a low speed hardware switch is operated with a *mode* of *lockout*.

When the network element receives a SW-TOPROTN command with an address indicating a function unit circuit pack slot pair, a hardware switch is operated with the following *modes* (in priority order): *inhibit*, *forced switch*, or *normal* (manual) switch.

When the network element receives a SW-TOPROTN command with an address indicating a *synchronization* circuit pack slot pair, a hardware switch is operated with the following *modes* (in priority order): *inhibit*, or *normal* (manual) switch.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the slot address within the network element for which the <code>SW-TOPROTN</code> command is intended. For low speed circuit pack protection switching, the <i>aid</i> value must identify either a single low speed slot (for example, ls-a-1) or all low speed slpt in a group (for example, ls-a-all). Valid low speed slot addresses for <i>modes</i> <code>FRCD</code> and <code>NORM</code>: ls-<i>{a,b,c}</i>-<i>{1-7}</i> (Note that only <i>service</i> slots are allowed, and <i>all</i> is not allowed). Valid low speed <i>service</i> slot addresses for <i>mode</i> <code>LOCKOUT</code>: ls-<i>{a,b,c}</i>-<i>{1-7,all}</i> (Note that <i>all</i> means 1,2,3,4,5,6,7). Valid low speed <i>protection</i> slot addresses for <i>mode</i> <code>LOCKOUT</code>: ls-<i>{a,b,c}</i>-8 (Note that's the protection slot only). For function unit and synchronization circuit pack protection switching, the <i>aid</i> value must identify a circuit pack slot pair. Other than the use of the <i>all</i> value within the <i>aid</i> field, grouping and/or ranging of values for this command is not allowed. Further, the use of <i>all</i> is only applicable when addressing low speed transmission circuit pack slots with a <i>mode</i> value of <code>LOCKOUT</code>. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>mode</i>	Protection switch mode (priority). This is the protection switch request priority of the command. The <i>mode</i> parameter must have one of the following values, listed in order of priority:

LOCKOUT	Lockout. This requests a lockout of protection switching and is applicable only when the <i>aid</i> value indicates a low speed transmission circuit pack slot(s). The effect of this type of protection switching request is to lockout protection switching requests for the addressed entity. If the lockout addresses a <i>protection</i> slot, any traffic that is currently on the protection circuit pack is unconditionally switched back to the service circuit pack, and not traffic from any service circuit pack will be switched to the protection circuit pack. If the lockout addresses a <i>service</i> slot, any traffic on that service circuit pack that was previously switched to protection is unconditionally switched back to the service circuit pack, and no further traffic can be switched from that service circuit pack to the protection circuit pack. The protection switching lockout remains in effect until a protection switching reset is entered (for example, SW-TOWKG with <i>mode</i> = RESET).
INHIBIT	Inhibit. This requests an inhibit or protection switching and is applicable only when the <i>aid</i> value indicates a function unit, or synchronization circuit pack slot pair. The effect of this type of protection switching request is to inhibit (freeze) protection switching for the addressed entity. The protection switching inhibit remains in effect until a protection switching reset is entered (for example, SW-TOWKG with <i>mode</i> = RESET).
FRCD	Forced. This requests an equipment protection switch with a priority of forced and is accepted unless another manual protection switch request of equal or higher priority is in effect. This <i>mode</i> value is applicable only when the <i>aid</i> value indicates a low speed service slot, a function unit, or synchronization circuit pack slot pair. The forced protection switch remains in effect until a protection switching lockout (when applicable) or reset is entered.

NORM

Normal. This requests an equipment protection switch with a priority of manual and is accepted if no other automatic or manual protection switch requests of equal or higher priority are in effect. This *mode* value is applicable when the *aid* value indicates a low speed service slot, a function unit slot, or synchronization circuit pack slot pair. The manual protection switch remains in effect until a protection switching lockout (when applicable), forced (when applicable), or reset is entered.

dirn

Direction. This parameter specifies the direction of transmission affected by the protection switch. This parameter field may be null or have the value **BTH** (both) for all **SW-TOPROTN-EQPT** commands to the network element. The default value is **BTH**.

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
sid date time
M ctag COMPLD
;
```

If the *SLC-2000* system receives a valid **SW-TOPROTN** command, but protection switching request does not alter the existing protection switching state and/or priority, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

```
SW-TOPROTN-EQPT:ATT-PF-2000:1s-5a:123456::LOCKOUT,,BTH;  
  
IP 123456  
<  
  
ATT-PF-2000 94-05-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The error responses listed there apply to the **SW-TOPROTN** command, also.

If the **SLC-2000** system receives a **SW-TOPROTN** command with a command code modifier other than **EQPT**, the following error response is returned to the OS:

```
sid date time  
M ctag DENY  
ICNV  
/* Input, Command Not Valid, invalid modifier */  
;
```

If the SLC-2000 system receives a SW-TOPROTN command without an *aid* value or with an *aid* value that is invalid in any case for this command (independent of the input *mode* value), the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the SLC-2000 system receives a SW-TOPROTN command without a *mode* value or with an invalid *mode* value (either due to a conflict with the *aid* value or a *mode* value that is not supported in any case by this command), the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid MODE */
;
```

If the SLC-2000 system receives a SW-TOPROTN command with a non-null *dirn* value that is other than BTH, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid DIRN */
;
```

If the SLC-2000 system receives a SW-TOPROTN command that would otherwise change the protection switching state and/or priority and is lower or equal to the priority of the pre-existing protection switching state, the following error response is returned:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied,
equal or higher priority switch request exists */
;
```

If the SLC-2000 system receives a SW-TOPROTN command but no protection circuit pack slot in the protection group is equipped with a circuit pack of the same type as in the service circuit pack slot, the following error response is returned:

```
sid date time
M ctag DENY
ENPS
/* Equipage, Not equipped with Protection Switching */
;
```

If the SLC-2000 system receives a SW-TOPROTN command directed to a single unequipped low speed service circuit pack slot, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid,
inconsistent with provisioned configuration */
;
```

If the SLC-2000 system receives a SW-TOPROTN command directed to a function unit slot pair equipped with an OC3 circuit pack (for which the SW-TOPROTN command does not apply), the following error response is returned:

```
sid date time
M ctag DENY
SSRD
/* Status, Switch Request Denied,
   equipped OC circuit pack incompatible with switch request
*/
;
```

NAME

sw-towkg: Switch To Working (SONET subsystem only)

INPUT FORMAT

SW-TOWKG-EQPTtid:aid:ctag::mode[,dirn];

DESCRIPTION

The sw-towkg command can be initiated by a user to instruct the SLC-2000 system to reset equipment (circuit pack) protection switching on low speed (DS1 or VTU) transmission, function unit, or synchronization circuit packs. Resets of both revertive and nonrevertive protection switching are included.

**NOTE:**

This command is not used to reset protection switching for OLIU circuit packs.

When the network element receives a sw-towkg command with an address indicating a valid circuit pack switching entity, a hardware switch is operated with a *mode* of reset.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>aid</i>	Access identifier. This is the slot address within the network element for which the SW-TOWKG command is intended. For low speed circuit pack (DS1) protection switching, the <i>aid</i> value must identify either a single low speed slot (for example, <i>1s-a-1</i>) or all low speed slots in a single group (for example, <i>1s-a-all</i>). Valid low speed <i>service</i> slot addresses for <i>mode</i> RESET: <i>1s-{a,b,c}-{1-7,all}</i> (Note that <i>all</i> means 1,2,3,4,5,6,7). Valid low speed <i>protection</i> slot addresses for <i>mode</i> RESET: <i>1s-{a,b,c}-8</i> (Note that's the protection slot only). For function unit, and synchronization circuit pack protection switching, the <i>aid</i> value must identify a circuit pack slot <i>pair</i>. Other than the use of the <i>all</i> for this <i>aid</i> field, grouping and/or ranging of <i>aid</i> values for this command is not allowed. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid low speed transmission and synchronization circuit pack slot addresses.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>mode</i>	Protection switch mode (priority). This provides the protection switch request priority of the command. The <i>mode</i> parameter must have the value RESET , which requests a reset of protection switching. The effect of this protection switching request is to reset any previous manual protection switching requests for the addressed entity.
<i>dirn</i>	Direction. This parameter specifies the direction of transmission affected by the protection switch reset. This parameter field may be null or have the value BTH (both) for all SW-TOWKG-EQPT commands to the network element. The default value is BTH .

OUTPUT FORMAT

If the command request completes successfully, the following normal completion response is returned:

```
      sid date time  
M  ctag COMPLD  
;
```

If the SLC-2000 system receives a valid `sw-towkg` command, but protection switching request does not alter the existing protection switching state and/or priority, the network element provides a normal completion response.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the `OUTPUT PARAMETERS` section for `RTRV-HDR`.

EXAMPLE INPUT/OUTPUT

```
SW-TOWKG-EQPT:ATT-PF-2000:1s-a-1:123456::RESET;  
  
IP 123456  
<  
  
ATT-PF-2000 94-05-26 16:42:11  
M 123456 COMPLD  
;
```

ERROR RESPONSES

Refer to the `RTRV-HDR` error responses section. The error responses listed there apply to the `sw-towkg` command, also.

If the SLC-2000 system receives a SW-TOWKG command with a command code modifier other than `EQPT`, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ICNV
/* Input, Command Not Valid, invalid modifier */
;
```

If the SLC-2000 system receives a SW-TOWKG command without an `aid` value or with an `aid` value that is invalid, the following error response is returned:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier */
;
```

If the SLC-2000 system receives a SW-TOWKG command without a `mode` value or with an invalid `mode` value, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid MODE */
;
```

If the SLC-2000 system receives a SW-TOWKG command with a non-null *dirn* value that is other than BTH, the following error response is returned:

```
sid date time
M ctag DENY
  IDNV
/* Input, Data Not Valid, invalid DIRN */
;
```

If the SLC-2000 system receives a SW-TOWKG command but no protection circuit pack slot in the protection group is equipped with a circuit pack of the same type as in the service circuit pack slot, the following error response is returned:

```
sid date time
M ctag DENY
  ENPS
/* Equipage, Not equipped with Protection Switching */
;
```

If the SLC-2000 system receives a SW-TOWKG command directed to a function unit slot pair equipped with an OC3 circuit pack (for which the SW-TOWKG command does not apply), the following error response is returned:

```
sid date time
M ctag DENY
  SSRD
/* Status, Switch Request Denied,
   equipped OC circuit pack incompatible with switch request
*/
;
```

NAME

TEST-TRMSN-T1: Test DS1 Transmission (SONET subsystem only)

INPUT FORMAT

TEST-TRMSN-T1:tid:aid:ctag[::[spec_block]];

DESCRIPTION

The TEST-TRMSN-T1 command can be initiated by a user to set up an automated transmission test at the DS1 signal level for a channel addressed by a single low speed DS1 port. The direction of the test can be towards either the TERMINAL (towards the high speed optical fiber) or the FACILITY (towards the DSX). In either case, an appropriate loopback must be set up at the far-end prior to the execution of this command. Only one channel is tested at a time; multiple channels may not be tested simultaneously.

**CAUTION:**

Execution of this command will affect service.

When the network element receives an TEST-TRMSN command from the user, network element will perform and report the results of the transmission test at the DS1 signal level for the channel specified by the low speed port address for a duration of one minute.

The test proceeds to completion unless interrupted by a network element reset or initialization.

**NOTE:**

If external fiber loopback is used while performing this test in the TERMINAL direction, "inconsistent DCC switches" alarm condition may be reported by the NE. This alarm should be ignored during the test. To avoid this condition, the user may disable the DCC prior to testing.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.
<i>aid</i>	Access identifier. This determines the low-speed port at which the test is to be conducted. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.
<i>spec_block</i>	Specific block. This parameter block is optional. Parameters set within the <i>spec_block</i> are positionally independent and are set using a name defined construct of: <i>PARAMETER=value</i> . The <i>spec_block</i> can have none or some of the following parameters set within it in a comma separated list. Furthermore, each parameter listed below can appear at most once within the specific block. For this command, in the <i>specific_block</i> only one parameter is allowed. The allowed parameter is:
DIRN	Direction of the transmission test. This optional parameter may have one of the following values:
TERMINAL	The test signal is inserted in the TERMINAL direction and the received signal is monitored from the high speed optical fiber. This is the default value.
FACILITY	The test signal is inserted in the FACILITY direction and the received signal is monitored from the low speed electrical interface.

OUTPUT FORMAT

Upon receiving a valid **TEST-TRMSN-T1** command, the NE will respond with the completion message as shown below:

```
sid date time
M ctag COMPLD
  "dur=n, es=m,error=error"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional output parameters are:

<i>dur</i>	This is the elapsed in seconds of the test.
<i>es</i>	This is the total number of errored seconds during the time interval indicated by the elapsed time value.
<i>error</i>	This parameter is set equal to 00f if at least one Out-Of-Frame condition was detected during testing.

EXAMPLE INPUT/OUTPUT

```
TEST-TRMSN-T1:ATT-PF-2000:a-2-1:123456::dirn=TERMINAL;

IP 123456
<

ATT-SLC-2000 93-10-26 16:42:11
M 123456 COMPLD
  "dur=60,es=0"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The error responses listed there apply to the **TEST-TRMSN-T1** command, also.

If the *SLC-2000* system receives a *TEST-TRMSN-T1* command without an *aid* value or with an *aid* value that is not supported, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier, AID is
   missing, wrong or inconsistent with modifier */
;
```

If the *SLC-2000* system receives a *TEST-TRMSN-T1* command with a *dirn* value that is not supported, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid DIRN */
;
```

If the *SLC-2000* system receives a valid *TEST-TRMSN-T1* command but the addressed *aid* is not properly equipped for this command, the following error response is returned to the OS:

```
sid date time
M ctag DENY
ENEQ
/* Equipage, Not Equipped */
;
```

If the *SLC-2000* system receives an otherwise valid **TEST-TRMSN-T1** command but the test can not be performed due to other activity in the system, such as another transmission test, the following error response is returned:

```
      sid date time
M  ctag DENY
   SSRB
/* Status, System Resources Busy */
;
```


NAME

TEST-TRMSN-T3 : Test DS3 Transmission

INPUT FORMAT

TEST-TRMSN-T3:tid:aid:ctag[::[spec_block]];

DESCRIPTION

The TEST-TRMSN-T3 command can be initiated by a user to set up an automated transmission test at the DS3 signal level for a channel addressed by a single low speed DS1 port. The direction of the test can be towards either the TERMINAL (towards the high speed optical fiber) or the FACILITY (towards the DSX). In either case, an appropriate loopback must be set up at the far-end prior to the execution of this command. Only one channel is tested at a time; multiple channels may not be tested simultaneously.

**CAUTION:**

Execution of this command will affect service.

If the DS3 transmission test is run in the TERMINAL direction, and an external loopback is used at the far-end, then the far-end must be provisioned for clear channel mode with no AIS. If not, only errors in the receive direction will be detected.

When the network element receives an TEST-TRMSN command from the user, network element will perform and report the results of the transmission test at the DS1 signal level for the channel specified by the low speed port address for a duration of one minute.

The test proceeds to completion unless interrupted by a network element reset or initialization.

**NOTE:**

If external fiber loopback is used while performing this test in the TERMINAL direction, "inconsistent DCC switches" alarm condition may be reported by the NE. This alarm should be ignored during the test. To avoid this condition, the user may disable the DCC prior to testing.

INPUT PARAMETERS

<i>tid</i>	Target identifier. This is the name of the network element to which the command is addressed.						
<i>ctag</i>	Correlation tag. This is included in the command by the user and is repeated by the network element in the response to allow the user to associate the command and response messages.						
<i>aid</i>	Access identifier. This determines the low-speed port at which the test is to be conducted. Refer to Tables 3-7 and 3-8 at the end of this section for a list of valid addresses.						
<i>spec_block</i>	Specific block. This parameter block is optional. Parameters set within the <i>spec_block</i> are positionally independent and are set using a name defined construct of: <i>PARAMETER=value</i>. The <i>spec_block</i> can have none or some of the following parameters set within it in a comma separated list. Furthermore, each parameter listed below can appear at most once within the specific block. For this command, in the <i>specific_block</i> only one parameter is allowed. The allowed parameter is: <table><tr><td>DIRN</td><td>Direction of the transmission test. This optional parameter may have one of the following values:</td></tr><tr><td> TERMINAL</td><td>The test signal is inserted in the TERMINAL direction and the received signal is monitored from the high speed optical fiber. This is the default value.</td></tr><tr><td> FACILITY</td><td>The test signal is inserted in the FACILITY direction and the received signal is monitored from the low speed electrical interface.</td></tr></table>	DIRN	Direction of the transmission test. This optional parameter may have one of the following values:	TERMINAL	The test signal is inserted in the TERMINAL direction and the received signal is monitored from the high speed optical fiber. This is the default value.	FACILITY	The test signal is inserted in the FACILITY direction and the received signal is monitored from the low speed electrical interface.
DIRN	Direction of the transmission test. This optional parameter may have one of the following values:						
TERMINAL	The test signal is inserted in the TERMINAL direction and the received signal is monitored from the high speed optical fiber. This is the default value.						
FACILITY	The test signal is inserted in the FACILITY direction and the received signal is monitored from the low speed electrical interface.						

OUTPUT FORMAT

Upon receiving a valid TEST-TRMSN-T3 command, the NE will respond with the completion message as shown below:

```
sid date time
M ctag COMPLD
  "dur=n, es=m, error=error"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the OUTPUT PARAMETERS section for RTRV-HDR. Additional output parameters are:

<i>dur</i>	This is the elapsed in seconds of the test.
<i>es</i>	This is the total number of errored seconds during the time interval indicated by the elapsed time value.
<i>error</i>	This parameter is set equal to <i>oof</i> if at least one Out-Of-Frame condition was detected during testing.

EXAMPLE INPUT/OUTPUT

```
TEST-TRMSN-T3:ATT-PF-2000:b-3:123456::dirn=FACILITY;

IP 123456
<

ATT-SLC-2000 93-10-26 16:42:11
M 123456 COMPLD
  "dur=60,es=30,error=oof"
;
```

ERROR RESPONSES

Refer to the RTRV-HDR ERROR RESPONSES section. The error responses listed there apply to the TEST-TRMSN-T3 command, also.

If the SLC-2000 system receives a TEST-TRMSN-T3 command without an *aid* value or with an *aid* value that is not supported, the following error response is returned to the OS:

```
sid date time
M ctag DENY
IIAC
/* Input, Invalid Access Identifier, AID is
   missing, wrong or inconsistent with modifier */
;
```

If the SLC-2000 system receives a TEST-TRMSN-T3 command with a *dirn* value that is not supported, the following error response is returned:

```
sid date time
M ctag DENY
IDNV
/* Input, Data Not Valid, invalid DIRN */
;
```

If the SLC-2000 system receives a valid TEST-TRMSN-T3 command but the addressed *aid* is not properly equipped for this command, the following error response is returned to the OS:

```
sid date time
M ctag DENY
  ENEQ
/* Equipage, Not Equipped */
;
```

If the SLC-2000 system receives an otherwise valid TEST-TRMSN-T3 command but the test can not be performed due to other activity in the system, such as another transmission test, the following error response is returned:

```
sid date time
M ctag DENY
  SSRB
/* Status, System Resources Busy */
;
```

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PARAMETER DETAIL TABLES

The following tables specify parameter details for various TL1 command parameters.

SLC-2000 Access System AID Tables

Tables 3-7 and 3-8, beginning on the following page, list valid access identifier (AID) parameter values and examples for the *SLC-2000* system, OC-3 Release 6.2.2 (linear) and 7.1.2 (ring), and later, and the DLC subsystem Release 3.02.01 and 4.0. These tables contain the same information as the *SLC-2000 Access System Command and Message Manual*, although the “-all” addresses are not used in TL1 output messages.

Where items appear in braces { }, any one (and only one) of these items may be used to form the address.

Table 3-7 SLC-2000 SONET Subsystem AIDs

Object	Entity	Address	Example
Slots	Entire system	all	all
	Main slot	main-{1,2,all}	main-all
	Function unit slot	fn-all fn-{a,c}-{1,2,all}	fn-all fn-a-all fn-c-1
	Function unit pair	fn-{a,c}	fn-a
	DS1 Low speed slot	ls-all ls-{a,c}-{1-8,all}	ls-all ls-c-2
	Timing slot	tg-{1,2,all}	tg-all
	Sys. control slot	sysctl	sysctl
	Aux. control slot	auxctl	auxctl
Lines	OC-3 line pair	all,main,fn-{a,c,all}	main
	OC-3 Line	all,{main,fn-a,fn-c}-{1,2,all}	main-1 fn-c-2
	EC-1 line	a,c,all	c
Ports	DS3 or EC-1 Port	all,a,c	fn-a
	DS1 Port	c-{1-7,all}-{1-4,all}	c-all c-2-all c-7-4
	DS1 Sync. Ref. Port	ref-{1,2}	ref-1

* If all is chosen as any part of an address, no subsequent address fields should be defined.

Table continues on the following page.

Table 3-7 SLC-2000 SONET Subsystem AIDs (Continued)

Object	Entity	Address	Example
<i>Channels and Paths</i>	STS-1 Channel (within OC-3)	{m,c,all*}{1-3,all}, {a}{1,2,all} m{1,2}{1-3,all} (Rings only)	m-3 a-2 m2-3
	STS-1 Channel for MXRVO, DS3, or STS1E	a,c,all	a
	VT1.5 Channel (within OC-3)	{m,c,all*}{1-3,all*}{1-7,all*}-a{1-4,all} {a,all*}{1,2,all*}{1-7,all*}{1-4,all} m{1,2}{1-3,all*}{1-7,all*}{1-4,all} (Rings only)	m-1-2-1 a-2-7-4 m1-3-2-3
	VT1.5 Channel for DS1 or STS1E	{a,c,all*}{1-7,all*}{1-4,all}	a-1-2 c-7-4
<i>STS-1 Cross-connections</i>	Main port	m-{1-3}	m-3
	Function Unit (OLIU)	{a}{1,2} {c}{1-3}	a-2 c-3
	Function Unit (MXRVO, STS1E, DS3)	{a,c}	c
<i>VT1.5 Cross-connections</i>	Main port	m-{1-3,all*}{1-7,all*}{1-4,all}	m-4-4-4
	DS1 Low Speed Port	{a,c}{1-7,all*}{1-4,all}	a-2-7
	Function Unit (OLIU)	{a}{1,2}{1-7,all*}{1-4,all} {c}{1-3}{1-7,all*}{1-4,all}	a-1-1-4 c-3-7-1
<i>Operation Interfaces</i>	User Panel	userpanel	userpanel
	CIT	cit-{1,2,all}	cit-1
	Section Data Comm. Channel	dcc-{m,a,c,all} dcc-{m1,m2,c,all} (Rings only) dcc-{m,c,all} (Rings security only)	dcc-m dcc-m1 dcc-m
	TBOS	tbos-1	tbos-1
	Parallel Telemetry	partlm	partlm
	X.25 Link	x25	x25
	Environmental Alarm Input	env-{1-15,all}	env-1
	Environmental Control Input	cont-{1-4,all}	cont-1

* If all is chosen as any part of an address, no subsequent address fields should be defined.

Table 3-8: SLC-2000 DLC Subsystem AIDs

Object	Entity	Address	Example
Entire System		all	all
ARM Slots	Quad Low Speed Slot	ls-a-{1-8}	ls-a-1
	Provisioning Display Cntrl	pdv	pdv
	System Memory Unit Slot	smu	smu
	LAN Slot	lan	lan
	MIU Slot	miu	miu
	Test Head Controller Slot	thc	thc
	CORE Slots	core-{1,2}	core-1
	STU/TSI Slot	tsi-{1,2}	tsi-2
	BMP Slot (R4)	bmp-{1,2}	bmp-1
Metallic Distribution Shelf Slot	Metallic Distribution Cntrl	mdc-{1-8}-{1,2}	mdc-7-2
	TR-008 Unit	t8u-{1-8}-{1,2}	t8u-8-1
	Power Test Unit	ptu-{1-8}-{1,2}	ptu-1-1
	Channel Unit (CU)	cu-{1-8}-{(1-24)}	cu-1-23
	DT Server	cu-{1-8}-{(1-24)}	cu-2-18
CP links*	MDC to CU bus	mdc-{1-8}-{1,2}-cubus-{1-3}	mdc-3-2-cubus-2
	MDC to MDC	mdc-{1-8}-1-mdc-{1-8}-2	mdc-1-1-mdc-2-2
	MDC to T8U	mdc-{1-8}-{1,2}-t8u-{1-8}-{1,2}	mdc-3-1-t8u-2-1
	MDC to PTU	mdc-{1-8}-{1,2}-ptu-{1-8}-{1,2}	mdc-1-1-ptu-1-1
	MDC to TSI	mdc-{1-8}-{1,2}-tsi-{1,2}	mdc-5-1-tsi-2
	THC to TSI	thc-tsi-{1,2}	thc-tsi-1
	PDC to TSI	pdv-tsi-{1,2}	pdv-tsi-2
	QLS to TSI	ls-a-{1-8}-tsi-{1,2}	ls-a-7-tsi-2
	TSI to TSI	tsi-1-tsi-2	tsi-1-tsi-1
	QLS #8 to QLS	ls-a-8-ls-a-{1-7}	ls-a-8-ls-a-4
	PDC to SYSCTL	pdv-sysctl	pdv-sysctl
	SMU to PDC	smu-pdv	smu-pdv
	PDC to UIP	pdv-uiip	pdv-uiip
	BMP to TSI (R4)	bmp-{1,2}-tsi-{1,2}	bmp-2-tsi-1

* Circuit pack (CP) links are used for reporting alarms on unisolated failures.

Table continues on the following page.

Table 3-8: SLC-2000 DLC Subsystem AIDs (Continued)

Object	Entity	Address	Example
DT SLOT	DT CU	dtcu-{1-8}-{(1-24)}-{1-6}	dtcu-6-15-1
	Optical Unit	ou-{1-8}-{(1-24)}	ou-4-17
	CDTU	cdtu-{1-8}-{(1-24)}	cdtu-5-9
	BIU	biu-{1-8}-{(1-24)}	biu-8-23
	PIU	piu-{1-8}-{(1-24)}	piu-7-9
	PCU	pcu-{1-8}-{(1-24)}	pcu-1-7
	RGU	rgu-{1-8}-{(1-24)}	rgu-2-6
Shelf/ Backplane	ARM	arm	arm
	Distribution Shelf Assembly	mds-{1-4}	mds-1
	Metallic Distribution Shelf	shelf-{1-8}	shelf-1
Peripherals	DT	dt-{1-8}-{(1-24)}	dt-1-1
Physical Feeder	QLS (VTU/LIU) DS1 port	a-{1-7}-{1-4}	a-5-3
Physical Drops	Physical Line (Drop)	drop-{1-8}-{1-24}-{1-4}	drop-8-24-3
	Physical Line in a DT	dtdp-{1-8}-{(1-24)}-{1-6}-{1-4}	dtdp-2-5-3-2
Virtual RT	TR-008 VRT	vrt-{1-8}	vrt-1
	TR-008 Digroup	dgr-{1-8}-{a-d}	dgr-1-b
	INA Digroups	ina-{1-28}	ina-3
	TR-303 VRT (R4)	v303-1	v303-1
Logical Feeder	TR-008 VRT logical feeder	vrtfdr-{1-8}-{a-d}	vrtfdr-2-c
	TR-303 VRT logical feeder (R4)	v3fdr-1-{1-28}	v3fdr-1-20
Logical Drops	TR-008 VRT drop	vrtdp-{1-8}-{1-96}	vrtdp-5-94
	INA DS0	inads0-{1-28}-{1-24}	inads0-28-1
	TR-303 drop (R4)	v3dp-1-{1-1536}	v3dp-1-998
Line Group	Line Group	lgrp-{1-8}	lgrp-1

Table 3-8: SLC-2000 DLC Subsystem AIDs (Continued)

Object	Entity	Address	Example
Operations Inter- face	User Panel	uip	uip
	CIT	cit-{1,2}	cit-1
	Test Access Path	tap-{a,b}-{1-8}	tap-a-1
	Integral Test Head	ith	ith
	ITH Links	ithlink-{1-3}	ithlin-2
	X.25 Link	x25	x25
	Alarm & Telemetry Unit	atu	atu
	External Major Input	extmj	extmj
Embedded Data Links	TR-008 Datalinks	tr8dl-{1-8}-{a-d}	tr8dl-4-c
	TR-303 EOC	v3eoc-1-{1,2}	v3eoc-1-2
	TR-303 TMC (R4)	v3tmc-1-{1,2}	v3tmc-1-1

**SLC-2000 Access System Alarm and Status Condition
Description Table**

Tables 3-9 and 3-10 on the following pages, contain the lists of condition and alarm descriptions (*conddescr* or *almmsg*) and their likely causes. Table 3-9 is for the SONET subsystem, Release 6.2.2 (linear) and 7.1.2 (ring), and later. Table 3-10 is for the DLC subsystem, Release 3.02.01 and 4.0. These tables contain the same information as the *SLC®-2000 Access System User/Service Manual* Retrieve Alarm Table descriptions, although not all conditions listed these tables are reported via TL1.

