Lucent Technologies
Bell Labs Innovations

DDM-2000 Multiplexers OC-3, OC-12, and FiberReach

Operations Systems Engineering Guide

824-102-151
Issue 3
October 1998

Copyright © 1998 Lucent Technologies.
All Rights Reserved.
Printed in U.S.A.

This material is protected by the copyright laws of the United States and other countries. It may not be reproduced, distributed, or altered in any fashion by any entity, including other Lucent Technologies Business Units or Divisions, without the permission of Lucent Technologies. For permission to reproduce or distribute, contact your local Lucent Technologies Account Executive or Market Manager.

Notice

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

Mandatory Customer Information

Interference Information: Part 15 of FCC Rules

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Security

In rare instances, unauthorized individuals make connections to the telecommunications network through the use of remote access features. In such event, applicable tariffs require that the customer pay all network charges for traffic. Lucent Technologies cannot be responsible for such charges and will not make any allowance or give any credit for charges that result from unauthorized access.

Trademarks

COMMON LANGUAGE is a registered trademark and CLEI, CLLI, CLCI, and CLFI are trademarks of Bell Communications Research, Inc.
DACScan is a registered trademark of Lucent Technologies.
Datakit is a registered trademark of Lucent Technologies.
Dataphone is a registered trademark of AT&T.
LGX is a registered trademark of Lucent Technologies.
Megastar is a registered trademark of Harris Corporation.
NMA is a trademark of Bell Communications Research, Inc.
RIDES is a registered trademark of Ericsson Raynet.
SLC is a registered trademark of Lucent Technologies.

Warranty

The terms and conditions of sale will include a five-year warranty on hardware and a one-year warranty on software.

Document Ordering Information

The ordering number for this document is 824-102-151. To order this document, call 1-888-LUCENT8. RBOC/BOC customers should process document orders or standing order requests through their Company Documentation Coordinator. For more ordering information, refer to "How to Order Documents" in the Section "About this Document."

Customer Assistance and Technical Support

The Lucent Technologies Regional Technical Assistance Center (RTAC) provides a technical assistance telephone number which is monitored 24 hours a day. The technical assistance telephone number is also available for customers to provide feedback and enhancement suggestions for improving the FT-2000 OC-48 Lightwave System. To receive technical assistance or to provide feedback and enhancement suggestions, simply call 1-800-225-RTAC.

Documentation Support

Lucent Technologies provides a telephone number for customers to report errors or to ask questions about the information in this document. The support telephone number is 1-888-LTINFO6 or 1-910-727-6681.

Developed by Lucent Technologies Network Systems Customer Training and Information Products.

How Are We Doing?

Document Title: DDM-2000 Multiplexers OC-3, OC-12, and FiberReach Operations Systems Engineering Guide

Document No.: 824-102-151 Issue 3 Date: October 1998

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

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

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

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

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

Please provide details for the suggested improvement. _____

_____

3. What did you like most about this document?

_____

_____

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

_____

_____

_____

_____

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

Name: _____ Telephone Number: _____

Company/Organization: _____ Date: _____

Address: _____

When you have completed this form, please fold, tape, and return to address on back or Fax to: 336-727-3043.

Do Not Cut—Fold Here And Tape

Lucent Technologies
Bell Labs Innovations

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

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

POSTAGE WILL BE PAID BY ADDRESSEE

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

How Are We Doing?

Document Title: DDM-2000 Multiplexers OC-3, OC-12, and FiberReach Operations Systems Engineering Guide

Document No.: 824-102-151 Issue 3 Date: October 1998

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

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

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

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

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

Please provide details for the suggested improvement. _____

_____

3. What did you like most about this document?

_____

_____

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

_____

_____

_____

_____

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

Name: _____ Telephone Number: _____

Company/Organization: _____ Date: _____

Address: _____

When you have completed this form, please fold, tape, and return to address on back or Fax to: 336-727-3043.

Do Not Cut—Fold Here And Tape

Lucent Technologies
Bell Labs Innovations

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

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

POSTAGE WILL BE PAID BY ADDRESSEE

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

Contents

About This Document i

- Purpose xv
- Intended Audiences xv
- Reason for Reissue xv
- Related Documentation xvii
- Related Training xxiv
- Engineering and Installation Services xxvi
- Customer Technical Support xxvii
- Documentation Support xxxi
- How to Order Documents xxxii
- How to Comment on This Document xxxiii
- Electronic Documentation xxxiii

1 Introduction 1-1

- Overview 1-1
- Introduction to the Lucent Technologies 2000 Product Family 1-2
- Introduction to Operations Systems Interfaces 1-3
- Introduction to This Document 1-3

2 TL1/X.25 Interface 2-1

- Overview 2-1
- Introduction 2-1
- TL1-Related Provisioning 2-2
- Resynchronization, Automatic Alarm, and Status, of the OS 2-12
- One DDM-2000 Subnetwork per TL1/X.25 Link 2-12
- X.25 Technical Specifications 2-13
- ***Datakit***® Provisioning 2-17
- Multiplexer Cabling 2-30

Contents

- NMA Data Base Definition 2-31

3 DDM-2000 TL1 Message Details 3-i

- Overview 3-1
- TL1 Messages 3-3
- Access Identifier Parameter Values 3-885
- Alarm and Status Condition Description 3-892
- Monitored Parameter Types 3-916
- Provisionable PM Parameters 3-917
- Condition Types 3-925
- TL1 Character Set Definitions 3-928

4 Serial Telemetry 4-1

- Overview 4-1
- Introduction 4-1
- Related Provisioning 4-2
- Multiplexers per Link 4-14
- Tests 4-14
- Alarm and Status Points — DDM-2000 OC-3 4-15
- Alarm and Status Points — DDM-2000 OC-12 4-32
- Alarm and Status Points — DDM-2000 OC-12 Regenerator 4-44
- Control Points — DDM-2000 OC-3 4-50
- Control Points — DDM-2000 OC-12 4-54
- Control Points — DDM-2000 OC-12 Regenerator 4-58
- Alarm and Status Point — TL1 Translation 4-60
- Control Point — TL1 Translation 4-66
- NMA Scan Point Definition 4-66
- Alarm and Status Points — FiberReach 4-70
- Control Points — FiberReach 4-73

Contents

5 Parallel Telemetry 5-1

- Overview 5-1
- Introduction 5-1
- Related Provisioning 5-2
- Wiring Together Multiplexers in a Bay 5-13
- Tests 5-13
- Alarm and Status Points 5-14
- Control Point 5-18
- Alarm and Status Points — TL1 Translations 5-19
- NMA Scan Point Definition 5-22
- Central Office — Miscellaneous Discrete Environmental Conditions 5-22

GL Glossary GL-1

Figures

About This Document

1. Customer Support Levels xxviii

2 TL1/X.25 Interface

2-1. Example of TL1-Related Provisioning for OC-3 Applications Only 2-10
2-2. Example of TL1-Related Provisioning for a Combined OC-3 and OC-12 Application 2-11
2-3. ***Datakit*** Provisioning Example 2-18
2-4. ***Datakit*** II to DDM-2000 Cabling Arrangement 2-30

4 Serial Telemetry

4-1. Example of TBOS-Related Provisioning for DDM-2000 OC-3 Multiplexer Applications Only 4-11
4-2. Example of TBOS-Related Provisioning for a Combined DDM-2000 OC-3, OC-12, or OC-12 Regenerator Multiplexer Application 4-12
4-3. Example of TBOS-Related Provisioning for a Combined DDM-2000 OC-3 and FiberReach Multiplexer Application 4-13
4-4. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG5 SYSCTL (TBOS or TL1/X.25 at Central Office) 4-26
4-5. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG8 SYSCTL (TBOS or TL1/X.25 at Central Office) 4-27

Figures

4-6. FiberReach Miscellaneous Discrete Environmental Alarms and Controls (TBOS or TL1/X.25 at Central Office) 4-28

5 Parallel Telemetry

5-1. Example of Parallel Telemetry-Related Provisioning for DDM-2000 OC-3 Only Applications 5-11
5-2. Example of Parallel Telemetry-Related Provisioning for a Combined DDM-2000 OC-3, OC-12, or OC-12 Regenerator Application 5-12
5-3. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG5 SYSCTL (Parallel Telemetry at Central Office) 5-24
5-4. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG8 SYSCTL (Parallel Telemetry at Central Office) 5-25
5-5. FiberReach Multiplexer Miscellaneous Discrete Environmental Alarms and Controls (Parallel Telemetry at Central Office) 5-26

Tables

About This Document

1. Documentation Order Information xxxii

2 TL1/X.25 Interface

2-1. TL1/X.25 Interface — Virtual Circuit Assignments 2-13
2-2. TL1/X.25 Interface — X.25 Packet Layer Parameters 2-14
2-3. TL1/X.25 Interface — Valid SVC Facilities 2-15
2-4. TL1/X.25 Interface — LAPB Link Layer Parameters 2-15
2-5. TL1/X.25 Interface — EIA-232D Pin Connections 2-16

4 Serial Telemetry

4-1. DDM-2000 OC-3 TBOS Alarm and Status Points 4-15
4-2. DDM-2000 OC-12 TBOS Alarm and Status Points 4-32
4-3. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Points 4-44
4-4. DDM-2000 OC-3 TBOS Control Points 4-50
4-5. DDM-2000 OC-12 TBOS Control Points 4-54
4-6. DDM-2000 OC-12 Regenerator TBOS Control Points 4-58
4-7. DDM-2000 OC-3 TBOS Alarm and Status Point Translation to TL1 Messages 4-61
4-8. DDM-2000 OC-12 TBOS Alarm and Status Point Translation to TL1 Messages 4-63

Tables

4-9. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Point Translation to TL1 Messages 4-65
4-10. NMA Field Label to TL1 Parameter Name Mapping 4-66
4-11. Recommended Abbreviations for TL1 CONDTYPE Entries 4-67
4-12. SONET Signal Mapping 4-68
4-13. FiberReach TBOS Alarm and Status Points 4-70
4-14. FiberReach TBOS Control Points 4-73

5 Parallel Telemetry

5-1. Site Number to Parallel Telemetry Far-End ID Mapping 5-5
5-2. Central Office Parallel Telemetry Alarm and Status Points 5-14
5-3. Central Office Parallel Telemetry Control Point 5-18
5-4. TL1 Translation — Option 1. Parallel Telemetry Alarm and Status Point Translation to TL1 Messages 5-20
5-5. TL1 Translation — Option 2. Parallel Telemetry Alarm and Status Point Translation to TL1 Messages 5-21
5-6. Central Office Parallel Telemetry Miscellaneous Discrete Environmental Alarm and Status Points 5-28
5-7. Central Office Parallel Telemetry Miscellaneous Discrete Environmental Control Points 5-31
5-8. TL1 Translation — Parallel Telemetry Miscellaneous Discrete Environmental Alarm and Status Point Translation to TL1 Messages 5-32

About This Document

Purpose

This document includes operations system (OS) engineering information for:

- DDM-2000 OC-3 Multiplexer (Releases 1.0 through 13.0, including Release 11.1)
- DDM-2000 OC-12 Multiplexer (Releases 1.0 through 7.0)
- DDM-2000 OC-12 Regenerator (Releases 1.0 and 2.0)
- DDM-2000 FiberReach Multiplexer (Release 2.1 through 3.0 including Release 2.2).

Unless other specific references are provided, DDM-2000 implies the OC-3, OC-12 and FiberReach Series.

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 DDM-2000 Multiplexer.

Reason for Reissue

This document, Issue 3, replaces the DDM-2000 OC-3, OC-12 and FiberReach Multiplexers Operations Systems Engineering Guide, Issue 2. This document was reissued to provide information for Release 13.0 and later of the OC-3

Multiplexer, Release 7.0 and later of the OC-12 Multiplexer and Release 3.0 and later of the FiberReach Multiplexer, Significant changes include the following:

- Because the DDM-2000 releases (listed above) are intended to facilitate OS-based centralized operations in multi-vendor networks and because TL1/X.25 OS access is the key standardized multi-vendor Operations Interworking (OI) application, the following Remote NE Status features are not supported in the DDM-2000 releases listed:
  - — Remote office alarms
  - — Remote CIT alarm reports
  - — Remote user panel indications
  - — TBOS
  - — Parallel telemetry

  s change in operations functionality affected the TL1 message details of many TL1 commands.
  - Updated Transaction Language 1 (TL1) message details (See above).
  - Added new TL1 messages
  - Parallel and Serial Telemetry are not supported in the releases listed above

Related Documentation

Lucent Technologies Documents

The following documents provide additional information about the DDM-2000 Multiplexers:

- Number: 190-523-101 (User Manual only) Release 3.0
  Order Comcode 107265944 for User Manual & Software for Release 3.0
  Title: *CPro-2000 User Manual*
  Audience: Maintenance personnel
  Content: Using the tool to provision and maintain ring networks
- Number: 365-576-100 (User Manual only) Release 4.0
  Number: 365-576-101 (User Manual & Software) Release 4.0
  Title: *CPro-2000 User Manual*
  Audience: Maintenance personnel
  Content: Using the tool to provision and maintain ring networks
- Number: 365-576-110 (User Manual only) Release 5.0
  Number: 365-576-111 (User Manual & Software) Release 5.0
  Title: *CPro-2000 User Manual*
  Audience: Maintenance personnel
  Content: Using the tool to provision and maintain ring networks
- Number: 365-576-120 (User Manual only) Release 6.0
  Number: 365-576-121 (User Manual & Software) Release 6.0
  Title: *CPro-2000 User Manual*
  Audience: Maintenance personnel
  Content: Using the tool to provision and maintain ring networks
- Number: 363-206-200
  Title: *DDM-2000 OC-3 and OC-12 Multiplexers Applications, Planning, and Ordering Guide*
  Audience: Network planners, equipment engineers, and sales teams
  Content: Features, applications, high-level description, operations, administration, maintenance, and provisioning (OAM&P), system planning, ordering, product support, reliability information, technical specifications, and a synchronous optical network (SONET) overview.
- Number: 363-206-201
  Title: *DDM-2000 OC-3 Multiplexer, System Commands Quick Reference*
  Audience: Maintenance personnel
  Content: Abbreviated list of system commands and parameters for OC-3 Multiplexers through Release 7.2

- Number: 363-206-204
  Title: *DDM-2000 OC-3 Multiplexer Installation Manual*
  Audience: Customers planning to install the equipment
  Content: Customer installation instructions
- Number: 363-206-206
  Title: *DDM-2000 OC-12 Multiplexer – System Commands Quick Reference*
  Audience: Maintenance personnel
  Content: Abbreviated list of system commands and parameters for OC-12 Multiplexers through Release 3.1
- Number: 107-564-270
  Title: *ITM SNC Users Guide*
  Audience: Operations personnel
  Content: Integrated Transport Management Subnetwork Controller information
- Number: 363-206-207
  Title: *DDM-2000 OC-12 Multiplexer and OC-12 Regenerator User/Service Manual*
  Audience: Maintenance personnel
  Content: Detailed description, technical specifications, commands and reports, and Operations and Maintenance (O&M) procedures for OC-12 Multiplexers through Release 3.1 and OC-12 Regenerator through Release 2.0
- Number: 363-206-208
  Title: *DDM-2000 OC-12 Multiplexer Installation Manual*
  Audience: Customers planning to install the equipment
  Content: Customer installation instructions
- Number: 363-206-220
  Title: *DDM-2000 OC-3/OC-12 Multiplexer Circuit Pack Options Job Aid*
  Audience: Maintenance personnel
  Content: List of circuit pack options
- Number: 363-206-222
  Title: *DDM-2000 OC-3/OC-12 Multiplexer Acceptance Task List Job Aid*
  Audience: Maintenance personnel
  Content: Checklist of acceptance and turnup procedures
- Number: 363-206-223
  Title: *DDM-2000 OC-12 Regenerator – System Commands Quick Reference*
  Audience: Maintenance personnel
  Content: Abbreviated list of system commands and parameters

- Number: 363-206-281

  Title: *DDM-2000 OC-3 Multiplexer – System Commands Quick Reference*

  Audience: Maintenance personnel

  Content: Abbreviated list of system commands and parameters for OC-3 Multiplexers Releases 8.1 and 9.1

- Number: 363-206-290

  Title: *DDM-2000 OC-12 Multiplexer User/Service Manual, Volumes I and II*

  Audience: Maintenance personnel

  Content: Detailed description, technical specifications, commands and reports (Volume I), and O&M procedures (Volume II) for DDM-2000 OC-12 Multiplexer Release 5.1

- Number: 363-206-291

  Title: *DDM-2000 OC-12 Multiplexer – System Commands Quick Reference*

  Audience: Maintenance personnel

  Content: Abbreviated list of system commands and parameters for DDM-2000 OC-12 Multiplexers Release 5.1

- Number: 363-206-300

  Title: *DDM-2000 FiberReach Multiplexer Applications, Planning, and Ordering Guide*

  Audience: Network planners, equipment engineers, and sales teams

  Content: Features, applications, high-level description, operations, administration, maintenance, and provisioning (OAM&P), system planning, ordering, product support, reliability information, technical specifications, and a synchronous optical network (SONET) overview

- Number: 363-206-301

  Title: *DDM-2000 FiberReach Multiplexer Wideband Shelf User/Service Manual*

  Audience: Maintenance personnel

  Content: Detailed description, technical specifications, and O&M procedures for the DDM-2000 FiberReach Multiplexer Wideband Shelf

- Number: 363-206-310

  Title: *DDM-2000 FiberReach Multiplexer Installation Manual*

  Audience: Users planning to install the equipment

  Content: Customer installation instructions

- Number: 824-102-144

  Title: *Lucent 2000 Product Family Multi-Vendor Operations Interworking Guide*

  Audience: Engineers responsible for system planning, using, or maintaining networks containing a mixture of 2000 Product Family products.

Content: Information on using operations interworking capabilities of the Lucent 2000 Product Family in multi-vendor subnetworks

- Number: 824-102-147
  Title: *Lucent 2000 Product Family Operations Interworking Guide*
  Audience: Maintenance personnel
  Content: Operations interworking information for the Lucent 2000 Product Family including DDM-2000 Multiplexers
- Number: 824-102-148
  Title: *FT-2000 OC-48 Lightwave Systems Operations Systems Engineering Guide*
  Audience: Engineers
  Content: Operations system engineering information for the DDM-2000 Multiplexers
- Number: 824-102-149
  Title: ***SLC***®*-2000 Access System Operations Systems Engineering Guide*
  Audience: Engineers
  Content: Operations system engineering information for *SLC*-2000
- Number: 824-102-151
  Title: *DDM-2000 Multiplexers Operations Systems Engineering Guide*
  Audience: Engineers
  Content: Operations system engineering information for the DDM-2000 Multiplexers
- DDM-2000 OC-3 Drawings

ED-8C724-10	OC-3/OC-12 Combined Bay Arrangements
ED-8C724-15	OC-3 Cabling Plan (Rear Access)
ED-8C724-16	Cabling Plan (Front Access)
ED-8C724-20	Cable Assemblies (Rear Access)
ED-8C724-21	Cable Assemblies (Front Access)
ED-8C724-30	Shelf Assembly
ED-8C724-31	User Panel Assembly
ED-8C724-34	Releases 2 and 3 Software Ordering
ED-8C724-36	Release 5 Software Ordering
ED-8C724-37	Release 6 Software Ordering
ED-8C724-38	Release 7 Software Ordering
ED-8C724-39	Release 8 Software Ordering
ED-8C724-40	Release 9 Software Ordering

ED-8C733-30	Fan, Filter, and Baffle Assemblies
SD-7C510-01	Application Schematic
T7C510-31	Interconnect Wiring (Rear Access)
T7C510-32	Interconnect Wiring (Front Access)
801-525-168	Floor Plan Data Sheets

- DDM-2000 OC-12 Drawings:

ED-8C724-10	OC-3 and OC-3/OC-12 Combined Bay Arrangements
ED-8C727-10	Typical Bay Arrangements
ED-8C727-15	Cabling Plan (Rear Access)
ED-8C727-16	Cabling Plan (Front Access)
ED-8C727-20	Cable Assemblies (Rear Access)
ED-8C727-21	Cable Assemblies (Front Access)
ED-8C727-30	Shelf Assembly
ED-8C727-31	User Panel Assembly
ED-8C727-34	Release 2 Software Ordering
ED-8C727-35	Release 3 Software Ordering
ED-8C727-36	Release 5 Software Ordering
ED-8C727-41	Regenerator Release 2 Software Ordering
SD-7C513-01	Application Schematic
T7C513-31	Interconnect Wiring Diagram (Rear Access)
T7C513-32	Interconnect Wiring (Front Access)
801-525-168	Floor Plan Data Sheets

Lucent Technologies Practices

DDM-2000 equipment is also available in traditional loop enclosure arrangements, description of which may be found in the following Lucent Technologies practices:

- Number: 363-205-000
  SLC*-2000 Series 5 Carrier System Ordering Guide – Loop Transmission Systems* (to be replaced by 363-205-010)
- Number: 363-205-010
  Title: ***SLC****-2000 Series 5 System Applications and Planning Guide*
- Number: 626-500-105
  Title: *80-Type Cabinets Ordering Information and Lettering Guide*
- Number: 626-500-115
  Title: *90-Type Cabinets Coding and Ordering Information*

Lucent Technologies Equipment

The following documents provide additional information about related equipment:

- Number: 363-206-150
  Title: *DDM-Plus User/Service Manual*
- Number: 363-206-151
  Title: *DDM-Plus Installation Manual*
- Number: 363-206-152
  Title: *DDM-Plus Quick Reference Guide*
- Number: 363-206-156
  Title: *DDM-Plus Equipment Engineering and Ordering Guide*
- Number: 363-206-157
  Title: *DDM-Plus Wall Distant Terminal Installation Manual*
- Number: 365-303-102
  Title: *DSX-3 Cross-Connect Bay, Description, Operation, and Maintenance Manual*
- Number: 365-301-130
  Title: *System III DSX-3/4, Planning, Engineering, Installation, and Operation – System Reference Guide*
- Number: 365-331-000
  Title: *DACS III-2000 Release 2.0 Applications, Planning, and Ordering Guide*
- Number: 365-340-800
  Title: *DACS IV-2000 Release 5.0 Reference Manual*
- Number: 365-575-100
  Title: *FT-2000 OC-48 Lightwave System Applications, Planning, and Ordering Guide*
- Number: 636-299-120
  Title: *LGX® Distribution System, Planning, Engineering, Installation, and Operation System Reference Guide*
- Title: *MegaStar* 2000 Documents*

Comcode 107585648	Installation Manual
Comcode 407397512	Schematic Package
Comcode 107585655	Reference Manual
Comcode 107585671	System Application Manual

Related Training

The National Product Training Center at Dublin, Ohio, and Lisle, Illinois, provides management courses for planning, engineering, and ordering, as well as training for telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses is available. Consult your local Lucent Technologies' Account Executive for more information or reservations. Call **1-800-TRAINER** for enrollment.