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Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions

Description	Meaning
AC power failed - FE	The AC power supply to a remote terminal cabinet has failed.
ACO active	The parallel telemetry outputs and audible office alarms normally active because of the alarm conditions in the system are being suppressed. (See the CIT SONET subsystem command, opr-aco.)
APS - automatic lock	The service associated with a DS1 CP has been automatically switched and locked onto the protection DS1 CP. The automatic protection switching (APS) lock will remain active until midnight. Cause is four automatic switches of a single DS1 CP in 10 minutes, probably because of an intermittent failure of the DS1 CP.
APS channel failed	The SONET automatic protection switching (APS) channel on the protection OC-3 line has failed. Likely causes include failure of the OLIU CP on the protection line at the far end, or failure of the OLIU CP on the protection line at the near end.
auto turnup test IP	An automatic turnup test is in progress.
communication failure	The system is not communicating with another shelf in the network. System is normally communicating with that shelf through the SONET section DCC specified in the address column. The CIT SONET subsystem command, rtrv-nmap, will report the name of the system(s) with which this system is not communicating. Likely cause includes a controller failure, reset, or initialization on another shelf; section DCC channel failure on this or another shelf; failure of the OHCTL CP.
control <i>n</i>	The specified environmental control point (miscellaneous discrete output) is active. The <i>real</i> message that appears in the alarm and status report for this condition can be provisioned; this is the default message. (See the CIT SONET subsystem commands, rtrv-attr-cont and set-attr-cont.) Cause is the system was instructed to close the environmental control point by either a TBOS control point or by the closing of the corresponding environmental control input at the far end.
CP removed	A CP previously installed in this system is removed. Replace the CP, or <i>update</i> to remove it from the system equipment list.
DS1 CP failed	Internal equipment failure of the specified DS1 CP.
DS1 loopback	A loopback (toward the optical fiber) is active on the specified T1 port. (See the CIT SONET subsystem commands, opr-lpbk-t1 and rls-lpbk-t1).
DS1 trmsn test IP	A transmission test using the internal test signal generator and monitor is in progress on the specified T1 port. (See the CIT SONET subsystem command, test-trmsn-t1.)

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
DS3 CP failed	Internal equipment failure of the specified DS3 CP.
DS3 loopback	A loopback (toward the optical fiber) is active on the specified T3 port. (See the CIT SONET subsystem commands, <code>opr-lpbk-t3</code> and <code>rls-lpbk-t3</code>).
DS3 trmsn test IP	A transmission test using the internal test signal generator and monitor is in progress on the specified T3 port. (See the CIT SONET subsystem command, <code>test-trmsn-t3</code> .)
duplicate site/ne address	Two or more shelves in the network have the same site address (determined by switches on the SYSCTL CP) and the same network element address (determined by switches on the OHCTL CP).
duplicate TBOS display	Two or more shelves in the network have the same TBOS display number (determined by switches on the SYSCTL CP).
duplicate TID	Two or more shelves in the network have the same system name or TID set by the CIT SONET command, <code>set-ne</code> .
environment <i>n</i>	The specified environmental alarm point (miscellaneous discrete input) is active. The <i>real</i> message that appears in the alarm and status report for this condition can be provisioned; this is the default message. (See the CIT SONET subsystem commands, <code>rtv-attr-env</code> and <code>set-attr-env</code> .)
excessive holdover	The system has been in holdover mode for more than 4 hours. May cause degraded performance (high error rates) on the transmitted and/or received signals. Whenever this condition exists, the condition <i>holdover mode active</i> also exists. Likely cause – refer to <i>holdover mode active</i> .
externalMinor	The external minor alarm input (environmental alarm input 15) is active. Typically, this input is connected to an external power shelf, and means that the DC power or the cooling fan in a remote terminal cabinet has failed. The <i>real</i> message that appears in the alarm and status report for this condition can be provisioned; this is the default message. (See the CIT SONET subsystem commands, <code>rtv-attr-env</code> and <code>set-attr-env</code> .)

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
forced switch	For an OC-3 line, the identified line is not selected as the active receiving line, and an automatic or manual protection switch to make this the active receiving line will not be done. The forced switch will remain in effect until the protection switch is reset, or a lockout or inhibit switch request is received. Note that switching is unidirectional. Because of this, the specified line might still be active (if the far end is selecting the specified line to receive traffic), and the far end might still be free to switch the line it is selecting to receive traffic. (See the CIT SONET subsystem command, switch-line.) For a function unit slot or a low speed service slot, the identified equipment is not active, and an automatic or manual switch to make it active will not be done. The forced switch will remain in effect until the protection switch is reset, or a lockout or inhibit switch request is received. (See the CIT SONET subsystem commands, switch-fn and switch-ls.)
holdover mode active	The system is in holdover synchronization mode. Likely causes include the system was manually switched to holdover mode [with the CIT SONET subsystem command, switch-sync, or in a central office (CO) system, with a TBOS control point] and the switch has not been reset; or the system automatically switched to holdover mode because of failure of the timing references, and either the reference failures have not cleared, or the system is provisioned for non-revertive synchronization mode switching, or the system is provisioned for <i>external</i> timing and no external timing references are available. The condition can be cleared by repairing at least one timing reference if both are failed) and resetting synchronization mode protection switching with the command switch-sync:s=mode,pri=reset. In a CO system, the synchronization mode can also be reset with a TBOS control point.
inc. DS1 LOS	At least 128 consecutive zeros are received in the DS1 signal incoming from the DSX-1, or the energy at the DS1 input is below a preset threshold. Likely causes include hard failure of upstream equipment or facility (towards the DSX-1). The DS1 input is disconnected at the backplane or the DSX-1; equipment is failed or removed at DSX-1.
inc. DS1 sig failed (BER)	Bit error ratio (BER) in the DS1 signal incoming from the DSX-1 exceeds the provisioned failure threshold, 10^{-3} or 10^{-6}. Likely causes include failure of upstream equipment or facility (towards the DSX-1). Crosstalk in office wiring. Failure of the DS1 CP.
inc. DS1 sync. ref. AIS	DS1 alarm indication signal (AIS) is being received from the DS1 synchronization reference signal. Likely causes include failure of upstream equipment or facility (towards the DSX-1).

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
inc. DS1 sync. ref. BER	Bit error ratio (BER) in the DS1 synchronization reference signal exceeds 10^{-3} . Likely causes include failure of upstream equipment or facility (towards the DSX-1).
inc. DS1 sync. ref. EEOF	Excessive out-of-frame (OOF) events were detected in the DS1 synchronization reference signal. Excessive OOF is defined as more than 512 out-of-frame events in one day. Likely cause is failure of the incoming DS1 synchronization reference signal.
inc. DS1 sync. ref. LOF	The system is unable to frame on the DS1 synchronization reference signal. Likely causes include upstream failure in the clock providing the reference signal; high bit error ratio on the received signal caused by failure of the office timing supply that provides the DS1 timing reference; the system is provisioned for SF format on the specified DS1 synchronization reference signal and the received DS1 signal is in ESF format.
inc. DS1 sync. ref. LOS	At least 128 consecutive zeros were received in the DS1 synchronization reference signal, or the energy at the DS1 input is below a preset threshold. Likely causes include failure of the office timing supply that provides the DS1 timing reference or failure of the connection to the timing supply.
inc. DS1 sync. ref. OOL	The incoming DS1 synchronization reference signal is out of lock (OOL). The clock frequency of the DS1 reference signal is out of specification. Likely causes include failure of the office timing supply that provides the DS1 timing reference.
inc. DS3 AIS	The system has detected DS3 alarm indication signal (AIS) in the DEMUX direction (that is, coming from the fiber) for the specified DS3 signal. Likely causes include the incoming DS3 signal at the far end is failed, or DS3 AIS is received from the DSX-3 at the far end.
inc. DS3 LOS	At least 128 consecutive zeros were detected in the DS3 signal received from the DSX-3. Likely causes include equipment failed or removed at DSX-3; DS3 input disconnected at the DSX-3 or at the DDM-2000 backplane.
inc. DS3 OOF	The system has detected a DS3 out-of-frame (OOF) condition in the DEMUX direction (that is, coming from the fiber) for the specified DS3 signal. Reported only if the DS3 interface is provisioned in VM or VMR mode. (See the CIT SONET subsystem commands, set-t3 and rtrv-t3.) Likely causes include an out-of-frame DS3 signal incoming to the DSX-3 at the far end; failure of the DS3 CP at the far end or near end; the DS3 signal is looped at both ends.

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
inc. DS3 sig. failed (BER)	Bit error ratio (BER) in the incoming DS3 signal exceeds the provisioned failure threshold, 10^{-3} or 10^{-6} . Likely causes include failure of the upstream equipment or facility (towards the DSX-3); cross talk in office wiring; unprotected failure of DS3 CP.
inc. OC3 BER	Bit error ratio (BER) in the received OC-3 signal exceeds 10^{-3} . Likely causes include failure of the OLIU CP at the near end, failure of the receive fiber, or failure of the OLIU CP at the far end.
inc. OC3 FERF	The system has detected the OC-3 far end receive failure (FERF) signal in the incoming OC-3 signal. Likely causes include: the far end has detected an incoming signal failure on OLIU CP at the near end, the OLIU CP at the far end, or the transmit fiber on the specified line.
inc. OC3 line AIS	The system has detected OC-3 line alarm indication signal (AIS) on an incoming OC-3 line. Likely cause is failure of an OLIU CP at the far end.
inc. OC3 LOF	The system has detected a loss-of-frame (LOF) condition in an incoming OC-3 signal. LOF is defined as an out-of-frame (OOF) condition (four consecutive errored STS-1 framing patterns) that lasts for at least three milliseconds. Likely causes include failure of the OLIU CP at the near end, failure of the OLIU CP at the far end, or failure of the receive fiber.
inc. OC3 LOP STS1 #x	The system has detected a loss-of-pointer (LOP) condition. A valid STS-1 pointer could not be found for eight consecutive frames in the identified STS-1 signal. Likely causes include if this condition occurs on the STS-1 on both OC-3 lines, the likely cause is an unprotected failure of a MXRVO or a DS3 CP at the far end. If this condition occurs on only one OC-3 line, the likely cause is failure of the OLIU CP at the near end or far end.
inc. OC3 LOS	The system has detected loss-of-signal (LOS) condition on the OC-3 line. Likely causes include failure of the OLIU CP at near end, failure of the OLIU CP at far end, or failure of the receive fiber.
inc. OC3 sig. degrade (BER)	Bit error ratio (BER) in the specified OC-3 line exceeds the provisioned soft error threshold (10^{-9} to 10^{-5}) but below the hard error threshold of 10^{-3} . Likely causes include failure of the OLIU CP at the near end, failure of the OLIU CP at the far end, failure of the receive fiber, or incorrect setting of the optical power switch on the OLIU CP.

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
inc. OC3 sig. failed (BER)	Bit error ratio (BER) in the received OC-3 signal exceeds 10^{-3} . Likely causes include failure of the OLIU CP at the near end, failure of the receive fiber, or failure of the OLIU CP at the far end.
inc. STS1 AIS	The system has detected an incoming STS-1 alarm indication signal (AIS) in the active OC-3 line. The system responds by transmitting DS1 or DS3 AIS toward the DSX and transmitting STS-1 yellow back toward the fiber from which the AIS is being received. Likely causes include unprotected removal or failure of a DS3, MXRVO, or OLIU CP at the far end.
inc. STS1 yellow	The system has detected an incoming STS-1 yellow signal, which means that the far end is receiving STS-1 AIS on the active OC-3 line. Likely causes include unprotected failure of a DS3 or MXRVO CP at the far end, unprotected failure of a DS3 or MXRVO CP at the near end, or unprotected failure of OLIU CP at the near or far end.
inc. VT AIS	The system has detected VT path alarm indication signal (AIS) incoming from the active OC-3 line. The system responds by transmitting DS1 AIS toward the DSX-1 and VT yellow back toward the fiber from which the AIS is being received. Likely causes include unprotected removal or failure of a DS1 CP at the far end.
inc. VT LOP	The system has detected a VT loss-of-pointer (LOP) condition. Likely causes include unprotected failure of a DS1 CP at the near end; unprotected failure of a DS1 CP at the far end; unprotected failure of a MXRVO CP at the near end; unprotected failure of a MXRVO CP at the far end.
inc. VT yellow	The far end is detecting VT AIS or VT LOP. Likely causes include unprotected failure of a DS1 CP at the near end, a DS1 at the far end, a MXRVO CP at the near end, or a MXRVO CP at the far end.

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
inhibit switch	For an OC-3 line, the identified line is not selected as the active receiving line, and a protection switch to make this the active receiving line will not be done. No further protection switching of specified line will be done until the protection switch is reset. Note that line switching is unidirectional. Because of this, the specified line might still be active (if the far end is selecting the specified line to receive traffic), and the far end might still be free to switch the line it is selecting to receive traffic. (See the CIT SONET subsystem command, switch-line.) For a function unit slot, timing slot, or timing reference, the identified equipment or reference is not active, and protection switches to the identified equipment or reference will not be done until the protection switch is reset. (See the CIT SONET subsystem commands, switch-fn and switch-sync.)
lockout of protection	For an OC-3 line, this message means that the identified protection line is not selected as the active receiving line, and a protection switch to make this the active receiving line will not be allowed. Note that line switching is unidirectional. Because of this, the specified line might still be active (if the far end is selecting the specified line to receive traffic), and the far end might still be free to switch the line it is selecting to receive traffic. The lockout will remain in effect until the protection switch is reset or until a protection switch <i>inhibit</i> request is entered. (See the CIT SONET subsystem command, switch-line.) For a low speed protection slot, this message means that no service slot in the whole low speed group will be allowed to switch to protection. The lockout will remain in effect until the protection switch is reset. (See the CIT SONET subsystem command, switch-ls.)
lockout of service	For a low speed service slot, this message means that the specified low speed service slot is active and will not be switched to protection. The lockout will remain in effect until the protection switch is reset. (See the CIT SONET subsystem command, switch-ls.)
manual switch	The specified DS1 CP is manually switched to protection. The manual switch will remain in effect until the protection switch is reset or until a failure occurs and an automatic switch pre-empts the manual switch. (See the CIT SONET subsystem command, switch-ls.)
manual sync. mode switch	The synchronization mode has been manually switched to holdover or free-running and will remain in that mode until the switch request is reset. See the CIT SONET subsystem command, switch-sync.)

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
MXRVO CP failed	Internal equipment failure of the specified MXRVO CP.
OHCTL CP failed	Internal equipment failure of the OHCTL CP.
OLIU CP failed	Internal equipment failure of the specified OLIU CP.
program installation IP	System is being used to install software into another system. If this procedure is interrupted before completion, the remote systems' control circuit packs will likely become inoperable until another install program attempt is successful.
section DCC channel failed	The system cannot communicate with the far-end system through the SONET section data communications channel (DCC). Likely causes include SYSCTL CP failure, reset, or initialization at the far end; failed program installation at far end; program installation in progress at the far end; SYSCTL or OHCTL CP failure at the near end.
SYSCTL CP failed	Internal equipment failure of the SYSCTL CP. The system has determined that some part of the SYSCTL CP has failed. Some types of failures cannot be reported since the SYSCTL CP cannot function properly.
TGS CP failed	Internal equipment failure of the specified TGS CP, or the systems at both ends of the span are loop-timed from each other.
TSI CP failed	Internal equipment failure of the TSI CP.
unexpected CP present	A DS1 CP is installed in a low speed slot associated with a function unit currently provisioned for DS3 service. Remove the DS1 CP from the shelf, or replace the DS3 CP with a MXRVO CP.
unexpected CP switches	For the SYSCTL slot, the site switch settings on the SYSCTL CP are invalid (Release 1 only), or some of the unused switches are not in the prescribed position. For the AUXCTL slot, an invalid switch setting has been selected on the OHCTL CP.
unexpected CP type	For a function unit (FN) slot, an MXRVO or OLIU CP is inserted in a slot provisioned for a DS3 CP. For the AUXCTL slot, a CP other than the TLMCTL is inserted in that slot when the SYSCTL slot is equipped with the BBG1 SYSCTL.

Table 3-9: SONET Subsystem Alarm and Status Condition Descriptions (Continued)

Description	Meaning
unexpected CP type/switches	For a TG slot, the timing mode switch settings on the TGS CP are either invalid, different from those on the companion TGS CP, or different from what they were before the TGS CP was replaced, or the DS1 format or line coding switches on the TGS CP are not the same as they were before the TGS CP was replaced. For a MAIN slot, a CP other than an OLIU is inserted in the specified slot, or that the optical power switch on the OLIU CP is different from what it was before the OLIU CP was replaced. For a function unit (FN) slot, a DS3 or OLIU CP is inserted in a slot provisioned for a MXRVO CP. For a low speed (LS) slot, the line coding switches on the DS1 CP are different from what they were before the DS1 CP was replaced. In Release 3 or higher, this message may mean that a 22F OLIU is present in a slot in which a 21G OLIU is expected or vice versa.
X.25 communication failure	Failure in the X.25 communication channel. Likely causes include failure of the X.25 communication equipment; failure at the OS; system is provisioned as a TL1/X.25 gateway but this interface is not being used. (For provisioning, see the CIT SONET subsystem command, set-ne.)

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Table 3-10: DLC Subsystem Alarms and Status Conditions Description

<i>AID</i>	Description	Meaning
-	12v power cnvtr failed	A fault has been detected in the internal 12V\IDC power supply. Likely causes are a fault on the PDC, SMU, or TSI circuit packs, or failure of the UIP circuit module.
-	-48v power/fuse A failed	The 'A' 48-volt power feed to the ARM shelf has failed. Likely cause is 48-volt fuse on UIP has blown.
-	-48v power/fuse B failed	The 'B' 48-volt power feed to the ARM shelf has failed. Likely cause is 48-volt fuse on UIP has blown.
tsi-n	ABN - forced switch	TSI #n has been forced active. Prevents automatic protection switching. Clear using the UIP command, SWITCH-CORE.
t8u-m-n	ABN- incompat. T8U for FITL	The version of the installed T8U is not compatible with FITL.
tsi-n	ABN - inhibit switch	TSI (CORE) automatic protection switching has been inhibited. Clear using the UIP command, SWITCH-CORE.
smu	ABN - SMU missing	The SMU has been removed.
-	AC power failed	The AC power supply to a remote terminal cabinet has failed.
a-m-n	DS1 line loopback	Line loopback has been established on the identified DS1.
dt-m-n	DT BIU failed	BIU failure in DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT CDTU failed	CDTU failure in MSDT
uip	CIT port failed	The CIT port on the UIP has failed.
dt-m-n	DT CLF	Loss of DS1 signal from DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT CU failed	A CU has failed in the DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
dtcu-m-n-x	DT CU incompatible	The CU #x in the DT supported by the MSDT Server in slot #n of the metallic distribution shelf #m is incompatible with the MSDT.
dt-m-n	DT misc alarm received	A miscellaneous alarm is being reported by the MSDT Server in slot #n of metallic distribution shelf #m (MSDT fan, etc.)
dt-m-n	DT on backup battery	The distant terminal supported by the MSDT Server in slot #n of metallic distribution shelf #m is operating on battery power.
dt-m-n	DT PCU failed	PCU failed in DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT PIU CP missing	PIU removed in DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT pwr alarm received	The distant terminal supported by the MSDT Server in slot #n of metallic distribution shelf #m has reported a power fault (PCU, PIU failure).
dt-m-n	DT RGU failed	RGU failed or missing at DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT datalink fail	Lost extended superframe (ESF) datalink from DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT door open	Open door at DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
dt-m-n	DT in dual CU mode	Distant terminal supported by the MSDT Server in slot #n of metallic distribution shelf #m in dual mode -- illegal configuration in SLC-2000 Access System.
site No.	FE alm (use SONET rtrv-alm)	There is at least one active alarm at the identified site. The SONET subsystem CIT alarm report should be used to obtain more details.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
dt-m-n	ISDN CU in wrong slot	ISDN channel unit placement violation in DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.
ptu-m-n	PTU CP power failure	Power to the PTU has failed.
smu	SMU powering-up	The SMU circuit pack is powering up. A test of the stored software is being performed.
-	SONET alarm active	Provides a summary of the active alarms and status conditions in the SONET subsystem. Use the CIT to get detailed information.
smu	SW download aborted	The software down load of DLC subsystem software to the SMU was aborted. The DLC subsystem software on the SMU may be corrupt.
smu	SW download in-progress	Software download of DLC subsystem software to the SMU has started.
mdc-m-n, tsi-n, ls-a-n	SW installation aborted	Aborted software installation on the identified pack. Likely cause is the circuit pack has failed.
ls-a-n, mdc-m-n, tsi-n	SW installation in-progress	A software installation is in progress to identified pack.
mdc-m-n, pdc, ls-a-n, tsi-n	SW installation pending	The identified circuit pack is waiting for a software (SW) installation from the SMU. The Fault LED of the circuit pack should be blinking.
vrt-m	TR-08 alarm received	<i>With Major Alarm</i> - A major alarm has been received on VRT #m (without a digroup alarm indication). <i>With Minor Alarm</i> - A Minor alarm has been received on VRT #m (without a digroup alarm indication).
tr8dl-m-n	TR-08 data link failed	The received TR-08 datalink has failed. Likely cause is failure of far end DLC or digital switch.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
vrtn	TR-08 FELP rcvd	A far end loopback (FELP) message has been received for VRT #m on the TR-08 datalink. If a DS1 has been looped back towards the facility, a corresponding fault message is in the Faults queue.
dgrm-n	TR-08 MJ digroup alarm rcvd	<i>With Major Alarm</i> - A Major alarm has been received for digroup letter n on VRT #m. Likely causes are local failure in the DLC subsystem that caused the far end to detect a facility failure, or the far end DLC terminal or digital switch has failed.
vrtn	TR-08 misc alarm rcvd	A power/miscellaneous alarm has been received on the TR-08 datalink of VRT #m.
-	external minor	The UIP External Minor input is active. Typically, this input is connected to an external power shelf and means that a single rectifier, a single ringing generator, or the fan shelf has failed. Normally, miscellaneous discrete input number 15 on the SYSCTL is used for this purpose.
uip	VRT test in-progress	A VRT test (initiated using the UIP command, TEST-VRT-ALM) is in progress.
ls-a-n	VTU input clock fail	The VTU input clock has failed.
ls-a-n	VTU protection unavailable	VTU protection is unavailable
ls-a-n	VTU received clock failed	VTU #n has received a bad clock input. Likely cause is VTU or MXRV0 failure (use SWITCH-LS or SWITCH-FN to switch a VTU or MXRV0 before pulling it).
smu	backup program mem. corrupt	The DLC subsystem software on the SMU is corrupted. A software download of the DLC subsystem software must be performed, or the SMU must be replaced to correct this situation.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
smu	backup program mem. disabled	The SMU has been disabled. Use the UIP command, RETRIEVE-PROG-VRSN, to verify the version of the program. Use the UIP command, SET-STATE-SMU, to enable the SMU.
tsi-n	bad system data memory	The copy of the system database stored on the indicated TSI contains uncorrectable errors. If only one TSI indicates this fault, it is probably failed. If both TSIs show this fault, then install the original TSIs from the system to permit the errors to be corrected, or use the INITIALIZE-SYSTEM command to clear both database copies.
cu-m-n, ls-a-n, mdc-m-n, pdc, ptu-m-n, smu, tsi-n, t8u-m-n, thc, uip	circuit pack failed	The identified circuit pack has failed.
ls-a-n, mdc-m-n, ls-a-n, smu, tsi-n, t8u-m-n	circuit pack missing	A circuit pack that was previously installed in this system is removed. The CP should be replaced, or an <i>update</i> should be done to remove it from the system equipment list. The circuit pack that was previously in has been removed.
ls-a-n	circuit pack on protection	Service for the indicated VTU is being provided by the protection VTU.
tsi-n	circuit pack unlatched	The faceplate latch for the TSI circuit pack is not latched. The latch must be closed in order for the circuit pack to operate.
compclk-n	composite clock failure	The composite clock input to the TSI has failed.
dt-m-n	cu failed	Channel unit failure in the DT supported by the MSDT Server in slot #n of metallic distribution shelf #m.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
tsi-n	data memory update aborted	An attempt to correct the system database copy on the indicated TSI has failed. Likely causes are removal of the other TSI before the database copy completed, or failure of the indicated TSI.
tsi-n	data memory updating	The copy of the system database stored on the indicated TSI is being updated.
-	dual ringer gen. failure	The external major alarm input on the UIP is active. Typically, the ringing supply to the system has failed. However, in some applications, this input may be externally multiplied with 1 of the 14 environmental alarm points (miscellaneous discrete inputs).
-	externalMinor	The UIP external minor input is active. Typically, this input is connected to an external power shelf and means that a single rectifier, a single ringing generator, or the fan shelf has failed. Normally, miscellaneous discrete input number 15 on the SYSCTL is used for this purpose.
tsi-n	free-running	The TSIs are no longer locked to a stable timing source. Likely cause is TGS packs failed/removed.
cu-m-n	hardware incompat.	The circuit pack in channel unit slot #n on metallic distribution shelf #m is incompatible with the system configuration. Possible errors are MSDT Server in wrong channel slot in the shelf, a metallic channel unit is installed in a shelf which has been provisioned for FITL operation, or a non-supported channel unit has been installed.
a-m-n	inc. DS1 AIS*	DS1 AIS is being received on the feeder DS1 signal #n on VTU #m. Likely causes are upstream network equipment or facility (upstream = towards the OC-3 feeder).