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

- Number: LW2211

  Title: *DDM-2000 OC-3/OC-12 Multiplexer Fundamentals*

  Audience: Anyone interested in learning the fundamentals of operation of the OC-3/OC-12 Multiplexers

  Content: A compact disk, read-only memory (CD-ROM) based course of general information about the OC-3 and OC-12 Multiplexers including a product overview, applications, and architecture

- Number: LW2212

  Title: *DDM-2000 OC-3 and OC-12 Multiplexer Applications and Architecture*

  Audience: Fundamental planners, account executives, and private telecommunications network technical consultants

  Content: General information about the OC-3 and OC-12 Multiplexers including a product overview, applications, architecture, and deployment planning (a course prerequisite for LW2312)

- Number: LW2312

  Title: *DDM-2000 OC-3 and OC-12 Multiplexer Equipment Engineering and Planning*

  Audience: Facility planners, outside plant engineers, central office equipment engineers, and private network design engineers

  Prerequisite: LW2212

  Content: Information and guidelines required to plan and order OC-3 and OC-12 Multiplexer equipment for loop feeder and interoffice applications

- Number: LW2604

  Title: *DDM-2000 OC-3 Multiplexer Ring/Linear Networks, Operations and Maintenance*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in day-to-day provisioning and maintenance

  Content: Information supporting operations, maintenance, and

---

* MegaStar is a registered trademark of Harris Corporation.

provisioning of ring and/or linear OC-3 Multiplexers. On-site shelves are used for extensive hands-on experience

- Number: LW2610

  Title: *DDM-2000 FiberReach Wideband Shelf, Operations and Maintenance*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in DDM-2000 FiberReach Multiplexer network functions

  Prerequisite: LW2212, LW2312, LW2603, or LW2608

  Content: Information supporting operations, maintenance, and provisioning of the DDM-2000 FiberReach Multiplexer Wideband Shelf. On-site shelves are used for extensive hands-on experience.

- Number: LW2611

  Title: *DDM-2000 FiberReach Multiplexer Self-Paced Course*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in DDM-2000 FiberReach Multiplexer network functions

  Prerequisite: LW2212, LW2312, LW2603, or LW2608

  Content: Information supporting system engineering and planning, applications, operations, maintenance, and provisioning of DDM-2000 FiberReach Multiplexer networks

- Number: LW2612

  Title: *DDM-2000 OC-12 Multiplexer Operations and Maintenance*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in day-to-day provisioning and maintenance

  Content: Information supporting operations, maintenance, and provisioning of the OC-12 Multiplexer. Includes information on OC-12 linear and ring applications. On-site shelves are used for extensive hands-on experience

- Number: LW2614

  Title: *2000 Product Family Surveillance and Performance Monitoring*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in day-to-day provisioning and maintenance

  Content: Information supporting operations interfaces using X.25 links to an operations center

- Number: LW2618

  Title: *Advanced Ring Network Applications, Operations, and Maintenance*

  Audience: Technicians, supervisors, maintenance engineers, and operation support personnel involved in day-to-day operations of FT-2000 and/or DDM-2000 OC-3/OC-12 rings having dual ring interworking (DRI) traffic

Prerequisites: LW2608 and LW2616

Content: Information supporting operations, maintenance, and provisioning of DRI networks. On-site shelves are used for extensive hands-on experience.

Engineering and Installation Services

The Lucent Technologies Customer Support and Operations (CS&O) organization is committed to providing customers with quality product support services. Whether you need assistance in engineering, installation, normal system maintenance, or disaster recovery, the support staff provides you with the quality technical support you need to get your job done. Each segment of the CS&O organization regards the customer as its highest priority and understands your obligation to maintain quality service for your customer.

Within the CS&O organization, the Engineering and Installation Services group provides a highly skilled force of support personnel to provide customers with quality engineering and installation services. These engineering and installation specialists use state-of-the-art technology, equipment, and procedures to provide customers with highly competent, rapid response services. These services include analyzing your equipment request, preparing a detailed specification for manufacturing and installation, creating and maintaining job records, installing the equipment, and testing and turning over a working system.

When the CS&O organization provides job records and installs the equipment, operationally affective changes to the system are automatically identified and applied to the system at no additional cost.

The Engineering and Installation Services group provides the customer with an individually tailored, quality-tested job that meets our published high standards and the customer's operational requirements. The group ensures that the customer's system order is integrated into a complete working system tailored to office conditions and preferences. This process provides for the customer's complete needs. It includes provisions for cabling, lighting, power equipment, and ancillary connections to local and/or remote alarm systems. The group will also respond to any customer changes that occur during installation.

All equipment engineered and installed by Lucent Technologies is thoroughly tested and integrated into a reliable system at cutover. Once approved by the Lucent Technologies Quality Assurance Test group (the industry's toughest), the system is turned over to the customer.

The group also provides any specialized engineering and installation services required for unusual or highly individualized applications. These specialized services may include engineering consultations and data base preparation. Your local Account Executive can provide more information about these services.

Customer Technical Support

Customer Technical Support (CTS) is available through a toll-free technical assistance number. Lucent maintains a highly-skilled, multi-tier support structure consisting of regional engineers, product specialists, and system designers to support your network equipment. All levels of technical expertise may be called upon to solve the customer problem (refer to Figure 1).

The CTS organization provides remote, diagnostic support. On-site assistance is available on a billable contract or time and material basis. Support services may include the following activities:

- Responding to all requests for assistance
- Tracking and maintaining visible ownership of all reported problems, from inception through resolution
- Analyzing and diagnosing reported problems
- Providing restoration and recovery service
- Providing preventive and/or circumventive measures
- Communicating the actions, plans, and problem status to the reporting customer
- Initiating action to establish Modification Requests (MRs) for design issues
- Writing and distributing technical bulletins (Urgent Problem Notification).

CTS services are available on a contract basis in three levels to meet varying customer needs: Preferred, Standard, and Basic Agreements.

- The Preferred level of support guarantees 24 x 7 (24 hour, 7 day-a-week) coverage of the customer's network. Guaranteed performance commitments for response, service restoration, and problem resolution times are validated by published Service Performance Reports.
- The Standard level of support guarantees 8 x 5 (8 hour, 5 day-a-week) coverage. Performance commitments are also validated by Service Performance Reports. Out-of-hours support is available for an additional fee.
- The Basic Agreements level of support guarantees 8 x 5 (8 hour, 5 day-a-week) coverage with hourly billing for each support call. Out-of-hours coverage is available with additional fees.

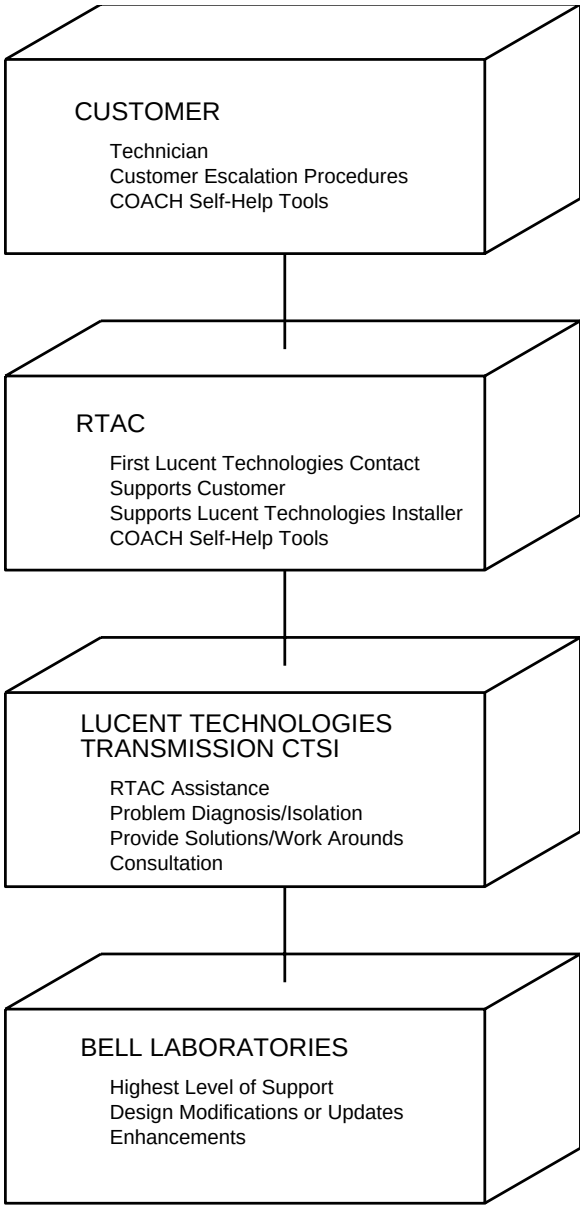


Figure 1. Customer Support Levels

Regional Technical Assistance Center

When the customer experiences a problem, the initial point of contact with Lucent Technologies is the Regional Technical Assistance Center (RTAC). RTAC is divided into three regions covering North America:

- East (includes Canada)
- South
- West.

They can be reached by calling **1-800-CAL-RTAC** (**1-800-225-7822**). Lucent Technologies works with the customer to define the problem and its severity.

Problems are worked during the contracted coverage period. By prior agreement, service-affecting problems are worked immediately regardless of contracted coverage with billing reconciliation if required. Acting as a single point of contact with the customer, the RTAC engineer will involve all necessary tiers of support to solve the customer problem.

Customized On-line Aid for Customer Help

The CTS organization has also established a dial-up technical support medium: Customized On-line Aid for Customer Help (COACH). COACH is a system of on-line support tools aimed at providing product news and bulletins, diagnostic services, compatibility information, and on-line documents. COACH tools provide you with the most up-to-date product information so that problems are either prevented or quickly resolved. Many Lucent Technologies' transmission products, including DDM-2000 Multiplexers, are supported by COACH.

Once logged into COACH, the user specifies which product to access and COACH grants the appropriate combination of tools and commands. The user reaches each one of these tools and commands through a centralized, menu-driven computer program. Every screen provides help in making appropriate menu selections. COACH users will achieve proficiency quickly because of the consistency of menu selections among products.

The following COACH tools are available to the user:

- Diagnostic Dictionary

  The diagnostic dictionary contains histories of previously encountered problems and descriptions of the solutions or work arounds. Your support staff can use this tool when published documentation or standard diagnostic procedures fail to address a problem.

- News and Bulletins

  Immediately after a user logs into COACH, the News and Bulletins tool displays bulletins containing urgent information related to the user's

products. All users are automatically notified about urgent matters, such as problems with scheduled releases, recalls of hardware or software, or scheduled maintenance for computer support. Less urgent messages are distributed through news items that can be sent to individuals or categories of users. Notification of news appears on the screen immediately following current bulletins.

- Compatibility Data

  Occasionally, hardware/software configuration problems arise when new software releases are issued. The Compatibility Data tools permit users to view the correct hardware configuration associated with a specific software release. The user simply enters the appropriate software release number and COACH responds with page-formatted lists of circuit packs compatible with the selected software release. This tool also contains the latest issue numbers of the customer documentation.

- COACH User's Guide

  COACH supplies an on-line version of its User's Guide. The COACH User's Guide includes instructions on using the customer support tools and documents any changes to the previous version of the guide.

For information on obtaining a COACH login, contact:

COACH Software Development
Lucent Technologies
1600 Osgood St.
North Andover, MA. 01845

Telephone: **1-800-238-4021**

The RTAC and CTS organization strive to provide proactive and responsive technical customer support for all its products. Through the combined efforts of the individual customer support groups and through COACH tools, the RTAC and CTS organization provide the best possible customer support.

Customer Technical Support Enhanced Services

The goal of Lucent Technologies Customer Technical Support (CTS) Enhanced Services is to keep Lucent Transmission Systems products operating at maximum performance and to prevent problems from interrupting service to customers.

Typical Enhanced Services include:

- Network design, growth planning, and performance analysis
- Multivendor troubleshooting
- Network integration
- Preventive and remedial maintenance
- Hardware and software upgrade services
- On-site maintenance programs
- Customized Method of Procedure (MOP) development.

For more information on CTS services, contact your Lucent Technologies Account Executive.

Documentation Support

The Lucent Technologies Customer Training and Information Products organization provides a contact to report errors or to ask questions about information in this document. The document support telephone number is:

1-888-LTINFO6 (**1-888-584-6366**) or **1-910-727-6681**
(Monday through Friday, 8:00 a.m. to 4:00 p.m. EST).

How to Order Documents

One-time orders include a binder (if applicable) and the document contents for the current issue in effect at the time of order. To order additional copies of this document and/or to request placement on the standing order list, send or call in an order as indicated in Table 1.

Table 1. Documentation Order Information

Customer	Mail Order	Telephone Order (*Monday through Friday*)
Commercial Customers *	Lucent Technologies Customer Information Center Attention: Order Entry Section 2855 N. Franklin Road P.O. Box 19901 Indianapolis, IN 46219	Within USA: **1-888-LUCENT8** (**1-888-582-3688**) 7:30 a.m. to 6:30 p.m. EST FAX: **1-800-566-9568** From Europe, The Middle East & Africa: Toll **1-317-322-6416** From Canada, the Caribbean & Latin America: Toll **1-317-322-6646** From Asia, the Pacific Region & China: Toll **1-317-322-6411** Worldwide: FAX: **1-317-322-6699**
RBOC	Process through your Company Documentation Coordinator	

* For commercial customers, a check, money order, purchase order number, or charge card number is required with all orders. Make checks payable to Lucent Technologies.

Lucent Technologies customers should use Form IND 1-80.80 FA, available through the Customer Information Center.

Standing Orders: After placing a one-time order, you may request placement on the standing order list for all later reissues of the document. The standing order list for each document provides automatic distribution for all reissues of the document. Customers should process document orders or standing order requests through their Company Documentation Coordinator. For questions regarding standing orders or to be placed on a standing order list, call the applicable Lucent Technologies Customer Information Center number listed in Table 1.

How to Comment on This Document

Feedback forms are located immediately after the title page of this document. Please fill out the form and return it to the address stamped on the front of the form or fax it to the number provided on the form.

If the feedback forms are missing, send comments on this document to:

Documentation Services
2400 Reynolda Road
Winston-Salem, NC 27106

You may also report errors or request changes to this document by calling the toll free number, **1-888-LTINFO6** (**1-888-584-6366**), and giving the nine-digit document number.

Electronic Documentation

Documentation for the *Operations Systems Engineering Guide* is now available in electronic form on CD-ROM. CD-ROM has many advantages over traditional paper documentation, including cost savings, search and retrieve capability, and the assurance of the most current information.

CD-ROM is available by annual subscription (on standing order).

- To order, call your Technical Information Resource Manager, your Lucent Technologies Account Executive, or the Lucent Technologies Customer Information Center (**1-800-432-6600**).
- For pricing information, contact your Lucent Technologies Network Systems' Account Executive or the Lucent Technologies Customer Information Center (**1-800-432-6600**). The CD-ROM Product Line Order Number for the All Access and Transport Products Grouping is 300-100-010.
- For technical information, call Lucent Documentation Support, **1-888-LTINFO6** (**1-888-584-6366**).

Introduction

1

Contents

Overview 1-1

Introduction to the Lucent Technologies 2000 Product Family 1-2

Introduction to Operations Systems Interfaces 1-3

Introduction to This Document 1-3

Introduction

1

Overview

This document provides information on the Lucent Technologies 2000 Family of Products and operations system (OS) interfaces as follows:

- DDM-2000 Multiplexers:
  - OC-3 Multiplexer (Releases 1.0 through 13.0)
  - OC-12 Multiplexer (Releases 1.0 through 7.0)
  - OC-12 Regenerator (Releases 1.0 and 2.0)
  - FiberReach Multiplexer (Release 2.1 through 3.0)
- DDM-2000 Operations Systems Interfaces
  - TL1/X.25
  - Serial Telemetry (TBOS)*
  - Parallel Telemetry*

* Parallel and serial telemetry are supported by DDM-2000 OC-3 Release 11.X, OC-12 Release 5.X, and FiberReach Release 2.X, and earlier only.

Introduction to the Lucent Technologies 2000 Product Family

Lucent Technologies is focused on a carefully planned and growing product family designed to provide total network solutions. The family complies with the synchronous optical network (SONET) standard and builds on items that customers have found to be useful and successful in networks such as single-ended maintenance features and upgrade capabilities. The Lucent Technologies 2000 Product Family includes the following products:

- DDM-2000 OC-3 Multiplexer
- DDM-2000 OC-12 Multiplexer
- DDM-2000 OC-12 Regenerator
- DDM-2000 FiberReach Multiplexer
- FT-2000 OC-48 Lightwave System
- DACS III-2000 Cross-Connect System
- DACS IV-2000 Cross-Connect System
- ITM XM
- *SLC*-2000 Access System
- Business Remote Terminal-2000 (BRT-2000).

Introduction to Operations Systems Interfaces

Transaction Language 1 (TL1), telemetry byte-oriented serial (TBOS) protocol, and parallel telemetry interfaces communicate alarm, status, and control information to/from alarm surveillance operations systems (OSs). In Regional Bell Operating Company (RBOC) applications, the alarm surveillance OS is typically a network monitoring and analysis system. TL1/X.25 interface complies with Bellcore TR-TSY-000833, Issue 3, Revision 1*, and TR-NWT-000833, Issue 4, Supplement 1. Serial telemetry interface uses the TBOS protocol. Parallel telemetry interface uses contact closures.

The DDM-2000 Multiplexer uses TBOS or parallel telemetry to communicate with a telemetry remote unit; the telemetry remote unit communicates with the OS. The TL1 interface communicates directly with the OS, not requiring the use of telemetry remote units or mediation devices (MDs).

The TL1 interfaces provide significantly more detailed alarm and status information than the TBOS or parallel telemetry interfaces. The TL1 interfaces also support performance-monitoring (PM) threshold-crossing alerts (TCAs) and retrievals of current and historical PM data. TBOS supports more detailed alarm, status, and control capabilities than parallel telemetry. Only a single TBOS connection to a DDM-2000 Multiplexer is required.

Introduction to This Document

The following five tabbed sections describe information in this document as follows:

- **TL1/X.25 Interface** — Provides information on the TL1/X.25 Interface.
- **TL1 Message Details** — Provides detailed information for TL1 Messages.
- **Serial Telemetry** — Provides information on serial telemetry operations system interfaces using TBOS protocol.
- **Parallel Telemetry** — Provides information on parallel telemetry to the operations system.
- **Glossary** — Provides a list of specialized terms and brief descriptions, and acronyms and their definitions.

---

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

TL1/X.25 Interface

2

Contents

Overview 2-1

Introduction 2-1

TL1-Related Provisioning 2-2

- Site and Network Element Numbers 2-3
- Central Office/Remote Terminal Select 2-3
- Target Identifier 2-4
- Gateway Network Element 2-4
- Directory Services Network Element (DSNE) 2-5
- Miscellaneous Discrete Environmental Alarm Level 2-5
- Miscellaneous Discrete Environmental Description 2-5
- Far-End Communication 2-6
- Section DCC User Side/Network Side 2-6
  - DDM-2000 OC-3 Release 7.2, OC-12 Release 3.1 and Earlier 2-6
  - DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0 and FiberReach 1.0 and Later 2-7
- Subnetwork Partitioning 2-7
- Security 2-7
- TL1-Related Provisioning Examples 2-9

Resynchronization, Automatic Alarm, and Status, of the OS 2-12

One DDM-2000 Subnetwork per TL1/X.25 Link 2-12

X.25 Technical Specifications 2-13

***Datakit*® Provisioning** 2-17

- Background and Assumptions 2-18
- Security 2-19

Contents

- Groups 2-19
- Destination Addresses 2-21
- PVC Addresses 2-22
- SVC Addresses 2-23
- Data Base Configuration 2-23
  - DDM-2000 Multiplexer End 2-23
  - NMA, OPS/INE and ***SLC***-2000 OS End 2-24
- Port Configuration 2-25
  - Network Element End 2-25
  - Operations System End 2-27

Multiplexer Cabling 2-30

NMA Data Base Definition 2-31

TL1/X.25 Interface

2

Overview

This chapter provides information about:

- The TL1/X.25 interface for the OC-3, OC-12, and FiberReach Multiplexers. The FiberReach Multiplexer supports a TL1 interface through the Synchronous Optical Network (SONET) data communications channel (DCC) only. The TL1/X.25 interface is supported by OC-3 Release 2.0, OC-12 Release 1.0, FiberReach Release 1.0 and later, systems.
- The TL1-related provisioning and X.25 specifications. The X.25 "short stack" protocol is based on TR-TSY-000827, Issue 1.

Introduction

The DDM-2000 Multiplexer supports a TL1/X.25 interface to report alarm and status conditions and performance-monitoring (PM) data to operations systems (OSs) such as Bellcore's Network Monitoring and Alarm (NMA) operations systems. The DDM-2000 TL1/X.25 interface also supports service provisioning with memory administration OSs such as Lucent ITM SNC. DDM-2000 also supports remote recovery and control functions, installation provisioning, and security on the TL1/X.25 interface. The TL1 message set has been updated to offer full remote reporting and control capabilities. This functional equivalency between CIT and TL1 allows the option of using either the CIT or TL1 for provisioning tasks, whichever is more convenient.

The TL1/X.25 interface provides significantly more detailed information (such as identifying specific circuit packs and facilities) than the telemetry byte-oriented serial (TBOS) protocol or parallel telemetry interfaces.

The DDM-2000 Multiplexer TL1/X.25 interface is via a synchronous EIA-232D port, capable of operating at 1200, 2400, 4800, 9600, or 19200 baud. Refer to OC-3 Application Schematic SD-7C510-01, CAD 10; OC-12 Application Schematic SD-7C513-01, CADs 4 and 23; and FiberReach Application Schematic SD-7C516-01.

TL1-Related Provisioning

The following list summarizes the TL1-related parameters that are provisionable in the DDM-2000 Multiplexer:

- Site and Network Element (NE) Numbers
- Central Office/Remote Terminal (CO/RT) Select
- Target Identifier (TID)
- Gateway Network Element (GNE)
- Application Context ID (ACID)
- Centralized Survivable Operations System Access (OSGNE)
- Directory Services Network Element (DSNE)
- Miscellaneous Discrete Environmental Alarm Level
- Miscellaneous Discrete Environmental Description
- Far-End (FE) Communication
- Section DCC User Side/Network Side (US/NS)
- Security
- Subnetwork Partitioning.

The craft interface terminal (CIT) user interface commands **`set-ne`**, **`set-attr-env`**, and **`set-fecom`** are used to set the software provisionable parameters. The **`rtrv-ne`**, **`rtrv-attr-env`**, **`rtrv-fecom`**, and **`rtrv-map-network`** commands report all the parameter values. Additional DDM-2000 Multiplexer 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 DS1, DS3, and EC1 facility failures is provisionable. Also provisionable are the failure thresholds for DS1s, DS3s, EC1s, STS-1s, VT1.5s, OC-1s, OC-3s, and OC-12s, and the PM threshold crossing alert (TCA) thresholds for DS1s, VT1.5s, DS3s, EC1s, STS-1s, OC-1s, OC-3s, and OC-12s. Only DDM-2000 OC-3 and FiberReach Multiplexers support OC-1 and DS1 transmission facilities and VT1.5 signals. Only DDM-2000 OC-3 Release 11.X and DDM-2000 OC-12 supports OC-12 facilities. Refer to the appropriate

user/service manual. (See the ***Related Documentation*** section in the **About This Document** chapter.)

Site and Network Element Numbers

Prior to DDM-2000 OC-3 Release 8.0 and OC-12 Release 5.0, the site number is provisionable via hardwire switch settings on the SYSCTL circuit pack and the NE number is provisionable via hardwire switch settings on the OHCTL circuit pack. As of OC-3 Release 8.0, OC-12 Release 5.0 and FiberReach Release 1.0, the site and NE numbers are provisionable via the CIT user interface command **`set-ne`**. For proper TL1 operation, the combination of site and NE numbers must uniquely identify each DDM-2000 Multiplexer within a subnetwork (or within each alarm group when alarm groups are used). This provisioning requirement applies even when unique TID values are provisioned.

- In DDM-2000 OC-3-only or DDM-2000 OC-12-only applications, each DDM-2000 OC-3 within the same subnetwork should be assigned a unique site number; thus the NE number may be any valid setting.
- In combined DDM-2000 OC-3, OC-12 and/or FiberReach applications:
  - — site numbers should be assigned to distinguish the DDM-2000 Multiplexer(s) in each office (or site) from the DDM-2000 Multiplexer(s) in other offices (or sites) within the same subnetwork.
  - — all DDM-2000 Multiplexers in the same office (or site) and in the same subnetwork should be assigned the same site number, but each of those DDM-2000 Multiplexers should be identified uniquely by assigning different NE numbers.
- In DDM-2000 OC-3 R13.0, OC-12 R7.9, and FiberReach R3.0 and later, the site and NE number parameters are eliminated.

Central Office/Remote Terminal Select

The selection of central office (CO) or remote terminal (RT) controls the appropriate processing of the miscellaneous discrete environmental alarm and status points. The fan control relay failure is applicable only at RT sites.

- For DDM-2000 OC-3 Release 7.2 and OC-12 Release 3.1 and earlier, the selection of CO or RT is provisionable via hardware switch settings on the SYSCTL circuit pack.
- For DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0, and FiberReach Release 1.0, and later, selection of CO or RT is provisionable via the CIT user interface command **`set-ne`**.
- The DDM-2000 OC-12 Regenerator does not support miscellaneous discrete environmental alarm and status points. The hardware switch settings on the SYSCTL circuit pack must be set to "CO" in regenerator

applications.

Target Identifier

Each DDM-2000 Multiplexer TID must be provisioned using the CIT user interface command **`set-ne`**. The TID is a unique identifier of the subject DDM-2000 Multiplexer and must match the TID provisioned in the OS. It 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 DDM-2000 Multiplexer, although additional characters [such as the relay rack and unit number or SONET carrier ID (SCID)] may need to be appended to the *CLLI* code to assure that the TID is unique. The initial value of the TID is `Site`**`x`**`NE`**`y`**, where **x** and **y** are the site and NE numbers until DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, when the initial value of the TID is LT-DDM-2000.

Gateway Network Element

One NE in each subnetwork must be the GNE to support TL1/X.25 access. In DDM-2000 OC-3 Release 7.2 and OC-12 Release 3.0, and earlier, the DDM-2000 Multiplexer with the physical X.25 connection to the OS must be provisioned as the GNE using the **`set-ne`** CIT user interface command. All other Multiplexers in the same subnetwork are *not* GNEs. The default is that each DDM-2000 Multiplexer is *not* the GNE. In DDM-2000 OC-3 Releases 6.0 through 7.2 and OC-12 Releases 2.0 through 3.0, when open systems interconnect (OSI) was first supported on the DCC, the DDM-2000 Multiplexer GNE also served as the DSNE.

The DDM-2000 Multiplexer **`rtrv-ne`** CIT user interface command indicates if the queried DDM-2000 Multiplexer is a GNE. In DDM-2000 OC-3 Release 3.0 through Release 7.1 and OC-12 Release 1.0 through Release 3.1, only, **`rtrv-ne`** also includes the *TID* of the GNE from the perspective of each queried DDM-2000 Multiplexer.

Either DDM-2000 OC-3 or OC-12 can serve as the GNE for all the remote DDM-2000 OC-3, OC-12 and FiberReach Multiplexers in the same subnetwork.

For DDM-2000 OC-3 Release 8.0 and OC-12 Release 3.0 and later, provisioning of the GNE is no longer required, instead DDM-2000 automatically assumes the role of the GNE when its X.25 interface is connected.

---

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

One or more OS the GNE to provide redundancy and/or to distribute TL1 message volume across multiple X.25 links. The GNE provides interface to the OS for the other NEs in the same subnetwork using X.25 interfaces.

The GNE receives operations information from all the NEs through the DCC and reports this information, as well as its own information, to the OS. The operations information is in the form of TL1 messages. Through the GNE, the OS can send TL1 commands to any NE in the subnetwork.

Directory Services Network Element (DSNE)

For DDM-2000 OC-3 Release 7.2 through 11.X, OC-12 Release 5.X, and FiberReach Release 1.0 through 2.X, supports OSI seven-layer protocol stack architecture over the SONET DCC. This architecture requires network layer 3 addresses (NSAPs), while users at remote OSs and at NE CITs use application layer 7 names TIDs. The single NE in each Lucent Technologies 2000 Product Family subnetwork that translates between NE names (TIDs) is called the DSNE.

Any DDM-2000 (except FiberReach) in a subnetwork can be provisioning to be the a DSNE. NEs added to a subnetwork are automatically registered by the DSNE and have access to all operations interworking features.

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`, and so forth.

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

Far-End Communication

Far end (FE) communication over the SONET section DCC or IAO LAN (DDM 2000 OC-3, R13.0, OC-12 R7.0, and later) 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 optical signals or on an IAO LAN. The section DCC is *not* available on EC1 signals.

- If FE communication is enabled for all intervening section DCCs and/or IAO LAN interface, each DDM-2000 Multiplexer transmits/receives its TL1 messages to/from the TL1 GNE DDM-2000 Multiplexer to which it is connected. Thus, remote DDM-2000 Multiplexer TL1 messages can be forwarded to the OS via the TL1 GNE DDM-2000 Multiplexer and vice versa.
- If FE communication is disabled, the exchange of TL1 messages is restricted accordingly, effectively dividing the DDM-2000 Multiplexer subnetwork.
- If FE communication is enabled but the section DCC (or the optical signal or IAO LAN interface) fails, the TL1 GNE DDM-2000 Multiplexer autonomously reports the communication failure status condition for each unintentionally isolated DDM-2000 Multiplexer using the SIDs of the isolated DDM-2000 Multiplexers. The DDM-2000 Multiplexer adjacent to the section DCC (or optical signal) failure autonomously reports that alarm condition.

In ring applications, all section DCCs should be enabled for communications survivability. The TL1 GNE DDM-2000 Multiplexer forwards one copy of each TL1 message (*not* multiple redundant TL1 message copies) to the OS.

Section DCC User Side/Network Side

DDM-2000 OC-3 Release 7.2, OC-12 Release 3.1 and Earlier

With the OSI protocol on the section DCC, the section DCC US/NS must be provisioned via hardware switch settings on the OHCTL circuit pack. There is a separate switch for each possible OC-3 or OC-12 termination on DDM-2000. Each end (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 CIT user interface command rtrv-ne reports the section DCC US/NS parameter values. If not provisioned correctly, the exchange of TL1 messages on the section DCC is restricted, effectively dividing the subnetwork. There is no interdependency among multiple section DCCs terminating on the same DDM-2000 Multiplexer.

DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0 and FiberReach 1.0 and Later

With the OSI protocol on the section DCC, the section DCC US/NS must be provisioned via CIT user interface command set-fecom. Each end (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 CIT user interface command **`rtrv-fecom`** reports the section DCC US/NS parameter values. If not provisioned correctly, the exchange of TL1 messages on the section DCC is restricted, effectively dividing the subnetwork. There is no interdependency among multiple section DCCs terminating on the same DDM-2000 Multiplexer.

Subnetwork Partitioning

For DDM-2000 OC-3 Release 6.0 through 11.X, OC-12 Release 2.0 through 5.X, and FiberReach Release 1.0 through 2.X, with the OSI protocol on the section DCC, portions of the NSAP are provisionable. The factory default values of that software parameter suffice and should not be changed in those releases. The CIT user interface command **`ent-ulsdcc`** is available to provision the NSAP, and the **`rtrv-ulsdcc`** command reports the NSAP parameter value.

In DDM-2000 OC-3 Release 13.0, OC-12 Release 7.0, FiberReach Release 3.0, and later, a subnetwork may be partitioned into multiple areas connected via Level 2 Intermediate Systems (ISs) to support subnetworks of more than 50 NEs. The provisionable fields within an NEs NSAP include the NE's area address. In these releases, the CIT user interface command **`ent-ulsdcc-l3`** is used to provision an NE's NSAP area address and to provision an NE to be a Level 2 IS, if necessary. The CIT user interface command **`rtrv-ulsdcc-l3`** reports the NE's NSAP value and Level2 IS assignment. Refer to 824-102-144.

If subnetwork partitioning is done incorrectly, the exchange of TL1 messages on the section DCC may be restricted, possibly dividing the subnetwork unintentionally.

Security

In DDM-2000 OC-3 Release 6.0, OC-12 Release 2.0, and earlier, the NE will always respond and/or send autonomous messages to the TL1 user once

communication is established. There is no separate login step necessary.

Starting with DDM-2000 OC-3 Release 6.1, OC-12 Release 2.1, FiberReach Release 1.0, and later, NE security administration messages are supported. 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 TL1 login attempt is completed for a given NE and virtual circuit, there is no communication (autonomous or command responses) outbound from the NE. The TL1 **ACT-USER** command is used to set up this session with each NE. The TL1 logins (user identifiers) and passwords (private identifiers) are the same as those used for CIT access.

The TL1 **CANC-USER** command is used to terminate a TL1 login session with the NE. A TL1 login session also terminates automatically if an NE resets or if there is a GNE-OS or GNE-remote NE communication failure.

Each login has an access privilege associated with it. See the **ACT-USER** command for information regarding the user access privileges.

- Privileged logins. There are two privileged logins. Privileged users are the only ones that can add, change, or delete logins. They also have access to all system capabilities.
- General logins. General users have access to all nonprivileged system capabilities.
- Maintenance logins. Maintenance users can only execute commands that access the system, extract reports, and execute maintenance functions through a specific set of commands. No privileged commands are allowed to be executed by maintenance users. (DDM-2000 OC-3 R9.1, OC-12 R5.1, FiberReach R2.1 and later,)
- Reports-only logins. Reports-only users can only make inquires of the NE and define their own password. Specifically, they can access only nonprivileged retrieve (**RTRV**) commands, as well as the **ED-PID** command for changing their password.

The following TL1 commands are provided for managing user logins, passwords, and security privileges:

DLT-USER-SECU	**ENT-USER-SECU**
ED-PID	**RTRV-USER-SECU**
ED-USER-SECU	

See Chapter 3 for detailed descriptions of these commands and the security levels of all the commands.

TL1-Related Provisioning Examples

Figures 2-1 and 2-2 provide examples of TL1-related provisioning for the DDM-2000 Multiplexer.

- Figure 2-1 provides some TL1-related provisioning examples for DDM-2000 OC-3 R11.X and earlier applications only.
- Figure 2-2 provides a TL1-related provisioning example for a combined DDM-2000 OC-3 R11.X and OC-12 R5.X, and earlier, application.

ACIDs and Security are not included in these examples, refer to the applicable command pages.

DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, Subnetwork Partitioning is documented in 824-102-144, *Lucent Technologies 2000 Product Family, Multi-Vendor Operations Interworking Guide*.

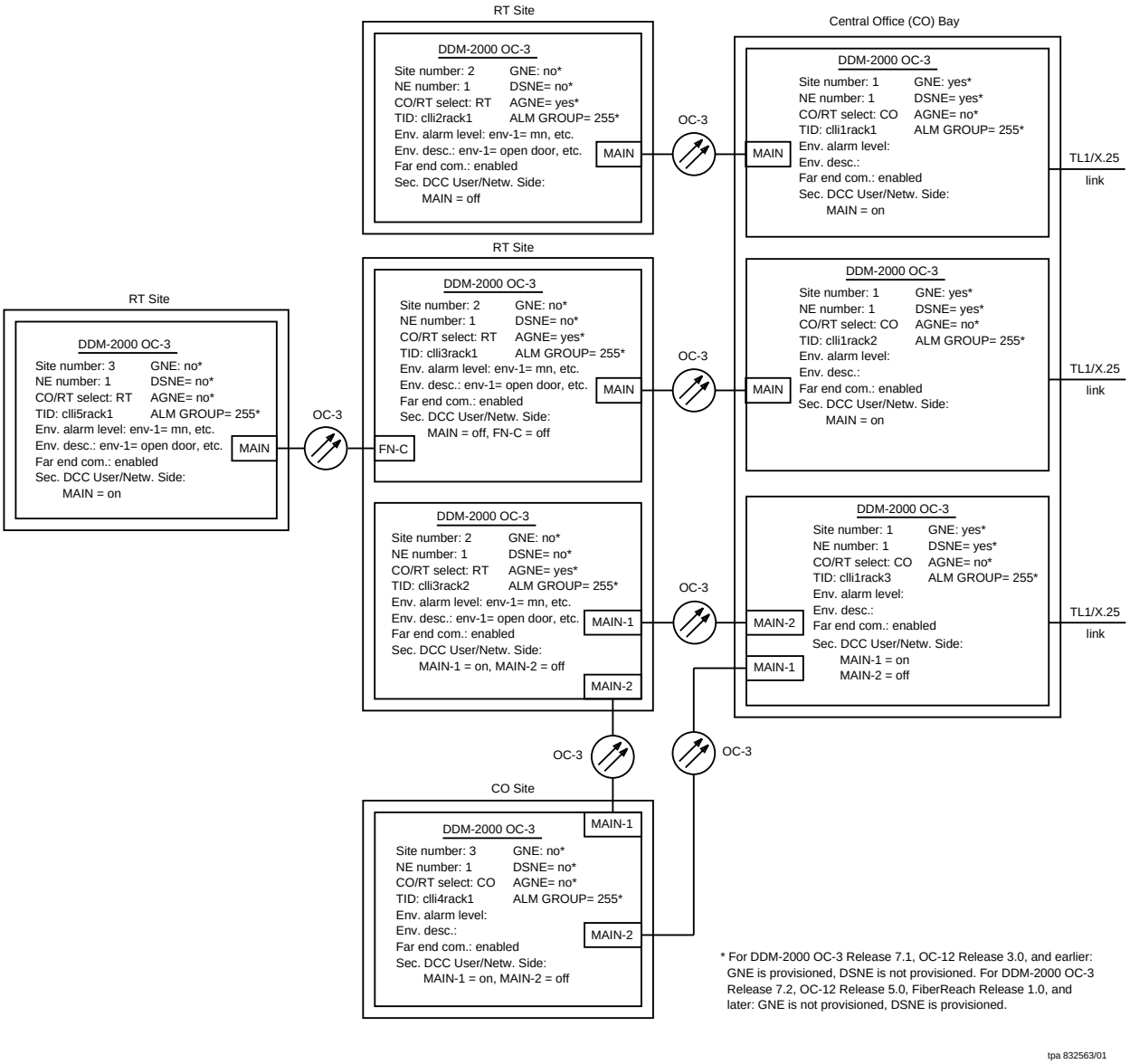


Figure 2-1. Example of TL1-Related Provisioning for OC-3 Applications Only

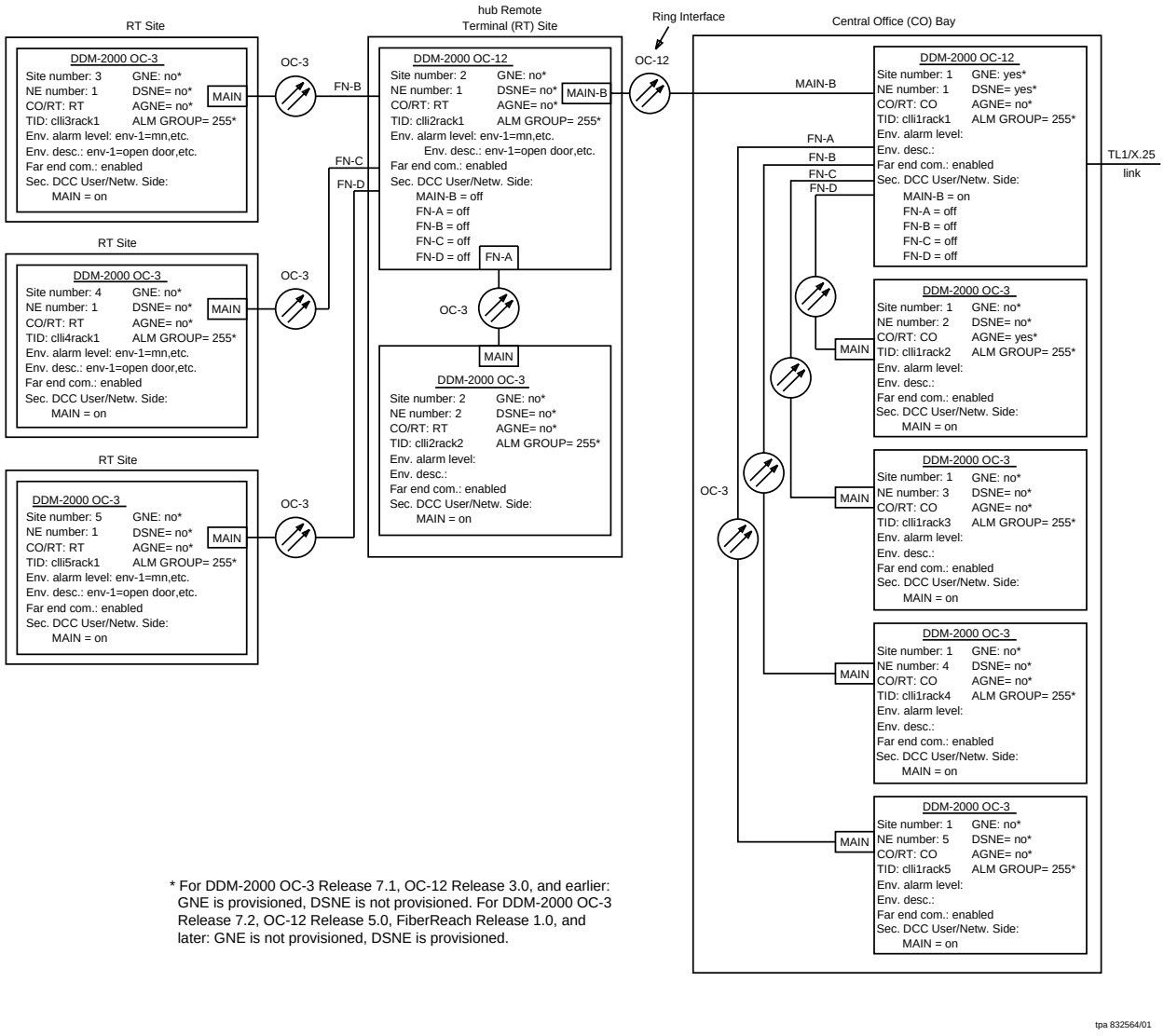


Figure 2-2. Example of TL1-Related Provisioning for a Combined OC-3 and OC-12 Application

Resynchronization, Automatic Alarm, and Status, of the OS

For DDM-2000 OC-3 R9.0, OC-12 R5.0, FiberReach R2.0, and earlier, if the X.25 link between the TL1 GNE DDM-2000 Multiplexer and the OS is restored after a temporary failure, including DDM-2000 Multiplexer TL1 output buffer overflow, every affected DDM-2000 Multiplexer in the subnetwork automatically reports its current alarm and status in individual autonomous messages to the OS. For DDM-2000 OC-3 Release 6.1 through Release 9.0, OC-12 Release 2.1 through Release 5.0, and FiberReach Release 1.0 through Release 2.0, this happens as soon as the TL1 session is reactivated with **ACT-USER**. 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 DDM-2000 Multiplexer and other DDM-2000 Multiplexers in the same subnetwork after a temporary failure. Each of the DDM-2000 Multiplexers that was temporarily isolated from the OS effectively reports its current alarm and status in individual autonomous messages to the OS.