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
a-m-n	inc. DS1 LOF	A loss-of-frame (LOF) condition exists on the identified feeder DS1 signal. Likely cause is failure of far end signal or hardware.
-	inc. DS1 sig. degrade	The bit error ratio (BER) in the received DS1 signal exceeds 10^{-3} . Likely causes include failure of the DS1 terminating CP at the far end, far end cable failure, cross talk in office wiring at the far end, or failure of the far end signal.
a-m-n	inc. DS1 sig. fail	The bit error rate (BER) on the identified feeder DS1 signal exceeds 10^{-3} .
a-m-n	inc. DS1 yellow	The far end is detecting a DS1 signal failure or DS1 AIS*.Likely causes include far end signal failure or a near end failure which is causing the system to transmit AIS. This is only detected on INA DS1s.
a-m-n	internal PCM path failure	There is an internal transmission problem for the feeder DS1 signal #n on VTU #m. Likely cause is TSI, VTU, MDC, or T8U circuit packs.
-	link failed [†]	A link has failed - the addresses identify the elements. Likely causes include MDC failure(s), MDS quadrant has lost power, the SYSCTL has failed (check the fault LEDs and try an LED Test), or the unit may have failed.
ptu-m-n	neg. ringing input failed	No negative ringing signal is present on the input to PTU #n in metallic distribution shelf #m. Therefore, no ringing is available for the circuits served by the PTU. Likely cause is ringing generator failure.
dt-m-n	no timeslots for DT server	Configuration error of conflicting or zero timeslots assigned to MSDT Server in slot #n of metallic distribution shelf #m (MSDT Server in wrong channel slot in the shelf).

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
-	no VTU protection	VTU protection unavailable to all VRTs.
pdc, ls-a-n, tsi-n, mdc-m-n	pack initialization	Software on the indicated circuit pack is being initialized and a self-test is being performed.
ptu-m-n	pos. ringing input failed	No positive ringing signal is present on the input to PTU #n in metallic distribution shelf #m. Therefore, no positive ringing is available for the circuits served by the PTU. Likely cause is ringing generator failure. Alarmed only if a multiparty channel unit is plugged into the quadrant served by the PTU.
a-m-n	rcvd DS1 AIS*	DS1 AIS is being received on the feeder DS1 signal #n on VTU #m. Likely causes are upstream network equipment or facility (upstream = towards the OC-3 feeder).
dt-m-n	rcvd FITL yellow	A yellow alarm signal is being received by the MSDT Server in slot #n of metallic distribution shelf #m. Likely causes are MSDT fault, or a local fault which has caused the far end to detect a failure.
cu-m-n	stuck relay	The test relay on channel unit (CU) #n on metallic distribution shelf #m is stuck. Try reseating the CU. If that does not clear the condition, the CU should be replaced.
cu-m-n, ptu-m-n	stuck test relay	A relay is stuck on PTU #n in metallic distribution shelf #m. Try pushing the reset button on the PTU. If this does not clear the problem, the PTU has probably failed.
-	sys data memory fault	The system database is not valid. No provisioning activities will be accepted until the fault is corrected. Likely causes include faults which affect both TSIs, or two TSIs which contain error-free but mismatched copies of the database.

Table 3-10: DLC Subsystem Alarms and Status Conditions Description (Continued)

<i>AID</i>	Description	Meaning
-	system on battery	The power minor alarm input is active, which indicates that the system is operating on battery reserve - input is internally multiplied with the PMN input on the SYSCTL.
mdc-m-n	to CU link	A link between MDC #n on metallic distribution shelf #m and its supported channel units has failed. Likely cause is a channel unit or MDC failed.

- * DS1 AIS is detected on the incoming signals for the feeder DS1s (a-{1-7}-{1-4}). Normally, the AIS is caused by an upstream failure in the network (for example, at another multiplex). However, sometimes this condition is also raised in a SLC-2000 Access System when there is a critical alarm in the *main* or *fn-c* slots in the SONET subsystem. In this case, the failure affects the DS1 which are carried on the SONET payload in OC-3 signals terminated on these slots. The system does not use the SONET TSI map to determine which DS1 are affected by these failures.

When VT1.5 or STS-1 AIS is received, AIS is sent on the DS1 signals carried in the payload. The system does not correlate these alarms.

The observed behavior is similar to that which would occur if the SONET and DLC subsystems were separate multiplexer and DLC systems.

AIS indicates that a failure has been detected elsewhere in the network (or in the system in this case) and should not be used to trigger craft personnel dispatch. The system raises a Major alarm when it detects DS1 AIS on the feeder DS1s since these signals are unprotected and receipt of AIS causes the system to initiate trunk processing on the affected lines.

- † Link faults are unisolated faults that occur between circuit packs in the system. These faults typically occur when a circuit pack has failed or is removed. Link alarms may also occur if there are cabling faults between the ADM shelf assembly and MDS assembly, or if there is a backplane fault. The system clears the link faults if and when it has isolated the failure to an individual circuit pack. It will then raise an alarm against the implicated pack. Ignore link alarms that do not persist for more than one minute.

Link AIDs use the form Circuit_Pack_1_AID-Circuit_Pack_2_AID. Circuit_Pack_1_AID is the AID of the circuit pack on one end of the link, and Circuit_Pack_2_AID is the AID of the circuit pack on the other end of the link.

In the CIT DLC subsystem alarm report, the first AID is listed in the address column, the second AID is included in the Description column.

If there are several link alarm messages and the same circuit pack AID is in more than one link AID, the fault most likely lies in that circuit pack.

The link AIDs are identified in the following list.

MDC to MDC	mdc-{1-8}-1-mdc-{1-8}-2
MDC to T8U	mdc-{1-8}-{1,2}-t8u-{1-8}-{1,2}
MDC to PTU	mdc-{1-8}-{1,2}-ptu-{1-8}-{1,2}
MDC to TSI	mdc-{1-8}-{1,2}-tsi-{1,2}
THC to TSI	thc-tsi-{1,2}
PDC to TSI	pdc-tsi-{1,2}
QLS to TSI	ls-a-{1-8}-tsi-{1,2}
TSI to TSI	tsi-1-tsi-2
QLS #8 to QLS	ls-a-8-ls-a-{1-7}
SMU to PDC	smu-pdc
PDC to UIP	pdc-uip

SLC-2000 Access System Monitored Parameter Types

Table 3-11 lists the subset of the monitored parameter types (*montype*) from Bellcore's TR-TSY-000833, Issue 3 and Issue 4, Supplement 1, that are supported by the SLC-2000 Access System, OC-3 Release 6.2.2 (linear) and 7.1.2 (ring), and later. There is no performance monitoring for the DLC subsystem.

Table 3-11: SLC-2000 TL1 Monitored Parameter Types (*montype*)

Description	Meaning
CVL	Coding violation count - line.
CVP	Coding violation count - path
ESA-L	Errored second type A count - line.
ESA-P	Errored second type A count - path
ESB-L	Errored second type B count - line.
ESB-P	Errored second type B count - path.
ESL	Errored second count - line.
ESP	Errored second count - path.
LBCL	Laser bias current level.
LPT	Light power intensity transmitted.
OOF	Out-of-frame second count, more specifically, severely errored frame second (SEFS) count.
PSC-L	Protection switching count - line.
PYERR-L	Parity error count. line.
SESL	Severe errored second count - line.
SESP	Severe errored second count - path.
UASL	Unavailable second count - line.
UASP	Unavailable second count - path.

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Provisionable PM Parameters

Table 3-12 on the following pages, describe the performance monitoring (PM) parameters provisionable via the CIT and supported by the *SLC-2000* Access System, OC-3 Release 6.2.2 (linear) and 7.1.2 (ring), and later. There is no performance monitoring for the DLC subsystem.

Additional information about these provisionable PM parameters may be found in the *SLC[®]-2000 Access System User/Service Manual*.

Table 3-12: SLC-2000 OC-3 Performance Monitoring Parameters Provisionable Via the CIT

Parameter Definition		Threshold Range (Default)		
Facility	Measure	Current Quarter Hour	Current Day	Command
OC-3 Optics	Optical Transmit Power* (21G/21G-U only)	-1 dB,-2 dB	-1 dB, -2 dB	set-pmthres-sect
	Laser Bias Current* (21G/21G-U only)	enable/disable	enable/disable	set-pmthres-sect
OC-3 Section	SE Frame Seconds (SEFS)	1-63[10]	1-4095[30]	set-pmthres-sect
OC-3 Line	B2 Coding Violations (CV)	1-13841[1384]	1-1328736[132874]	set-pmthres-line
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	set-pmthres-line
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	set-pmthres-line
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	set-pmthres-line
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	set-pmthres-line
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	set-pmthres-line
	Line Protection Switch Counts (PSC-L)	1-63[2]	(1-255)[4]	set-pmthres-line
EC-1 Line****	B2 Coding Violations (CV) EC-1	1-4613[461]	1-442848 [44285]	set-pmthres-line
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	set-pmthres-line
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	set-pmthres-line
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	set-pmthres-line
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	set-pmthres-line
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	set-pmthres-line
DS3	P-Bit Error Counts	1-4026[403]	1-386500[38650]	set-pmthres-t3
	SE Frame Seconds (SEFS)	1-63[10]	1-4095 [30]	set-pmthres-t3

Table 3-12: SLC-2000 OC-3 Performance Monitoring Parameters Provisionable Via the CIT (Continued)

Parameter Definition		Threshold Range (Default)		
Facility	Measure	Current Quarter Hour	Current Day	Command
STS-1 Path	B3 Coding Violations (CV)	1-4510[451]	1-432960 [43296]	set-pmthres-sts1
	B3 Errored Seconds (ES)	1-900[40]	1-65535[900]	set-pmthres-sts1
	B3 Errored SecondsType A (ESA)	1-900[30]	1-65535[90]	set-pmthres-sts1
	B3 Errored SecondsType B (ESB)	1-900[30]	1-65535[90]	set-pmthres-sts1
	B3 Severely Errored Seconds (SES)	1-63[20]	1-4095[60]	set-pmthres-sts1
	B3 Unavailable Seconds (UAS)	1-63[30]	1-4095[90]	set-pmthres-sts1
VT1.5 Path **	V5 Errored Seconds (ES)	1-900 [40]	1-65535 [900]	set-pmthres-vtl
	V5 Severely Errored Seconds (SES)	1-63[20]	1-4095 [60]	set-pmthres-vtl
	V5 Unavailable Seconds (UAS)	1-63[30]	1-4095 [90]	set-pmthres-vtl
DS-1 Path ***	ES-P Errored Seconds	-	1-65535 [648]	set-pmthres-tl
	SES-P Severely Errored Seconds	-	1-4095 [100]	set-pmthres-tl
	UAS-P Unavailable Seconds	-	1-4095 [10]	set-pmthres-tl
	ES-PFE Errored Seconds	-	1-65535 [648]	set-pmthres-tl
	SES-PFE Severely Errored Seconds	-	1-4095 [100]	set-pmthres-tl
	UAS-PFE Unavailable Seconds	-	1-4095 [10]	set-pmthres-tl

* Threshold is set once for both current quarter hour and current day.

** Release 6.0 and later linear releases, Release 7.0 and later ring releases (feature package option).

*** Release 5.1 and later ring releases and Release 6.0 and later linear releases (feature package option).

**** Release 5.1 and later ring releases and Release 6.0 and later linear releases

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SLC-2000 Access System Condition Tables

Tables 3-13 and 3-14 on the following pages, list the subset of the condition types (*condtype*) from Bellcore's TR-TSY-000833, Issue 3, that are supported by the *SLC-2000* Access System. Table 3-13 is for the SONET subsystem (Releases 6.2.2 and 7.1.2). Table 3-14 is for the DLC subsystem (Releases 3.02.01 and 4.0).

SLC-2000 Access System SONET Subsystem Condition Types

Table 3-13 lists the subset of the condition types (*condtype*) from Bellcore's TR-TSY-000833, Issue 3, that are supported by the SLC-2000 Access System OC-3 Release 6.2.2 (linear) and 7.1.2 (ring), and later.

Table 3-13. SLC-2000 Access System SONET Subsystem Condition Types (*condtype*)

Description	Meaning
AIS	Alarm indication signal detected.
BUFROVLD	Buffer overload. Used to report TL1 autonomous message <i>output</i> buffer overflow.
CONTR	Control processor failure. Used to report controller circuit pack failures, removals, or unexpected switch settings, when feasible, and processor resets.
EC1TERM	EC1 terminating equipment failure. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
EOC	Embedded operations channel.
EXT	External failure.
FACTERM	Facility terminating equipment. Used to report illegal circuit packs in function unit slots when SLC-2000 does not know what type of circuit pack to expect.
FERF	Line far-end-receive failure.
HLDOVRSYNC	Holdover synchronization mode.
INHAUDB	Alarm audibles inhibited.
INHMSG	Automatic messages to OS inhibited.
INHSWPR	Inhibited switch to protection.
INHSWWKG	Inhibited switch to working. Used to report DS1 circuit pack automatic lock.
LHI	Loss of holdover integrity. Used to report excessive synchronization holdover.
LOF	Loss of frame.
LOP	Loss of pointer.
LOS	Loss of signal.
LPBKNETWORK	Loopback, Network. Used for all loopbacks and network tests.
MAN	Manual. Used to report CIT logins, login attempts, and logouts.
MISC	Miscellaneous condition. Used to report miscellaneous discrete environmental alarm and status conditions.
MUX	Multiplexer failure. Used to report failures of internal multiplexer circuit packs that do not directly terminate external signals. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.

Table 3-13. SLC-2000 Access System SONET Subsystem Condition Types (*condtype*) (Continued)

Description	Meaning
NORMAL	Normal condition. Used for REPT EVT condition "clears" only, with clarification of which condition has cleared in the condition description field.
OC3TERM	OC-3 terminating equipment failure. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
PRCDRERR	Procedure error. Used to report duplicate site and NE addresses, duplicate TIDs, and duplicate GNEs and TID address map full.
PWR	Power failure. This system is on battery or one of the -48 V feeders to the ARM shelf has failed.
SYNC	Loss of timing on a protected synchronization link.
SYNCLK	Synchronization unit failure. Used to report internal timing circuit pack equipment failures. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
SYNCOOS	Loss of timing on both primary and secondary synchronization links.
T1TERM	DS1 terminating equipment failure. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
T3TERM	DS3 terminating equipment failure. Also, used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
T-BERL	Threshold violation for incoming line BERs.
T-x	Threshold violation for x= <i>montype</i> . Used for PM TCA reporting. Refer to Table 11-11 for the valid values.
T-BERP	Incoming ring path signal BER threshold exceeded.
WKSWPR-x	Working facility switched to protection line x.Used to report manual and automatic protection switches for timing references and optical lines.
YEL	Yellow signal received, outgoing signal failure.

SLC-2000 Access System DLC Subsystem Condition Types

Table 3-14 lists the subset of the condition types (*condtype*) from Bellcore's TR-TSY-000833, Issue 3, that are supported by the SLC-2000 Access System for DLC subsystem, Release 3.02.01 and 4.0.

Table 3-14. SLC-2000 Access System DLC Subsystem Condition Types (*condtype*)

Condition	Meaning
AIS	Incoming DS1 AIS detected.
BKUPMEMP	Data memory has failed, or there is a database mismatch.
CNVT	The PTU power converter, or, the 12 V power converter on the UIP has failed.
DBCRRPT	Data memory on the TSI is corrupt.
DBMEMTRF	Attempt to update data memory on the TSI was aborted.
EOC	DT datalink has failed.
EXTRNGR	Dual ringing generator failure.
FRCDWKSWPR	One side of the bandwidth management core has been forced active.
IMPROPRMVL	A circuit pack has been removed.
INC	Incoming DS1 from DT has failed (24 or 12 line).
INHSWDX	Bandwidth management core switching is inhibited.
INT	A CU or the UIP has failed, or, a DT server provisioned for 24 lines has failed, or, a circuit pack link failure has occurred, or, the SMU (or its memory) is corrupt.
IOTERM	CIT port failed.
LOF	DS1 loss of frame.
LOS	DS1 loss of signal.
LPBKLINE	A line loopback is active.
NEGRNG	The negative ringing input to the PTU has failed.
ONU-BATTERY	DT is on backup battery power.
ONU-BIU	BIU failed at the DT (24 or 12 line).
ONU-CDTU	CDTU failed at the DT.
ONU-CU	A CU failed at the DT.
ONU-ISDNERR	ISDN CU is in wrong slot at the DT.
ONU-MISC	DT MISC input is active.
ONU-MODE	The DT server is set for a dual CU mode.
ONU-OPENDR	Door alarm at the DT.
ONU-PCU	PCU failed at the DT.
ONU-PIU	PIU removed at the DT

Table 3-14. SLC-2000 Access System DLC Subsystem Condition Types (*condtype*) (Continued)

Condition	Meaning
ONU-PWR	Power alarm at the DT.
ONU-RGU	RGU failed at the DT.
ONU-TS	No timeslots are available for the 24 (or 12) line DT.
POSRNG	The positive ringing input to the PTU has failed.
PRCDRERR	A T8U, CU, or server that is incompatible with the DT is present, or, a TSI is unlatched.
PWR	The system is on battery or one of the -48 V feeders to the ARM shelf has failed.
SYNCCLK	VTU input clock has failed, or, the sync inputs to the TSI from the QLSs have failed.
T-BERL	DS1 high bit error rate, or, DS1 signal degrade.
TERM-T1	A service (or non-service) affecting internal PCM path failure has occurred that has not been isolated to a particular circuit pack, or, the QLS circuit pack failed.
TSTACC	A test access relay on the CU is stuck.
YEL	Incoming yellow has been detected by the DT server (24 or 12 line).

**SLC[®]-2000 Access System Serial
Telemetry (TBOS)**

4

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SLC[®]-2000 Access System Serial Telemetry (TBOS)

4

Overview

This section presents information on serial telemetry operations system (OS) interfaces, using telemetry byte-oriented serial (TBOS) protocol. This section includes information about TBOS-related provisioning, alarm and status points, control points, and TL1 translations for the SONET subsystem TBOS. The TBOS link carries SONET subsystem alarms only. Therefore, this is only useful when the system is configured for a SONET feeder. TBOS is supported with either a central office DDM-2000, or a SLC-2000 central office terminal. See the configurations described in Section 1 of this manual.

Introduction

The SLC[®]-2000 Access System and DDM-2000 support serial telemetry using the TBOS protocol. TBOS offers more detailed SONET subsystem alarm, status, and control capabilities to and from a remote operations center than parallel telemetry. The SLC-2000 system's and DDM-2000's TBOS interface is via a 2400-baud RS-422 port. (Refer to the SLC-2000 Central Office Terminal Application Schematic SD-7C180-01, CAD 14. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide*, Section 4, for DDM-2000 SD information.)

Each DDM-2000 and SLC-2000 system supports one alarm and status display and one control display. Each TBOS link supports up to eight alarm and status

displays and eight control displays, so one TBOS link can support any combination of up to eight DDM-2000 and SLC-2000 systems. Displays may be shared amongst systems in the same subnetwork, and/or amongst DDM-2000s sharing a cascaded TBOS link in a bay.

TBOS-Related Provisioning

The following list summarizes the TBOS-related parameters (described below) that are provisionable via hardware switch settings on the SYSCTL circuit pack or software provisionable in the SLC-2000 system and DDM-2000:

- CO/RT select
- TBOS termination
- TBOS display number
- TBOS backup function
- Remote TBOS enable
- Far end communication
- Section DCC user side/network side
- Network service access point (NSAP)
- Gateway Network Element (GNE).

Refer to AT&T 363-208-001, *SLC[®]-2000 Access System User/Service Manual*, and AT&T 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*, for the specific switch addresses and settings. The CIT user interface command `set-fecom` and `set-ulsdcc`, which are used to set the software provisionable parameters, and `rtrv-ne`, `rtrv-fecom`, and `rtrv-ulsdcc`, which report all the parameter values are explained in AT&T 363-208-003, *SLC[®]-2000 Access System Command and Message Manual*.

Figures 4-1 and 4-2, presented later in this section, provide TBOS-related provisioning examples for SLC-2000 systems. Figure 4-1 is for OC-3 only. Figure 4-2 is an example of a combined SLC-2000 system and DDM-2000 OC-3 and OC-12 application. The user should also be familiar with the DDM-2000 information found in AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide*, Section 4.

CO/RT Select

The SLC-2000 system and DDM-2000 support separate TBOS displays for central office (CO) and remote terminal (RT) applications. The selection of CO or RT is provisionable via hardware switch settings on the SYSCTL circuit pack. The

selection of CO or RT also controls the appropriate processing of the miscellaneous discrete environmental points as alarm/status and controls. If use of the TBOS link is desired, the terminal should be set for CO.

If the RT is selected, a TBOS link, if any, physically connected to the system, either directly or through intrabay multiple connections, is ignored. Thus, for example, the TBOS backup function (see below) is not applicable. RT information is mapped into displays at the CO as explained below.

TBOS Termination

A SLC-2000 COT may only be connected to a TBOS link directly, not through the DDM-2000 intrabay multiple cable. Therefore, the SLC-2000 system COT must be designated as the TBOS termination. The TBOS termination is provisionable via a hardware switch setting (S4-2) on the SYSCTL circuit pack.

⇒ NOTE:

For SLC-2000 systems, TBOS termination switch S4-2 should always be set to OFF.

If a DDM-2000 is used in the CO, the DDM-2000 may be connected direct or via intrabay cable. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide* for how to use this feature with a DDM-2000 about how to use this feature with DDM-2000.

TBOS Display Number

Each system reporting via the same TBOS link must be assigned a unique TBOS display number (1 - 8). The TBOS display number is provisionable via hardware switch settings on the SYSCTL circuit pack.

The TBOS display number (and telemetry remote and TBOS link) must be associated in the monitoring OS with the identity of each system.

TBOS Backup Function

Multiple DDM-2000 systems can be connected to the same TBOS link via intrabay cable. This is not supported by the SLC-2000 system COT, as stated earlier. Refer to the AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide* if a DDM-2000 is used in a CO.

Remote TBOS Enable

The sending and receiving of TBOS display information via the synchronous optical network (SONET) section data communications channel (DCC), without affecting any other far end communications (see below), can be enabled or disabled via a hardware switch on the SYSCTL circuit pack. In the following applications, remote TBOS reporting should typically be enabled:

- RTs that are to be mapped into CO links
- CO DDM-2000, if it is receiving TBOS information from a RT
- SLC-2000 system COT, if it is receiving TBOS information from a RT

In all other cases, remote TBOS reporting should typically be disabled.

Far End Communication

Far end communication over the SONET section DCC may be provisioned, using the craft interface terminal (CIT) user interface command `set-fecom`, as either enabled (default) or disabled. The TBOS display updates are exchanged using the section DCC in the OC3 signal. (The section DCC is *not* available on EC1 signals.) If far end communication is enabled (and remote TBOS reporting is enabled, see above) for all intervening section DCCs, each system shares its TBOS display information with the other systems to which it is connected via OC3 facilities. Thus, a remote system's TBOS alarm and status display can be forwarded to the telemetry remote via a CO DDM-2000 system or, SLC-2000 COT, and vice versa for TBOS controls.

If far end communication is disabled, the exchange of TBOS display (and other alarm, control and maintenance) information is restricted accordingly, effectively partitioning the SONET subnetwork.

If far end communication is enabled but the section DCC (or the OC3 itself) fails, the CO DDM-2000 or SLC-2000 system COT (with access to the TBOS link) responds for each of the unintentionally isolated systems by reporting TBOS point 14 controller failure and all other TBOS points in the isolated system's alarm and status displays are cleared.

Section DCC User Side/Network Side

The section DCC user side/network side must be provisioned via hardware switch settings on the OHCTL circuit pack since the OSI protocol is supported on the section DCC. There is a separate switch for each possible OC-3 termination on the system. Each *end*, i.e., the near-end and far-end, of the section DCC must be

provisioned *differently*. For example, if the near-end of a section DCC is provisioned to "ON", the far-end of the same section DCC must be provisioned to "OFF", or vice versa.

The **rtrv-ne** CIT command reports the section DCC user side/network side parameter values. If not provisioned correctly, the exchange of TBOS displays on the section DCC is restricted, effectively partitioning the SONET subnetwork. There is no interdependency among multiple section DCCs terminating on the same system.

Network Service Access Point (NSAP)

Another provisionable parameter is the network service access point (NSAP). The factory default values of that software parameter suffice for currently supported applications. The CIT user interface command **set-ulsdcc** is used to provision the NSAP, and the **rtrv-ulsdcc** command reports the NSAP parameter value. If the NSAP is provisioned incorrectly, the exchange of TBOS displays on the section DCC may be restricted, possibly partitioning the SONET subnetwork.

Gateway Network Element (GNE)

One system in each subnetwork must be provisioned as the GNE using the **set-ne** CIT user interface command. Although the GNE terminology is applicable to TL1/X.25 specifically, GNE provisioning is required for TBOS with the OSI stack on the DCC, because a SLC-2000 system, or a DDM-2000, GNE also serves as the directory services network element (DSNE). One system in each subnetwork must be provisioned as the GNE; all other systems in the same subnetwork are *not* GNEs. The default is that each system is *not* the GNE.

The DDM-2000 and the SLC-2000 system **rtrv-ne** CIT user interface command indicates *if* the queried system is a GNE. The **rtrv-ne** command also includes the *address* of the GNE from the perspective of each queried system.

Typically the CO DDM-2000 or the SLC-200 system COT serve as the GNE.

TBOS-Related Provisioning Example

Figures 4-1 and 4-2 on the following pages provide examples of TBOS-related provisioning for the SLC-2000 system. Figure 4-1 provides TBOS-related provisioning examples for SLC-2000 system applications. Figure 4-2 provides a TBOS-related provisioning example for a combined SLC-2000 system and DDM-2000 OC-3, OC-12 application.



NOTE:

Examples do NOT show DDM-2000 intrabay cable features.