For DDM-2000 OC-3 Release 6.0 through Release 9.0, OC-12 Release 2.0 through Release 5.0, and later, with the OSI protocol on the section DCC, each DDM-2000 Multiplexer maintains its own TL1 buffers; thus an *individual* DDM-2000 Multiplexer, after a TL1 output buffer overflow, may report its current alarm and status in individual autonomous messages to the OS.

For DDM-2000 OC-3 Release 9.1, OC-12 Release 5.1, FiberReach Release 2.1, and later, the *automatic* alarm and status resynchronization of the OS was discontinued as recommended by Bellcore (SR-1665, Issue 5, December 1995).

One DDM-2000 Subnetwork per TL1/X.25 Link

Each CO DDM-2000 Multiplexer is capable of supporting a direct, synchronous TL1/X.25 link to the OS. Although the TBOS and parallel telemetry interfaces from multiple DDM-2000 Multiplexers in a CO bay can be combined via intrabay multiple cables, the TL1/X.25 link from each DDM-2000 Multiplexer in a CO bay is separate for OC-3 Multiplexer-only applications. Multiple DDM-2000 Multiplexer TL1/X.25 physical links in a CO may be combined through an X.25 concentrator, such as the Lucent Technologies *Datakit*® II virtual circuit switch (VCS) module or remote shelf, but that would be independent of the DDM-2000 Multiplexer shelf/bay.

As indicated in the ***Gateway Network Element*** section, a single DDM-2000 OC-12 Multiplexer shelf can serve as the TL1 GNE for all other DDM-2000 Multiplexers in the same subnetwork.

X.25 Technical Specifications

This section lists X.25 detailed technical specifications that are supported by DDM-2000 Multiplexers. FiberReach APOGs

Table 2-1. TL1/X.25 Interface — Virtual Circuit Assignments

PVC ID *	SVC ID *	Logical Group #	Logical Channel #	Use
1	-	0	1	Command/Response Messages and (User Definable †)
2	-	0	2	Autonomous Maintenance Messages, Command/Response ‡ Messages, and (User Definable †)
3 §	-	0	3	Autonomous Provisioning Messages (REPT DBCHG), Command/Response Messages, and (User Definable †)
-	1 ¶	0	16	Autonomous Maintenance and Provisioning Messages, Command/Response Messages, and (User Definable †)
-	2 †	0	17	User Definable †
-	3 †	0	18	User Definable †
-	4 †	0	19	User Definable †
-	5 †	0	20	User Definable †
-	6 †	0	21	User Definable †

∗ Default values.

† Release 8.0 (linear), Release 9.0 (rings) and later

‡ Release 6.0 and later

§ Release 6.1 (linear), Release 5.1 (rings) and later

¶ Release 6.2 (linear), Release 7.1 (rings) and later

DDM-2000 OC-3 Release 2.0 does not expect or respond to *any* TL1 commands (including **RTRV-HDR**) on the autonomous message PVC. DDM-2000 OC-3 Release 3.0 and 5.0 and OC-12 Release 1.0 accept commands on the autonomous message PVC but respond to all of them with the following negative acknowledgement only:

```
NA 0<cr><lf>
<
```

where:

NA is no acknowledgement
0 is a *ctag*
<cr> is a carriage return
<lf> is a line feed.

The latter implementation is designed to satisfy the NMA of the **RTRV-HDR** command as a keep-alive signal on the autonomous message PVC before full support of command/responses on that PVC.

In DDM-2000 OC-3 Release 6.0, OC-12 Release 2.0, and earlier, the operation of PVC ID 1 is dependent upon PVC ID 2 being operational.

At the packet layer, the DDM-2000 Multiplexer is configured as active data-terminating equipment (DTE) with the parameters listed in Table 2-2.

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

Parameter	Value
Packet Size	128 bytes* or 256 bytes
Window Size	2 packets
D bit support	NO
M bit support†	YES

* The DDM-2000 Multiplexer uses the M bit when more than one packet is required to respond to an input command.

† DDM-2000 OC-12 Release 8.0 (linear), 7.2 (rings), and later

For SVC facilities, the following parameters listed in Table 2-3 should be set to the specified values for communication to take place.

Table 2-3. TL1/X.25 Interface — Valid SVC Facilities

Parameter	Value
Window negotiation	2
Packet size negotiation	7 (128 bytes), 8 (256 bytes)*
Modulo	8
Reverse charging	Don't care†
Closed User Group	Don't care†

* The DDM-2000 Multiplexer will accept this facility only if it matches the provisioned packet size (see x25ps parameter in the **ENT-SYS** command). Otherwise, the call will be cleared.

† The DDM-2000 Multiplexer 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, the DDM-2000 Multiplexer uses the standard link access procedure B (LAPB) protocol with the parameters listed in Table 2-4.

Table 2-4. 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

* DDM-2000 OC-3 Release 3.2, OC-12 Release 2.0, and later.

The DDM-2000 Multiplexer uses synchronous, full duplex, continuous carrier communication. Data rates of 1200, 2400, 4800, 9600, and 19200 baud are supported. **Data rates of at least 9600 baud should be used.** At 1200 baud, when multiple or significant network failures occur, or multiple large PM command responses are requested, the DDM-2000 Multiplexer output buffers could overflow because of such a data transmission bottleneck.

The EIA-232D (V.24) interface is configured as DTE, using the pins listed in Table 2-5.

Table 2-5. 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 (DCS to DTE) (TC)
17	Receiver Signal Element Timing (DCE to DTE) (RC)
20	DTE Ready* (DTR)

* DTE is always on when the DDM-2000 Multiplexer is powered.

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

If a dial-up modem connection is desired, a pair of *Dataphone** II 2224 CEO modems may be used. The following switch settings were used during testing with the 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 (switch toward the side with the numbers).

* Dataphone is a registered trademark of AT&T.

Datakit® Provisioning

The X.25 ports in a *Datakit* II VCS network may be configured for monitoring Operations Systems/Intelligent Network Elements (OPS/INE) by OSs such as Bellcore's NMA or Lucent's ITM SNC. By using a *Datakit* network between the DDM-2000 GNEs, costly dedicated and private lines are eliminated. A *Datakit* network also offers the following benefits:

- 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.

Datakit II connections are available for OC-3 Release 3.2 and OC-12 Release 1.2 and later. Earlier versions of software may require different configurations.

The following paragraphs detail the steps needed to configure the *Datakit* II X.25 module and its constituent ports on each end 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 3.0 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
- 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 the NMA system and the OPS/INE to the DDM-2000 Multiplexer. Figure 2-3 provides an example network. *Datakit* nodes BOST5 and MVNSMA are highlighted. Examples presented in this section are based on this figure. It is assumed that there are three PVCs:

- Both Logical Channel Number (LCN) 1 and LCN 2 are used between the DDM-2000 Multiplexer and the NMA system.
- LCN 3 is used between the DDM-2000 Multiplexer and OPS/INE.

An SVC is used between the DDM-2000 OS (LCN 1) and the DDM-2000 (LCN 16).

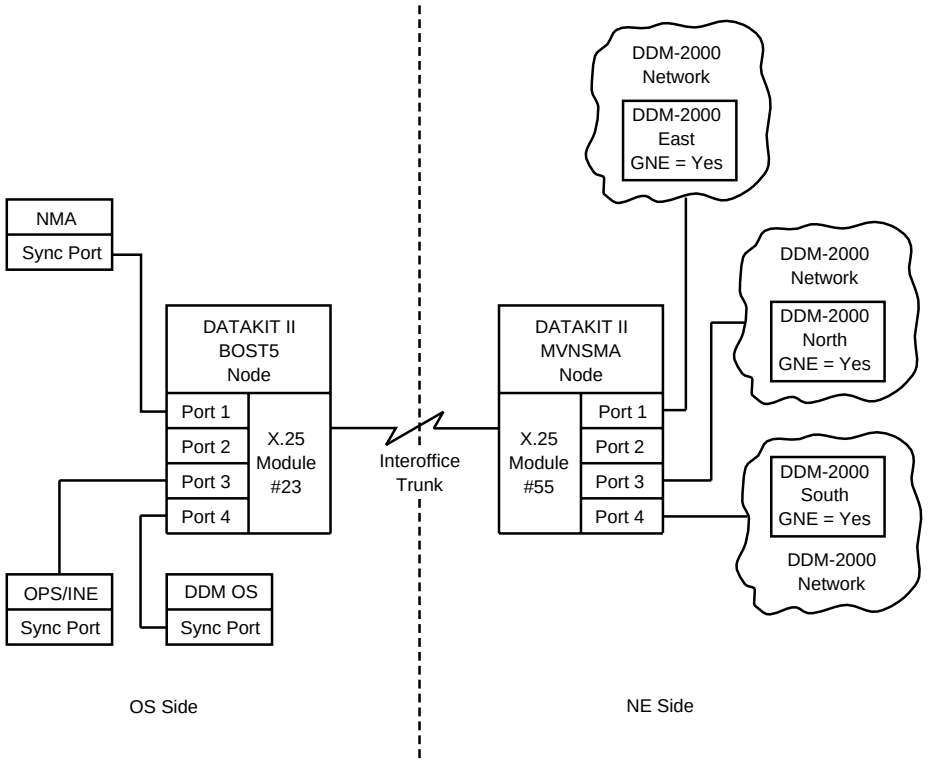


Figure 2-3. *Datakit* Provisioning Example

The connection between each DDM-2000 Multiplexer and the NMA host consists of two X.25 PVCs. LCN 1 is used to carry TL1 commands from the NMA host to the DDM-2000 Multiplexer and the responses to these commands from the DDM-2000 Multiplexer GNE. LCN 2 is used to carry autonomous TL1 messages from the DDM-2000 Multiplexer network GNE node to the NMA host. Even if information for LCN 2 is flowing in one direction only, a two-way PVC is required by NMA host. LCN 3 is used to carry **REPT DBCHG** autonomous TL1 messages and TL1 command/response messages from and to the OPS/INE.

The PVCs from multiple DDM-2000 Multiplexer networks may connect logically to the same physical NMA or OPS/INE port. The *Datakit* X.25 module concentrates the PVCs from the DDM-2000 Multiplexers onto one port of the NMA or OPS/INE host.

All *Datakit* nodes between the node containing the X.25 modules connecting to the DDM-2000 Multiplexers and the node containing the X.25 module connecting to the NMA host must have installed *Datakit* II, Release 2.1 software or higher. *Datakit* I (2000) nodes running Release 3.4 and earlier 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 ensure 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 DDM-2000 Multiplexer 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 2-3 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 Multiplexer ports and one group for the trunk(s) between BOST5 and MVNSMA.

In MVNSMA, each DDM-2000 Multiplexer port could belong to its own individual group, if desired. For this example, one universal group is sufficient for the PVCs.

Assume that there is a group called **ddm_pvc** defined for the PVCs on the local DDM-2000 Multiplexer ports in the MVNSMA node. The DEVICE OR HOST parameter for this group is assumed to be **ddm2000**. This group must be defined as a two-way group and should not be given any passwords. The HOST AUTOBAUD feature should be **off** and the ROUND ROBIN SERVICE parameter should be **none**. A similar group (for example, **os_pvc**) must be defined in the BOST5 node for the X.25 NMA and OPS/INE ports.

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

For SVCs, a different group (**ddm_svc**) should be created at the MVNSMA node. Likewise, another group (**os_pvc**) should be created at the BOST5 node. Each group should be created with DIRECTION equal to **2WAY**, DEVICE or HOST equal to **ddm2000**, and ROUND ROBIN SERVICE equal to **none**. The PASSWORD field can be either **none** or an eight-character value, depending upon the application.

Referring to Figure 2-3, the sync ports and group names are associated as follows:

OS Side (BOST5 Node)		**NE side** (MVNSMA Node)	
Sync Port	*Group Name*	*Sync Port*	*Group Name*
NMA	**os_pvc**	DDM-2000 North	**ddm_pvc**
OPS/INE	**os_pvc**	DDM-2000 South	**ddm_pvc**
DDM OS	**os_svc**	DDM-2000 East	**ddm_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 eight alphanumeric characters. The level hierarchy is arranged as follows:

  network/area/exchange/local address

- For X.121 addresses, each part consists only of three to four digits depending on level. The level hierarchy is arranged as follows:

  DNIC/service region/service area/endpoint number

  Where (assuming the North American numbering plan):

  — The Data Network Identification Code (DNIC) has four digits

  — The Service Region (SR) has three digits

  — The Service Area (SA) has three digits

  — The 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.

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.

- Within an office complex, one usually 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, and so forth. Hence, one uses the minimum number of levels required to call the destination.

Refer to Figure 2-3. 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 area,	`netel`	2345
service region	`mab`	617
Node MVNSMA		
network, DNIC area,	`netel`	2345
service region	`ma`	508
Node BOST5		
exchange, service area	`bos`	123
Node MVNSMA		
exchange, service area	`mvdk1`	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 2-3, 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 a *SLC*-2000 OS synchronous port. The PVCs on the NMA and OPS/INE ports will point to the destination PVCs on the DDM-2000 Multiplexer ports.

The MVNSMA node has an X.25 module in slot 55. Port 3 is connected to DDM-2000 Multiplexer North via PVC channels 1 and 2. Port 2 is similarly connected to DDM-2000 Multiplexer South via PVC channels 1 and 2 on that port. The assigned EPN for the PVCs on port 3 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:

DDM-2000 North	**DDM-2000 South**
ma/mvdk1/2300.55.3.1	ma/mvdk1/2400.55.4.1
ma/mvdk1/2300.55.3.2	ma/mvdk1/2400.55.4.2

EPNs will also be assigned to PVCs for the "*SLC*-2000 Network" (for example, 2100) but will need to be used.

SVC Addresses

When placing a call from the *SLC* OS (that is, submitting a call indication packet) to the "*SLC*-2000 Network," a user should specify the EPN assigned to the SVCs for that port in the "DTE Called Address" field of the call indication packet. The EPN for the SVCs on the "*SLC*-2000 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.

DDM-2000 Multiplexer End

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 2-3.

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>
```

The response to the `INTERNAL BAUD RATE` prompt is dependent on the type of X.25 Input/Output (I/O) board to which the DDM-2000 Multiplexer 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 DDM-2000 Multiplexer port cable is connected. A DCE I/O board is used when the DDM-2000 Multiplexer 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 *SLC*-2000 OS End

For the OS end, the X.25 module is defined in the BOST5 node the same as in the ***DDM-2000 Multiplexer End*** section except for the slot location and the number of user channels. The number of channels depends on the number of DDM-2000 Multiplexers 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 only can support the monitoring of 25 DDM-2000 Multiplexers. 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 *SLC*-2000 OS is connected, 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 DDM-2000 Multiplexer NEs and *SLC*-2000 NEs in the office. Refer to Figure 2-3. The parameters shown there 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 six PVC channels, three per DDM-2000 Multiplexer, as described above for NMA monitoring and OPS/INE provisioning and monitoring, and 2 SVCs for the *SLC*-2000 OS.

```
CC0> enter x25 port<ret>
MODULE ADDRESS: 55<ret>
PORT NUMBER [1-4]: <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]: ddm_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)]: 0<ret>
NUMBER OF PVC CHANNELS [0-34: +(34)]: 3<ret>
PVC GROUP [up to 8 chars]: ddm_pvc<ret>
ENDPOINT NUMBER FOR SVC 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 [1-3]: <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 [0-31: +(31)]: 0<ret>
NUMBER OF PVC CHANNELS [0-31: +(31)]: 3<ret>
PVC GROUP [up to 8 chars]: ddm_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 [1-3]: <del>
PORT NUMBER [1-4]: <del>
```

Since DDM-2000 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"
```

Operations System End

To define the X.25 port in BOST5 (specifically, the PVCs on that port that point to the DDM-2000 Multiplexer PVCs in MVNSMA), assume 50 user channels were specified in the definition of the module. 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)]: 4<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 [1-4]: 1<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2300.55.3.1<ret>

PVC LOGICAL CHANNEL NUMBER [1-4]: 2<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2300.55.3.2<ret>

PVC LOGICAL CHANNEL NUMBER [1-4]: 3<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2400.55.4.1<ret>

PVC LOGICAL CHANNEL NUMBER [1-4]: 4<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2400.55.4.2<ret>

PVC LOGICAL CHANNEL NUMBER [1-4]: <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, transparent:
  +(transparent)]: <ret>
NUMBER OF SVC CHANNELS PER PORT [0-46: +(46)]: 0<ret>
NUMBER OF PVC CHANNELS [0-46: +(46)]: 2<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 channels
      using the following prompts.  Hit <DEL> once when
      finished making entries.