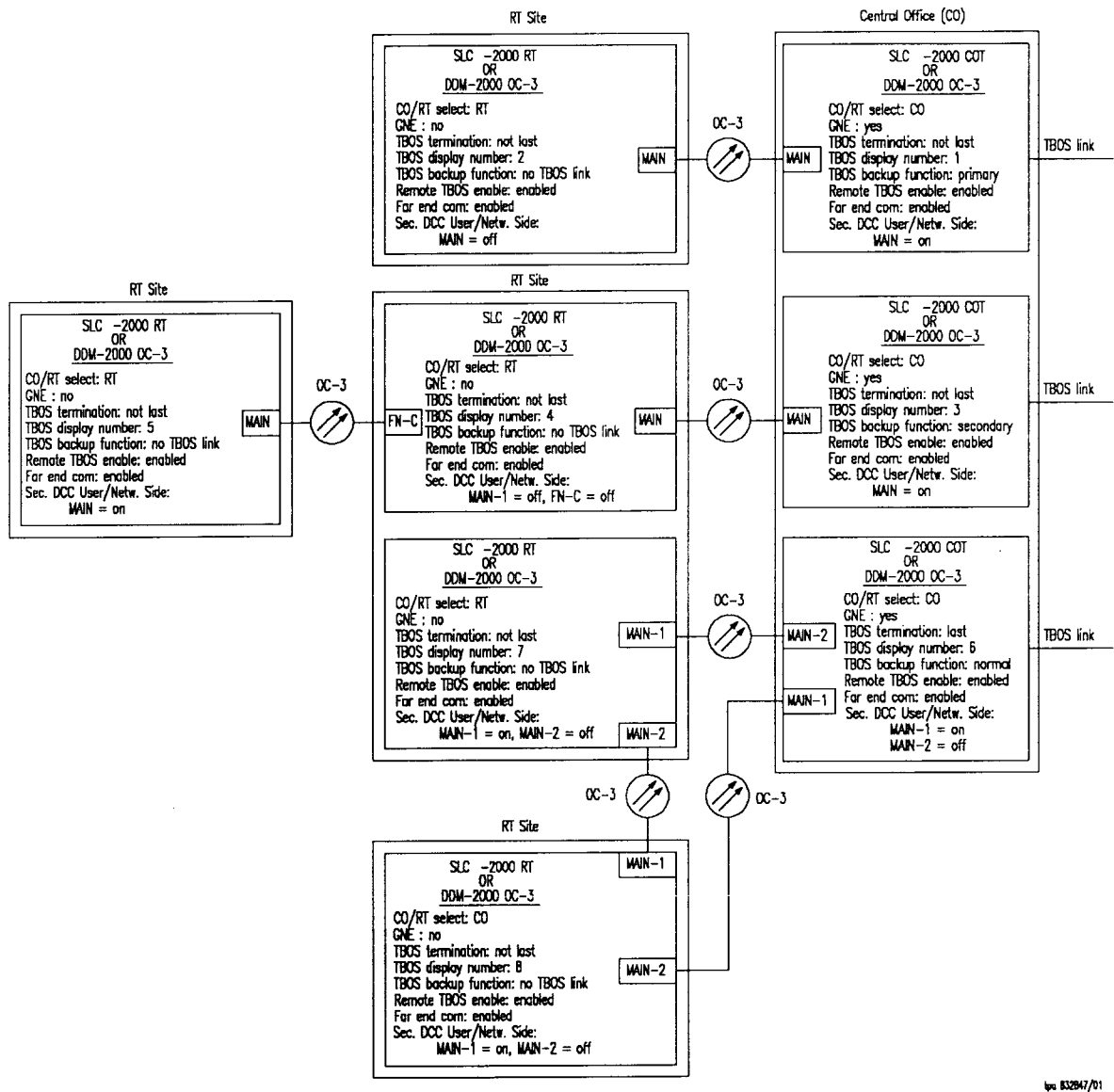


Figure 4-1. Example of TBOS-Related Provisioning for SLC-2000 System OC-3 Only Applications

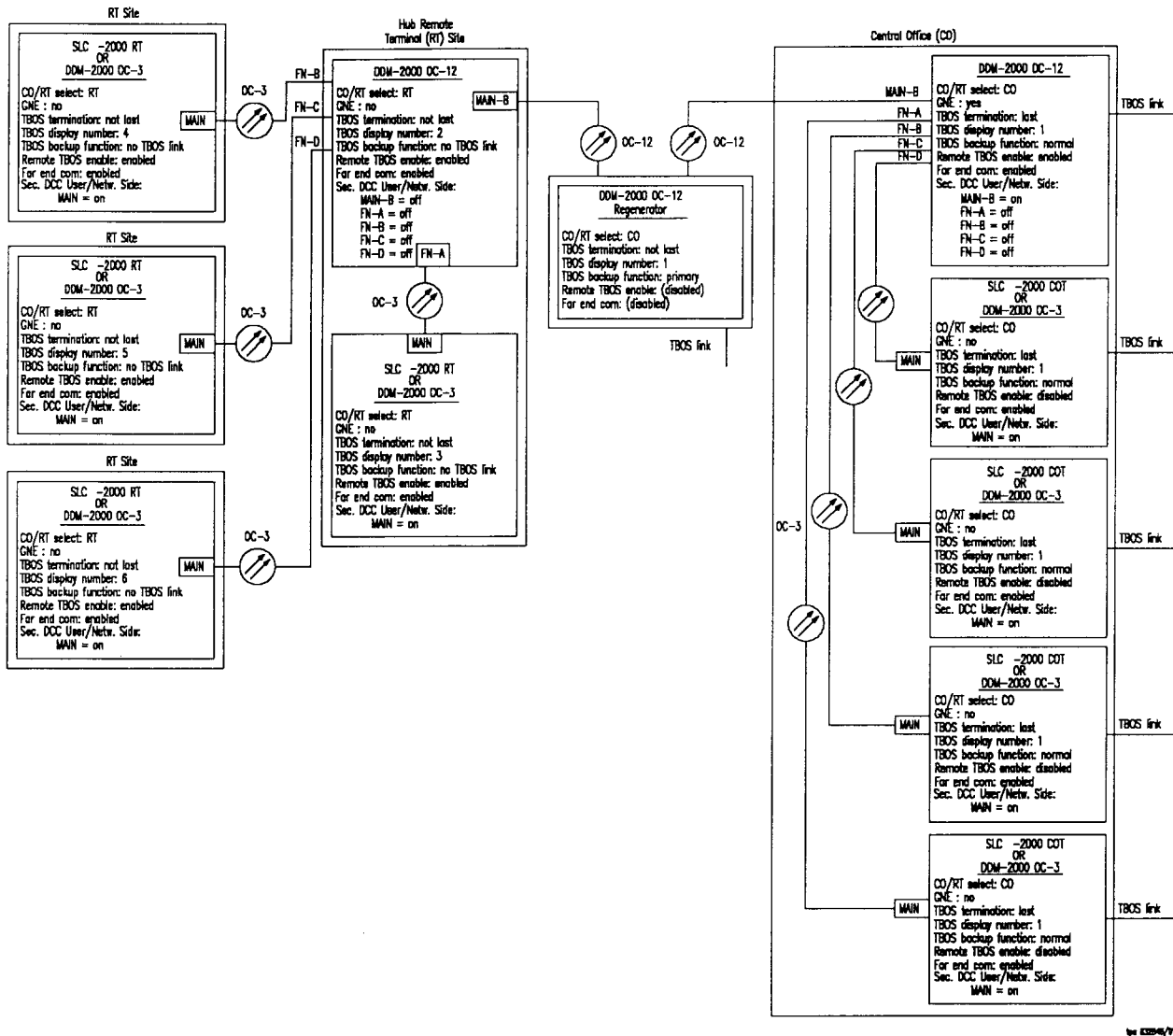


Figure 4-2. Example of TBOS-Related Provisioning for a Combined SLC-2000 System OC-3, OC-12, or OC-12 Regenerator Application

Eight Systems per TBOS Link

A single TBOS link connected to a CO DDM-2000 or SLC-2000 COT system can be used to support up to eight systems, because a TBOS link supports eight TBOS alarm and status displays and each system supports one TBOS alarm and status display. Thus, for example, four point-to-point systems (with DDM-2000s in the CO) can be supported via a single TBOS link by physically connecting the TBOS link to one of the CO DDM-2000 systems and connecting the other three CO DDM-2000 systems in the same bay via the intrabay multiple cable (refer to AT&T 363-208-148, *2000 Family of Products Operations Systems Engineering Guide*.) The four RT systems (DDM-2000 and SLC-2000) map into their respective CO DDM-2000.

As another example, up to seven RT/COTs in the same SONET subnetwork can map into the COT TBOS link. The SLC-2000 system COT does not support intrabay cable.

TBOS Test

The SLC-2000 system and DDM-2000 support serial telemetry (TBOS) display testing via the craft interface terminal (CIT) user interface command `test-tlm-ser`. Refer to AT&T 363-208-003, *SLC[®]-2000 Access System Command and Message Manual*.

The TBOS tests consist of setting the user-specified alarm or status points "on" for 20 seconds and then "off" for 20 seconds. The same test may be repeated up to 10 times. The user can include any or all TBOS points in a test, as follows:

- Any one point
- All even points
- All odd points
- All points (1 - 63).

TBOS Alarm and Status Points — **SLC-2000 System**

Table 4-1, on the following pages, summarizes the *SLC-2000* system TBOS alarm and status display. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide* for the DDM-2000 alarm and status points.

Table 4-1. SLC-2000 SONET Subsystem TBOS Alarm and Status Points

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
1	SA	Incoming DS1 Signal Failure (LOS+SF/SD)		
2	SA	Incoming DS3/EC1* Signal Failure (LOS+LOF*+SF/SD +STS1 LOP* +EC1 AIS*)		
3	NSA	Incoming OC3 Signal Failure (LOS+LOF+SF +STS1/STS3C** LOP)		
4	SA	Incoming OC3 Signal Failure (LOS+LOF+SF+AIS)		
5	SA	Incoming STS1/STS3C** LOP (on OC3)		
6	SA	Incoming VT Path AIS LOP		
7	NSA	Incoming OC3 Signal Degrade		
8	SA	Incoming OC3 Signal Degrade/STS Path AIS Signal Failures‡		
9	NSA	Fuse/Power Circuit Failure		
10	SA	Used in DDM-2000 Only		
11	NSA	Used in DDM-2000 Only		
12	SA	Used in DDM-2000 Only		
13	NSA	Used in DDM-2000 Only		
14	NSA	Controller Failure/Provisioning Error		
15	NSA	Section Data Comm. Channel (DCC) Failure/Provisioning Error		
16	SA	Used in DDM-2000 Only		
17	NSA	Used in DDM-2000 Only		
18	SA	Used in DDM-2000 Only		
19	NSA	Used in DDM-2000 Only		
20	SA	Used in DDM-2000 Only		
21	NSA	Used in DDM-2000 Only		
22	Alarm	Reserved for Future Alarm Use		
23	NSA	DS1 Terminating Equipment APS Automatic Lockout		
24	NSA	OC3 APS Channel Failure §		
25	NSA	Protected DS1 Sync. Ref. Failure		
26	NSA	Unprotected DS1 Sync. Ref. Failure		
27	NSA	PM Summary TCA		
28	NSA	Invalid TBOS Command Received		
29	NSA	Incoming OC3 Line AIS		
30	NSA	Incoming VT Path AIS/LOP‡		
31	NSA	Incoming STS Path AIS/Signal Failure‡		
32	SA	Excessive Sync. Holdover		
33	NSA	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 1
34	NSA	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 2
35	NSA	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 3
36	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 4
37	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 5
38	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 6
39	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 7
40	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 8
41	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 9
42	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 10
43	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 11
44	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 12
45	Alarm	Reserved for Future Alarm Use	NSA	Misc. Discrete Env. Alarm/Status 13
46	NSA		NSA	Misc. Discrete Env. Alarm/Status 14

See note at end of table.

Table 4-1. SLC-2000 SONET Subsystem TBOS Alarm and Status Points (Cont'd)

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
47	Alarm	Reserved for Future Alarm Use	NSA	External Minor
48	Alarm	Reserved for Future Alarm Use	NSA	
49	Status	Inhibit Sync. Equipment Protection Switching		
50	Status	Inhibit DS1 Sync. Ref. Protection Switching		
51	Status	Holdover Mode Active		
52	Status	Incoming OC3 Line FERF		
53	Status	Manual Forced/Inhibit/Lockout OC3 Line Prot. Switching §		
54	Status	Manual Forced/Inhibit Function Unit Equipment Prot. Switching		
55	Status	Manual DS1 Terminating Equipment Protection Switch		
56	Status	Manual Forced/Lockout DS1 Terminating Equipment Prot. Switching		
57	Status	Abnormal Condition		
58	Status	Valid TBOS Command Received		
59	Status	Communication Failure		
60	Status	Incoming STS Path Yellow		
61	Status	Incoming VT Path Yellow		
62	Status	Reserved for Future Status Use		
63	Status	Reserved for Future Status Use		
64	-	TBOS Telemetry Link Failure		

Note: Each TBOS point is identified as either an alarm or status point. Alarm points are further distinguished as either service affecting (SA) or non-service affecting (NSA). Status points are always understood to be NSA.

The alarm/status distinction specified in this table is for telemetry remote polling purposes. Alarm points are assured of being communicated to the OS, whereas status points may not be communicated to the OS when alarm or hybrid polling is used. It is recommended that the telemetry remote station constants assign attributes to the SLC-2000 system TBOS points as follows:

Points 1 - 48 = alarms

Points 49 - 63 = status.

LOF = Loss of Frame, LOP = Loss of Pointer, LOS = Loss of Signal
SD = Signal Degrade Bit Error Ratio, SF = Signal Fail Bit Error Ratio
TCA = Threshold Crossing Alert

* EC1 interfaces only.

** STS3C signals only.

‡ Ring releases.

§ Not applicable to the main OC3 lines in ring applications.

The following explanations are provided for the SLC-2000 system TBOS alarm and status points listed in Table 4-1. The specific conditions that may trigger each point are listed, using exactly the same condition descriptions used in the SLC-2000 system user interface alarm and status report, for example, *inc. (from DSX) DS1 LOS*. For detailed explanations and likely causes of these conditions, refer to the Alarm and Status Condition Description Table (Table 3-9), located in Section 3 of this document.

Most of the TBOS alarm points are subject to the user-provisioned alarm hold-off delay. The alarm hold-off delay is provisionable via the CIT user interface; the default is 2 seconds. Refer to the **set-attr-alm** command, as documented in AT&T 363-208-003, *SLC®-2000 Access System Command and Message Manual*.

Each TBOS alarm and status point stays on for a minimum of 20 seconds so that even if the OS polling interval for telemetry remotes without memory is 20 seconds, all alarms will be received by the OS.

Alarm Point 1 — Incoming DS1 Signal Failure (LOS + SF/SD) — indicates at least one of the following is detected:

- *inc. (from DSX) DS1 LOS*
- *inc (from DSX) DS1 sig fail*

Alarm Point 2 — Incoming DS3/EC1 Signal Failure (LOS + LOF + SF/SD + STS1 LOP + EC1 AIS) — indicates at least one of the following is detected:

- *inc. (from DSX) DS3 LOS*
- *inc. (from DSX) DS3 sig fail*
- *inc. EC1 line AIS*
- *inc. EC1 LOF*
- *inc. EC1 LOS*
- *inc. EC1 sig degrade (BER)*
- *inc. EC1 sig failed (BER)*
- *inc. STS1 LOP EC1*

Alarm Point 3 — Incoming OC3 Signal Failure (LOS + LOF + SF + STS1/STS3C LOP) — indicates if at least one of the following is detected:

- *inc. OC3 LOF*
- *inc. OC3 LOS*
- *inc. OC3 sig failed (BER)*
- *inc. STS1 LOP OC3 slotaid*
- *inc. STS3C LOP OC3 slotaid*

The condition is protected; thus it is non-service-affecting (NSA).

Alarm Point 4 — Incoming OC3 Signal Failure (LOS + LOF + SF + AIS) — indicates if at least one of the following is detected:

- inc. OC3 line AIS
- inc. OC3 LOF
- inc. OC3 LOS
- inc. OC3 sig failed (BER)

The condition is not protected; thus it is service-affecting (SA).

Alarm Point 5 — Incoming STS1/STS3C LOP (on OC3) — indicates if the following is detected:

- inc. STS1 LOP OC3 *slotaid*
- inc. STS3C LOP OC3 *slotaid*

The condition is not protected; thus it is service-affecting (SA).

Alarm Point 6 — Incoming VT AIS/LOP — indicates if at least one of the following is detected:

- inc. VT AIS
- inc. VT LOP

The condition is service-affecting (SA).

Alarm Point 7 — Incoming OC3 Signal Degrade — indicates if the following is detected:

- inc. OC3 sig. degrade (BER)

The condition is protected thus non-service-affecting (NSA).

Alarm Point 8 — Incoming OC3 Signal Degrade/STS Path AIS/Signal Failure indicates if at least one of the following is detected:

- inc. OC3 sig. degrade (BER)
- inc. STS1 AIS
- inc. STS1 sig. failed (BER) (SLC-2000 SONET subsystem Release 7.1 (ring) only)

The condition is not protected thus service-affecting (SA).

Alarm Points 9 and 10 — Synchronization Equipment Failure — indicate if at least one of the following is detected in a TG slot:

- CP not allowed - (timing)
- CP removed

- illegal CP type
- invalid CP switches
- TGS CP failed
- unexpected CP switches

Alarm Points 11 and 12 — Multiplex Equipment Failure — indicate if at least one of the following is detected in a function unit (FN) slot:

- 2nd CP required for BBF3
- CP not allowed - (timing)
- CP removed
- illegal CP type
- MXRVO CP failed
- unexpected CP type

Alarm Point 13 — Fuse/Power Circuit Failure — indicates if at least one of the following is detected:

- -48 V power/fuse failed
- AC power failed

This condition is based on the wired input to SLC-2000 Remote Terminal Application Schematic SD-7C174-01, CAD3.

The condition is protected; thus it is non-service-affecting (NSA).

Alarm Point 14 — Controller Failure/Provisioning Error — indicates if at least one of the following is detected:

- CP removed (from SYSCTL or AUXCTL slot)
- duplicate GNE
- duplicate site/ne address
- duplicate TBOS display
- duplicate TID
- OHCTL CP failed
- SYSCTL CP failed
- TID address map full
- unexpected CP switches (in SYSCTL or AUXCTL slot)
- unexpected CP type (in AUXCTL slot)

The condition is non-service-affecting (NSA) but may mask service-affecting (SA) conditions.

Alarm Points 15 and 16 — Optical Terminating Equipment Failure — indicate if at least one of the following is detected:

- CP not allowed - (crs)
- CP not allowed - (timing)
- CP removed
- illegal CP type
- OLIU CP failed
- unexpected CP switches
- unexpected CP type

Alarm Point 17 — DS1 Terminating Equipment Failure — indicates if at least one of the following is detected in a low speed (LS) slot:

- CP not allowed - (eqpt)
- CP removed
- DS1 CP failed
- DS1PM CP failed
- illegal CP type
- unexpected CP present
- unexpected CP switches
- unexpected CP type

The condition is protected; thus it is non-service-affecting (NSA).

Alarm Point 18 — DS1 Terminating Equipment Failure — indicates if at least one of the following is detected:

- CP not allowed - (eqpt)
- CP removed
- DS1 CP failed
- DS1PM CP failed
- illegal CP type
- unexpected CP switches
- unexpected CP type

The condition is not protected; thus it is service-affecting (SA).

Alarm Points 19 and 20 — DS3/EC1 Terminating Equipment Failure — indicate if at least one of the following is detected in a function unit (FN) slot:

- 2nd CP required for BBF3
- CP not allowed - (crs)
- CP not allowed - (timing)
- CP removed
- DS3 CP failed
- illegal CP type
- STS1E_H CP failed
- STS1E_L CP failed
- unexpected CP type

Alarm Point 21 — Data Comm. Channel (DCC) Failure/Provisioning Error — indicates if the following is detected:

- inconsistent DCC switches
- section DCC channel failed

The condition is non-service-affecting (NSA).

Alarm Point 22 — Reserved for future alarm use (may be assigned in a later release).

Alarm Point 23 — DS1 Terminating Equipment APS (Automatic Protection Switching): - Automatic Lockout — indicates if the following is detected:

- APS - automatic lock

The condition is non-service-affecting (NSA).

Alarm Point 24 — OC3 APS Channel Failure — indicates if the following is detected:

- APS channel failed (Not applicable to ring applications without linear OC3 extensions)

The condition is non-service-affecting (NSA).

Alarm Points 25 and 26 — DS1 Sync. Ref. Failure — indicate at least one of the following is detected:

- inc. DS1 sync. ref. AIS
- inc. DS1 sync. ref. BER
- inc. DS1 sync. ref. EOOF
- inc. DS1 sync. ref. LOF

- inc. DS1 sync. ref. LOS
- inc. DS1 sync. ref. OOL

If the condition is not protected by another DS1 Sync. Ref. signal, the system automatically goes into synchronization holdover mode; thus the condition is non-service-affecting (NSA).

Alarm Point 27 — PM Summary TCA — indicates if at least one 15-minute or one-day performance-monitoring (PM) threshold-crossing alert (TCA) is detected during the current 15-minute or one-day interval, respectively. The condition is non-service-affecting (NSA). This alarm point is only set “on” once, at most, per 15-minute interval. After the minimum 20 seconds, the alarm point is turned “off” automatically. The PM parameters and threshold levels are documented in Table 3-12, located in Section 3 of this document.

Alarm Point 28 — Invalid TBOS Command Received — indicates if a TBOS control point command is received for a control point which is reserved for future use. This condition is non-service-affecting (NSA). This alarm point will only be set “on” for the minimum 20 seconds, then turned “off” automatically for each such control point received.

Alarm Point 29 — Incoming OC3 Line AIS — indicates if the following is detected:

- inc. OC3 line AIS

The condition is non-service-affecting (NSA). (If the condition is unprotected, TBOS alarm point 4, incoming OC-3 signal failure, is also triggered to indicate the condition is service-affecting (SA).)

Alarm Point 30 — Incoming VT Path AIS/LOP — indicates if at least one of the following is detected:

- inc. VT AIS
- inc. VT LOP (SLC-2000 system VT-path-switched rings only)

The condition is non-service-affecting (NSA).

Alarm Point 31 — Incoming STS Path AIS/Signal Failure — indicates if at least one of the following is detected:

- inc. STS1 AIS
- inc. STS1 sig failed (BER) (SLC-2000 system Release 7.1 (ring), and later)

The condition is non-service-affecting (NSA).

Alarm Point 32 — Excessive Sync. Holdover — indicates if the following is detected:

- excessive holdover

The condition may be service-affecting (SA) because it may cause degraded performance (high error rates) on the transmitted and/or received signals. Whenever this condition exists, TBOS status point 51, holdover mode active, is also set.

CO Alarm Points 33 - 45 — reserved for future alarm use (may be assigned in a later release).

CO Alarm Point 46 — not used. Only used in DDM-2000
The condition is non-service-affecting (NSA).

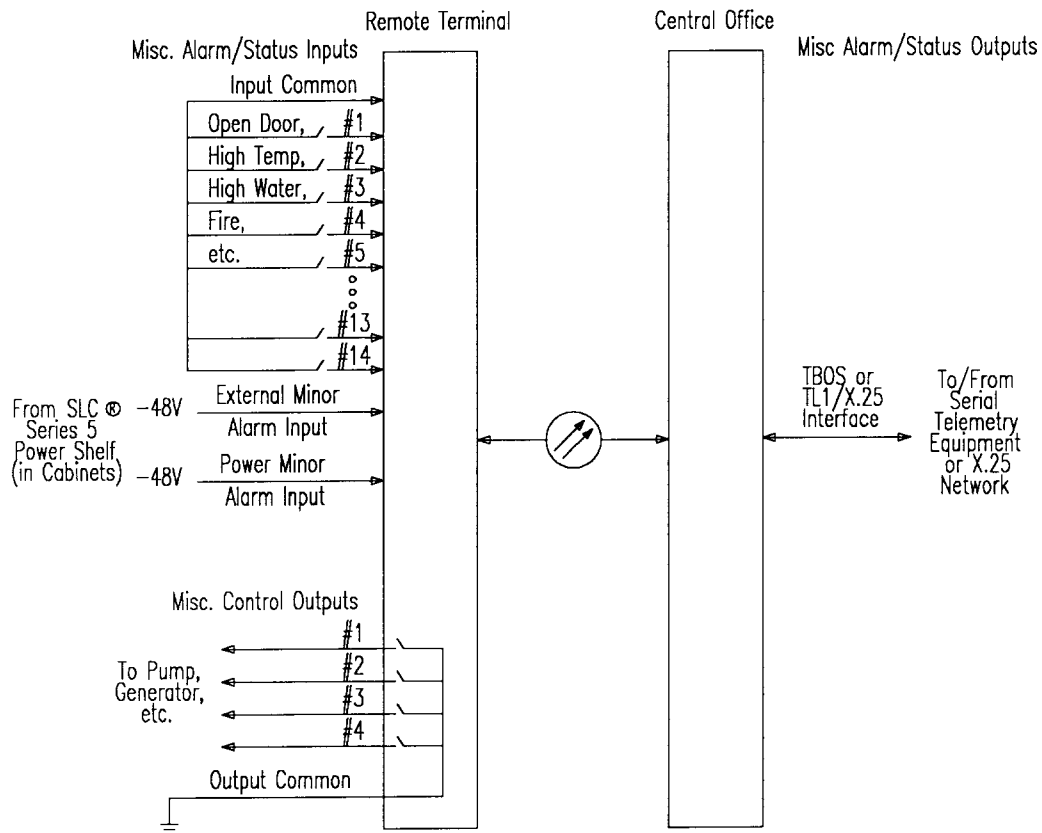
CO Alarm Points 47-48 — reserved for future alarm use (may be assigned in a later release).

RT Alarm Points 33 - 46 — Misc. Discrete Env. Alarm/Status 1 through 14 — indicate if the following is detected at a remote terminal (RT) site:

■ environmentXX

The conditions are non-service-affecting (NSA). Because these miscellaneous discrete environmental alarm and status points are user settable, the text description of the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point can be provisioned by the user.

Figure 4-3 shows the miscellaneous discrete environmental alarms and controls for TBOS at the central office.



Notes:

1. In a remote terminal, the output common must be wired to ground in all applications.
2. Miscellaneous alarm input #1 is typically wired to open door alarm in AT&T cabinets.

Figure 4-3. Miscellaneous Discrete Environmental Alarms and Controls (TBOS or TL1/X.25 at Central Office)

RT Alarm Point 47 — External Minor — indicates if the following is detected:

- ExternalMinor

The condition is non-service-affecting (NSA). This condition is based on the wired input to SLC-2000 Remote Terminal Application Schematic SD-7C174-01, CAD 3. Because this miscellaneous discrete environmental alarm and status points is user settable, the text description of the actual condition monitored and reported by this miscellaneous discrete environmental alarm and status point must be provisioned at the OS.

RT Alarm Point 48 — Used in DDM-2000 only.
The condition is non-service-affecting (NSA).

Status Point 49 — Inhibit Sync. Equipment Protection Switching — indicates if the following is detected:

- inhibit switch (for TGS CP)

Status Point 50 — Inhibit DS1 Sync. Ref. Protection Switching — indicates if the following is detected:

- inhibit switch (for DS1 sync. ref.)

Status Point 51 — Holdover Mode Active — indicates if the following is detected:

- holdover mode active

Status Point 52 — OC3 Line FERF — indicates if the following is detected:

- inc. OC3 FERF

Status Point 53 — Manual Forced/Inhibit/Lockout OC3 Line Prot. Switching — indicates if at least one of the following is detected for an OC3 line:

- forced switch
- inhibit switch
- lockout of protection

Status Point 54 — Manual Forced/Inhibit Function Unit Equipment Prot. Switching — indicates if at least one of the following is detected for equipment in a function (FN) unit slot:

- forced switch
- inhibit switch

Status Point 55 — Manual DS1 Terminating Equipment Protection Switch — indicates if the following is detected in a low-speed (LS) slot:

- manual switch

Status Point 56 — Manual Forced/Lockout DS1 Terminating Equipment Prot. Switching — indicates if at least one of the following is detected in a low-speed (LS) slot:

- forced switch
- lockout of protection
- lockout of service

Status Point 57 — Abnormal Condition — indicates if at least one of the following manually initiated abnormal (ABN) conditions is detected:

- Any of the status conditions associated with TBOS status points 49, 50, 53, 54, 55, or 56.
- auto turnup test IP
- DS1 loopback
- DS1 trmsn test IP
- DS3 loopback
- DS3 trmsn test IP
- EC1 loopback
- manual sync. mode switch

Status Point 58 — Valid TBOS Command Received — indicates if a TBOS control point command is received for a valid control point (refer to Table 4-4-2 containing a list of SLC-2000 system TBOS control points). This status point will only be set "on" for the minimum 20 seconds, then turned "off" automatically for each such control point received.

Status Point 59 — Communication Failure — indicates if the following is detected:

- communication failure

Status Point 60 — Incoming STS Path Yellow — indicates if the following is detected:

- inc. STS1 yellow

Status Point 61 — Incoming VT Path Yellow — indicates if the following is detected:

- inc. VT yellow

Status Points 62 - 63 — Reserved for future status use (may be assigned in a later release).

Status Point 64 — TBOS Telemetry Link Failure — indicates if the TBOS link between the telemetry remote equipment and the CO SLC-2000 system fails. The telemetry remote controls this point.

TBOS Control Points — SLC-2000 SONET Subsystem

Table 4-2 lists the TBOS control display points for SLC-2000 SONET Release 6.2.2 (linear), 7.1.2 (ring), and later. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide* for the DDM-2000 control points.