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

PVC LOGICAL CHANNEL NUMBER [1-2]: 2<ret>
PVC DESTINATION [up to 72 chars, none: +(none)]:
ma/mvdk1/2400.55.4.3<ret>

PVC LOGICAL CHANNEL NUMBER [1-2]: <del>


PORT NUMBER [1-4]: 4<ret>
COMMENT [up to 60 chars double quoted, none: +(none)]:
 "SLC OS 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 [0-44: +(44)]: 1<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]: 3400<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 [0-43: +(43)]:0 <ret>


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"
```

Multiplexer Cabling

Referring to Figure 2-3, 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 DDM-2000 Multiplexer NE 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 2-4 shows a preferred cabling arrangement.

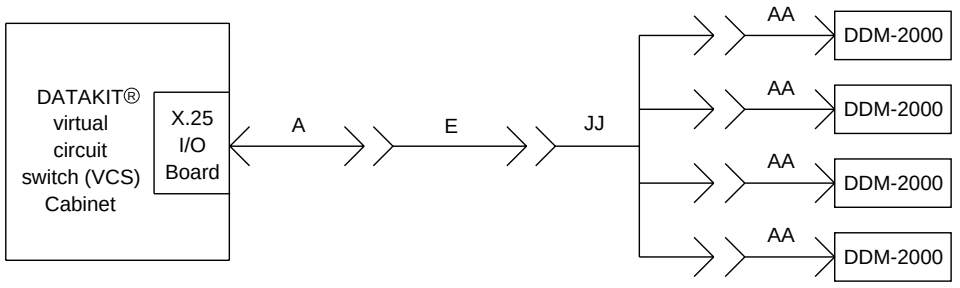


Figure 2-4. *Datakit* II to DDM-2000 Cabling Arrangement

Cables A, E, and JJ can be ordered from the *Datakit* product line using the part numbers listed in the following table. Cable AA (the X.25 cable) can be ordered through the DDM-2000 Multiplexer.

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 DDM-2000 Multiplexer equipment hierarchy, required in the NMA OS to monitor DDM-2000 Multiplexers via TL1/X.25 is specified in Methods documents prepared by Bellcore under the Operations Systems Modifications for Intelligent Network Elements (OSMINE) contract with Lucent Technologies. Contact Lucent Technologies Technical Support Organization or Regional Technical Assistance Center for copies of these documents.

DDM-2000 TL1 Message Details

3

Contents

Overview 3-1

TL1 Messages 3-3

ACT-USER 3-19

ALW-MSG 3-33

APPLY 3-37

CANC-USER 3-45

CNVT-CRS 3-49

CPY-PRGM 3-57

DLT-CRS-rr 3-67

DLT-OSACMAP 3-79

DLT-TADRMAP 3-83

DLT-ULSDCC 3-89

DLT-ULSDCC-L4 3-95

DLT-USER-SECU 3-101

ED-DAT 3-105

ED-PID 3-109

ED-USER-SECU 3-115

ENT-CID-SECU 3-121

Contents

TL1 Messages (Continued)

ENT-crs-rr	3-127
ENT-FEAT	3-155
ENT-FECOM	3-163
ENT-NCT	3-171
ENT-OSACMAP	3-177
ENT-rr	3-185
ENT-SYNCN	3-229
ENT-SYS	3-247
ENT-TL1MSGMAP	3-275
ENT-ULSDCC	3-281
ENT-ULSDCC-L3	3-289
ENT-ULSDCC-L4	3-299
ENT-USER-SECU	3-325
INH-MSG	3-331
INIT-REG	3-335
INIT-SYS	3-339
OPR-ACO	3-345
OPR-EXT-CONT	3-349
OPR-LPBK-rr	3-353
OPR-PROTNSW-OC12	3-361
OPR-SYNCNSW	3-363
REPT ALM	3-369
REPT ALM ENV	3-375
REPT COND	3-379
REPT DBCHG	3-383
REPT EVT	3-393
REPT PM	3-401
REPT SW	3-407
RLS-EXT-CONT	3-409

Contents

TL1 Messages (Continued)

RLS-LPBK-rr	3-415
RLS-PROTNSW	3-423
RLS-SYNCNSW	3-431
RTRV-ALM	3-437
RTRV-ALM-ENV	3-445
RTRV-AO	3-451
RTRV-ATTR-ALM	3-459
RTRV-ATTR-CONT	3-463
RTRV-ATTR-ENV	3-469
RTRV-ATTR-rr	3-473
RTRV-CID-SECU	3-479
RTRV-COND	3-487
RTRV-CRS-rr	3-495
RTRV-EQPT	3-507
RTRV-FEAT	3-517
RTRV-FECOM	3-521
RTRV-HDR	3-525
RTRV-LOG	3-537
RTRV-MAP	3-561
RTRV-MAP-NEIGHBOR	3-565
RTRV-MAP-NETWORK	3-573
RTRV-NCT	3-581
RTRV-OSACMAP	3-585
RTRV-OW	3-589
RTRV-PM	3-593
RTRV-PM-TCA	3-625
RTRV-PMSCHED	3-637
RTRV-PTHTRC-sts1	3-645
RTRV-rr	3-653

Contents

TL1 Messages (Continued)

RTRV-STATE-EQPT 3-677
RTRV-STATE-PATH 3-687
RTRV-STATE-X25 3-693
RTRV-SYNCN 3-699
RTRV-SYS 3-725
RTRV-TH 3-741
RTRV-TL1MSGMAP 3-751
RTRV-ULSDCC 3-755
RTRV-ULSDCC-L3 3-759
RTRV-ULSDCC-L4 3-765
RTRV-USER-SECU 3-773
SCHED-PMREPT 3-777
SET-ATTR-ALM 3-791
SET-ATTR-CONT 3-797
SET-ATTR-ENV 3-803
SET-ATTR-rr 3-809
SET-OW 3-815
SET-SID 3-821
SET-SYNCN 3-825
SET-TH 3-833
SW-TOPROTN 3-842
SW-TOWKG 3-851
TEST-IAOLAN 3-859
TEST-SYSCTL 3-863
TEST-TRMSN 3-867
UPD-SYS 3-877

Access Identifier Parameter Values 3-885

Table 3-1. OC-3 Adddress 3-886
Table 3-2. OC-12 and OC-12 Regenerator Address 3-889

Table 3-3. FiberReadh Multiplexer Address 3-891

Alarm and Status Condition Description 3-892

Table 3-4. Alarm and Status Condition Descriptions 3-892

Monitored Parameter Types 3-916

Table 3-5. TL1 Monitored Parameter Types (montype) 3-916

Provisionable PM Parameters 3-917

Table 3-6. OC-3 Performance Monitoring Parameters Provisionable Via the CIT 3-917

Table 3-7. OC-12 Performance Monitoring Parameters Provisionable Via the CIT 3-919

Table 3-8. OC-12 Regenerator Performance Monitoring Parameters Provisionable Via the CIT 3-920

Table 3-9. FiberReach Multiplexer Parameters Provisionable Via the CIT 3-921

Table 3-10. FiberReach Multiplexer Performance Monitoring Parameters Provisionable Via the CIT 3-924

Condition Types 3-925

Table 3-11. Condition Types (condtype) 3-925

TL1 Character Set Definitions 3-928

Table 3-12. TL1 Character Set Definitions 3-928

DDM-2000 TL1 Message Details

3

Overview

This section provides detailed information about the input and output parameters for the supported Transaction Language 1 (TL1) messages. Both autonomous messages (generated by DDM-2000 Multiplexer 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
- Provisionable performance monitoring parameters
- Condition types.

The DDM-2000 Multiplexer is case insensitive for all TL1 commands. For example, the DDM-2000 Multiplexer 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 TL1 command responses and autonomous messages are output in uppercase except:

- Correlation tag (*ctag*). The *ctag* is output exactly as it is received from the OS to assure compatibility.
- Access identifier (*aid*). The *aid* is always displayed in lowercase in the user and TL1 interface.
- Condition description (*conddescr*). The *conddescr* is output in mixed case for readability.
- Alarm message description (*almmsg*). The *almmsg* is output in mixed case for readability.
- Error text. Error text is output in mixed case for readability.

The DDM-2000 Multiplexer does not support parameter grouping.

TL1 commands, command parameter values, and user interface commands are to be input exactly as shown (upper-, lower-, or mixed-case alphabetic characters are acceptable, as mentioned above) and 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.

Where an **INPUT FORMAT** parameter appears in braces ({ }), one (and only one) of these parameters may be used.

TL1 Messages

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

The following autonomous messages are supported:

REPORT ALARM (REPT ALM) —
autonomous reports of alarm conditions
[OC-3 Release 2.1 (linear), 5.0 (rings) and later,
OC-12 Release 1.1 (linear), 1.1 (rings) and later,
FiberReach Release 1.0 and later releases]

REPORT ALARM ENVIRONMENT (REPT ALM ENV) —
autonomous reports of environmental alarm conditions
[OC-3 Release 2.1 (linear), 5.0 (rings) and later,
OC-12 Release 1.1 (linear), 1.1 (rings) and later,
FiberReach Release 1.0 and later releases]

REPORT CONDITION (REPT COND) —
periodic autonomous reports of standing status conditions
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

REPORT DATABASE CHANGE (REPT DBCHG) —
autonomous reports of provisioning changes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

REPORT EVENT (REPT EVT) —
autonomous reports of status conditions, including performance-monitoring (PM) threshold-crossing alerts (TCAs).
[OC-3 Release 2.1 (linear), 5.0 (rings) and later,
OC-12 Release 1.1 (linear), 1.1 (rings) and later,
FiberReach Release 1.0 and later releases]

REPORT PERFORMANCE MONITORING (REPT PM) —
autonomous reports of performance-monitoring (PM) data
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

---

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

REPORT SWITCH (REPT SW) —
autonomous reports of autonomous circuit pack protection switches
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

The following command/response messages are supported:

ACTIVATE-USER (**ACT-USER**) —
establishes a user login session
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

ALLOW-MESSAGE (**ALW-MSG**) —
allows autonomous message reporting
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

APPLY (**APPLY**) —
activates the dormant software generic
[OC-3 Release 9.1 and later,
OC-12 Release 5.1 and later]

CANCEL-USER (**CANC-USER**) —
terminates a user login session
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

CONVERT-CROSS-CONNECT (**CNVT-CRS**) —
converts STS1 cross-connections into up to 28 individual VT-1.5 cross-connections
[OC-3 Release 8.0 (linear), 9.0 (rings) and later]

COPY-PROGRAM (**CPY-PRGM**) —
copies the software generic contained in the memory of one network element to the memory of another network element of the same type
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

DELETE-CROSS-CONNECT-*rr* (**DLT-CRS-*rr***) —
deletes a cross connection
[OC-3 Release 6.1 (linear), Release 7.1 (rings) and later,
OC-12 Release 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

DELETE-OSACMAP (**DLT-OSACMAP**) —
deletes OS application context ID map entry
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

DELETE-TADRMAP (**DLT-TADRMAP**) —
instructs a Directory Services Network Element (DSNE) to remove an entry from the network maps of all the network elements in the subnetwork
[OC-3 Release 8.0 (linear), 9.0 through 11.X (rings),
OC-12 Release 5.0 through 5.X (rings),
FiberReach Release 1.0 through 2.X]

DELETE-UPPER-LAYER-STACK-DCC - LAYER 4 (**DLT-ULSDCC-L4**) —
deletes provisionable parameters in upper layer Section DCC, Layer 4
[OC-3 Release 13.0 (rings) and later,
OC-12 Release 7.0 (rings) and later,
FiberReach Release 3.0 and later releases]

DELETE-USER-SECURITY (**DLT-USER-SECU**) —
deletes a user login
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

EDIT-DATE (**ED-DAT**) —
changes the date and/or time
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

EDIT-PRIVATE-IDENTIFIER (**ED-PID**) —
changes a user's password
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

EDIT-USER-SECURITY (**ED-USER-SECU**) —
edits the security parameters associated with a user
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-CID-SECURITY (**ENT-CID-SECU**) —
sets CIT and DCC port security and timeouts
[OC-3 Release 8.0 (linear), 7.2 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-CROSS-CONNECT (**ENT-CRS-*rr***) —
enters a cross connection
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 3.1 and later rings releases,
FiberReach Release 1.0 and later releases]

ENTER-EC1 (**ENT-EC1**) —
enters EC1 line attributes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **ENT-*rr*** TL1 command)

ENT-FEATURE (**ENT-FEAT**) —
configures the network element for feature options that are licensed for use
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-FECOM (**ENT-FECOM**) —
provisions the section DCC channels and/or IAO LAN interface
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-OC1 (**ENT-OC1**) —
enters OC1 line attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-OC3 (**ENT-OC3**) —
enters OC3 line attributes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-OC12 (**ENT-OC12**) —
enters OC12 line attributes
[OC-3 Release 11.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-OSACMAP (**ENT-OSACMAP**) —
maps an X.25 VC to an OS type (ACID)
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later]

ENTER-STS1 (**ENT-STS1**) —
enters STS1 attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later releases,
FiberReach Release 1.0 and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-STS3C (**ENT-STS3C**) —
enters STS3C attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later]
(See the **ENT-*rr*** TL1 command)

ENTER-SYNCHRONIZATION (**ENT-SYNCN**) —
provisions the synchronization mode switching, synchronization source,
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-SYSTEM (**ENT-SYS**) —
modifies the system attributes of a network element
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-T1 (**ENT-T1**) —
enters DS1 line attributes
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-T3 (**ENT-T3**) —
enters DS3 line attributes
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **ENT-*rr*** TL1 command)

ENTER-TL1MSGMAP (**ENT-TL1MSGMAP**) —
maps TL1 autonomous message types to an OS type (ACID)
[OC-3 Release 8.0 (linear), 7.2 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-ULSDCC (**ENT-ULSDCC**) —
provisions the user-settable fields of the OSI network service access point (NSAP) address
[OC-3 Release 8.0 (linear), 7.2 through 11.X (rings),
OC-12 Release 5.0 through 5.X (rings),
FiberReach Release 1.0 through 2.X]

ENTER-UPPER-LAYER-STACK-DCC - LAYER 3 (**ENT-ULSDCC-L3**) —
enters user-settable parameters in upper layer Section DCC, Layer 3
[OC-3 Release 13.0 and later,
OC-12 Release 7.0 and later,
FiberReach Release 3.0 and later]

ENTER-UPPER-LAYER-STACK-DCC - LAYER 4 (**ENT-ULSDCC-L4**) —
enters user-settable parameters in upper layer Section DCC, Layer 4
[OC-3 Release 13.0 and later,
OC-12 Release 7.0 and later,
FiberReach Release 3.0 and later]

ENTER-USER-SECURITY (**ENT-USER-SECU**) —
enters a user login
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

ENTER-VT1 (**ENT-VT1**) —
enters VT1.5 attributes
[OC-3 Release 6.2 (linear), Release 7.1 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **ENT-*rr*** TL1 command)

INHIBIT-MESSAGE (**INH-MSG**) —
inhibits TL1 autonomous message reporting
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

INITIALIZE-REGISTER (**INIT-REG-ALL**) —
initializes (resets) all current performance-monitoring storage registers
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

INITIALIZE-SYSTEM (**INIT-SYS**) —
initializes (resets) all provisionable parameters to their default values
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

OPERATE-ALARM-CUTOFF (**OPR-ACO**) —
operates the alarm cutoff (ACO) to silence office audible alarms
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

OPERATE-EXTERNAL-CONTROL (**OPR-EXT-CONT**) —
operates an external miscellaneous discrete control, such as a relay activation, a fan, a light, or a sprinkler
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,

FiberReach Release 1.0 and later releases]

OPERATE-LOOPBACK (**OPR-LPBK-*rr***) —
operates a loopback
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

OPERATE-PROTECTION-SWITCH (**OPR-PROTNSW-*rr***) —
operates OC-N line protection switching capabilities and ring path protection switching capabilities [OC-3 Release 6.0 and later
OC-3 Release 7.1, OC-12 Release 3.1 (rings) and later only,
FiberReach Release 1.0 and later releases]

OPERATE-SYNCHRONIZATION-SWITCH (**OPR-SYNCNSW**) —
operates DS1 synchronization input reference protection switching capabilities
[OC-3 Release 5 and later,
OC-12 Release 2, and later]

RELEASE-EXTERNAL-CONTROL (**RLS-EXT-CONT**) —
releases an external miscellaneous discrete control, such as a generator, a fan, a light, or sprinkler
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RELEASE-LOOPBACK (**RLS-LPBK-*rr***) —
releases a loopback
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RELEASE-SYNCHRONIZATION-SWITCH (**RLS-SYNCNSW**) —
release an existing inhibit of DS1 synchronization input reference protection switching
[OC-3 Release 6.1 (linear), 6.0 (rings) and later,
OC-12 Release 2.1 (linear), 2.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ALARM-ENVIRONMENT (**RTRV-ALM-ENV**) —
retrieves current environmental alarm conditions
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ALARM (**RTRV-ALM-*rr***) —
retrieves current alarm conditions, and for OC-3 Release 2 only, current status conditions
[OC-3 Release 6.1 (linear), 5.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-AUTONOMOUS-OUTPUT (**RTRV-AO**) —
retrieves TL1 autonomous messages
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ATTRIBUTE-ALARM (**RTRV-ATTR-ALM**) —
retrieves delay (almdel), clear delay interval (clrdel), and power minor alarm (pmn) alarm attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 4.0 (linear), 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ATTRIBUTE-CONTROL (**RTRV-ATTR-CONT**) —
retrieves provisioned description associated with an external miscellaneous discrete control
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 4.0 (linear), 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ATTRIBUTE-ENVIRONMENT (**RTRV-ATTR-ENV**) —
retrieves the environmental alarm/status point attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ATTRIBUTE (**RTRV-ATTR-*rr***) —
retrieves the notification code associated with incoming signal failure
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-CID-SECURITY (**RTRV-CID-SECU**) —
retrieves the CIT and DCC port security and timeout information
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-CONDITION (**RTRV-COND-*rr***) —
retrieves current status conditions
[OC-3 Release 3, OC-12 Release 1 and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-CROSS-CONNECT (**RTRV-CRS-*rr***) —
retrieves cross connections
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-EC1 (**RTRV-EC1**) —
retrieves EC1 line attributes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-EQUIPMENT (**RTRV-EQPT**) —
retrieves circuit pack and version numbers for one or more slots
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-FEATURE (**RTRV-FEAT**) —
retrieves the list of active feature options enabled
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-FECOM (**RTRV-FECOM**) —
retrieves the section DCC provisioning
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-HEADER (**RTRV-HDR**) —
retrieves system ID, time, and date
[OC-3 Release 6.1 (linear),
OC-12 Release 2.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-LOG (**RTRV-LOG**) —
initiate to retrieve the history log for the network element
[OC-3 Release 13.0 and later,
OC-12 Release 7.0 and later,
FiberReach Release 3.0 and later releases]

RETRIEVE-MAP (**RTRV-MAP**) —
initiates to retrieve the topological map of the subnetwork
[OC-3 Release 6.2 (linear), 7.1 through 7.2 (rings),
OC-12 Release 2.2 (linear), 3.1 through 3.X (rings),

RETRIEVE-MAP-NEIGHBOR (**RTRV-MAP-NEIGHBOR**) —
retrieves all network elements that are immediate DCC and/or IAO LAN neighbors
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-MAP-NETWORK (**RTRV-MAP-NETWORK**) —
retrieves all network elements in the subnetwork
[OC-3 Release 8.0 (linear), 9.0 through 11.X (rings),
OC-12 Release 5.0 through 5.X (rings),
FiberReach Release 1.0 through 2.X]

RETRIEVE-MAP-NETWORK (**RTRV-MAP-NETWORK**) —
retrieves all reachable network elements in the local area only (in a partitioned subnetwork) or reachable Level 2 IS NEs across all areas (if the local NE is provisioned to be a Level 2 IS in a partitioned subnetwork)
[OC-3 Release 13.0,
OC-12 Release 7.0,
FiberReach Release 3.0 and later releases]

RETRIEVE-OC1 (**RTRV-OC1**) —
retrieves OC1 line attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-OC3 (**RTRV-OC3**) —
retrieves OC3 line attributes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-OC12 (**RTRV-OC12**) —
retrieves OC12 line attributes
[OC-3 Release 11.0 (rings) and later,
[OC-12 Release 2.1 (linear), 3.1 (rings), and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-OSACMAP (**RTRV-OSACMAP**) —
displays the mapping of X.24 VCs ro OS types (ACIDS)
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later releases]

RETRIEVE-ORDERWIRE (**RTRV-OW**) —
displays the orderwire mode that is currently effective
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-PERFORMANCE-MONITORING (**RTRV-PM-*rr***) —
retrieves performance-monitoring data, including historical PM data.
[OC-3 Release 3.0 (linear), 5.0 (rings) and later,
OC-12 Release 1.0 (linear), 2.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-PERFORMANCE-MONITORING-TCA (**RTRV-PM-TCA**) —
displays total number of threshold crossing alerts (TCAs) associated with signals terminating in the system
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-PERFORMANCE-MONITORING-SCHEDULE (**RTRV-PMSCHED-*rr***) —
retrieves active PM report schedules
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-PATH-TRACE (**RTRV-PTHTRC-STS1**) —
retrieves the provisioned transmit and receive path traces, the status of the path trace, and the actual receive path trace, if available
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-STATE-EQUIPMENT (**RTRV-STATE-EQPT**) —
retrieves the port, slot, and protection switch information
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-STATE-PATH (**RTRV-STATE-PATH**) —
displays signal path state information for paths dropped at the NE and (for FiberReach and OC-3) for pass-through signals on the high-speed ring channels
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-STATE-X25 (**RTRV-STATE-X25**) —
displays the x.25 link packet size information, an indication whether this is an active GNE or not, and the status of the x.25 communication
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-STS1 (**RTRV-STS1**) —
retrieves STS1 attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-STS3C (**RTRV-STS3C**) —
retrieves STS3C attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-SYNCHRONIZATION (**RTRV-SYNCN**) —
displays the provisioning and operational information on the synchronization attributes
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-SYSTEM (**RTRV-SYS**) —
retrieves a network element's system attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-T1 (**RTRV-T1**) —
retrieves DS1 line attributes
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-T3 (**RTRV-T3**) —
retrieves DS3 line attributes
[OC-3 Release 6.1 (linear), 7.0 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **RTRV-*rr*** TL1 command)

RETRIEVE-THRESHOLD (**RTRV-TH-*rr***) —
displays the current threshold level of one or more monitored performance parameters
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-TL1MSGMAP (**RTRV-TL1MSGMAP**) —
the mapping of displays TL1 autonomous message types to OS types (ACID)
[OC-3 Release 8.0 (linear), 7.2 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-ULSDCC (**RTRV-ULSDCC**) —
retrieves the OSI network service access point (NSAP) address
[OC-3 Release 8.0 (linear), 9.0 through 11.X (rings),
OC-12 Release 5.0 through 5.X (rings),
FiberReach Release 1.0 through 2.X]

RETRIEVE-UPPER-LAYER SECTION-DCC - LAYER 3 (**RTRV-ULSDCC-L3**) —
retrieves provisionable parameters in upper layer Section DCC, layer 3.
[OC-3 Release 13.0 and later,
OC-12 Release 7.0 and later,
FiberReach Release 3.0 and later releases]

RETRIEVE-UPPER-LAYER SECTION-DCC - LAYER 4 (**RTRV-ULSDCC-L4**) —
retrieves provisionable parameters in upper layer Section DCC, layer 4.
[OC-3 Release 13.0 and later,
OC-12 Release 7.0 and later,
FiberReach Release 3.0 and later releases]

RETRIEVE-USER-SECURITY (**RTRV-USER-SECU**) —
retrieves user logins
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

RETRIEVE-VT1 (**RTRV-VT1**) —
retrieves VT1.5 attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
FiberReach Release 1.0 and later releases]
(See the **RTRV-*rr*** TL1 command)

SCHEDULE-PERFORMANCE-MONITORING-REPORT
(**SCHED-PMREPT-*rr***) —
schedules a PM report
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-ATTRIBUTE-ALARM (**SET-ATTR-ALM**) —
sets alarm level attributes
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-ATTRIBUTE-CONTROL (**SET-ATTR-CONT**) —
provisions the description associated with an external miscellaneous discrete control
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 4.0 (linear), 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-ATTRIBUTE-ENVIRONMENT (**SET-ATTR-ENV**) —
sets the environmental alarm/status point attributes
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-ATTRIBUTE (**SET-ATTR-*rr***) —
sets the notification code associated with an incoming signal failure event
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-ORDERWIRE (**SET-OW**) —
set/modifies the orderwire mode
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-SYSTEM-IDENTIFICATION (**SET-SID**) —
sets the system ID [the Source Identifier (SID)/Target Identifier (TID)]
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-SYNCHRONIZATION (**SET-SYNCN**) —
sets the synchronization mode of the network element
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-THRESHOLD (**SET-TH-*rr***) —
sets the threshold level for a monitored performance parameter
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

SET-X.25-PACKET-SIZE (**SET-X25**) —
sets the packet size of the X.25 channel
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later releases]

SWITCH-TO-PROTECTION (**SW-TOPROTN**) —
operates circuit pack protection switching capabilities
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

SWITCH-TO-WORKING (**SW-TOWKG**) —
releases circuit pack protection switching requests
[OC-3 Release 6.1 (linear), 7.1 (rings) and later,
OC-12 Release 2.1 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

TEST-SYSCTL (**TEST-SYSCTL**) —
causes the entire control system to perform a self test
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

TEST-TRANSMISSION (**TEST-TRMSN-*rr***) —
sets up automated transmission test at DS1 or DS3 level
[OC-3 Release 6.2 (linear), 7.1 (rings) and later,
OC-12 Release 2.2 (linear), 3.1 (rings) and later,
FiberReach Release 1.0 and later releases]

UPDATE-SYSTEM (**UPD-SYS**) —
updates the system database (as recorded in the non-volatile memory) to reflect the existing configuration and incoming signals
[OC-3 Release 8.0 (linear), 9.0 (rings) and later,
OC-12 Release 5.0 (rings) and later,
FiberReach Release 1.0 and later releases]

NAME

ACT-USER: Activate User

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- OC-3 Release 7.0 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0.

INPUT FORMAT

ACT-USER:*tid*:*uid*:

DESCRIPTION

NOTE:
This command is available to all users.

ACT-USER commands can be initiated to set up a TL1 session with the Network Element (NE).

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 NE, 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.

Until a successful login attempt is complete for a given NE and virtual circuit, there is no communications (autonomous or command responses) outbound from the NE, 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 a DDM-2000 Gateway Network Element (GNE). In those cases only, some other invalid commands are DENY-ed by the GNE (refer to the **RTRV-HDR ERROR RESPONSES** section for details.

DDM-2000 TL1 login security is always enabled.

If the X.25 link to a DDM-2000 GNE fails, all active X.25 logins are terminated without notice to the user. Similarly, all active logins to a remote NE may be terminated if:

- a communication failure occurs between the GNE and that remote NE or
- either the GNE, the targeted remote NE or an intermediate NE is reset or initialized.

Communication failures also include OC-N and Data Communications Channel (DCC) failures, unless protected in rings, between the GNE and the targeted remote NE.

INPUT PARAMETERS

tid Target identifier. This is the name of the NE 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.

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

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 NE.

Four classes of users are allowed, as listed below in order of decreasing privilege:

— Privileged Users
— General Users
— Maintenance Users (Editors NOTE: Effective what releases)?
— Reports-Only Users

Login IDs for TL1 access are not treated any differently from other user login IDs. That is, a *uid* for TL1 access can have the same possible user privileges and that login ID can be used for CIT access as well as TL1 access.

ctag Correlation tag. This is included in the command by the user and is repeated by the NE 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 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 (white space is ignored). Password strings are transmitted in unencrypted form in the **ACT-USER** command. They are encrypted when stored in the NE and are never transmitted from the NE.

Refer to Table 3-12 at the end of this section for a list of valid characters.

OUTPUT FORMAT

Prior to DDM-2000 OC-3 R7.1.3 and OC-12 R5.0, if the login request completes successfully, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "uid"
   /*  LUCENT <system>
       <release>
       User Privilege Level: <privilege>
            LUCENT - PROPRIETARY
      THIS SOFTWARE CONTAINS INFORMATION OF LUCENT
      TECHNOLOGIES  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 LUCENT AND CUSTOMER.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.
        */
```