Table 4-2. SLC-2000 System OC-3 TBOS Control Points

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
1	55&57&58	Manual LS Switch to Protection - MXR A, DS1 1-4 (switch-ls:ls-a-1:pri>manual)
2	55&57&58	Manual LS Switch to Protection - MXR A, DS1 5-8 (switch-ls:ls-a-2:pri>manual)
3	55&57&58	Manual LS Switch to Protection - MXR A, DS1 9-12 (switch-ls:ls-a-3:pri>manual)
4	55&57&58	Manual LS Switch to Protection - MXR A, DS1 13-16 (switch-ls:ls-a-4:pri>manual)
5	55&57&58	Manual LS Switch to Protection - MXR A, DS1 17-20 (switch-ls:ls-a-5:pri>manual)
6	55&57&58	Manual LS Switch to Protection - MXR A, DS1 21-24 (switch-ls:ls-a-6:pri>manual)
7	55&57&58	Manual LS Switch to Protection - MXR A, DS1 25-28 (switch-ls:ls-a-7:pri>manual)
8	55&57&58	USED IN DDM-2000 ONLY
9	55&57&58	USED IN DDM-2000 ONLY
10	55&57&58	USED IN DDM-2000 ONLY
11	55&57&58	USED IN DDM-2000 ONLY
12	55&57&58	USED IN DDM-2000 ONLY
13	55&57&58	USED IN DDM-2000 ONLY
14	55&57&58	USED IN DDM-2000 ONLY
15	55&57&58	Manual LS Switch to Protection - MXR C, DS1 1-4 (switch-ls:ls-c-1:pri>manual)
16	55&57&58	Manual LS Switch to Protection - MXR C, DS1 5-8 (switch-ls:ls-c-2:pri>manual)
17	55&57&58	Manual LS Switch to Protection - MXR C, DS1 9-12 (switch-ls:ls-c-3:pri>manual)
18	55&57&58	Manual LS Switch to Protection - MXR C, DS1 13-16 (switch-ls:ls-c-4:pri>manual)
19	55&57&58	Manual LS Switch to Protection - MXR C, DS1 17-20 (switch-ls:ls-c-5:pri>manual)
20	55&57&58	Manual LS Switch to Protection - MXR C, DS1 21-24 (switch-ls:ls-c-6:pri>manual)
21	55&57&58	Manual LS Switch to Protection - MXR C, DS1 25-28 (switch-ls:ls-c-7:pri>manual)

See note at end of table.

Table 4-2. SLC-2000 System OC-3 TBOS Control Points (Cont'd)

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
22	56&57&58	Lockout Switching - LS-A (switch-ls:ls-a-all:pri=lockout)
23	56&57&58	USED IN DDM-2000 ONLY
24	56&57&58	Lockout Switching - LS-C (switch-ls:ls-c-all:pri=lockout)
25	55&56&57 clear & 58	Reset Switching - LS-A (switch-ls:ls-a-all:pri=reset)
26	55&56&57 clear & 58	USED IN DDM-2000 ONLY
27	55&56&57 clear & 58	Reset Switching - LS-C (switch-ls:ls-c-all:pri=reset)
28	57&58 & 54 & 53	Forced Switch - FN-A (switch-fn:fn-a:pri=forced) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-a:pri=forced) (if OC3 equipped)
29	57&58 & 54 & 53	USED IN DDM-2000 ONLY
30	57&58 & 54 & 53	Forced Switch - FN-C (switch-fn:fn-c:pri=forced) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-c:pri=forced) (if OC3 equipped)
31	58	Manual Switch - FN-A (switch-fn:fn-a:pri=manual) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-a:pri=manual) (if OC3 equipped)
32	58	USED IN DDM-2000 ONLY
33	58	Manual Switch - FN-C (switch-fn:fn-c:pri=manual) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-c:pri=manual) (if OC3 equipped)
34	57&58 & 54 & 53	Inhibit Switching - FN-A (switch-fn:fn-a:pri=inhibit) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-a:pri=inhibit) (if OC3 equipped)
35	57&58 & 54 & 53	USED IN DDM-2000 ONLY
36	57&58 & 54 & 53	Inhibit Switching - FN-C (switch-fn:fn-c:pri=inhibit) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-c:pri=inhibit) (if OC3 equipped)
37	53&57&58	Lockout Switching - FN-A (only if OC3 equipped) (switch-line:fn-a:pri=lockout)
38	55&57&58	NOT USED
39	56&57&58	USED IN DDM-2000 ONLY
40	57 clears & 58 & 54 clears & 53 clears	Reset Switching - FN-A (switch-fn:fn-a:pri=reset) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-a:pri=reset) (if OC3 equipped)

See note at end of table.

Table 4-2. SLC-2000 System OC-3 TBOS Control Points (Cont'd)

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
41	57 clears & 58 & 54 clears & 53 clears	NOT USED
42	57 clears & 58 & 54 clears & 53 clears	Reset Switching - FN-C (switch-fn:fn-c:pri=reset) (if MXRVO/DS3/STS1E† equipped) (switch-line:fn-c:pri=reset) (if OC3 equipped)
43	53&57&58/28†	Forced Switch - Main† (switch-line:main:pri=forced)
44	58/28†	Manual Switch - Main† (switch-line:main:pri>manual)
45	53&57&58/28†	Inhibit Switching - Main† (switch-line:main:pri=inhibit)
46	53&57&58/28†	Lockout Switching - Main† (switch-line:main:pri=lockout)
47	53&57 clear & 58/28†	Reset Switching - Main† (switch-line:main:pri=reset)
48	58	Manual Switch - TGS CP (switch-sync:s=circuitpack,pri>manual)
49	49&57&58	Inhibit Switching - TGS CP (switch-sync:s=circuitpack,pri=inhibit)
50	49&57 clear & 58	Reset Switching - TGS CP (switch-sync:s=circuitpack,pri=reset)
51	58	Manual Switch - Sync. Reference (switch-sync:s=reference,pri>manual)
52	50&57&58	Inhibit Switching - Sync. Reference (switch-sync:s=reference,pri=inhibit)
53	50&57 clear & 58	Reset Switching - Sync. Reference (switch-sync:s=reference,pri=reset)

See note at end of table.

Table 4-2. SLC-2000 system OC-3 TBOS Control Points (Cont'd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)	RT Control Function (Equivalent CIT Command)
54	CO51&CO57 & CO58 or RT58*	Manual Switch - Sync. Mode (switch-sync:s=mode,pri>manual)	Operate Misc. Discrete Env. Control 1
55	CO51&CO57 clear & CO58 or RT58*	Reset Switching - Sync. Mode (switch-sync:s=mode,pri=reset)	Operate Misc. Discrete Env. Control 2
56	CO28 or RT58*	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 3
57	CO28 or RT58*	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 4
58	CO28 or RT58*	Reserved for Future Control Use	Release Misc. Discrete Env. Control 1
59	CO28 or RT58*	Reserved for Future Control Use	Release Misc. Discrete Env. Control 2
60	CO28 or RT58*	Reserved for Future Control Use	Release Misc. Discrete Env. Control 3
61	CO28 or RT58*	Reserved for Future Control Use	Release Misc. Discrete Env. Control 4
62	58	Alarm Cut Off (opr-aco)	
63	58	Processor Reset (reset)	
64	28	Reserved For Future Control Use	

Note: The verification status points identified as clearing in response to controls will be cleared if the verification status point was set prior to the TBOS control, and in the case of status point 57, abnormal condition; no other abnormal conditions exist.

* For each RT miscellaneous discrete environmental control point, it is recommended that a miscellaneous discrete environmental alarm or status point be wired and data based to serve as a verification status point to confirm that *the desired effect* of each miscellaneous discrete environmental control is achieved. Refer to Figure 4-3.

† EC1 interfaces only.

‡ These TBOS control points for Main are not applicable to the main OC3 lines for path switched ring applications. Therefore, these commands are not valid for ring applications.

The control function descriptions provided in Table 4-2 provide clear explanations of the control points. The equivalent CIT commands are also included in Table 4-2 as a specific cross-reference to AT&T 363-208-003, *SLC®-2000 Access System Command and Message Manual*, if additional detailed explanation is required.

TBOS Alarm and Status Point — TL1 Translation

See AT&T 824-102-148, *2000 Family of Products Operations Systems Guide*, Section 4, for the recommended translation of the TBOS alarm and status points to TL1 messages for SLC-2000. The same translations for DDM-2000 OC-3 may be used for SLC-2000 systems COTs and RTs.

TBOS Control Point — TL1 Translation

See AT&T 824-102-148, *2000 Family of Products Operations Systems Guide*, Section 4, for NMA user activated TBOS controls. The same translations for DDM-2000 OC-3 may be used for SLC-2000 systems COTs and RTs.

SLC[®]-2000 Access System Parallel Telemetry

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SLC[®]-2000 Access System Parallel Telemetry

5

Overview

This section presents information on parallel telemetry interfaces from the SLC[®]-2000 Access System Central Office Terminal (COT) to the operations system (OS). This section includes information about parallel telemetry-related provisioning, alarm and status points, the control point, and TL1 translations. It is applicable for systems with the SONET feeder only. Consult AT&T 824-102-148, *2000 Family of Products - Operations Systems Engineering Guide*, Section 5, if a DDM-2000 is used in a CO instead of a COT. Refer to Section 7 of this document if DS1 Feeder is used.

Introduction

As an alternative to TL1/X.25 and telemetry byte-oriented serial (TBOS) protocol, SLC[®]-2000 Access System Release 3.02.01 for the DLC subsystem, and SONET subsystem Releases 6.2.2 (linear), and 7.1.2 (ring), support parallel telemetry. The SLC-2000 system's parallel telemetry interface is dependent on the wiring of individual (parallel) leads to the telemetry remote. (Refer to SLC-2000 Central Office Terminal Application Schematic SD-7C180-01, CAD 17.)



NOTE:

Release 4 does not support the COT.

Parallel Telemetry-Related Provisioning

The following list summarizes the parallel telemetry-related parameters (described below) that are provisionable via hardware switch settings on the SYSCTL circuit pack or software provisionable in the SLC-2000 Access System:

- Site number/far end ID
- Network element (NE) number
- Gateway network element (GNE)
- CO/RT select (SONET and DLC subsystems)
- Far end communication
- Section DCC user side/network side
- Network service access point (NSAP).

Refer to AT&T 363-208-001, *SLC®-2000 Access System User/Service Manual*, for the specific switch addresses and settings. The DLC CIT command `ED-NE`, and the CIT user interface commands `set-ne`, `set-fecom`, and `set-ulsdcc`, which are used to set the software provisionable parameters, and `rtrv-ne` and `rtrv-fecom`, and `rtrv-ulsdcc`, which report all the parameter values are explained in AT&T 363-208-003, *SLC®-2000 Access System Command and Message Manual*.

Figures 5-1 and 5-2, presented later in this section, provide parallel telemetry-related provisioning examples for SLC-2000 systems. Figure 5-1 provides an example of an application. Figure 5-2 provides an example for a combined OC-3 and OC-12 application. See AT&T 824-102-148, *2000 Family of Products Operations Systems Engineering Guide*, Section 5, for details about the latter application.

Site Number/Far End ID

The site number is provisionable via hardware switch settings on the SYSCTL circuit pack. The site number relates to the far end ID, as follows. A central office (CO) SLC-2000 system may be connected to the parallel telemetry interface, in which case, no far end ID applies to that CO SLC-2000 system. But, the site number of that CO SLC-2000 system affects the mapping of site number to far end ID for all other SLC-2000 systems in the same subnetwork. When the site number of the CO SLC-2000 system with the parallel telemetry interface is set to "7", as recommended, the site number equals the far end ID for each remote SLC-2000 system.

Table 5-1 shows the mapping between site numbers and resultant far end ID assignments. Each row of the table contains the *SLC-2000* system site numbers mapped to the far end IDs (1-6), depending on the site number of the CO *SLC-2000* system with the parallel telemetry interface. For example, if the site number of the CO system with the parallel telemetry interface is "1" (first row of the table), then all the site numbers match the far end IDs except the *SLC-2000* system with site number "7" is assigned to far end ID "1".

Table 5-1. Site Number to Parallel Telemetry Far End ID Mapping

Site Number of <i>SLC-2000</i> System With Parallel Telemetry Interface (that is typically the CO <i>SLC-2000</i>)	Site Number Parallel Telemetry Far End ID							
	1	2	3	4	5	6	7	≥8
1	-	2	3	4	5	6	1	-
2	1	-	3	4	5	6	2	-
3	1	2	-	4	5	6	3	-
4	1	2	3	-	5	6	4	-
5	1	2	3	4	-	6	5	-
6	1	2	3	4	5	-	6	-
7 (<i>Recommended</i>)	1	2	3	4	5	6	-	-
≥8 (<i>not valid</i>)	1	2	3	4	5	6	-	-

Network Element (NE) Number

The NE number is provisionable via hardware switch settings on the OHCTL circuit pack. For proper parallel telemetry operation, the combination of site (described above) and NE numbers must identify uniquely each *SLC-2000* system within a subnetwork.

In *SLC-2000* system applications, each *SLC-2000* system within the same subnetwork should be assigned a unique site number, thus the NE number may be any valid setting.

Gateway Network Element (GNE)

One system in each SONET subnetwork must be provisioned as the GNE using the `set-ne` CIT user interface command. Although the GNE terminology is applicable to TL1/X.25 specifically, GNE provisioning is required for parallel telemetry because the *SLC-2000* system GNE also serves as the directory services network element (DSNE). One system in each subnetwork must be provisioned as the GNE; all other systems in the same subnetwork are *not* GNEs. The default is that each system is *not* the GNE.

The SLC-2000 system `rttrv-ne` CIT user interface command indicates *if* the queried SLC-2000 system is a GNE. In the SLC-2000 system, `rttrv-ne` also includes the *address* of the GNE from the perspective of each queried SLC-2000 system.

A CO SLC-2000 system can serve as the GNE for all the remote SLC-2000 OC-3 shelves in the same subnetwork.

CO/RT Select (SONET Subsystem)

The selection of the central office (CO) or remote terminal (RT) in the SONET subsystem controls the appropriate processing of the miscellaneous discrete environmental points as alarm/status and controls. The selection of CO or RT in the SONET subsystem is provisionable via hardware switch settings on the SYSCTL circuit pack.

As for TBOS, an intrabay multiple cable is provided for this purpose when DDM-2000s are in the same bay. (Refer to SLC-2000 OC-3 Application Schematic SD-7C510-01, CAD 12, and to AT&T 824-102-148, 2000 Family of Products Operations System Engineering Guide).

CO/RT Select (DLC Subsystem)

The SET-NE command on the UIP or the ED-NE command on the DLC subsystem is used to provision the Term Type (COT/RT). Setting the Term Type to "COT" activates the alarm and test unit (ATU), and the miscellaneous alarm outputs on the LIUs.

Far End Communication

Far end communication over the synchronous optical network (SONET) section data communications channel (DCC) may be provisioned, using the craft interface terminal (CIT) user interface command `set-fecom`, as either enabled (default) or disabled. The `set-fecom` command setting (enabled or disabled) must be the same on both ends. The parallel telemetry updates are exchanged using the section DCC in the OC3 signals. (The section DCC is *not* available on EC1 signals.) If far end communication is enabled for all intervening section DCCs, each SLC-2000 system shares its parallel telemetry information with the other SLC-2000 system to which it is connected via OC3 facilities. Thus, a remote SLC-2000 system's parallel telemetry alarm and status points can be forwarded to the telemetry remote via a CO SLC-2000 system, and vice versa for parallel telemetry controls.

If far end communication is disabled, the exchange of parallel telemetry (and other alarm, control and maintenance) information is restricted accordingly, effectively partitioning the *SLC-2000* system subnetwork.

If far end communication is enabled but the section DCC (or the OC3 itself) fails, the *SLC-2000* system adjacent to the section DCC (or OC3) failure reports that alarm condition via parallel telemetry.

In ring applications, all section DCCs should be enabled for communications survivability.

Section DCC User Side/Network Side

For the *SLC-2000* system, with the OSI protocol on the section DCC, the section DCC user side/network side must be provisioned via hardware switch settings on the OHCTL circuit pack. There is a separate switch for each possible OC-3 termination on the *SLC-2000* system. Each *end* (that is, the near-end and far-end) of the section DCC must be provisioned *differently*. For example, if the near-end of a section DCC is provisioned to "ON", the far-end of the same section DCC must be provisioned to "OFF", or vice versa.

The `rtv-ne` command reports the section DCC user side/network side parameter values. If not provisioned correctly, the exchange of parallel telemetry updates on the section DCC is restricted, effectively partitioning the *SLC-2000* system subnetwork. There is no interdependency among multiple section DCCs terminating on the same *SLC-2000* system.

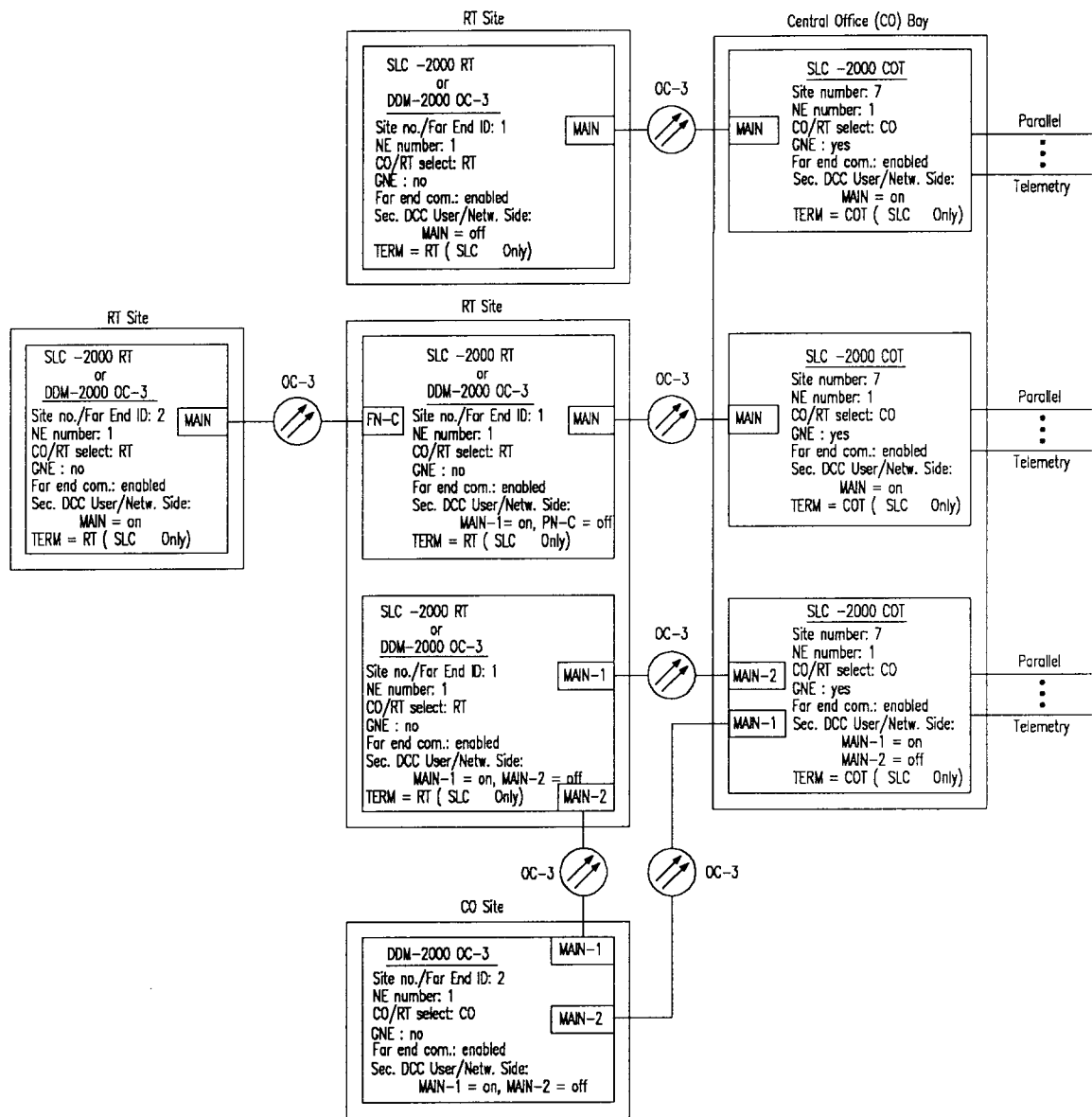
Network Service Access Point (NSAP)

For the *SLC-2000* system, with the OSI protocol on the section DCC, another provisionable parameter is the network service access point (NSAP), but the factory default values of that software parameter suffice for currently supported applications. The CIT user interface command `set-ulsdcc` is used to provision the NSAP, and the `rtv-ulsdcc` command reports the NSAP parameter value. If the NSAP is provisioned incorrectly, the exchange of parallel telemetry updates on the section DCC may be restricted, possibly partitioning the *SLC-2000* system subnetwork.

Parallel Telemetry-Related Provisioning Examples

Figures 5-1 and 5-2 on the following pages provide examples of parallel telemetry-related provisioning for the *SLC-2000* system. Figure 5-1 provides parallel telemetry-related provisioning examples for *SLC-2000* system OC-3-only applica-

tions. Figure 5-2 provides a parallel telemetry-related provisioning example for a combined SLC-2000 system OC-3 and OC-12 application. See AT&T 824-102-148, *2000 Family of Products Operations System Engineering Guide*, Section 5, for details about the latter application.



tpa 831115/01

Figure 5-1. Example of Parallel Telemetry-Related Provisioning for SLC-2000 System Applications

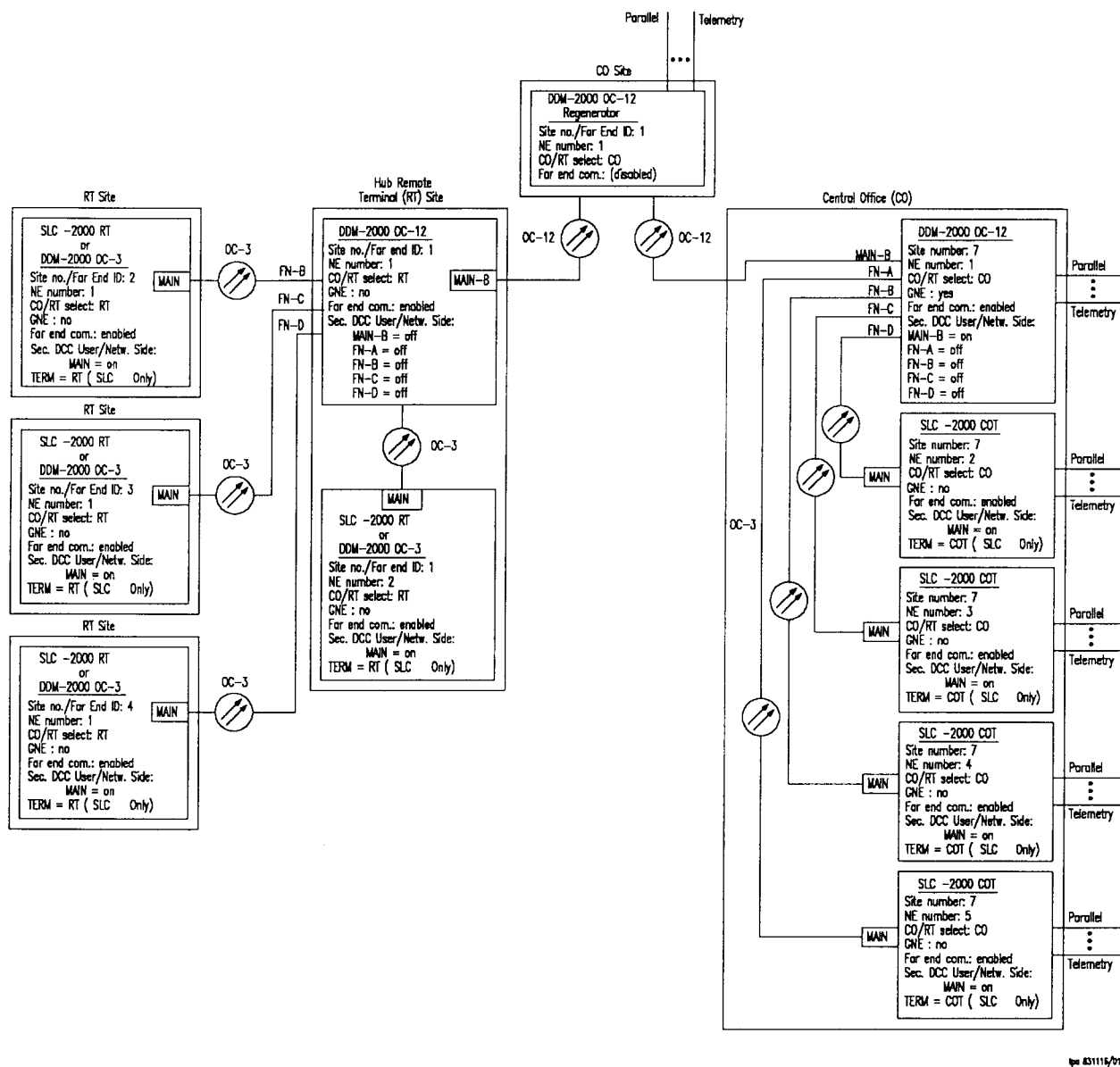


Figure 5-2. Example of Parallel Telemetry-Related Provisioning for a Combined SLC-2000 System OC-3, OC-12, or OC-12 Regenerator Application

Wiring Together SLC-2000 Systems from the Same Subnetwork

To provide a single point of access for office wiring, all common parallel telemetry alarm and status points (not including the system ID points) from all *SLC-2000* systems at the same site can be wired together.

A parallel telemetry system ID is assigned automatically and uniquely to each *SLC-2000* system based on the order in which the *SLC-2000* systems are cabled together for parallel telemetry reporting purposes. The first *SLC-2000* system, that is, the *SLC-2000* system providing the external connection to the telemetry remote, is assigned system ID "1", and the next *SLC-2000* system is assigned system ID "2", etc.

Special Considerations for DLC Alarms

DLC alarm information is remoted via TR8 datalinks and the TR303 EOC (Release 4.0). See Figures 1-1, 1-2, and 1-3 in Section 1 of this document. VRT alarm information activates closures on the CO terminal on which the VRT terminates. DLC summary alarm information also comes from the CO DDM-2000, however, the VRT and digroup ID closures are not supported by DDM-2000. These two scenarios are described below.

- Example: An alarm on VRT#1 (from a *SLC-2000* system RT that terminates on a *SLC-2000* COT) activates an alarm closure (CR, MJ, MN) on the DDM-2000 and the *SLC-2000* system COT. A VRT ID will be set at the *SLC-2000* COT VRT#1. In addition, a digroup closure may also be activated at the *SLC-2000* COT.
- Example: An alarm on VRT#2 (from a *SLC-2000* system RT) terminates on a *SLC-96*. See Figure 1-1 in Section 1 of this document. An RT alarm which affects VRT#2 activates an alarm closure (CR, MJ, MN) on the DDM-2000 in the CO. An alarm closure will also be set at the *SLC-96* COT. In addition, a digroup closure may also be activated, but only at the *SLC-96* COT.

Parallel Telemetry Alarm and Status Points

Table 5-2 summarizes the SLC-2000 system ATU parallel telemetry alarm and status points.

Table 5-2. SLC-2000 COT Parallel Telemetry Alarm and Status Points

Wire ID (Note)	Type	Scan Point Description
CRT	SA	Critical Alarm (CR)
CL4	SA	Major Alarm (MJ)
MNT	NSA	Minor Alarm (MN)
CL5	NSA	Power Minor Alarm (PMN)
NE	STATUS	Near End = location of condition detected
SID	STATUS	System ID
CL8	STATUS	Reported Condition detected at Far End ID #1
CL9	STATUS	Far End ID #2
CL10	STATUS	Far End ID #3
CL11	STATUS	Far End ID #4
CL12	STATUS	Far End ID #5
CL13	STATUS	Far End ID #6
CL28	STATUS	Far End ID #7
CL29	STATUS	Far End ID #8
CL7	STATUS	Incoming SONET Subsystem Signal Failure (CLF)
CL6	STATUS	Incoming Asynchronous Electrical Signal Failure (INC)
CL27	STATUS	DLC Far End (FE)
CL20	STATUS	Alarm CutOff (ACO)
CL30	STATUS	Bank (VRT) ID #1 (BNK1)
CL31	STATUS	Bank (VRT) ID #2 (BNK2)
CL32	STATUS	Bank (VRT) ID #3 (BNK3)
CL33	STATUS	Bank (VRT) ID #4 (BNK4)
CL34	STATUS	Bank (VRT) ID #5 (BNK5)
CL35	STATUS	Bank (VRT) ID #6 (BNK6)
CL36	STATUS	Bank (VRT) ID #7 (BNK7)
CL37	STATUS	Bank (VRT) ID #8 (BNK8)
CL38	STATUS	Shelf A (SHLFA) (DIGROUP A)
CL39	STATUS	Shelf B (SHLFB) (DIGROUP B)
CL40	STATUS	Shelf C (SHLFC) (DIGROUP C)
CL41	STATUS	Shelf D (SHLFD) (DIGROUP D)

Table 5-2. SLC-2000 COT Parallel Telemetry Alarm and Status Points (Cont'd)

Wire ID (Note)	Type	Scan Point Description
CL42	STATUS	DLC Subsystem Carrier Line Failure (CLF)
CL43	STATUS	ABN
Note: Refer to SLC-2000 Central Office Terminal Application Schematic, SD-7C180-01, CAD 17.		

The following explanations are provided for the SLC-2000 system parallel telemetry alarm and status points. The specific conditions that may trigger the incoming SONET signal failure (CL7), the incoming asynchronous (and low speed SONET) electrical signal failure (CL6), or the power minor (CL5) points, are listed, using exactly the same condition descriptions used in the SLC-2000 system user interface alarm and status report, for example, *inc. OC3 line AIS*. For detailed explanations and likely causes of these conditions, refer to the Alarm and Status Condition Description Table 3-9, located in Section 3 of this document.

When multiple alarms are active, only the highest level parallel telemetry alarm point and all status points are reported by each SLC-2000 system. When the highest level alarm clears, the next highest level active alarm point and all status points will be reported. For example, a minor alarm is cleared by a major alarm.

The parallel telemetry alarm points are not subject to the user-provisioned alarm hold-off delay. (The alarm hold-off delay in DDM-2000 is provisionable via the CIT user interface *set-attr-alm* command.)

Even if the OS polling interval for telemetry remotes without memory is 20 seconds, each parallel telemetry alarm and status output point stays on for a *minimum* of 20 seconds so that all alarms will be received by the OS. The alarm and status points are defined as follows:

Critical (CRT) — This point indicates that a critical alarm is detected.

Major (CL4) — This point indicates that a major alarm is detected.

Minor (MNT) — This point indicates that a minor alarm is detected.

Power Minor (CL5) — This point indicates if the following is detected:

- AC power failed

(that is, any non-service-affecting switch from AC power to battery backup at a remote site).

This condition is based on the wired input to SLC[®]-2000 Access System Central Office Terminal Application Schematic SD-7C180-01, CAD 17, P113 pin 7.

Near End (NE) — This point identifies the near end as the location at which the reported condition was detected.

System ID (SID) — This point identifies the CO *SLC-2000* system shelf reporting a condition and is used when the parallel telemetry alarm and status points are wired together among multiple CO *SLC-2000* systems.

Far End ID (CL8-13,28,29) — These eight points identify the far-end DDM-2000 or *SLC-2000* shelf at which a reported condition is detected. The assignment of far end IDs depends on the site number of the CO *SLC-2000* system with the parallel telemetry interface as described in the "Site Number/Far End ID" section.

Incoming SONET Signal Failure (CL7) — This point indicates if at least one of the following is detected:

- inc. EC1 LOF (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 LOS (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 line AIS (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 sig. degrade (BER)
(if provisioned to be an alarm and high-speed EC1)
- inc. EC1 sig. failed (BER)
(if provisioned to be an alarm and high-speed EC1)
- inc. OC3 LOF
- inc. OC3 LOS
- inc. OC3 line AIS
- inc. OC3 sig. degrade (BER)
- inc. OC3 sig. failed (BER)
- inc. STS1 LOP EC1 (if provisioned to be an alarm and high-speed EC1)
- inc. STS1 LOP OC3 *slotaid*
- inc. STS3C LOP OC3 *slotaid*
- inc. VT LOP (*SLC-2000* OC-3 only)

Incoming Asynchronous (and low-speed SONET) Electrical Signal Failure (CL6)
— This point indicates if at least one of the following is detected:

- inc. EC1 LOF (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 LOS (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 line AIS (if provisioned to be an alarm and high-speed EC1)
- inc. EC1 sig. degrade (BER)
(if provisioned to be an alarm and high-speed EC1)

- inc. EC1 sig. failed (BER)
(if provisioned to be an alarm and high-speed EC1)
- inc. DS1 sync. ref. AIS
- inc. DS1 sync. ref. BER
- inc. DS1 sync. ref. EEOF
- inc. DS1 sync. ref. LOF
- inc. DS1 sync. ref. LOS
- inc. DS1 sync. ref. OOL
- inc. STS1 LOP EC1 (if provisioned to be an alarm and high-speed EC1)
- inc. (from DSX) DS1 LOS (if provisioned to be an alarm)
- inc. (from DSX) DS1 sig fail (if provisioned to be an alarm)
- inc. (from DSX) DS3 LOS (if provisioned to be an alarm)
- inc. (from DSX) DS3 sig fail (if provisioned to be an alarm)

Far End (CL27) — This point indicates that a DLC alarm (e.g. a TR8 VRT alarm) is active on a far end system.

Alarm Cutoff (CL20) — This point indicates if an active alarm condition exists, but the office audible alarm and all parallel telemetry alarm and status points except for the system IDs have been silenced. The ACO indicator stays on as long as a silenced alarm condition remains active or until a new alarm occurs (at which time, the highest level active alarm will be reported by each CO SLC-2000 system via its parallel telemetry output points). The ACO is only reported as active for SLC-2000 systems (identified by their system IDs) with active alarm conditions. The ACO may have been activated in any of the following ways:

- User panel ACO button
- CIT user interface `opr-aco` command
- Parallel telemetry RACO input control point
- TBOS ACO control point 62.

BNKn (CL30-CL37) — This point indicates that a TR8 VRT alarm is active. The closure indicates which VRT is affected.

SHLFm (CL38-CL41) — This point indicates that a TR8 VRT digroup alarm is active. A Bank ID closure indicates which VRT is affected. The Shelf closure indicates which digroup on the VRT is affected.

DLC CLF (CL42) — This point indicates that a feeder DS1 or DT DS1 carrier line failure exists.

ABN (CL43) — This point indicates that an abnormal condition exists. This is a craft initiated condition (e.g. DS1 loopback, SMU disabled).

CL6, CL7, CL8-13, CL28, CL29 — These points are for the SONET subsystem only.

Parallel Telemetry Control Point

Table 5-3 identifies the control point for *SLC-2000* system parallel telemetry.

Table 5-3. *SLC-2000 System Central Office (CO) Parallel Telemetry Control Point*

Wire ID (Note)	Verification Status Point Wire ID (Note)	Control Point Description (Equivalent CIT Command)
RACO	CL20	Remote Alarm CutOff (opr-aco)

Note: Refer to the *SLC[®]-2000 Access System Central Office Terminal Application Schematic*, SD-7C180-01, CAD 17.

The following explanation is provided for the *SLC-2000* system parallel telemetry control point. The equivalent CIT command is also included in Table 5-3 as a specific cross-reference to AT&T 363-208-003, *SLC[®]-2000 Access System Command and Message Manual*.

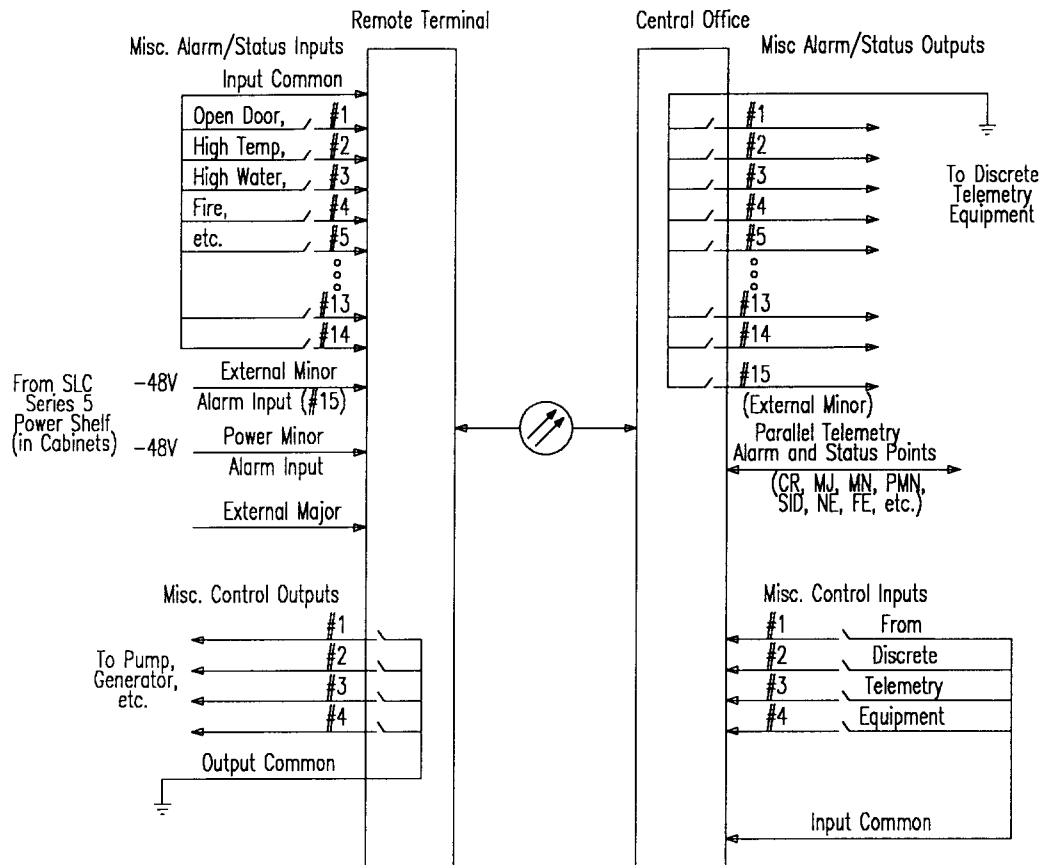
Remote Alarm Cutoff (RACO) — For all existing alarm conditions at the time this point is received, this point silences the office audible alarm and all parallel telemetry alarm and status points except for the system ID.

CO Parallel Telemetry — Miscellaneous Discrete Environmental Conditions

Miscellaneous Discrete Environmental Alarm and Status Points

To allow monitoring of conditions and equipment collocated with a *SLC-2000* system at a remote site, 15 miscellaneous discrete environmental alarm and status points are available. These points are typically wired to report environmental alarm conditions (for example, open door and high temperature) at the site of the remote *SLC-2000* system, although points 1 through 14 are user-settable. Point 15 (although user-settable also) is defined to report external minor alarms. A separate discrete external major input also triggers central office alarms for dual ringer failure at the RT. The user-settable miscellaneous discrete environmental alarm and status points may also be used to report alarms from collocated digital loop carrier.

The operation of these miscellaneous discrete environmental alarm and status points is dependent on the wiring of the same at the remote *SLC-2000* system shelf per *SLC*®-2000 Access System Central Office Terminal Application Schematic, SD-7C180-01, CAD 5, and Figure 5-3.



tp 831117/01

Notes:

1. In a remote terminal, the output common must be wired to ground in all applications.
2. Miscellaneous alarm input #1 is typically wired to open door alarm in AT&T cabinets.

Figure 5-3. Miscellaneous Discrete Environmental Alarms and Controls (Parallel Telemetry at Central Office)

The severity of user settable miscellaneous discrete environmental alarm inputs may be provisioned as Critical (CR), Major (MJ), Minor (MN), or Not Alarmed (NA). If an input is provisioned as "NA" it is reported as a *status* condition (i.e., not an alarm), and does not activate any other parallel telemetry SID or FE ID outputs. (Only the corresponding miscellaneous *output* is activated when the input is active.)

When a remote miscellaneous discrete environmental input is provisioned as an *alarm* (MJ, MN, CR), and the input is active, the appropriate miscellaneous output, an ID output (SID or one of the FE IDs), and an output which indicates the severity of the condition (MJ, MN, CR, etc.), will be activated.

Table 5-4 identifies the SLC-2000 system parallel telemetry miscellaneous discrete environmental alarm and status points.

Table 5-4. SLC-2000 System Central Office (CO) Parallel Telemetry
Miscellaneous Discrete Environmental Alarm and Status Points

Wire ID (Note)	Type	Scan Point Description
TLMO-1	NSA	Misc. Discrete Env. Alarm/Status 1
TLMO-2	NSA	Misc. Discrete Env. Alarm/Status 2
TLMO-3	NSA	Misc. Discrete Env. Alarm/Status 3
TLMO-4	NSA	Misc. Discrete Env. Alarm/Status 4
TLMO-5	NSA	Misc. Discrete Env. Alarm/Status 5
TLMO-6	NSA	Misc. Discrete Env. Alarm/Status 6
TLMO-7	NSA	Misc. Discrete Env. Alarm/Status 7
TLMO-8	NSA	Misc. Discrete Env. Alarm/Status 8
TLMO-9	NSA	Misc. Discrete Env. Alarm/Status 9
TLMO-10	NSA	Misc. Discrete Env. Alarm/Status 10
TLMO-11	NSA	Misc. Discrete Env. Alarm/Status 11
TLMO-12	NSA	Misc. Discrete Env. Alarm/Status 12
TLMO-13	NSA	Misc. Discrete Env. Alarm/Status 13
TLMO-14	NSA	Misc. Discrete Env. Alarm/Status 14
TLMO-15	NSA	External Minor

Note: Refer to SLC[®]-2000 Access System Application Schematic, SD-7C180-01, CAD 5.

The following explanations are provided for the SLC-2000 system parallel telemetry miscellaneous discrete environmental alarm and status points. The conditions that may trigger the miscellaneous discrete environmental alarm and status points are listed, using exactly the same condition descriptions used in the SLC-2000 system user interface alarm and status report, for example, *environmentxx*. For explanations of these conditions, refer to the Alarm and Status Condition Description Table 3-8, located in Section 3 of this document.

Each miscellaneous discrete environmental alarm and status output point reported via parallel telemetry stays on for a *minimum* of 20 seconds so that all alarms will be received by the OS, even though the OS polling interval for telemetry remotes without memory is 20 seconds.

Misc. Discrete Env # — These 14 points indicate when the following is detected at a remote terminal (RT) site:

- `environmentXX`

Because these miscellaneous discrete environmental alarm and status points are user settable, the text description of the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point must be provisioned at the OS.

External Minor — This indicates if the following is detected:

- `ExternalMinor`

Because this miscellaneous discrete environmental alarm and status point is user settable, the text description of the actual condition monitored and reported by this miscellaneous discrete environmental alarm and status point must be provisioned at the OS.

External Major — This indicates if the following is detected:

- `ExternalMajor`

The input is provided to monitor dual ringing failure at the RT. The severity of this alarm is CR.

CO Parallel Telemetry — Miscellaneous Discrete Environmental Control Points

Four user settable miscellaneous discrete environmental control points are available to allow control of equipment collocated with a SLC-2000 system at a *remote* site (for example, these control points may be wired to turn generators on or off).

The operation of these miscellaneous discrete environmental control points is dependent on the wiring of the same at the remote SLC-2000 system per SLC-2000® Access System Central Office Terminal Application Schematic, SD-7C180-01, CAD 5.

The miscellaneous discrete environmental control points operate entirely independent of the parallel telemetry control point described earlier.

Table 5-5 identifies the miscellaneous discrete environmental control points for SLC-2000 system parallel telemetry.

**Table 5-5. SLC-2000 System Central Office (CO) Parallel Telemetry
Miscellaneous Discrete Environmental Control Points**

Wire ID (Note)	Verification Status Point Wire ID (Note)	Control Point Description
TLMI-1	†	Operate Misc. Discrete Env. Control 1
TLMI-2	†	Operate Misc. Discrete Env. Control 2
TLMI-3	†	Operate Misc. Discrete Env. Control 3
TLMI-4	†	Operate Misc. Discrete Env. Control 4

Note: Refer to SLC®-2000 Access System Central Office Terminal Applications Schematic, SD-7C180-01, CAD 5.

† For each miscellaneous discrete environmental control point, it is recommended that a miscellaneous discrete environmental alarm or status point be wired and data based to serve as a verification status point to confirm that the desired *effect* of each miscellaneous discrete environmental control is achieved.

There are no equivalent CIT user interface commands for these control points.

The four user settable miscellaneous discrete environmental control points listed in Table 5-5 identify the miscellaneous discrete environmental control point to be activated on a remote SLC-2000 system. Because these miscellaneous discrete environmental control points are user settable, the text description of the actual control effected by each miscellaneous discrete environmental control point should be provisioned at the OS.

**SLC[®]-2000 Access System RTU
Interface**

6

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SLC[®]-2000 Access System RTU Interface

6

Overview

This section provides information on the Remote Test Unit (RTU) interface for the SLC[®]-2000 Access System.

Introduction

Remote testing is supported in the SLC-2000 system via TL1 messages. The SLC-2000 system accepts TL1 messages which will perform a variety of functions to provide test access. The test heads that the SLC-2000 system currently supports are Reliance's INTS system and Teradyne's 4TEL system. Reliance's INTS system is primarily used for testing special services but can be equipped to test POTS lines. Teradyne's 4TEL system is used only for testing POTS lines. The RTU interfaces with the OS via a VF line (e.g., a dial-up connection). See Figure 1-5 in Section 1 of this document. The test heads interface with the SLC-2000 system via TL1 messages on a RS232 port that terminates on the LAN card in the SLC-2000 ARM shelf. The RS232 interface (and thus the LAN card) is not required for POTS testing with the INTS system.

The RTU TL1 messages that the SLC-2000 system supports are based on Bellcore's TR-TSY-000834, Issue 4. See AT&T 363-208-001, *SLC[®]-2000 Access System, User/Service Manual* for details about the integral test head, or use of a bypass pair.

RTU Interfaces

SLC-2000 Access System POTS testing with the RTUTeradyne 4TEL RMU 270/275

In order to perform testing of subscriber lines, the RMU 270/275 must request the SLC-2000 system to access the lines. In the process of accessing lines, the SLC-2000 system should send status information back to the RMU 270/275 so that the RMU 270/275 knows how to proceed. The RMU 270/275 needs to know the state and condition of the subscriber's line (busy, idle) and the access state of the test connection (success or failure).

Before a line has been accessed, the RMU 270/275 can perform the following:

- Connect to a line to be tested
- Query DLC for type and software version
- Force access to a busy line

Once the line has been accessed and the status information returned, the RMU 270/275 can perform the following:

- Outward testing with line equipment removed
- Release previous line and connect to next line
- Monitor line (after CONN-FACC-MET command)
- Refresh test bus timeout
- Release line
- Query DLC for type and software version

The following commands will be used by the RMU 270/275:

- QUERY-TACC
- CONN-IMPACC-MET
- CONN-FACC-MET
- CHG-SPLIT-LILO
- CONN-MON
- REF-TACC
- DISC-TACC

Questions concerning the commands or operation of the RMU should be referred to Teradyne's Technical Assistance Center (TAC) at the following address or by calling, 1-800-222-1425.

TERADYNE, INC.
TELECOMMUNICATIONS DIVISION
1405 Lake Cook Road
Deerfield, Illinois 60015

SLC-2000 Access System Special Services Testing with the Reliance INTS

Commands and Responses Supported Between the SARTS OS and INTS

The following messages are supported between the SARTS (Switched Access Remote Test System) OS and INTS to perform special services testing. Details on these messages can be found in Bellcore TR-NWT-000834, *OTGR: Operations Application Messages Network Maintenance Access And Testing Messages*, April, 1993.

**Table 6-1: Command/Response Messages Supported Between the SARTS
OS and INTS**

TL1 Command	Definition
CHG-PRTP	Change Port Parameters
CHG-PTRST	Change Port Restore
CHG-SPLTSUPV	Change Split and Supervision
CONN-MONLIST	Connect Monitor Listen
CONN-TACC	Connect Test Access
CONN-TLKSPLT	Connect Talk Split
CONN-TN	Connect Tone
DISC-MEAS	Disconnect Measurement
DISC-TACC	Disconnect Test Access
DISC-TSTSIG	Disconnect Test Signal

Table 6-1: Command/Response Messages Supported Between the SARTS OS and INTS (Cont'd)

TL1 Command	Definition
MEAS-CAP	Measure Capacitance
MEAS-CUR	Measure Current
MEAS-IMPNSE	Measure Impulse Noise
MEAS-RES	Measure Resistance
MEAS-TN	Measure Tone
MEAS-VG	Measure Voltage
TST-OUTPLSE	Test Outpulsing
TST-RINGSGL	Test Ringing Signal
REPT-RESLT	Report Results

Commands and Responses Supported Between the SLC-2000 System and INTS

The following messages are supported between the SLC-2000 system and INTS. There are two types of messages. The Command/Response messages sent by the RTU are listed in Table 6-2. The Autonomous messages sent by the SLC-2000 system are listed in Table 6-3. Details of these messages are provided in the next section.

Table 6-2: Command/Response Messages Between the SLC-2000 System and INTS

TL1 Command	Definition
CHG-SPLIT	Change Split, Full Metallic
CONN-LPACC-MET	Connect Loop-Around Access Metallic
CONN-MON	Connect Monitor
CONN-TACC-MET	Connect Test Access Metallic
DISC-TACC	Disconnect Test Access
REPT-INITZN	Report Initialization
REPT-STAT	Report Status
RST-TAP-MET	Restore Test Access Paths Metallic

Table 6-3: Autonomous Messages Between the SLC-2000 System and INTS

TL1 Command	Definition
REPT INITZN	Report Initialization

Figure 6-1, on the following page, represents the different states of a *SLC-2000* system when being sent test commands by the INTS. It also shows the valid state transitions.

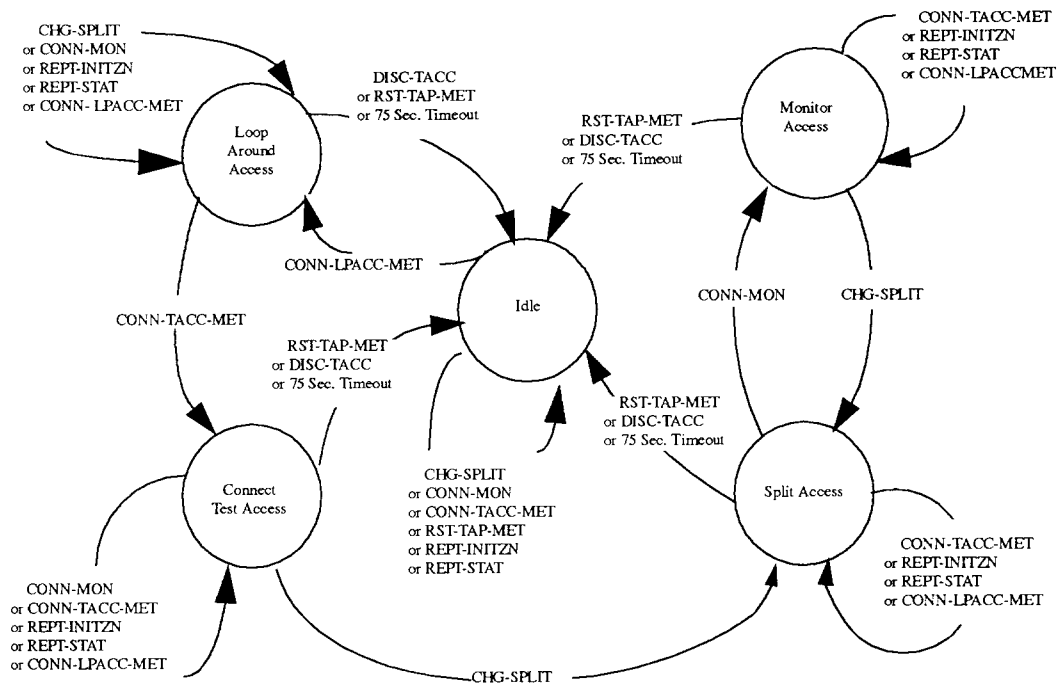


Figure 6-1. RTU State Diagram

TL1 Message Details

Detailed information about the input and output parameters for the supported TL1 messages for special services testing with the INTS system, found in Tables 6-2 and 6-3, begins on page 6-7.

NAME

CHG-SPLIT: Change split, full metallic.

INPUT FORMAT

CHG-SPLIT: *tap*: *ctag*;

DESCRIPTION

This command instructs the RT to provide necessary connections to the TAP and split, at the access point, the equipment and facility pairs specified by the access command of the circuit under test. This command should be executed after CONN-MON or CONN-TACC-MET.

INPUT PARAMETERS

tap Test Access Path ID. This parameter identifies the TAP to be used. The two possible values for *tap* are:

1 - TAP B, normally used for POTS testing

2 - TAP A, normally used for special services testing

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
CHG-SPLIT::2:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag DENY
errcde
/*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a *SLC-2000* system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
   non-alphanumeric characters are used. */
;
```

If a SLC-2000 system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter
   has been inserted into the TL1 command. */
;
```

If a SLC-2000 system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character. Command is not in TL1
   format. */
;
```

If the *SLC-2000* system receives a command without the *tap* specified, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/*Input, Parameter Missing. Null TAP not allowed. */
;
```


If the user selects a TAP different than the one chosen during test access and before test access is disconnected, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPNC
/* Input, Parameter Not Consistent. Selected TAP does not
match TAP selected in earlier command. */
;
```

If a user enters a CHG-SPLIT command while the CHG-SPLIT state still exists, the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SRCN
/* Status, Requested Condition Already Exists. */
;
```

If a user enters a CHG-SPLIT command after any command other than the CONN-TACC-MET or the CONN-MON commands, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SCSN
/* Status, Invalid Command Sequence. */
;
```

NAME

CONN-LPACC-MET: Connect loop-around access metallic.

INPUT FORMAT

CONN-LPACC-MET:tid:aid:ctag::[tap]:cnfgrn;

DESCRIPTION

This message initiates access to the circuit, TAP selection, and TAP loop around.

INPUT PARAMETERS

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

tid Target Identifier. This is the name of the network element to which the command is addressed. The *tid* is limited to 20 characters. If characters other than letters or digits are used, then the characters must be enclosed in double quotes. The alpha characters in *tid* are case sensitive. The *tid* cannot have embedded spaces. The *tid* is provisioned via "SET-SID" or "SET-NE".



NOTE:

When the testing OS controlling the RTU is the AT&T SARTS system with the TA201 Translator, the *tid* received is limited to 10 alphanumeric character (including space). The input to SARTS consists of an 8-character location (CLLI) code and a 2-character numeric system number, both strings are concatenated by the Translator and sent to the RTU as the *tid*.

aid Access Identifier. This identifies the circuit to be accessed. The *aid* is a required parameter for this command. Note that SARTS testing is mainly concerned with special services circuit in the MDS (i.e. metallic drops). Valid values are:

1. drop-{1-8}-{1-24}-{1-4} - For a Physical Line Drop (metallic drop)
2. dtdp-{1-8}-{1,3,5,7,9,11,13,15,17,19,21,23}-{1-6}-{1-4} - For a Physical Line Drop in a DT



NOTE:

Since SARTS limits the *aid* field to six character, the *SLC-2000* system shall accept an *aid* of the form {1-8}-{1-24}-{1-4} and interpret it as an *aid* with the 'drop-' prefix. Currently, FITL cannot be tested with SARTS.

tap Test Access Path ID. This parameter selects the TAP to be used during testing. If a value is not selected, it shall default to TAP 2. If TAP 2 is busy, the default will not be TAP 1. An error message stating that TAP 2 is busy will be returned instead.

The two possible values for *tap* are:

1 - TAP B, normally used for POTS testing

2 - TAP A, normally used for special services testing

cnfgrn Configuration Code. This parameter defines the TAP-to-circuit configuration. Acceptable configuration codes and definitions are listed below.

Configuration	Definition
2WA	2-wire, A pair
4AB	4-wire, FE orientation
4BA	4-wire, EF orientation
DAB	4-wire, A&B pairs in FE orientation at DS0A level
DBA	4-wire, A&B pairs in EF orientation at DS0A level
MAB	4-wire, A&B pairs in FE orientation, E&M leads on C pair
MBA	4-wire, A&B pairs in EF orientation, E&M leads on C pair
CAB	4-wire, A&B pairs in FE orientation, control channel on C pair
CBA	4-wire, A&B pairs in EF orientation, control channel on C pair
2EM	2-wire, A pair, E&M leads on C pair

OUTPUT FORMAT

In response to a valid CONN-LPACC-MET command, the following output shall be returned to the user of the line:

```
      sid date time
M    ctag COMPLD
      tap
      spl
      ;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.
<i>tap</i>	This is the <i>tap</i> access path designated in the input command message and is echoed in the response message or the test access path assigned by SLC-2000 system when the test access path is not specified in the input message.
<i>spl</i>	Identifies the access point as a special circuit (red line). The presence of the <i>spl</i> parameter in the NORMAL RESPONSE is represented by the value S.