For DDM-2000 OC-3 R7.1.3, OC-12 R5.0, FiberReach R1.0, and later, if the login request completes successfully, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "uid"
   /*  LUCENT <system>
       <release>
       User Privilege Level: <privilege>
           LUCENT - PROPRIETARY
      THIS SOFTWARE IS NOT TO BE DISCLOSED OR USED EXCEPT
      IN ACCORDANCE WITH APPLICABLE AGREEMENTS.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.
 */
;
```

For DDM-2000 OC-3 R8.1 and R9.1 and later, if the login request completes successfully on a MegaStar 2000 system, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "uid"
   /*  MegaStar 2000 SONET Radio
       <release>
       User Privilege Level: <privilege>
           LUCENT TECHNOLOGIES & HARRIS CORP - PROPRIETARY
      THIS SOFTWARE IS NOT TO BE DISCLOSED OR USED EXCEPT
      IN ACCORDANCE WITH APPLICABLE AGREEMENTS.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.
 */
;
```

If the NE receives a valid **ACT-USER** command and the addressed *uid* is already currently logged in on the same access channel and has the same privilege level, the NE provides a normal completion response.

One of the following strings is used for the <system> value:

```
DDM-2000 OC-3 Multiplexer
DDM-2000 OC-12 Multiplexer
DDM-2000 OC-12 Regenerator
DDM-2000 FiberReach
```

The <release> string is of the form:

```
Release x.y.z
```

where x.y.z reflects the actual software release number.

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

PRIVILEGED	This indicates that the user has a privileged login. A privileged login has access to all the system functional capabilities. Only the privileged logins have access to the security and access functions. These functions include assigning/changing login/passwords for other users , setting target identifier (TID) names, resetting the system, and system initialization functions.
GENERAL	This indicates that the user has a general login. A general login has access to all the system functional capabilities except security, access, system initialization and software installation functions.
MAINTENANCE	This indicates that the user has a maintenance login. Maintenance users can only execute commands that access the system, extract reports and execute maintenance functions through a specific set of commands. No privileged commands may be executed by maintenance users.
REPORTS	This indicates that the user has a reports only login. A reports only user has access to the **RETRIEVE-** (except **RTRV-USER-SECU**), **ACT-USER**, **ED-PID** and **OPR-ACO** TL1 command/response messages.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. The additional parameter that specifically applies to this command response is described below:

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

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:LT-PF-2000:PeterPan:123456::N*v*rL*d3;


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "PeterPan"
   /*  LUCENT DDM-2000 OC-3 Multiplexer
       Release 6.1.0
       User Privilege Level: REPORTS ONLY
              LUCENT - PROPRIETARY
      THIS SOFTWARE CONTAINS INFORMATION OF LUCENT
      TECHNOLOGIES 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 LUCENT AND CUSTOMER.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.
   */
;
```

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 for DDM-2000 OC-3 R8.1 and R9.1 and later:

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


   sid date time
M  ctag COMPLD
   "uid"
   /*  LUCENT <system>
       <release>
       User Privilege Level: <privilege>
           LUCENT - PROPRIETARY
      THIS SOFTWARE IS NOT TO BE DISCLOSED OR USED EXCEPT
      IN ACCORDANCE WITH APPLICABLE AGREEMENTS.
      UNAUTHORIZED ACCESS OR USE MAY LEAD TO PROSECUTION.
 */
;
```

ERROR RESPONSES

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

For invalid login tries, the error response message is transmitted only after both *uid* and *pid* are provided by the session requester, irrespective of whether the *uid*, *pid*, or both are invalid.

[Exception: For an **ACT-USER** command with extra punctuation *after* the *pid* other than an end-of-message semicolon (**;**), no error response is returned if there no active login to the NE exists. Usually, if non-null *uid* and *pid* values are received, the NE would provide a response.]

If the NE receives an **ACT-USER** command with an invalid *uid*, invalid *pid* or both, or if a different login session is already active on the access channel or logins are disabled, the following error response is returned:

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

If the NE 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 */
;
```

If the NE receives an **ACT-USER** command by a non-privileged user when the channel is in locked state, access is denied and the following error response is returned:

```
   sid date time
M  ctag DENY
   PIUI
   /* Privilege, Illegal User Identity, locked state - no non-privileged
      access*/
;
```

For DDM-2000 OC-3 R11.x, OC-12 R5.x, and earlier, if the NE is a DDM-2000 GNE and receives an **ACT-USER** command for routing to an FT-2000 NE, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, no access to NE via DDM-2000 */
;
```

In DDM-2000 OC-3 Release 11.x, OC-12 Release 5.x, and FiberReach Release 2.x, and earlier, if the remote NE receives an **ACT-USER** command when the maximum number of associations are already in use, the following error response is returned. (In this case, the DDM-2000 GNE responds for the RNE.)

```
   sid date time
M  ctag DENY
   SSRB
   /* Status, System Resources Busy, maximum connections already in use */
;
```

If a DDM-2000 OC-3 R11.x, OC-12 R5.x, and earlier, GNE receives an **ACT-USER** command when the maximum number of assocations (TL1 logins) are already in use, the following error response is returned:

```
   sid date time
M  ctag DENY
   SARB
   /* Status, All Resources Busy, maximum connections to NE already
      in use */
;
```

For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, if the GNE receives an **ACT-USER** command, when the maximum number of associations (TL1 logins) are already in use, the following error response is returned:

```
   sid date time
M  ctag DENY
   SARB
   /* Status, All Resources Busy, TL1-GNE maximum associations
      already in use */
;
```

For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, if an **ACT-USER** command is addressed to a remote NE, but the DDM-2000 GNE is unable to determine a TID-to-NSAP translation, the following error response is returned by the GNE using the *sid* value of the addressed RNE:

```
   sid date time
M  ctag DENY
   IITA
   /* Input, Invalid Target identifier, TL1-GNE unknown TID */
;
```

For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, if an **ACT-USER** command is addressed to a remote NE, but the DDM-2000 GNE's association setup attempt fails, the following error response is returned by the GNE using the *sid* of the addressed RNE:

```
   sid date time
M  ctag DENY
   SARB
   /* Status, All Resources Busy, TL1-GNE association setup failure */
;
```

If an RNE receives an otherwise valid **ACT-USER** command, but the TID in the command does not match the RNE's local TID, the following error response is returned using the *sid* value of the addressed RNE:

```
   sid date time
M  ctag DENY
   IITA
   /* Input, Invalid Target identifier, TL1-RNE unknown TID,
      NSAP=xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx */
;
```

RELATED TL1 MESSAGES

CANC-USER

ED-PID

DLT-USER-SECU

ENT-USER-SECU

RTRV-USER-SECU

ED-USER-SECU

NAME

ALW-MSG: Allow Message.

Support for this message is available for DDM-2000 Multiplexers starting with:

- DDM-2000 OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- DDM-2000 OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0.

INPUT FORMAT

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

DESCRIPTION

ALW-MSG commands are initiated by users to resume transmission of autonomous messages from a Network Element (NE) if autonomous message reporting from that NE had been inhibited.

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, when an NE receives an **ALW-MSG** command from a user, the NE resumes transmission of all autonomous messages if autonomous message reporting had been inhibited.

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, the default system state at user login is **ALW-MSG**.

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, when autonomous message reporting to the user is resumed after having been inhibited, the NE reports that autonomous message reporting is allowed in an autonomous REPT EVT message.

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, the NE reports all active alarm and status conditions to all users, depending on OS type, in autonomous (REPT) messages, when the reporting of autonomous messages is resumed by any user after having been inhibited.

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, if there are no active alarm or status conditions to report, the NE returns a normal completion (COMPLD) response to the **ALW-MSG** command and report that autonomous message reporting is allowed in an autonomous REPT EVT message.

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Modifier. The *modifier* value must be **ALL**.

tid In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Target identifier. This is the name of the NE to which the command is addressed.

aid In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Acess Identifier. The *aid* value must be **all** or null (default=**all**) because the entire system is affected.

ctag In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, if the NE fully complies with the **ALW-MSG-ALL** request, the following completion response is returned.

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

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, if the NE receives an **ALW-MSG** command from a user when autonomous message reporting to the user had already been allowed, the NE 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

```
alw-msg-eqpt:LT-PF-2000::123xyz;

IP 123xyz
<

   LT-PF-2000 94-06-06,09:30:49
M  123xyz COMPLD
;
```

ERROR RESPONSE

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

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, 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 */
;
```

In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, if an **ALW-MSG** command is received with an invalid *aid* value, anything other that **all** or null, the following error response is returned:

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

RELATED TL1 MESSAGES

INH-MSG

REPT EVT

NAME

APPLY: Activate New Software Generic

This message is generically defined for Lucent Technologies Product Family 2000 (PF-2000) products. Support for this message is available for DDM-2000 Multiplexers, starting with:

- DDM-2000 OC-3 Release 9.1 (for rings)
- DDM-2000 OC-12 Release 5.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

APPLY:*tid*::*ctag*[::*action*];

For DDM-2000 OC-3 R11.0, OC-12 R7.0, and later:
APPLY:*tid*::*ctag*[::[*time*],[*date*][,*action*]];

DESCRIPTION

NOTE:
This command is restricted to privileged users.

The **APPLY** command can be initiated by users or applications to install a dormant copy of a software generic stored in the Network Element's (NE) flash memory, overwriting the currently executing software. The **APPLY** command works with compressed or uncompressed files. The software in memory is left undisturbed so that it can be copied to other like NEs.

The installation of the software will occur 30 minutes after the NE receives the install command. This delay is designed to give the user a chance to cancel the install command and to allow other apply commands to travel through the subnetwork before new software is installed and communications are potentially disrupted. The *action* parameter is used to cancel the **APPLY** command.

Whenever the dormant software version does not match the currently executing software version, a standing condition will be raised indicating that the software releases do not match. When the NE determines it is time to install the new software, the software mismatch standing condition will be cleared and a software download IP (In Progress) standing condition will be raised.

When new software begins executing, all alarms and conditions will be cleared. The user will need to reestablish communications with the NE and update alarm information by sending a **RTRV-COND** command.

The *time* and *date* parameters identify when the software is to be downloaded. Both may be provided, or only the time may be provided. When only the time is provided, the install is scheduled within the following 24 hours. When an installation is requested and no time/date are provided, the software will be installed by the NE 15 minutes after receiving the **apply** command.

Unlike DDM-2000 OC-3 R11 and DDM-2000 OC-12 R7.0, FiberReach systems cannot use the time and date parameter to schedule software installation. For FiberReach systems, software is always installed immediately when it is downloaded.

If the dormant file is compressed, the NE will decompress the file prior to installing it as then executing copy.

INPUT PARAMETERS

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

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

time The *time* parameter is supplied to identify the time at which the software is to be installed on the NE. If no *time* parameter is supplied, and the action parameter has the value of *install* or is null, the software will be scheduled for installation 15 minutes after the command is processed by the NE. The fifteen minute interval is designed to give the user a chance to cancel the command and/or to issue similar commands to other NEs in the subnetwork while being assured that communications have not been disrupted by the installation of new software.

The *time* parameter has the form: HH.MM [.SS].

HH expresses the hour on a 24 hour clock and must have a value between 00 and 23 inclusive with leading zeros required for single digit numbers;

MM expresses the minutes and must have a value between 00 and 59 inclusive with leading zeros required for single digit numbers;

SS expresses the seconds and must be null or have a value between 00 and 59 inclusive with leading zeros required for single digit numbers.

The time will be assumed to refer to a time that occurs within 24 hours of the current time when no date is provided.

date The *date* parameter is supplied to identify the date when the software is to be installed on the NE. When a *date* parameter is supplied, a *time* parameter must be supplied as well.

The *date* parameter has the form: YY/MM/DD.

YY YY represents the last two digits of the year where leading zeros are required for single digit numbers.

MM represents the month of the year and must have a value between 01 and 12 inclusive with leading zeros required for single digit numbers.

The date is assusmed to refer to a date within the next 12 months.

DD expresses the day of the month and must have a value between 0 and 31 inclusive with leading zeros required for single digit numbers.

action The *action* parameter enables the apply command to be used to cancel or reschedule a planned software download. Allowed values are:

- *install* – The default value used when a null value is supplied.
- *cancel* – when this value is received, a scheduled software installation will be canceled. If a software installation has been scheduled, a second request with a different time/date will cause the installation to be rescheduled for the new time/date.
- null.

For OC-3 Release 11.0 and OC-12 Release 7.0 and later, the *action* parameter enables the **APPLY** command to be used to reschedule or cancel a planned software download. Allowed values are:

- **install** – The default value used when a null value is supplied.
- **reschedule** – when this value is received, the software installation is scheduled for the time and date supplied in the *time and date* parameters.If a software installation has been scheduled, a second request with a different time/date will cause the installation to rescheduled for the new time/date.
- **cancel** – when this value is received, a scheduled software installation will be canceled.
- null.

OUTPUT FORMAT

If the NE is able to verify that the file is uncorrupted, the COMPLD response below is given prior to scheduling the installation of the new software. Once the new software is installed, the NE will not "know" of the **APPLY** command.

```
IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  123456 COMPLD
/* New Software generic installation scheduled  */
   "TID=tid"
   "System=system"
   "NewRelease=newrelease"
   "OldRelease=oldrelease"
   "Time=time"
   "Date=date"
;
```

If the NE receives a valid command with the action parameter set to *cancel*, the following COMPLD response given:

```
IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  123456 COMPLD
/* Scheduled software installation has been canceled */
   "TID=tid"
   "System=system"
   "NewRelease=newrelease"
   "OldRelease=oldrelease"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **APPLY** command, also.

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

system The *system* parameter is one of the following:

- DDM-2000 OC-3
- DDM-2000 OC-12.

newrelease The *newrelease* parameter is pulled off the header of the downloaded file and represents the software release contained in the file. It has the form *x.y.z* where *x.y.z* reflects the actual software release number.

oldrelease The *oldrelease* parameter represents the release currently running at the NE to which the command was addressed. It has the form *x.y.z* where *x.y.z* reflects the actual software release number.

time

The *time* parameter has the form HH.MM.SS and represents the time scheduled for the software download.

date

The *date* parameter has the form YY/MM/DD and represents the date scheduled for the software download.

EXAMPLE INPUT/OUTPUT

The following example shows an **APPLY** command that requests the immediate installation of a new generic to a DDM-2000 OC3 system currently running Release 9.1.00. The command was processed by the NE when its local clock said 22:25:30. Note that an "immediate' installation is actually delayed until 30 minutes after the NE processes the command.

```
APPLY:LT-PF-2000::123456;
IP 123456
<

   LT-PF-2000 97-10-30 22:55:30
M  123456 COMPLD
/* New Software generic installation scheduled  */
   "TID=tid"
   "System=DDM-2000 OC-3"
   "NewRelease=11.00.00"
   "OldRelease=9.1.00"
   "Time=22.55.30"
   "Date=97/10/30"
;
```

The following example shows an **APPLY** command that requests the schedule of

an installation of a new generic to a DDM-2000 OC-12 system currently running Release 7.0.00.

```
APPLY:LT-PF-2000::123456::1130;
IP 123456
<

   LT-PF-2000 97-10-30 11:30:00
M  123456 COMPLD
/* New Software generic installation scheduled  */
   "TID=tid"
   "System=DDM-2000 OC-3"
   "NewRelease=7.0.00"
   "OldRelease=7.0.01"
   "Time=11:30:00"
   "Date=97/10/30"
;
```

The following example shows an **APPLY** command that requests the cancellation of a scheduled software installation.

```
APPLY:LT-PF-2000::123456::,cancel;
IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  123456 COMPLD
/* Scheduled software installation has been canceled */
   "TID=tid"
   "System=DDM-2000 OC-3"
   "NewRelease=11.00.00"
   "OldRelease=9.1.00"
;
```

ERROR RESPONSE

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

If an **APPLY** command is entered by a non-privileged user, the following error response is given:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  PICC
/* Privilege, Illegal Command Code */
;
```

If an **APPLY** command is entered and an uncorrupted dormant copy of software does not reside in the flash memory, the following error response is given.

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  SROF
/* Status, Requested Operation Failed */
;
```

If an **APPLY** command is entered to schedule or reschedule a software installation and the time or date parameter is invalid, the following error response is given:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
/* Input Data Not Valid, invalid date or time specified */
;
```

If an otherwise valid cancel command is received by an NE, but no outstanding apply command exists, the request will succeed.

NAME

CANC-USER: Cancel User

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- OC-3 Release 7.0 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

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

DESCRIPTION

NOTE:
This command is available to all users.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0, **CANC-USER** commands can be initiated to terminate a login session with the Network Element (NE).

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0, when the NE receives a **CANC-USER** command, the given login identifier will terminate a login session on the NE 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.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0, after the **CANC-USER** command successfully completes, a TL1 autonomous **REPT-EVT** 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.

INPUT PARAMETERS

tid In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0: Target identifier. This is the name of the NE to which the command is addressed.

uid In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0: 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.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0: grouping and/or ranging of *uid* values for this command is not allowed.

ctag In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0: Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0, if the logout 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

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1 and FiberReach R1.0, the following example shows a successful login session termination:

```
CANC-USER:LT-PF-2000:PeterPan:123456;

IP 123456
<

   LT-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.