EXAMPLE INPUT/OUTPUT

```
CONN-LPACC-MET:ATT-SLC-2000:drop-1-8-4:123456::2:4AB;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
2  
S  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag DENY
  errcde
/*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
  IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a *SLC-2000* system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
I ICT
/* Input, Invalid Correlation TAG. CTAG is too long or
   non-alphanumeric characters are used. */
;
```

If a *SLC-2000* system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
I PEX
/* Input, Parameter Extra. An extra parameter has been
   inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
S ROF
/* Status, Requested Operation Failed. */
;
```


If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character. Command is not in TL1
   format. */
;
```

If a *SLC-2000* system receives a command, but the TID is missing, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter, Missing. Null TID Not Valid.*/
;
```

If a *SLC-2000* system receives a command with a syntactically incorrect TID value, such as the use of invalid characters or too many characters, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IITA
/* Input, Invalid TID. TID is too long or includes
   invalid characters. */
;
```

If a *SLC-2000* system receives a command with a TID value that does not match the SID, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IITA
/* Input, Invalid TID. TID does not match the SID. */
;
```

If the *SLC-2000* system receives a command with a null AID value, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
  IPMS
  /* Input, Parameter, Missing. Null AID not allowed. */
;
```

If the *SLC-2000* system receives a command with a syntactically incorrect AID value, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
  IIAC
  /* Input, Invalid Access Identifier. */
;
```

If the *SLC-2000* system receives a command with an AID for a line that is not equipped with a channel unit, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
  ENEQ
  /* Equipage, Not Equipped. */
;
```

If the SLC-2000 system receives a command to test a drop at the DT, but the line is equipped with a metallic drop, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
ENRE
/* Equipage, Not Recognized Equipage.
   Equipped with a metallic drop and not a DT drop */
;
```

If the SLC-2000 system receives a command to test a metallic drop, but the line is equipped with a DT drop, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
ENRE
/* Equipage, Not Recognized Equipage.
   Equipped with a DT drop, not a metallic drop. */
;
```

If TAP 2 is selected by the user or is selected by default and TAP 2 is busy, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
RTBY
/* Resource, Requested TAP is Busy. TAP 2 is busy. */
;
```

If TAP 1 is selected by the user and TAP 1 is busy, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
RTBY
/* Resource, Requested TAP is Busy. TAP 1 is busy. */
;
```

If the SLC-2000 system receives a command requesting a TAP other than TAP 1 or TAP 2, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
RTEN
/* Resource, Requested TAP does Not Exist.
Valid Values in the TAP block are either 1 or 2. */
;
```

If the SLC-2000 system receives a command, but the CONFGN is missing, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CONFGN not valid. */
;
```

If the SLC-2000 system receives a command with a value for CONFGRN that is not listed in the table as a valid parameter, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SRAC
/* Status, Requested Access Configuration is Not Valid.
   Do not recognize CONFGRN value. */
;
```

If the SLC-2000 system receives a command with a value for CONFGRN that does not match the channel unit being tested, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SRAC
/* Status, Requested Access Configuration is Not Valid.
   CONFGRN value does not match channel unit being tested. */
;
```

If the user tries to access a circuit that is already under test through another TAP, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SCAT
/* Status, Circuit is Already Connected to Another TAP. */
;
```

If a user enters a CONN-LPACC-MET command after a CONN-TACC-MET command and before a corresponding DISC-TACC command, the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SCSN
/* Status, Invalid Command Sequence. */
;
```

If a user enters a CONN-LPACC-MET command and attempts to access the same channel unit in the same SLC-2000 system with the same configuration, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SRCN
/* Status, Requested Conditions already Exist. */
;
```

If a user attempts to access a circuit, but another channel on the same MDS is being tested, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
RANB
/* Resource, Access Network is Busy.
Metallic Test Bus is Busy. */
;
```

If a user attempts to access a circuit, but the PTU or MDC is out of service, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
  STOS
/* Status, Test Access Unit Out of Service.
   PTU or MDC is out of service. */
;
```


NAME

CONN-MON: Connect Monitor Metallic.

INPUT FORMAT

CONN-MON::tap:ctag;

DESCRIPTION

This command is used to establish a monitor state without having to reaccess the circuit under test. This command must be executed after CHG-SPLIT.



CAUTION:

The SLC-2000 architecture currently does not allow for hitless monitoring.

INPUT PARAMETERS

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

tap Test Access Path ID. This parameter identifies the TAP to be used.

The two possible values for *tap* are:

1 - TAP B, normally used for POTS testing

2 - TAP A, normally used for special services testing

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line.

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
CONN-MON::2:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line.

```
sid date time
M ctag DENY
errcde
/*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a SLC-2000 system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the SLC-2000 system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
   non-alphanumeric characters are used. */
;
```

If a *SLC-2000* system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter has been
   inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character.
   Command is not in TL1 format. */
;
```

If the *SLC-2000* system receives a command without the tap specified, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/*Input, Parameter Missing. Null TAP not allowed. */
;
```

If the user selects a TAP different than the one chosen during test access and before test access is disconnected, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  IPNC
  /* Input, Parameter Not Consistent. Selected TAP does not
    match TAP selected in earlier command. */
;
```

If a user enters a CONN-MON command when the RTU is already in a monitor state, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  SRCN
  /* Status, Requested Condition Already Exists */
;
```

If the user enter a CONN-MON command after any command other than a CHG-SPLIT command, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  SCNS
  /* Status, Circuit Not in Split Condition */
;
```

NAME

CONN-TACC-MET: Connect Test Access Metallic.

INPUT FORMAT

CONN-TACC-MET::*tap*:*ctag*;

DESCRIPTION

This command enables the RT to provide a zero-loss, high-impedance monitor connection to the transmission pairs of a circuit and complete circuit access.

This command removes the TAP loop around and connects the appropriate TAP lead pairs to the access point. The circuit access number (address) is found in the CONN-LPACC-MET command which must always be successfully transmitted before this command.

INPUT PARAMETERS

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

tap Test Access Path ID. This parameter identifies the TAP to be used.

The two possible values for *tap* are:

- 1 - TAP B, normally used for POTS testing
- 2 - TAP A, normally used for special services testing

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line:

```
sid date time  
M ctag COMPLD  
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
CONN-TACC-MET::2:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time  
M ctag DENY  
errcde  
/*free_form_text*/  
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a SLC-2000 system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the SLC-2000 system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the SLC-2000 system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
non-alphanumeric characters are used. */
;
```

If a SLC-2000 system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter has been
inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character. Command is not in TL1
   format. */
;
```

If the SLC-2000 system receives a command without the tap specified, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  IPMS
  /*Input, Parameter Missing. Null TAP not allowed. */
;
```

If the user selects a TAP different than the one chosen during test access and before test access is disconnected, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  IPNC
  /* Input, Parameter Not Consistent. Selected TAP does not
    match TAP selected in earlier command. */
;
```

If a user enters a CONN-TACC-MET command after any command other than the CONN-LPACC-MET command, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  SCSN
  /* Status, Invalid Command Sequence */
;
```

If a user enters a CONN-TACC-MET command when the RTU is already in a CONN-TACC-MET state, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
SRCN
/* Status, Requested Conditions Already Exists */
;
```

NAME

DISC-TACC: Disconnect Test Access.

INPUT FORMAT

DISC-TACC::*tap*:*ctag*;

DESCRIPTION

This command causes the RT to restore the circuit under test to its through state and open all TAP connections to that access point. The RTU releases all resources associated with that test.

INPUT PARAMETERS

- ctag* Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.
- tap* Test Access Path ID. This parameter identifies the TAP to be used.
- The two possible values for *tap* are:
- 1 - TAP B, normally used for POTS testing
 - 2 - TAP A, normally used for special services testing

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag COMPLD
;
```


OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
DISC-TACC::2:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag DENY
  errcde
/*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
  IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a *SLC-2000* system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
   non-alphanumeric characters are used. */
;
```

If a *SLC-2000* system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter has been
   inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character.
   Command is not in TL1 format. */
;
```

If the *SLC-2000* system receives a command without the *tap* specified, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/*Input, Parameter Missing. Null TAP not allowed. */
;
```

If the user selects a TAP different than the one chosen during test access and before test access is disconnected, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  IPNC
/* Input, Parameter Not Consistent. Selected TAP does not
   match TAP selected in earlier command. */
;
```

If a user attempts to disconnect test access when the RTU is already in an idle state, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
  SADC
/* Status, Already Disconnected */
;
```

NAME

REPT INITZN: Report Initialization (Automatic).

DESCRIPTION

This is an automatic command sent by the *SLC-2000* system to the RTU to inform the RTU that the RT has been initialized.

OUTPUT FORMAT

When an initialization has occurred at the *SLC-2000* system, the following message will be automatically returned to the user:

```
sid date time
A atag REPT INITZN
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>A</i>	The character <i>A</i> signifies that the message is a non-alarm autonomous message.
<i>atag</i>	This is the automatic message tag used to sequence automatic messages. The value of <i>atag</i> is a decimal numeral limited to a maximum of ten digits and is assigned by the RT. In this case <i>atag</i> will always be 0001 since it is only set after the <i>SLC-2000</i> system has been reset.

EXAMPLE OUTPUT

```
ATT-PF-2000 93-07-11 13:01:11  
A 123456 REPT INITZN  
;
```


NAME

REPT-INITZN: Report Initialization (Input/Response).

INPUT FORMAT

REPT-INITZN:::ctag;

DESCRIPTION

This command indicates to the SL-2000 system that the RTU has been initialized.

INPUT PARAMETERS

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
REPT-INITZN:::123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag DENY
  errcde
  /*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
  IISP
  /* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a *SLC-2000* system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the SLC-2000 system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
  IICT
  /* Input, Invalid Correlation TAG. CTAG is too long or
    non-alphanumeric characters are used. */
;
```

If a SLC-2000 system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
  IPEX
  /* Input, Parameter Extra. An extra parameter has been
    inserted into the TL1 command. */
;
```

If a SLC-2000 system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
  SROF
  /* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character.
   Command is not in TL1 format. */
;
```

NAME

REPT-STAT: Report Status.

INPUT FORMAT

REPT-STAT:::ctag;

DESCRIPTION

This command is sent from the RTU to the RT to check that the data link between them is in operation. If the RT does not receive a command from the RTU for a period of 75 seconds, it shall release any accesses that are up at the request of the RTU for the 75-second period. No response other than the acknowledgment is required for this command.

INPUT PARAMETERS

ctag Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.

OUTPUT FORMAT

In response to a valid REPT-STAT command, the following output shall be returned to the user:

OK ctag

OUTPUT PARAMETERS

- OK* All Right. The command was received and the requested action was initiated and completed. This response will only be sent after the REPT-STAT command.
- ctag* Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.

EXAMPLE INPUT/OUTPUT

```
REPT-STAT:::123456;  
  
OK 123456  
<
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time  
M ctag DENY .  
errcde  
/*free_form_text*/  
;
```


ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a SLC-2000 system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any

supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
non-alphanumeric characters are used. */
;
```

If a *SLC-2000* system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter has been
   inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character. Command is not in TL1
format. */
;
```

NAME

RST-TAP-MET: Restore Test Access Paths Metallic.

INPUT FORMAT

RST-TAP-MET::*tst*:*ctag*;

DESCRIPTION

This command is used to release all existing test access connections in the SLC-2000 that were established by an OS over its control link. The command is issued after the RTU receives a REPT-INITZN from the OS. This command also releases all TAPs involved in these connections and returns them to an idle state.

INPUT PARAMETERS

- ctag* Correlation Tag. This parameter is used by the system in the response message from the RT to allow the user to correlate the response message with the command message sent by the RTU. The value of *ctag* must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters. The alpha characters for *ctag* are case sensitive.
- tst* This parameter represents all existing test access and TAP connections in the SLC- 2000 system. Valid value for this parameter is given below:
- ALL - to indicate release

OUTPUT FORMAT

In response to a successful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag COMPLD
;
```

OUTPUT PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message. Embedded spaces are not allowed in <i>sid</i> . The <i>sid</i> is provisioned via "SET-SID" or "SET-NE".
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>M</i>	The character <i>M</i> signifies that the message is the response to the input command message.
<i>ctag</i>	Correlation tag. This is included in the input command message and is repeated in the response message from the RT. The value of <i>ctag</i> must be a TL1 identifier or a non-zero decimal number, consisting of no more than six characters.
<i>COMPLD</i>	This indicates that the input command has been successfully executed.

EXAMPLE INPUT/OUTPUT

```
RST-TAP-MET::ALL:123456;  
  
IP 123456  
<  
  
ATT-PF-2000 93-07-11 13:01:11  
M 123456 COMPLD  
;
```

ERROR FORMAT

In response to an unsuccessful TL1 command, the following output shall be returned to the user of the line:

```
sid date time
M ctag DENY
  errcde
  /*free_form_text*/
;
```

ERROR MESSAGE PARAMETERS

<i>sid</i>	This is the source identifier and is restricted to 20 characters maximum and identifies the NE generating the message.
<i>date</i>	This is the date output message. It is in the format of YY-MM-DD (year-month-day).
<i>time</i>	This is the time output message. It is in the format of HH:MM:SS (hour:minute:second).
<i>errcde</i>	This is a 4-character mnemonic error code.
<i>free_form_text</i>	The free form text is used to clarify and explain the reason for the error. Messages longer than 72 characters should include TL1 format effectors of <i>< cr lf ></i> to aid in the display at a terminal or storage and presentation at an OS.

EXAMPLE ERROR MESSAGE

```
ATT-SLC-2000 94-01-04 14:04:23
M 123456 DENY
  IISP
  /* Input, Invalid Syntax or Punctuation. */
;
```

ERROR MESSAGES

If a *SLC-2000* system receives a command but cannot parse the command for at least 6 colons (:) before the TL1 end of message semicolon(;) or parses the command for more than the maximum number of colons allowed for any supported TL1 command, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
IISP
/* Input, Invalid Syntax or Punctuation. */
;
```

If the *SLC-2000* system receives a command, but the CTAG is missing, the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null CTAG not valid. */
;
```


If the *SLC-2000* system receives a command, but the CTAG is syntactically incorrect, then the command will be denied, CTAG will be defined as six zeroes, and the following message shall be returned:

```
sid date time
M ctag DENY
IICT
/* Input, Invalid Correlation TAG. CTAG is too long or
non-alphanumeric characters are used. */
;
```

If a *SLC-2000* system receives a parameter where no parameter is needed, then the command is denied and the following output message shall be returned:

```
sid date time
M ctag DENY
IPEX
/* Input, Parameter Extra. An extra parameter has been
inserted into the TL1 command. */
;
```

If a *SLC-2000* system receives a valid command, but for some undetermined reason, it cannot execute the command, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
SROF
/* Status, Requested Operation Failed. */
;
```

If a *SLC-2000* system receives a command in a TL1 format, but does not recognize it, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
IICM
/* Input, Invalid Command. Command is not part of current
   set of TL1 commands used for Special Services testing. */
;
```

If a *SLC-2000* system receives a command that is not in TL1 format, then the command is denied and the following message shall be returned:

```
sid date time
M ctag DENY
ISCH
/* Input, Syntax Invalid Character.
   Command is not in TL1 format. */
;
```

If the *SLC-2000* system receives a command, but the *TST* parameter is not *ALL*, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPNV
/* Input, Parameter Not Valid.
   Only valid TST parameter is ALL. */
;
```

If the *SLC-2000* system receives a command, but the TST parameter is missing, then the command will be denied and the following message shall be returned:

```
sid date time
M ctag DENY
IPMS
/* Input, Parameter Missing. Null TST is not valid */
;
```

If the *SLC-2000* system receives a command, but all test access connections are released, then the command will be denied and the following output response message shall be returned:

```
sid date time
M ctag DENY
SRCN
/* Status, Requested Condition Already Exists.
All test access connections are already released. */
;
```

SLC[®]-2000 Access System
Operations with DS1 Feeder

7

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***SLC*[®]-2000 Access System Operations with DS1 Feeder**

7

Overview

This section presents information on the *SLC*[®]-2000 Access System Central Office Terminal (COT) and Remote Terminal (RT) interfaces with the DS1 Feeder to the operations system (OS). This section includes information about the provisioning required to support the TL1/X.25 and parallel telemetry interfaces.

Introduction

The *SLC*[®]-2000 Access System Releases 3.02.01 and 4.0 for the DLC subsystem, and for the SONET subsystem, OC-3 Release 6.2.2, support the DS1 Feeder. The *SLC*-2000 system's DS1 Feeder interface is dependent on the wiring of individual (parallel) leads to the telemetry remote. (Refer to *SLC*-2000 Central Office Terminal Application Schematic SD-7C180-01, CAD 5 and 24.)

DS1 Feeder-Related Provisioning

The parameters described on the following page must be provisioned to support TL1/X.25 and parallel telemetry in DS1 feeder configurations. Other parameters which are applicable to SONET feeder configurations are not used in this application.

Refer to AT&T 363-208-001, *SLC[®]-2000 Access System User/Service Manual*, for the specific switch addresses and settings. The user interface commands used to set and retrieve the software provisionable parameters, are explained in AT&T 363-208-003, *SLC[®]-2000 Access System Command and Message Manual*.

Figure 7-1, presented later in this section, provides a DS1 Feeder provisioning example for SLC-2000 systems.

Gateway Network Element (GNE)

The SLC-2000 system in the CO and RT must both be provisioned as a GNE using the `set-ne` CIT user interface command.

CO/RT Select (SONET Subsystem)

The selection of the central office (CO) or remote terminal (RT) in the SONET subsystem controls the appropriate processing of the miscellaneous discrete environmental points as alarm/status and controls. In the CO outputs are activated if the RT inputs are activated. The selection of CO or RT in the SONET subsystem is provisionable via hardware switch settings on the SYSCTL circuit pack.

CO/RT Select (DLC Subsystem)

The SET-NE command on the UIP or the ED-NE command on the DLC subsystem is used to provision the Term Type (COT/RT). Setting the Term Type to "COT" activates the alarm and test unit (ATU), and the miscellaneous outputs on the LIUs.

DS1 Feeder-Related Provisioning Examples

Figure 7-1 on the following page provides an example of DS1 Feeder provisioning for the SLC-2000 system.

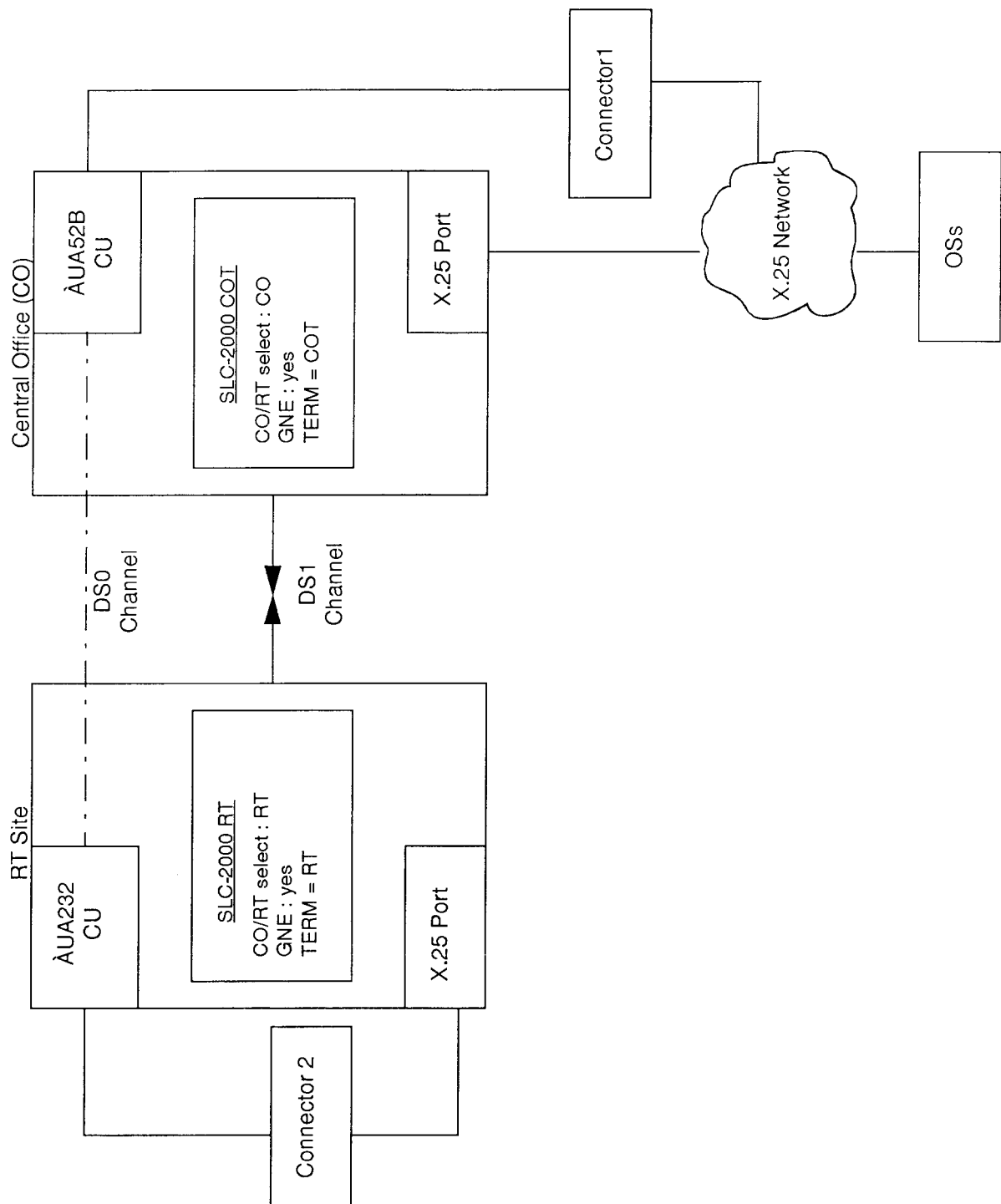


Figure 7-1. Example of DS1 Feeder-Related Provisioning for SLC-2000 System Applications

TL1/X.25 Interface

See Section 3 of this document for TL1/X.25 Interface information on the following topics:

- List of Autonomous and Command/Response Messages (in the Introduction portion of the section)
- Security
- Alarm, Status & Database Change Refreshment After X.25 Failures
- X.25 Technical Specifications
- Datakit Provisioning
- Cabling
- TL1 Message Details

Parallel Telemetry Interface

The following sections pertain only to the parallel telemetry interface.

Wiring Together *SLC-2000* Systems In The CO

To provide a single point of access for office wiring when parallel telemetry is used, all common DS1 Feeder alarm and status points (not including the system ID points) from different *SLC-2000* COTs can be wired together.

Special Considerations for DLC Alarms

DLC alarm information is remoted via TR-08 datalinks and the TR303 EOC (Release 4.0). See Figure 1-4 in Section 1 of this document. VRT alarm information activates closures on the CO terminal on which the VRT terminates. If a VRT terminates on a *SLC-2000* system COT, the appropriate VRT and digroup status closures will be activated.

Alarm and Status Points

Table 5-2, in Section 5 of this document, summarizes the *SLC-2000* system ATU alarm and status points supported at the COT. The CL6, CL7, CL8, CL9, CL10, CL11, CL12, CL13, CL28, and CL29 outputs are not required.

Control Point

Table 5-3, in Section 5 of this document, identifies the control point for the SLC-2000 system COT.

CO DS1 Feeder — Miscellaneous Discrete Environmental Conditions

Miscellaneous Discrete Environmental Alarm and Status Points

To allow monitoring of conditions and equipment collocated with a SLC-2000 system at a remote site, eight of the 15 miscellaneous discrete environmental alarm and status points (points 2-8, and 15) are available. These points are typically wired to report environmental alarm conditions (for example, high temperature and high water) at the site of the remote SLC-2000 system, although points 2 through 8 are user-settable. Point 15 (although user-settable also) is defined to report external minor alarm input. A separate discrete external major input also triggers central office alarms for dual ringer failure at the RT. The user-settable miscellaneous discrete environmental alarm and status points may also be used to report alarms from collocated systems.

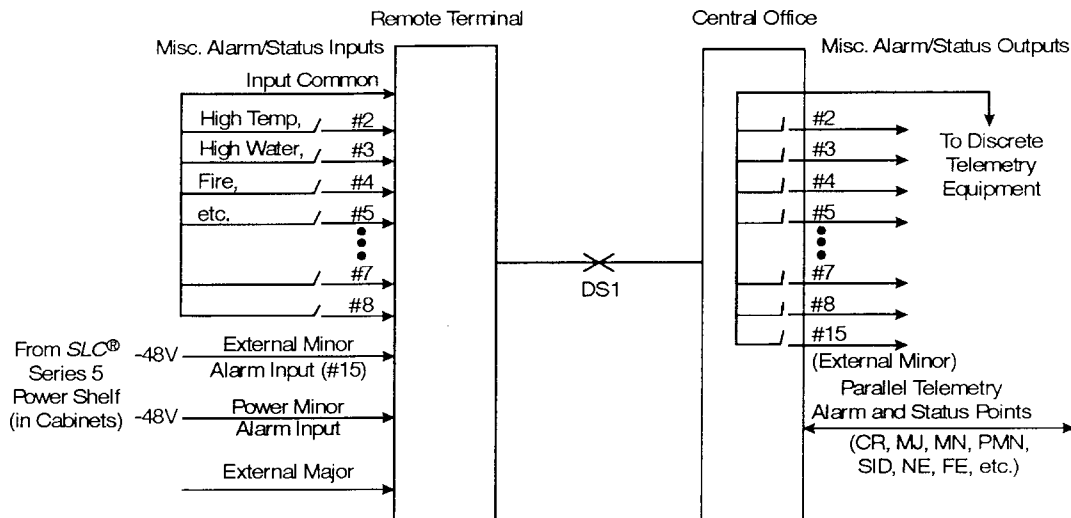
The severity of user settable miscellaneous discrete environmental alarm inputs may be provisioned as Critical (CR), Major (MJ), Minor (MN), or Not Alarmed (NA). If an input is provisioned as "NA" it is reported as a *status* condition (i.e., not an alarm), and does not activate any other parallel telemetry SID or FE ID outputs. (Only the corresponding miscellaneous *output* is activated when the input is active.)

When a remote miscellaneous discrete environmental input is provisioned as an *alarm* (MJ, MN, CR), and the input is active, the appropriate miscellaneous output, an ID output (SID or one of the FE IDs), and an output which indicates the severity of the condition (MJ, MN, CR, etc.), will be activated.

⇒ NOTE:

TR-08 datalinks only support MJ and MN severities.

The operation of these miscellaneous discrete environmental alarm and status points is dependent on the wiring of the same at the remote SLC-2000 system per SLC®-2000 Access System Central Office Terminal Application Schematic, SD-7C180-01, CAD 24, and Figure 7-2.



Note:

1. In a remote terminal, the output common must be wired to ground in all applications.

Figure 7-2. Miscellaneous Discrete Environmental Alarms and Controls (Parallel Telemetry at Central Office)

Table 7-1 identifies the SLC-2000 system miscellaneous discrete environmental alarm and status points available at the SLC-2000 system COT with the DS1 Feeder. Additional points may be wired at installation if future upgrade to a SONET feeder is anticipated. In this case the wire IDs shown in Table 5-4, in Section 5 of this document, should be used.

Table 7-1 SLC-2000 System Central Office (CO) DS1 Feeder Miscellaneous Discrete Environmental Alarm and Status Points

Wire ID (Note)	Type	Scan Point Description
QDSXI/O02	NSA	Misc. Discrete Env. Alarm/Status 2
QDSXI/O03	NSA	Misc. Discrete Env. Alarm/Status 3
QDSXI/O04	NSA	Misc. Discrete Env. Alarm/Status 4
QDSXI/O05	NSA	Misc. Discrete Env. Alarm/Status 5
QDSXI/O06	NSA	Misc. Discrete Env. Alarm/Status 6
QDSXI/O07	NSA	Misc. Discrete Env. Alarm/Status 7
QDSXI/O08	NSA	Misc. Discrete Env. Alarm/Status 8
QDSXI/O15	NSA	External Minor

Note: Refer to SLC[®]-2000 Access System Application Schematic, SD-7C180-01, CAD 5 and 24.

The following explanations are provided for the SLC-2000 system miscellaneous discrete environmental alarm and status points. The conditions that may trigger the miscellaneous discrete environmental alarm and status points are listed, using exactly the same condition descriptions used in the SLC-2000 system user interface alarm and status report, for example, `environmentxx`. For explanations of these conditions, refer to the Alarm and Status Condition Description Table 3-9, located in Section 3 of this document.

Each miscellaneous discrete environmental alarm and status output point reported via parallel telemetry stays on for a *minimum* of 20 seconds so that all alarms will be received by the OS, even though the OS polling interval for telemetry remotes without memory is 20 seconds.

Misc. Discrete Env # — These 7 points indicate when the following is detected at a remote terminal (RT) site:

■ `environmentxx`

Because these miscellaneous discrete environmental alarm and status points are user settable, the text description of the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point must be provisioned at the OS.

External Minor — This indicates if the following is detected:

■ `ExternalMinor`

Because this miscellaneous discrete environmental alarm and status point is user settable, the text description of the actual condition monitored and reported by this miscellaneous discrete environmental alarm and status point must be provisioned at the OS. This input activates MN on all in-service VRTs.

External Major — This indicates if the following is detected:

■ ExternalMajor

The input is provided to monitor dual ringing failure at the RT. The status of this alarm is CR on the TR303 VRT (Release 4.0), and MJ on all in-service TR-08 VRTs.

Miscellaneous Discrete Environmental Control Points

Four user settable miscellaneous discrete environmental control points are available to allow control of equipment collocated with a SLC-2000 system at a *remote* site. They may be connected in case of future upgrade to a SONET feeder, but are not supported with the DS1 feeder. Refer to Section 5 of this document, Table 5-5 for details.

Miscellaneous Inputs to VRT Mappings

AT&T 363-208-001, *SLC[®]-2000 Access System User/Service Manual*, contains virtual remote terminal (VRT) descriptions. Each TR-08 VRT has a datalink. Miscellaneous inputs, power minor alarms (PMN), external major alarms, and external minor alarms are mapped into the TR-08 datalinks. See Table 7-3. A SLC-2000 system can support up to 7 Mode 1 VRTs. An RT can support 8 TR-08 VRTs if VRT7 and VRT8 are set to Mode 2. In order for the EXTPWRMN or MISC2 through 7 inputs to be supported, the corresponding VRT must be in service as shown in Table 7-3.

Table 7-2. SLC-2000 Access System RT Detectors

Scan Point Description	VRT	TR08 Alarm
Misc. Discrete Env. Alarm/Status 2	2	MISC**
Misc. Discrete Env. Alarm/Status 3	3	MISC**
Misc. Discrete Env. Alarm/Status 4	4	MISC**
Misc. Discrete Env. Alarm/Status 5	5	MISC**
Misc. Discrete Env. Alarm/Status 6	6	MISC**
Misc. Discrete Env. Alarm/Status 7	7	MISC**
Misc. Discrete Env. Alarm/Status 8	8*	MISC**
External Minor (EXTMN)	All (1-8)	MN
External Major (EXTMJ)	All (1-8)	MJ
External Power Minor (EXTPWRMN)	1	MISC**

* Only used if VRT 7 and VRT8 are set to Mode 2.

** Depending on the provisioned severity, the appropriate parallel telemetry output (MJ, MN) is asserted.

The COT receives the alarms via these datalinks and maps them to output closures. Table 7-3 shows which LIU needs to be equipped for each environmental alarm point. A COT can only support up to 7 Mode 1 VRTs.

Table 7-3. SLC-2000 Access System COT Closures

Closure Description	LIU
Misc. Discrete Env. Alarm/Status 2	2
Misc. Discrete Env. Alarm/Status 3	3
Misc. Discrete Env. Alarm/Status 4	4
Misc. Discrete Env. Alarm/Status 5	5
Misc. Discrete Env. Alarm/Status 6	6
Misc. Discrete Env. Alarm/Status 7	7
Misc. Discrete Env. Alarm/Status 8	8
External Minor	—
External Major (EXTMJ)	—
External Power Minor (EXTPWRMN)	1

Additional points may be wired at installation if future upgrade to a SONET feeder is anticipated. In this case the wire IDs shown in Table 5-4, in Section 5 of this document, should be used

Glossary

1+1 Line Protection

A 1+1 protection system has two bidirectional lines. The transmitting terminal transmits the same signal on both lines. The receiving terminal monitors each line independently and chooses one line as the working line and the other line as the standby line. When a protection switch occurs, the receiving terminal selects the signal from the standby line which causes the standby line to be the new working line. The original working line becomes the standby line. This status remains the same (nonrevertive) after the fault clears.

1x1 Line Protection

A 1x1 protection system has two bidirectional lines. One line is designed as the service line, and the other line is designed as the protection line. The service line normally carries traffic. When a protection switch occurs, the protection line is selected to carry traffic. When the fault clears, the original service line is selected (revertive).

A

ABN

Abnormal (status condition)

ACO

Alarm Cutoff — A push-button switch available on the user panel that can be used to retire an audible office alarm.

ACO/TST

Alarm Cutoff and Test — The name of a push-button on the user panel.

AID

Access Identifier

Active

Active identifies a 1+1 protected OC-N line which is currently selected by the receiver at either end as the payload carrying signal or a 1x1 or 1xn protected circuit pack that is currently carrying service. (See Standby.)

AIS

Alarm Indication Signal — A code transmitted downstream in a digital network that shows that an upstream failure has been detected and alarmed.

ALMCDE

Alarm code

ALMMMSG

Alarm message description

ALMTYPE

Alarm type

AMI

Alternate Mark Inversion — A line code that employs a ternary signal to convey binary digits, in which successive binary ones are represented by signal elements that are normally of alternating positive and negative polarity but equal in amplitude and in which binary zeros are represented by signal elements that have zero amplitude.

ANSI

American National Standards Institute

ASN.1

Abstract Syntax Notation 1

APS

Automatic Protection Switch

AS&C

Alarm, Status, and Control

ASCII

American Standard Code for Information Interchange — A standard 8-bit code used for exchanging information among data processing systems and associated equipment.

ASN.1

Abstract Syntax Notation 1

Auto

Automatic — One possible state of a DS1 or DS3 port. In this state, the port will automatically be put in service if a good signal is detected coming from the DSX panel.

Automatic Protection Switch

A protection switch that occurs automatically in response to an automatically detected fault condition.

Automatic Synchronization Reconfiguration

A feature that allows another synchronization source to be automatically selected and the synchronization source provisioning to be automatically reconfigured in the event of a synchronization source failure or network synchronization change (for example, a fiber cut).

AUXCTL

Auxiliary Control — The name of the slot to the left of the SYSCTL slot on the DDM-2000 OC-3 shelf.

B**B3ZS**

Bipolar 3-Zero Substitution — A line coding method that replaces a string of three zeros with a sequence of symbols having some special characteristic.

B8ZS

Bipolar 8-Zero Substitution — A line coding method that replaces a string of eight zeros with a sequence of symbols having some special characteristic.

BER

Bit Error Ratio — The ratio of bits received in error to the total bits sent.

BIP

Bit Interleaved Parity — A method of error monitoring over a specified number of bits, that is, BIP-3 or BIP-8.

BITS

Building Integrated Timing Supply

Broadband

Any communications channel with greater bandwidth than a voice channel; sometimes used synonymously with wideband.

C**CAD**

Cable Diagram

CC

Clear Channel

CCITT

International Telephone and Telegraph Consultative Committee — An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications.

CEV

Controlled Environment Vault

CIMAP

Circuit Installation and Maintenance Assistance Package operations system

CIT

Craft Interface Terminal

CLF

Carrier Line Failure Status

CLK

Clock	
CMOS	Complementary-Symmetry Metal Oxide Semiconductor
CO	Central Office
COACH	Customized On-Line Aid for Customer Help
CONDDESCR	Condition description
CONDEFF	Condition effect
CONDTYPE	Condition type
CP	Circuit Pack
CR	Critical (alarm status)
CSA	Carrier Serving Area
CS&O	Customer Support and Operations
CTAG	Correlation tag
CTS	Clear To Send
CU	Channel Unit
CUG	Closed User Group
CV	Coding Violation (a performance-monitoring parameter)
CVFE	Coding Violation Far-End — An indication returned to the transmitting terminal that an errored block has been detected at the receiving terminal.

D

DACS

Digital Access and Cross-Connect System

DACS III-2000

Digital Access and Cross-Connect System that provides clear channel switching at either the DS3 or the STS-1 rates, eliminating the need for manual DSXs.

DACS IV-2000

Digital Access and Cross-Connect System that provides electronic DS3/STS-1 or DS1/VT1.5 cross-connect capability, eliminating the need for manual DSXs.

DCC

Data Communications Channel — The embedded overhead communications channel in the SONET line. It is used for end-to-end communications and maintenance. It carries alarm, control, and status information between network elements in a SONET network.

DCD

Received line signal detector

DCE

Data Circuit-Terminating Equipment — In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

DDM-1000

AT&T's Dual DS3 Multiplexer — A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or optical signal.

DDM-2000

AT&T's next generation network multiplexer that multiplexes DS1, DS3, or STS-1E inputs into an STS-1E, OC-3 or OC-12 outputs.

Default Provisioning

The parameter values that are preprogrammed as shipped from the factory.

Demultiplexing

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

DEMUX

Demultiplexer - the DEMUX direction is from the fiber toward the DSX.

Digital Multiplexer

Equipment that combines by time-division multiplexing several digital signals into a single composite digital signal.

DIRN

Direction

DLC

Digital Loop Carrier

DPLL

Digital Phase-Locked Loop

DRI

Dual Ring Interworking. Two ring networks interconnected at two common nodes.

Drop and continue

A technique that allows redundant signal appearances at two central offices in a DRI network, allowing protection against central office failures.

DS1

Digital Signal Level 1 (1.544 M/bs)

DS1 Circuit Pack

The DS1 interface circuit pack interfaces to the DSX-1 panel.

DS3

Digital Signal Level 3 (44.736 M/bs)

DS3 Circuit Pack

The DS3 circuit pack interfaces to the DSX-3 panel.

DSn

Digital Signal Rate n — One of the possible digital signal rates at DDM-2000 interfaces: DS1 (1.544 Mb/s), DS3 (44.736 Mb/s).

DSNE

Directory Services Network Element

DSR

DCE ready

DTR

DTE ready

DSX

Digital Cross-Connect Panel — A panel designed to interconnect equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3 rate.

DT

Distant Terminal

DTE

Data Terminating Equipment — That part of a data station that serves as a data source (originates data for transmission), a data sink (accepts transmitted data), or both.

E

EC-1, EC-n

Electrical Carrier — The basic logical building block signal with a rate of 51.840 Mb/s for an EC-1 signal and a rate of n times 51.840 Mb/s for an EC-n signal. An EC-1 signal can be built in two ways: A DS1 can be mapped into a VT1.5 signal and 28 VT1.5 signals can be multiplexed into an EC-1 (VT1.5 based EC-1), or a DS3 can be mapped directly into an EC-1 signal (DS3 based EC-1).

ECI

Equipment Catalog Item — The bar code number on the faceplate of each circuit pack used by some inventory systems.

EEPROM

Electrically Erasable Programmable Read-Only Memory

EIA

Electronic Industries Association

EMC

Electromagnetic Compatibility

EMI

Electromagnetic Interference

EOOF

Excessive Out of Frame

EPN

Endpoint Number

EPROM

Erasable Programmable Read-Only Memory

EQ

Equipped (memory administrative state)

ES

Errored Seconds — A performance-monitoring parameter. ES type A (ESA) is a second with exactly one error; ES type B (ESB) is a second with more than one and less than the number of errors in a severely errored second for the given signal. ES by itself means the sum of the type A and type B ESs.

ESA

Errored seconds type A. See ES.

ESB

Errored seconds type B. See ES.

ESD

Electrostatic Discharge

ESF

Extended Super Frame (format for DS1 signal)

F

FDDI

Fiber Distribution Data Interface

FE

Far End

FE-ACTY

Far End Activity — An LED on the user panel.

FEBE

Far End Block Error — An indication returned to near-end transmitting node that an errored block has been detected at the far end.

FE ID

Far End Identification — The 7-segment display on the faceplate of the SYSCTL circuit pack.

FEPROM

Flash EPROM — A new technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

FERF

Far-End-Receive Failure — An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure.

FE SEL

Far End Select — An LED on the user panel.

FIT

Failures in 10^9 hours of operation

FLS

Frame Loss Seconds

Free Running

An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000

AT&T's SONET OC-48 Lightwave System

Function Unit (FN)

Refers to any one of a number of different circuit packs that can reside in the A, B, or C function unit slots on the DDM-2000 OC-3 multiplexer, or in the A, B, C, or D function unit slots of the DDM-2000 OC-12 Multiplexer.

G

GNE

Gateway Network Element — A network element provides the OS interface for itself and the other network elements in the subnetwork.

GTP

General Telemetry Processor

H

Holdover

An operating condition of a clock in which its local oscillator is not locked to an external reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

HS

High Speed

I

IEC

International Electrotechnology Commission

IIAC

Input, Invalid Access Identifier

IICM

Input, Invalid Command

IICT

Input, Invalid Correlation Tag

IIDT

Input, Invalid Data Parameter

IISP

Input, Invalid Syntax or Punctuation

IITA

Input, Invalid Target Identifier

IM

Interim Methods

INC

Incoming Status

INCM

A parallel telemetry point used to indicate incoming low-speed failures.

I/O

Input/Output

IR

Intermediate Reach

IS

In Service — One possible state of a DS1, DS3, or STS-1E port. Other possible states are auto (automatic) and nmon (not monitored).

IS-3

Interconnect Signal Level 3

J

Jitter

Timing jitter is defined as short-term variations of the significant instants of a digital signal from their ideal positions in time.

L

LAN

Local Area Network

LAPB

Link Access Procedure B

LAPD

Link Access Procedure D

LBO

Line Build Out — An equalizer network between the DDM-2000 multiplexer and the DSX panel. It guarantees the proper signal level and shape at the DSX panel.

LCN

Local Communications Network

LCN

Logical Channel Number

LED

Light Emitting Diode — Used on a circuit pack faceplate to show failure (red) or service state. It is also used to show the alarm and status condition of the system.

LOF

Loss of Frame

LOGINS

User identifiers

Loop Timing

A timing mode in which the terminal derives its transmit timing from the received line signal.

LOP

Loss of Pointer

LOS

Loss of Signal

LR

Long Reach

LS

Low Speed

LTA

Lightwave Terminating Assembly

M**Main**

Two slots on the DDM-2000 OC-3 shelf in which the OLIU circuit packs are installed.

MD

Mediation Device

Midspan Meet

The capability to interface between two lightwave terminals of different vendors. This applies to high-speed optical interfaces.

MJ

Major Alarm

MML

huMan-Machine Language defined by CCITT

MN

Minor Alarm

MTBF

Mean Time Between Failures

MTBMA

Mean Time Between Maintenance Activities

Multiplexing

The process of combining several distinct digital signals into a single composite digital signal.

MUX

Multiplex

MXRVO Circuit Pack

The MXRVO circuit pack multiplexes seven VT-G signals from the DS1 circuit packs to an STS-1 signal for connection to the OLIU circuit packs.

N

NA

No Acknowledgment

NE

Near End

NE

Network Element — The basic building block of a telecommunications network that meets SONET standards. Typical internal attributes of a network element include: one or more high- and low-speed transmission ports, built-in intelligence, synchronization and timing capability, access interfaces for use by technicians and/or operations systems. In addition, a network element may also include a time slot interchanger.

NE-ACTY

Near End Activity — An LED on the user panel.

NEBS

Network Equipment-Building System

nm

Nanometer (10^{-9} meters)

NMA

Network Monitoring and Analysis — An operations system designed by Bellcore which is used to monitor network facilities.

NMON

Not Monitored — A provisioning state for equipment that is not monitored or alarmed.

Non-Revertive

A protection switching mode in which, after a protection switch occurs, the equipment remains in its current configuration after any failure conditions that caused a protection switch to occur clear or after any external switch commands are reset. (See Revertive.)

NRZ

Nonreturn to Zero

NSA

Not Service Affecting

NSAP

Network Service Access Point

Null

Omitted; for example, no value, zero or space.

O**OAM&P**

Operations, Administration, Maintenance, and Provisioning

OC, OC-n

Optical Carrier — The optical signal that results from an optical conversion of an STS signal; that is, OC-1 from STS-1 and OC-n from STS-n.

OC-1

Optical Carrier Level 1 Signal (51.84 Mb/s)

OC-3

Optical Carrier Level 3 Signal (155 Mb/s)

OC-3c (STS-3c)

Optical Carrier Level 3 concatenated Signal — The low-speed broadband signal equivalent to 3 STS-1 signals linked together with a single path overhead

OC-12

Optical Carrier Level 12 Signal (622 Mb/s)

OHCTL

The overhead controller circuit pack provides user access to the SONET overhead channels.

OLIU

Optical Line Interface Unit

OOF

Out of Frame

OOL

Out of Lock

Operations Interface

Any interface that provides information on the system performance or control. These include the equipment LEDs, user panel, CIT, office alarms, and all telemetry interfaces.

OPS/INE

Operations Systems/Intelligent Network Elements. This is an operations system that allows centralized provisioning of intelligent network elements.

Original Value

The value assigned to a parameter by the factory.

OS

Operations System — A central computer-based system used to provide operations, administration, and maintenance functions.

OSI

Open Systems Interconnect. This is a communications protocol of the International Standards Organization (ISO) for data communications.

OSMINE

Operations Systems Modifications for Intelligent Network Elements

OSP

Outside Plant

P

Parameter

A characteristic of the system that affects its operation.

PASSWORDS

Private identifiers

PC

Personal Computer

Phase Locked

An operating condition of a clock in which it is locked to an external reference and is using time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

PID

Private Identifier (or password).

PINFET

Positive Intrinsic Negative Field Effect Transistor

PJC

Pointer Justification Count

Plesiochronous Network

A network that contains multiple subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant. For example in SONET networks, each timing traceable to their own Stratum 1 clock are considered plesiochronous with respect to each other.

PLL

Phased-Locked Loop

PM

Performance Monitoring — Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

PMN

Power Minor Alarm

Proactive Maintenance

Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect (for example, performance monitoring).

POH

Path Overhead

Port

The physical, electrical, or optical interface on a system.

Protection Line

As defined by the SONET standard, the protection line is the pair of fibers (one transmit and one receive) that carry the SONET APS channel (K1 and K2 bytes in the SONET line overhead). On a DDM-2000 OC-3 system, a *protection* line is a pair of fibers that terminate on an OLIU circuit pack in the **main-2**, **fn-a-2**, **fn-b-2**, or **fn-c-2** slot. (See Service Line.)

PROT

Protection

PSC

Protection Switching Count

PVC

Permanent Virtual Circuit

PWR

Power

R**RAM**

Random Access Memory

RBOC

Regional Bell Operating Company

RC

Receiver signal element timing (DOE to DTE)

RD

Received Data

RL

Repeat Later

Reactive Maintenance

Refers to detecting defects/failures and clearing them.

Revertive

A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the service equipment is active, and the pro-

tection equipment is standby) after any failure conditions that caused a protection switch to occur clear or after any external switch commands are reset. (See Non-Revertive.)

RT

Remote Terminal — An unstaffed equipment enclosure that may have a controlled or uncontrolled environment.

RTAC

AT&T Regional Technical Assistance Center (1-800-225-RTAC)

RTS

Request To Send

RZ

Return to Zero

S

SA

Service Affecting

SA

Service Area

SCID

SONET Carrier ID

SD

Signal Degrade

SD

Schematic Drawing

SDNR

Status, Data Not Ready

SEFS

Severely Errored Frame Seconds

Self-healing

A ring architecture in which two or more fibers are used to provide route diversity. Node failures only affect traffic dropped at the failed node.

SEO

Single-Ended Operations

Service Line

On a DDM-2000 OC-3 system, a service (or working) line is a pair of fibers (one transmit and one receive) that terminate on an OLIU circuit pack in the **main-1**, or **fn-a-1**, or **fn-b-1**, or **fn-c-1** slot. As defined by the SONET standard, the SONET APS channel is not defined on a service (or working) line. (See Protection Line.)

SES

Severely Errored Seconds — A performance-monitoring parameter for an OC-3 line. A second with more than 32 errors is considered severely errored.

SF

Signal Fail

SG

Signal Ground

SID

Source Identifier

SLO@-2000 Access System

A next generation digital loop carrier (DLC) system with a built-in OC-3 SONET multiplexer. The system supports basic telephone service, a full complement of special services, Integrated Services Digital Network (ISDN), and Fiber in the Loop (FITL) through standard TR-08 and TR-303 interfaces.

SONET

Synchronous Optical Network

SPE

Synchronous Payload Envelope

SQU

Sync Quality Unknown. Used in synchronization messaging.

SR

Service Region

SROF

Status, Requested Operation Failed

SRVEFF

Service affecting

Standby

Standby identifies a 1+1 protected OC-N line which is not currently selected by the receiver at either end as the payload carrying signal, or a 1x1 or 1xn protected circuit pack that is not currently carrying service. (See Active.)

Status

The indication of a short-term change in the system.

STS, STS-n

Synchronous Transport Signal — The basic logical building block signal with a rate of 51.840 Mb/s for an STS-1 signal and a rate of n times 51.840 Mb/s for an STS-n signal.

STS-1 SPE

STS-1 Synchronous Payload Envelope — A 125-microsecond frame structure composed of STS path overhead and the STS-1 payload.

STS-3c

Synchronous Transport Level 3 concatenated Signal. See OC-3c.

Subnetwork

A subnetwork consists of a CO (or GNE) DDM-2000 and all the remote DDM-2000s connected via SONET section DCC that are enabled.

SVC

Switched Virtual Circuit

Synchronous

Refers to network elements that are timed from references traceable to a single Stratum-1 source.

SYSCTL

The system controller circuit pack that provides overall administrative control of the terminal.

T

T1X1 and T1M1

The ANSI committees responsible for telecommunications standards.

TA

Bellcore Technical Advisory

TABS

Telemetry Asynchronous Byte Serial (Protocol)

TBOS

Telemetry Byte-Oriented Serial (Protocol) — Defines one physical interface for direct connection between the telemetry remote and the monitored equipment. An RS-422 port is used to provide the operations system with sufficient alarm and status information to localize a problem to a given DDM-2000 and to determine the severity of the problem.

TC

Transmitter signal element timing (DCS to DTE)

TCA

Threshold-Crossing Alert — A condition set when a performance-monitoring counter exceeds a user-selected threshold. A TCA does not generate an alarm but is available on demand through the CIT and is shown by TBOS and causes a message to be sent to NMA via the X.25/TL1 interface.

TCVCXO

Temperature-Compensated Voltage-Controlled Crystal Oscillator — A highly stable and accurate clock source used in the DDM-2000 TGS circuit pack.

TD

Transmitted Data

TGS

The timing generator circuit pack generates clock signals for distribution to the transmit circuits. It operates in the free-running, loop-timing, phase-lock, and holdover modes.

TID

Target Identifier — The Bellcore name for the system name.

TL1

Transaction Language 1 — A Bellcore machine-to-machine communications language that is a subset of CCITT's human-machine language.

TLMCTL

The TLMCTL circuit pack provides the optional parallel telemetry interface in the central office DDM-2000 OC-3 Release 1.

TOP

Task Oriented Practice

TR

Bellcore Technical Requirement

TSA

Time Slot Assignment

TSI

Time Slot Interchange

TSO

Technical Support Organization — Supports RTAC and the customers.

U

UAS

Unavailable Seconds

UID

User Identifier (or login).

Unidirectional

A protection switching mode in which the system at each end of an optical span monitors both service and protection lines and independently chooses the best signal (unless overridden by an equipment failure or by an external request, such as a forced switch or lockout). In a system that uses unidirectional line switching, both the *service* and *protection* lines may be *active* simultaneously, with one line carrying traffic in one direction and the other line carrying traffic in the other direction. The K1 and K2 bytes in the SONET line overhead are used to convey to the far end which line the near end receiver has chosen, so that an active indication may be made at the far end.

UPD/INIT

A push-button on the user panel.

V

VCS

Virtual Circuit Switch (for example, Datakit®)

VF

Voice Frequency

VLSI

Very Large Scale Integration — Refers to very complex state of the art integrated circuits.

VM

Violation Monitor — A mode of the DS3 circuit pack in which it will monitor but not remove P-bit parity violations on the DS3 signal received from the fiber.

VMR

Violation, Monitor, and Removal — A mode of the DS3 circuit pack in which it will monitor and remove P-bit parity violations on the DS3 signal received from the fiber.

VT

Virtual Tributary — A structure designed for transport and switching of sub STS-1 payload.

VT1.5

A 1.728 Mb/s virtual tributary

VT-G

Virtual Tributary Group — A 9-row by 12-column SONET 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 STS-1 synchronous payload envelope.

W

WFA

Work Force Administration

Z

Zero Code Suppression

A technique used to reduce the number of consecutive zeros in a line-codes signal (B3ZS for DS3 signals and B8ZS for DS1 signals).

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