RELATED TL1 MESSAGES

ACT-USER

ED-PID

DLT-USER-SECU

ENT-USER-SECU

RTRV-USER-SECU

NAME

CNVT-CRS: Convert STS-1 Cross-Connection into up to 28 individual VT-1.5 Cross-Connections.

Support for this command is available starting with:

- OC-3 Release **8.0** (for linear)
- OC-3 Release **9.0** (for rings)

This command is not available in DDM-2000 FiberReach.

INPUT FORMAT

CNVT-CRS:*tid*:*aid1*,*aid2*:*ctag*[:[:[:]]];

DESCRIPTION

The **CNVT-CRS** command can be initiated by users to convert the STS-1 Cross-Connection between the specified *aid*s into up to 28 individual VT-1.5 Cross-Connections.

CAUTION:
Execution of this command will affect service. The command should only be executed when existing STS-1 cross-connections are supporting either no services or DS1 services. Executing this command will cause a service interruption of approximately 25 milliseconds on each associated DS1 service.

This command converts an existing STS-1 cross-connection to up to 28 individual VT-1.5 cross-connections with the same end-points. VT-1.5 signals carried within the original STS-1 will appear in the same timeslots in the upstream and downstream NEs before and after the conversion. This enables an easy upgrade of existing STS-1 networks to DS1 networks. This command will reconfigure all hardware.

This command is available in ring and linear releases. The Cross-Connection Type (*cct* in the **ENT/DLT/RTRV-CRS** commands) of all converted VT-1.5 cross-connections will be the same as the *cct* of the STS-1 cross-connection before the conversion. That is, if *cct*=2WAYBR *with* **Ring=**m1*, for the STS-1 cross-connection, all VT-1.5 cross-connections will be* *cct*=2WAYBR with **Ring=**m1 also. 22-type, 24-type or 27-type OLIU circuit packs must be used to convert cross-connections in OC-3 systems.

When a NE (NE) receives an **CNVT-CRS** command, the NE will convert the STS-1 cross-connection specified between the specified *aid*s into up to 28 individual VT-1.5 cross-connections while preserving their end-points and cross-connection types.

This enables an easy upgrade of existing STS-1 networks to DS1 networks. This command will reconfigure all hardware.

No inverse capability is available to consolidate 28 individual VT-1.5 cross-connections back into a single STS-1 cross-connection. Consequently, the user willing to recreate the converted STS-1 cross-connection must delete all the created VT-1.5 cross-connections to free-up the end-points and reenter an STS-1 cross-connection.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid1	Access identifier for one of the ends of an existing STS-1 cross-connection.
aid2	Access identifier for the other end of that STS-1 cross-connection.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the NE fully complies with the **CNVT-CRS** request, the following completion response is returned.

```
IP ctag
<

   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 command to convert the STS-1 cross-connection between m-1 and b in a linear DDM-2000 system:

```
cnvt-crs:LT-PF-2000:m-1,b:123456:::;

IP 123456
<

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

ERROR RESPONSES

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

If an **CNVT-CRS** command is received with an invalid *aid1* or *aid2* value, the following error response is returned:

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

If an NE whose current cross-connect mode is `default` receives a **CNVT-CRS** command, the following error response is returned:

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

If an NE receives an otherwise valid **CNVT-CRS** command, but both *aid*s in the input command point to STS1 channels in the function units, the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, cross-connection
      can not be converted */
;
```

If an NE receives a **CNVT-CRS** command with *aid* values that do not match an existing STS-1 cross-connection, the following error response is returned:

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

The *aid*s in the input command must point to slots equipped with circuit packs that support VT-1.5 cross-connection. If a NE receives a **CNVT-CRS** command with *aid* values that do not conform to this equipage requirement, then the following error response is returned:

```
   sid date time
M  ctag DENY
   ENSI
   /* Equipage, Not Equipped for Setting specified Information. */
;
```

If a ring NE receives a **CNVT-CRS** command with *aid*s pointing to a drop-and-continue (*cct*=2WAYBR) STS-1 cross-connection, and the **Ring** identification of that cross-connection does not agree with that assigned for an existing VT-1.5 drop-and-continue cross-connection, then the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, drop and continue
      direction mismatch */
;
```

If an NE receives a **CNVT-CRS** command with one of the *aid*s pointing to an EC-1 port that is in the NMON state, then the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, EC-1 port is in OOS state. */
;
```

In DDM-2000 OC-3 R9.0, if an NE receives a **CNVT-CRS** command with one of the *aid*s pointing to an OC-1 line that is in the NMON state, then the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, OC-1 port is in OOS state. */
;
```

In DDM-2000 OC-3 R11.0, if the maximum number of STS-1s (3) has already been reached and the user attempts to convert one or more additional STS-1s, which would exceed the allowed STS-1 bandwidth, the request will be denied and the following denial message displayed:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, cross-connect
      capacity is not available */
;
```

In DDM-2000 OC-3 R11.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must
      be equipped with compatible OLIU packs */
;
```

RELATED TL1 MESSAGES

DLT-CRS-rr

ENT-CRS-rr

RTRV-CRS-rr

REPT DBCHG

NAME

CPY-PRGM: Copy Program.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach Release **1.0**

INPUT FORMAT

CPY-PRGM:*tid*::*ctag*::,,,*dest_tid*;

DESCRIPTION

NOTE:
This command is available to privileged users only.

The **CPY-PRGM** command can be initiated by users to copy the software generic contained in the memory of one NE (the source) to the memory of another NE (the destination) of the same type. The source and destination must have DCC connectivity.

Copying the program (software download) occurs in the background. Once the background download is initiated, there is no mechanism provided to cancel the operation.

Starting with DDM-2000 OC-3 Release 9.1 and DDM-2000 OC-12 Release 5.1, the software to be copied may be a non-executing, dormant, copy of a software generic. The NE will check to see whether the currently executing software or a dormant copy should be used for the copy operation. If no dormant copy exists, the currently executing software will be copied. This ability to hold a separate copy does not apply to DDM-2000 FiberReach.

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, when software is copied to an NE, the NE will attempt to copy it as a non-executing, dormant, copy and await an **APPLY** command to overwrite the currently executing generic. If the software will not fit in the space allocated in the flash memory for it, the currently executing generic will be overwritten.

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, when new software is copied to an NE as a non-executing dormant copy, a standing condition will exist on the receiving NE until an APPLY command is issued which will cause the dormant copy to be be installed as the executing copy. This condition is triggered when the release number of the dormant copy does not match the release number of the executing copy. It exists as a reminder that a software download is in process but has not been completed. The condition type is EOC and the

message sent is "program installation IP".

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
dest_tid	Destination target identifier. This is the target identifier of the destination NE to which the program will be copied. It has no default value. A valid value must be entered.

OUTPUT FORMAT

The NE sends the following normal completion response just prior to transmitting the software.

```
IP ctag
<


  sid date time
M ctag COMPLD
;
```

The NE sends the following Event Report prior to transmitting the software.

```
   sid date time
A  ctag REPT EVT COM
   "address:EOC,SC,date,time,,,,:\"copy program IP\""
;
```

The NE sends the following Event Report on completion of the copy program command.

```
   sid date time
A  ctag REPT EVT COM
   "address:EOC,CL,date,time,,,,:\"cpy-prog compl.\""
;
```

The download condition is reported in the REPT EVT COM message with a condition effect of SC (standing condition raised).

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, the download condition is reported in the REPT EVT COM message with a condition effect of SC (standing condition raised) only if the software cannot be downloaded as a dormant copy.

When the software download is completed or has failed, it is reported in the REPT EVT COM message with a condition effect of CL (standing condition cleared). This message does not state whether the download was successful or not.

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, if the software has been copied as a dormant copy to the target NE, then no REPT EVT COM message needs to be sent to clear the standing condition, as no standing condition will have been raised at this NE - although the receiving NE will raise a standing condition when it determines that it has a dormant release whose software version does not match that of the executing version.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **CPY-PRGM** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows an input and output of CPY-PRGM command for a PF-2000 system:

```
CPY-PRGM:LT-PF-2000::123456::,,,Node5NE;


IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  123456 COMPLD
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **CPY-PRGM** command, also.

If the *dest_tid* is syntactically incorrect, the following error response will be returned:

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

If the product type of the *dest_tid* does not match the product type of the *tid*, the following error response will be returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, destination
      TID is of different product type */
;
```

In DDM-2000 OC-3 Release 11.0, OC-12 Release 5.1 and earlier, FiberReach Release 2.1, if communications cannot be established to the *dest_tid* because of a DCC failure condition, the following error response will be returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, remote communication failure */
;
```

The *dest_tid* cannot be the *tid*. If the *tid* is entered as the *dest_tid*, the following error response will be returned:

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

If the *dest_tid* is too long, the following error response will be returned:

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

If the *dest_tid* is null, the following error response will be returned:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, destination
      TID must be specified */
;
```

In DDM-2000 OC-3 Release 9.1 and earlier, OC-3 Release 11.0, OC-12 Release 5.1 and earlier, and FiberReach Release 2.1, if communications cannot be established to the destination NE because of an invalid *tid* (i.e., the destination (*tid* is not in Local Cache/DIB), the following error response will be returned:

```
   sid date time
M  ctag DENY
   IITA
   /* Input, Invalid TArget identifier, unknown destination TID */
;
```

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, if the dormant copy is corrupted, and it is the only copy which can be copied (the release executing and the dormant release have different release numbers), the following error response will be returned:

```
  sid date time
M ctag DENY
  SROF
  /* Status, Requested Operation Failed, dormant file corrupted */
;
```

In DDM-2000 OC-3 R9.1 and OC-12 R5.1, if the dormant copy cannot be copied to the destination NE because:

- it is a compressed file and the destination NE is not capable of receiving a compressed file
- the currently executing file cannot be copied because it is a different release from the dormant copy and, therefore, no longer is compatible with the PROM boot code (which also must be copied)

the following error response will be returned. This response was chosen because no copy from the source NE to the destination NE is possible in this situation until the executing copy's release number matches that of the dormant copy, requiring the **`apply`** command to be issued:

```
  sid date time
M ctag DENY
  SROF
  /* Status, Requested Operation Failed, APPLY command needed first */
;
```

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach R3.0, and later,if an invalid destination TID (*`dest_tid`*) is entered (i.e., the corresponding *`dest_tid`*-NSAP translation information is not found in the local TARP Data Cache (TDC) and the *`dest_tid`* entered cannot be found in the subnetwork), the following error response will be returned:

```
  sid date time
M ctag DENY
  SROF
  /* Status, Requested Operation Failed, destination TID not found by source */
;
```

In DDM-2000 OC-3 R13.0, OC-12 R7.0 and FiberReach R3.0 and later, if the user enters a destination TID (*dest_tid*) that has a corresponding *dest_tid*-NSAP translation in the local TARP Data Cache (TDC), but the association setup attempt to the destination NE fails (e.g. the destination NE is currently unreachable), the following error response will be returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Association Setup Failure,
      NSAP = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx */
;
```

In DDM-2000 OC-3 R13.0, OC-12 R7.0 and FiberReach R3.0 and later, if the user enters an otherwise valid destination TID (*dest_tid*), but the local TDC translation results in an association setup request to a remote NE whose TID does not match the *dest_tid*, the following error response will be returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Inconsistent dest_tid,
      NSAP = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx */
;
```

RELATED TL1 MESSAGES

None

NAME

DLT-CRS-*rr*: Delete Cross-Connection rr

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 (for linear systems)
- OC-3 Release 7.0, 7.1, OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

DLT-CRS-*rr* command can be initiated by a TL1 user to request the NE to take down VT-1.5 and STS1 (in FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases), STS-3c (in FiberReach Wide-Band Shelfrelease 3.1 and later releases), STS-1/STS-3c/VT-1.5 cross-connections in the DDM-2000 OC-3 and STS-1/STS-3c cross-connections in DDM-2000 OC-12 Add/Drop or Ring systems. Cross-connections in the DDM-2000 family of products are always two-way in the sense that a single command takes care of both the transmit and receive directions.

Refer to the ENT-CRS-*rr* command description for details on the restrictions on cross-connections in the the NE Add/Drop Rings Terminal for Path Protection Switched Rings.

When the NE receives an **DLT-CRS-*rr*** command, it will take down the cross-connections of the requested level (STS-1/STS-3c/VT-1.5) between the *aid*s specified in the input command.

INPUT FORMAT

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

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R3.1 and FiberReach R1.0, this is the message modifier for the **DLT-CRS-*rr*** message and may have only one of the following values:

STS1 This specifies that an STS-1 cross-connection be taken down. Applicable in DDM-2000 OC-3 and OC-12 ring and linear releases, and FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases (when equipped with the 28-type OLIU in Main slots).

STS3C This specifies that an STS-3c cross-connection be taken down. This is applicable in DDM-2000 OC-12 releases starting from 5.0 and DDM-2000 OC-3 releases starting from 11.0 and FiberReach Wide-Band Shelf releases starting with 3.1. (Applicable only when the shelf is

equipped with 28-type OLIU circuit packs in its Main unit slots, and 22-type OLIU circuit packs in its function unit slots.)

VT1 This specifies that a VT-1.5 cross-connection be taken down. Applicable in DDM-2000 OC-3 ring and linear releases and DDM-2000 FiberReach Wide-Band Shelf (WBS) rleases. (The 26-type or 28-type - available in Release 2.2, 3.1 and later releases - OLIU circuit packs must be used to establish VT1.5 cross-connects)

tid Target identifier. This is the name of the network element to which the command is addressed. *tid* is a required parameter.

src_aid In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R3.1 and FiberReach R1.0, Source access identifier. The *src_aid* is a required parameter and must address a valid STS-1/STS-3c/VT-1.5 channel of the NE in order to be accepted.

For the valid *aid*s for FiberReach, OC-3 and OC-12 systems, see Table 11-1 of the appropriate versions of the the NE User Service Manual.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R3.1 and FiberReach R1.0, **ALL** is not allowed in the *src_aid* for this command.

dest_aid In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R3.1 and FiberReach R1.0, Destination access identifier. The *dest_aid* is a required parameter and must address a valid STS-1/STS-3c/VT-1.5 channel of the NE in order to be accepted.

For the valid *aid*s for FiberReach, OC-3 and OC-12 systems, see Table 11-1 of the appropriate versions of the the NE User Service Manual.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R3.1 and FiberReach R1.0, **ALL** is not allowed in the *dest_aid* for this command.

ctag Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user 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 OUTPUT PARAMETERS** section. The requirements listed there apply to this command also.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example takes down a two-way (add/drop) cross-connection between an STS-1 channel in the high speed OC-n line ("m-2") and a low speed port ("b"):

```
dlt-crs-sts1:ATT-PF-2000-3:m-2,b:123456;


IP 123456
<


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

The following FiberReach example takes down a two-way (add/drop) cross-connection between a VT-1.5 channel in the high speed OC-1 line ("m-1-3-3") and a low speed port ("b-1-4"):

```
dlt-crs-vt1:ATT-PF-2000-3:m-1-3-3,b-1-4:123456;


IP 123456
<


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

The following example takes down a two-way pass-through cross-connection for the VT-1.5 channel in the high speed OC-3 lines ("m-1-5-4") in an OC-3 Path Switched Ring.

```
dlt-crs-vt1:ATT-PF-2000-3:m-1-5-4,m-1-5-4:Z89abc;


IP Z89abc
<


   ATT-PF-2000-3 93-11-26 16:53:22
M  Z89abc COMPLD
;
```

The following example takes down a drop-and-continue cross-connection between a low speed port ("b-6-2") and a VT-1.5 channel in the high speed OC-n line ("m-1-1-1") from Ring 1:

```
dlt-crs-vt1:ATT-PF-2000-3:b-6-2,m-1-1-1:654321;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

The following example takes down a two-way (add/drop) cross-connection between a low speed port ("c-2") and an STS-1 channel in the high speed OC-12 line ("mb-6") in a DDM-2000 OC-12 ring system:

```
dlt-crs-sts1:ATT-PF-2000-3:c-2,mb-6:654321;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

The following example takes down a STS-3c pass-through two-way cross-connection between the two STS-3c *aid*s "m-7" and "m-7" on its high speed OC-12 line interface in a DDM-2000 OC-3 ring system:

```
dlt-crs-sts3c:ATT-PF-2000-3:m-7,m-7:654321;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to this command also. In addition to the non-message-specific error found in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses are those that the NE checks for each condition.

In DDM-2000 OC-12 R5.0, if a the system receives an **DLT-CRS-*rr*** command with a command code modifier other than STS1 or STS3C, the following error response is returned to the user:

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

In DDM-2000 OC-3 R11.0, if the system receives an **DLT-CRS-*rr*** command with a command code modifier other than STS3C, STS1 or VT1, the following error response is returned:

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

In DDM-2000 FiberReach R1.0, if the system receives an **DLT-CRS-*rr*** command with a command code modifier other than VT1, the following error response is returned:

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

In DDM-2000 FiberReach R2.2, if the system receives an **DLT-CRS-*rr*** command with a command code modifier other than VT1, or STS1, the following error response is returned:

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

In DDM-2000 FiberReach R3.1, if the system receives an **DLT-CRS-*rr*** command with a command code modifier other than VT1, STS1, or STS3C, the following error response is returned:

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

If the NE 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 modifier */
;
```

If the NE receives an otherwise valid **DLT-CRS-*rr*** command for which the system does not support cross-connection between the *src_aid* and *dest_aid* parameters 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 NE receives an otherwise valid **DLT-CRS-*rr*** command but at least one of the *aid*s in the input command is currently cross connected to an *aid* other than the other *aid* specified in the input command then the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, the specified cross-connection
      does not exist and can not be deleted */
;
```

If the NE 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 */
;
```

Users may not delete an STS-1 pass-through cross-connect through a 24G-U OLIU only if the STS-1 contains AIS in both directions. Adjacent shelves should have `idle` set to **`ais`** to insure AIS is inserted on STS-1 channels that are not cross-connected.) To remove the pass-through cross-connect, users should first delete the associated VT1.5 or STS-3 cross-connect at the ring drop nodes.

Otherwise, the request will be denied and the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, The specified path must be in the AIS
      state to delete the cross-connect */
;
```

If the NE receives an otherwise valid **`DLT-CRS-`***`rr`* command but for which the DDM-2000 is not properly equipped, the following error response is returned to the user:

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

The following list provides some sample cases, where the above error would result:

- DDM-2000 OC-3, OC-12 or FiberReach WBS system receives an otherwise valid cross-connection command, but the slot pair addressed by at least one of the *aid*s in the input command is equipped with a mix of incompatible circuit packs

In DDM-2000 OC-3 R11.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must be
      equipped with compatible OLIU packs */
;
```

RELATED TL1 MESSAGES

ENT-CRS-*rr*

RTRV-CRS-*rr*

NAME

DLT-OSACMAP: Delete OS application context ID map entry

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)

INPUT FORMAT

DLT-OSACMAP:*tid*:*aid*:*ctag*::[*vc*]:*spec_block*;

DESCRIPTION

NOTE:
This command is available to privileged users only.

This command deletes data terminal equipment (DTE) calling addresses of operations systems (OS) that are assigned to the switched virtual circuit (SVC), and/or the permanent virtual circuit (PVC) in the X.25 subnetwork application context map. This map lists both the PVCs and the DTE calling addresses for the SVC available in the X.25 channel and maps them to operation systems application contexts. The DTE entries of both SVC and the PVC can be deleted. The PVC entries can be deleted and replaced by SVC entries, or can be changed using the **ENT-OSACMAP** command.

NOTE:
While this command is allowed at all Network Elements (NEs) in the subnetwork, only the table at the active GNE node is valid. The maps at inactive GNE nodes can be modified, but they have no effect.

This command causes the NEs affected virtual circuit to be reset. This will drop all currently active logins on that virtual circuit.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. The *aid* can only have the value **ALL**.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
vc	Virtual circuit. This parameter is the virtual circuit type X.25 attachment for the OS. It takes one of the following values:

PVC permanent virtual circuit.

SVC switched virtual circuit (default value).

spec_block Specific Parameter Block. Parameters within *spec_block* are specified using *name=value*. The *spec_block* contains the following:

SNPA SNPA is the X.25 subnetwork point of attachment address for the OS. It is either the PVC logical channel number (LCN) 1, 2, 3, 4, 5, 6, 7, 8, or 9 or it is the SVC Data Terminal Equipment (DTE) calling address, which is 1 to 15 digits.

If SNPA is null, the mapping is not changed and a COMPLD normal completion response is returned.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

```
dlt-osacmap:LT-PF-2000:all:123456::svc:snpa=12345678901234;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, or invalid.

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

The NE returns the following error response if the **vc** value is invalid.

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

The NE returns the following error response if the **SNPA** value in the *spec_block* is invalid, or not found in the map.

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

RELATED TL1 MESSAGES

ENT-OSACMAP

ENT-TL1MSGMAP

RTRV-OSACMAP

RTRV-TL1MSGMAP

NAME

DLT-TADRMAP: Delete TID Address Map

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 (for linear systems)
- OC-3 Releases 9.0 and OC-12 Release 5.0 (for rings).

INPUT FORMAT

DLT-TADRMAP:*tid*:*aid*:*ctag*[:[:]]:*spec_block*;

DESCRIPTION

NOTE:
This command is available only to privileged users.

This command instructs a Directory Services Network Element (DSNE) to remove an entry from the network maps of all the Network Elements (NEs) in the OSI network. The DSNE is where the network map, listing all active nodes in the network, is maintained.

When a node is removed from an OSI network, the DSNE must be updated to reflect that the node is no longer active. Entering this command at the DSNE will remove the obsolete node entry from the DSNE network map and from all **RTRV-MAP** reports at all nodes. This command will also remove any communication failure alarms related to removing the node from the network.

This command can only be executed at the DSNE and will only succeed if the communication status of the NE being deleted is "FAILED". The command **RTRV-MAP** may be used to list the communication status of a NE.

INPUT PARAMETERS

tid	Target identifier (TID). This is the name of the Directory Services Network Element (DSNE).
aid	Access identifier. The *aid* can only have the value **ALL**.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
spec_block	Specific Parameter Block. Parameters within *spec_block* are specified using *name=value* syntax. The *spec_block* contains the following:

DLT_TID The *TID* identifies the NE to be removed from the DSNE's network map.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command also.

EXAMPLE INPUT/OUTPUT

```
DLT-TADRMAP:LT-PF-2000:all:123456:::tid=DELETED-NE;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, or invalid.

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

The NE returns the following error response if the **TID** value in the *spec_block* is invalid.

```
   sid date time
M  ctag DENY
   IITA
   /* Input, Invalid TArget identifier, invalid TID */
;
```

The NE returns the following error response if it is directed to a NE that is not the DSNE.

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, TID is not the DSNE */
;
```

The NE returns the following error response if the TID to be deleted is not listed in the DSNE network map.

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, System name does not exist */
;
```

Only NEs whose communication status is "FAILED" may be removed from the network map. The NE returns the following error response if a user attempts to remove a NE whose communication status is not "FAILED".

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, Can only delete NEs with FAILED status */
;
```

When more than one NE is defined as the DSNE, an alarm will result. The NE returns the following error response if a user attempts to remove a NE while the network has more than one DSNE defined.

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, Duplicate DSNE */
;
```

The NE returns the following error response if the user attempts to execute this command while the DSNE is in a busy state (i.e: handling initial registration).

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, DIB is locked */
;
```

RELATED TL1 MESSAGES

RTRV-MAP-NEIGHBOR

RTRV-MAP-NETWORK

NAME

DLT-ULSDCC: Delete Upper Layer Section DCC

Starting with DDM-2000 OC-3 Release 13.0 and all subsequent TARP based-releases, this command is replaced by **DLT-ULSDCC-L4**.

INPUT FORMAT

DLT-ULSDCC:*tid*:[*aid*]:*ctag*:::[*spec_block*];

DESCRIPTION

NOTE:
This command is available to privileged users only.

NOTE:
The version of this command for DDM-2000 OC-3 R13.0, DDM OC-12 R7.0, and FiberReach R3.0 has been renamed **DLT-ULSDCC-L4** to be consistent with versions of **ENT-ULSDCC** and **RTRV-ULSDCC** which have been split into separate commands according to the OSI layer being provisioned or retrieved.

DLT-ULSDCC is used to delete provisionable parameters of Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between network elements as specified by the International Standards Organization (ISO).

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. This identifies the associated facility. Specifying the *aid* is optional.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
spec_block	Specific Parameter Block. Parameters within *spec_block* are specified using *name=value* syntax. Any *spec_block* parameter may appear only once in the command line. If the same parameter is in the command line more than once, the command is denied and an error message is returned.

If the *spec_block* is null, the current attributes at the NE remain in effect.

The *spec_block* contains the following:

L4AJSYS This parameter specifies the System ID field of the NSAP address of a NE to delete from TARP Manual Adjacency list of the target NE (i.e., the NE indicated by the *tid* parameter). Since the System ID is unique for each NE, the System ID is sufficient to identify a specific Manual Adjacency.

The format for this parameter is "**L4AJSYS=***l4ajsys*" where *l4ajsys* is the 6 byte (12-digit hexadecimal) System ID field of the NSAP of the Adjacent NE in the list.

This parameter deletes a single Manual Adjacent NE. Multiple Manual Adjacent NEs are deleted using multiple occurrences of **DLT-ULSDCC**.

If the *spec_block* is null, the current attributes at the NE remain in effect.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the requested command does not alter the existing condition, the NE shall respond with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and earlier, the following example shows the deleting of a TARP Manual Adjacency on the target NE:

```
dlt-ulsdcc:LT-PF-2000::123456:::l4ajsys=08006A112345;

LT-PF-2000 98-04-23 13:12:16
M  123456 COMPLD
;
```

ERROR RESPONSES

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

If an error is detected in any of the command parameters, the entire command is denied; there is no partial completion of the command.

If there are errors in more than one command parameter, an error is detected and reported in only one of the parameters. The parameter for which the error is detected may not be the first parameter in the command that is in error.

The NE returns the following error response if the *L4AJSYS* syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJSYS */
;
```

The NE returns the following error response if the *L4AJSYS* does not correspond to the NSAP SYS ID field of one of the TARP manual adjacencies that have been entered.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, L4AJSYS is not one of the
      TARP Manual Adjacencies  */
;
```

RELATED TL1 MESSAGES

ENT-ULSDCC

RTRV-ULSDCC

DLT-ULSDCC-L4

ENT-ULSDCC-L3

ENT-ULSDCC-L4

RTRV-ULSDCC-L3

RTRV-ULSDCC-L4

NAME

DLT-ULSDCC-L4: Delete Upper Layer Section DCC - Layer 4.

Support for this command is available for DDM-200 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

DLT-ULSDCC-L4:*tid*:[*aid*]:*ctag*:::[*spec_block*];

DESCRIPTION

NOTE:
This command is available to privileged users only.

DLT-ULSDCC commands are used to delete data which affects Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between SONET Network Elements (NEs) as specified by the International Standards Organization (ISO).

DLT-ULSDCC-L4 is used to delete data which affects Layer 4 of the OSI protocol stack. A TARP Manual Adjacency or a TARP Data Cache (TDC) entry may be deleted.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. The *aid* value may be **all** or null. Specifying the *aid* is optional.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
spec_block	Specific Parameter Block. The parameters to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using *name=value, name=value,...* with no constraints on the order of the arrangement of parameters. Constructs such as *name1=value1, name2=, name3=value3,...* are acceptable, and in this example only the parameters *name1*

and *name3* will be attempted to be changed. If the current value of the parameter *name1* is already *value1* in the above example, then *name1* will not be changed.

If a null value is provided for a parameter, (e.g., *name=)*, the value will not be changed.

Any *spec_block* parameter may appear only once in the command line. If the same parameter is in the command line more than once, the command is denied and an error message is returned.

If the *spec_block* is null, the current attributes at the NE remain in effect.
The *spec_block* may contain one or more of the following parameters:

L4AJSYS This parameter specifies the NSAP System Identifier of a TARP Manual Adjacency. Because the System Identifier is unique for each NE, the System Identifier is sufficient to identify a specific TARP Manual Adjacency.

The format for this parameter is "**L4AJSYS=***l4ajsys*" where *l4ajsys* is the 6-byte (12-digit hexadecimal) System Identifier of the TARP Manual Adjacency.

This parameter deletes a single TARP Manual Adjacency. Multiple TARP Manual Adjacencies are deleted using multiple occurrences of **DLT-ULSDCC-L4**. If the specified *l4ajsys* does not match an existing TARP Manual Adjacency, then no action is taken and an error response is returned.

L4TDCTID This parameter specifies the Target Identifier (TID) of a TDC entry to delete. Because each TID in the TDC is unique, the TID is sufficient to identify a specific TDC entry.

The TDC stores three parameters for each entry, the TID, NSAP and the address type (referred to as "tar-pro" in Bellcore GR-253). The address type is not user provisionable and is set to its default value ("FE" hex) in the TDC. Specifying the TID is sufficient to identify the complete TDC entry. The entire entry, including the address type, is deleted.

The format for this parameter is "**L4TDCTID=***l4tdctid*" where *l4tdctid* is the TID of a TDC entry.

This parameter deletes a single row of data in the TDC. Multiple rows of data are deleted using multiple occurrences of **DLT-ULSDCC-L4**.

If the specified *l4tdctid* does not match any TID in the TDC, then no action is taken and an error response is returned.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

The following example deletes a TARP Manual Adjacency:

```
DLT-ULSDCC-L4:LT-PF-2000::123456:::l4ajsys=08006A112345;

IP 123456
<

LT-PF-2000 98-04-23 13:12:16
M  123456 COMPLD
;
```

The following example deletes an entry in the TARP Data Cache:

```
DLT-ULSDCC-L4:LT-PF-2000::987654::: l4tdctid=LT-PF2001;

IP 123456
<

LT-PF-2000 98-04-23 13:12:16
M  987654 COMPLD
;
```

ERROR RESPONSES

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

If an error is detected in any of the command parameters, the entire command is denied; there is no partial completion of the command.

If there are errors in more than one command parameter, an error is detected and reported in only one of the parameters. The parameter for which the error is detected may not be the first parameter in the command that is in error.

The NE returns the following error response if the **L4AJSYS** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJSYS */
;
```

The NE returns the following error response if the **L4AJSYS** does not match the NSAP System Identifier of an existing TARP Manual Adjacency:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, L4AJSYS is not one of the TARP
      Manual Adjacencies  */
;
```

The NE returns the following error response if the **L4TDCTID** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCTID */
;
```

If there is no entry in the TDC that matches **L4TDCTID**, the NE returns the following error response:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, The TDC does not contain the entry
      specified by L4TDCTID */
;
```

RELATED TL1 MESSAGES

ENT-ULSDCC-L4

RTRV-ULSDCC-L4

NAME

DLT-USER-SECU: Delete User Security

Support for this command is available starting in DDM-2000 OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems), and DDM-2000 OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).

Support for this command is available starting in FiberReach Release 1.0.

INPUT FORMAT

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

DESCRIPTION

CAUTION:
Execution of this command will remove a user account. That user will no longer be able to log in.

DLT-USER-SECU command is used by an appropriate administrator to delete the security parameters associated with a user. This is applicable where 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. For DDM-2000 and SLC-2000, its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. For FT-2000, its valid values are a case-sensitive alphanumeric string of 1 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:LT-PF-2000:kjlee:123456;

IP 123456
<

   LT-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 */
;
```

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
   PIUI
   /* Privilege, Illegal User Identity, invalid UID */
;
```

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

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

RELATED TL1 COMMANDS

ENT-USER-SECU

ED-USER-SECU

RTRV-USER-SECU

NAME

ED-DAT: Edit Date and Time

Support for this command is available in DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

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

DESCRIPTION

The **ED-DAT** command is initiated by users to request the Network Element (NE) to change its system date and time to a given value.

NOTE:
This command is available to privileged users only.

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 NE. 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 NE to which the command is addressed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE 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

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

OUTPUT PARAMETERS

sid Source identifier. This is the system name.

date Date output message is generated. This has the format YY-MM-DD (year-month-day). If this message is successful *date* equals the input date.

time Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds). If this message is successful *time* equals the input time plus the time (seconds) required to send the response message.

M In DDM-2000 OC-3 R6.1, 7.1. OC-12 R2.1, 3.1, and FiberReach R1.0, this indicates that the output message is generated in response to a manual command.

ctag In DDM-2000 OC-3 R6.1, 7.1. OC-12 R2.1, 3.1, and FiberReach R1.0: Correlation tag. The *ctag* is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

COMPLD This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
ed-dat:LT-PF-2000::xyz123::96-01-06,09-30-45;

IP xyz123
<


   LT-PF-2000 96-01-06,09:30:49
M  xyz123 COMPLD
;
```

ERROR RESPONSE

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

If the NE 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≥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 */
;
```

RELATED TL1 MESSAGES

None.

NAME

ED-PID: Edit Private Identifier (Password)

Support for this command is available starting in DDM-2000 OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems), and DDM-2000 OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
Support for this command is available starting in FiberReach 1.0.

INPUT FORMAT

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

DESCRIPTION

ED-PID commands can be initiated to change the user's password (PID) on the Network Element.

NOTE:
This command is available to reports-only users, also.

NOTE:
This command is available to maintenance users, also.

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.

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 **ED-PID** login command is intended.

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.

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 (white space is ignored). Password strings are transmitted in unencrypted form in the **ED-PID** command; 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 in at least one character.

Refer to Table ?-?? at the end of this section for a list of valid characters.

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:LT-PF-2000:PeterPan:123456::soup3r+,8_6oober;

IP 123456
<

   LT-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:

```
   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:

```
   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:

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

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

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

RELATED TL1 MESSAGES

ACT-USER

CANC-USER

DLT-USER-SECU

ENT-USER-SECU

RTRV-USER-SECU

NAME

ED-USER-SECU: Edit User Security

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.2 and OC-12 Release 2.2 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

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

DESCRIPTION

NOTE:
This command is available only to privileged users.

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

This command enables a privileged user to edit:

- the login ID, password, and/or user privileges of any non-privileged user
- the login ID and/or password of the other privileged user.

INPUT PARAMETERS

tid	Target identifier. This is the name of the Network Element (NE) to which the command is addressed.
uid	User Identifier. Its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. This is the *uid* to be changed and/or whose password and/or privilege level are to be changed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
new_uid	New User Identifier. Its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. If omitted this parameter is not changed.
new_pid	New 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 (white space is

ignored). Any character that is used in the TL1 syntax is not permitted. If omitted, this parameter is not changed.

Refer to Table 3-12 at the end of this section for a list of valid characters.

uap User Access Privilege. It takes one of the following values: If omitted this parameter is not changed.

GENERAL	This indicates that the user has a general login. A general login hasaccess to all the system functional capabilities except security, access, system initialization and software installation functions.
MAINTENANCE	Beginning with DDM-2000 OC-3 R9.1, OC-12 R5.1, FiberReach R2.1. and later, this indicates that the user has a maintenance login. Maintenance users can only execute commands that access the system, extract reports and execute maintenance functions through a specific set of commands. No privileged commands may be executed by maintenance users.
REPORTS	This indicates that the user has a reports only login. A reports only user has access to the **RETRIEVE-** (except **RTRV-USER-SECU**), **ACT-USER**, **ED-PID** and **OPR-ACO** TL1 command/response messages.

OUTPUT FORMAT

If the NE fully complies with the edit user security 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 NE provides a normal completion response. An example of this is when the *uap* of the *uid* is **general** and an **ED-USER-SECU** command is received which sets the *uap* to **general**.

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 changes the current *uid*, **kjlee**, to a *new_uid*, **ilf**, and assigns **ilf** a *new_pid* and an *uap*.

```
ed-user-secu:LT-PF-2000:kjlee:123456::ilf,pass12+,,general;

IP 123456
<

   LT-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-USER-SECU** command, also.

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

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

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

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

RELATED TL1 COMMANDS

ED-PID

DLT-USER-SECU

ENT-USER-SECU

RTRV-USER-SECU

NAME

ENT-CID-SECU: Enter Channel Identifier Security

Support for this message is available starting in DDM-2000 OC-3 linear Release **8.0**, DDM-2000 OC-3 ring Release **9.0**, OC-12 Release **5.0**, and FiberReach Release **1.0**.

INPUT FORMAT

ENT-CID-SECU:*tid*:*aid*:*ctag*::[*state*][:*tmout*];

DESCRIPTION

The **ENT-CID-SECU** command is initiated by privileged users to set system security for CIT and DCC interface. CIT user access is affected. TL1 users will always have security enabled. They are effected only by the lockout state which may limit their access to some NEs whose DCC access has been locked out.

When security has been enabled on a DCC or CIT, at that DCC or CIT, only privileged users can submit the CIT commands that are restricted to privileged users.

When security is enabled on a DCC or CIT, at that CIT or DCC, general users can use all commands except those listed as privileged.

When security is enabled on a DCC or CIT, reports-only users are accessing an NE on that channel are restricted to those CIT commands allowed reports-only users.

When security is enabled on a DCC or CIT, maintenance users are accessing an NE on that channel are restricted to those CIT commands allowed maintenance users.

When security is enabled on a channel (DCC or CIT), a CIT user must provide a login and password.

When security has been set to "lockout", only privileged CIT users with valid login and passwords can execute any commands when accessing that NE through the locked out DCC or CIT interface. Only privileged TL1 users will be able to access any NE whose DCCs have all been set to the lockout state. Other users currently active are not logged out. All subsequent attempts to login are affected.

Non-privileged CIT users are blocked from accessing any system via a locked DCC or CIT.

Non-privileged TL1 users are prohibited from accessing any system whose DCCs are all set to lockedout.

"Unlocked" DCCs allow access through to the connected NEs for CIT users through ring/linear chains until DCCs set to lockedout block access. This makes it possible for the customer to lockout a single NE, a whole ring that is part of the subnetwork, or the entire subnetwork.

The setting of CITs to lockedout has no effect on the TL1 user.

INPUT PARAMETERS

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

aid Access Identifier. This is the address of the communication ports for which parameters need to be set. A null value is not allowed.

Valid addresses are dcc-all and cit-{1,2,all}.

Valid addresses are dcc-all, cit-{1,2,all}.

Valid addresses are dcc-{m,all}, cit-1.

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.

state The *state* is the security state being set for the CIT or DCC interface identified by the *TID* and *aid* parameters. Allowable values are "is" (In Service or enabled), "oos" (out of service or disabled), "lo" (Lockout) and null. When *state* is null, it is set to "oos", the default value.

tmout The *tmout* is the time out parameter. The time out clear delay parameter sets the time (0 to 120 minutes) before an inactive session is automatically terminated. The default value is 15 minutes. When a null value is provided, *tmout* is unchanged. Setting this parameter to 0 will disable timeout. The format for the parameter is "tmout=*tmout*".

spec_block

portacc

porttype

baudrate

chan

ostype

calladdr

tmout

OUTPUT FORMAT

If the Network Element fully complies with the **ENT-CID-SECU** request, the following normal completion response is returned.

```
IP ctag
<


  sid date time
M ctag COMPLD
;
```

If the **ENT-CID-SECU** command does not alter the existing attributes, the Network Element will not deny the command. Instead the system will respond with the completion message (shown above).

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **ENT-CID-SECU** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a **ENT-CID-SECU** command that enables security on dcc-all (all DCC's) and sets the time out to 30 minutes.

```
ENT-CID-SECU:LT-PF-2000:dcc-all:123456::IS:tmout=30;

IP 123456
<

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

The following example shows a **ENT-CID-SECU** command that enables security on all CIT interfaces and disables the timeout.

```
ENT-CID-SECU:cit-all:LT-PF-2000:123456::IS:TMOUT=0;
```

```
IP 123456
<

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

The following example shows a **ENT-CID-SECU** command that disables security on dcc-m on an OC-3 system, and leaves the timeout unchanged.

```
ENT-CID-SECU:LT-PF-2000:dcc-m:123456::oos;
```

```
IP 123456
<

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

ERROR RESPONSE

Refer to the **ERROR RESPONSE** section of **RTRV-HDR**. The error responses listed there apply to the **ENT-CID-SECU** command, also.

If an **ENT-CID-SECU** command is received with an invalid state parameter, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
  /* Input, Data Not Valid, invalid STATE parameter */
;
```

If an **ENT-CID-SECU** command is received with an invalid TMOUT parameter, the following error response is returned:

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

RELATED TL1 MESSAGES

This command complies with Bellcore's specification for ENT-CID-SECU as given in TR-NWT-000835, the state of "lo" is Lucent Technologies PF2000 defined and does not exist in the Bellcore specification. The RTRV-CID-SECU command is a related command.

NAME

ENT-CRS-*rr*: Establish an STS-1/STS-3c/VT-1.5 cross-connection.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1, 7.0, 7.1
- OC-12 Release 3.1
- FiberReach Release 1.0

INPUT FORMAT

In all DDM-2000 OC-3 linear releases up to and including R6.2, DDM-2000 OC-3 ring releases up to and including R7.0, DDM-2000 OC-12 linear releases up to and including R2.2, and DDM-2000 OC-12 ring releases up to and including R3.0, the following input format will be used:

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

In all DDM-2000 OC-3 linear release 8.0 and later, DDM-2000 OC-3 ring release 7.1 and later, DDM-2000 OC-12 linear release 4.0 and later, DDM-2000 OC-12 ring release 3.1 and later, and DDM-2000 FiberReach release 1.0 and later the following input format will be used:

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

DESCRIPTION

ENT-CRS-*rr* command can be initiated by a user to request the DDM-2000 to establish VT-1.5 cross-connections in FiberReach systems, STS-1/VT-1.5 cross-connections in the DDM-2000 OC-3 and STS-1/STS-3c cross-connections only in DDM-2000 OC-12 Add/Drop or Ring systems. Different types of cross-connections, *Drop* (including hairpin), *Drop and Continue*, *pass-through*, and *locked* (but all of them two-way in the DDM-2000 family of products in the sense that a single command takes care of both transmit and recieve directions) can be established by setting the appropriate parameters in the input command line.

When the Network Element (NE) receives an **ENT-CRS-***rr* command, it will establish a STS-1/STS-3c/VT-1.5 cross-connection according to the parameter settings in the command.

The established cross-connections will remain in effect until modified (for example, by a DLT-CRS-*rr* TL1 and a subsequent ENT-CRS-*rr* TL1 command, or by the appropriate DDM-2000 CIT command).

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R3.1 and FiberReach 1.0, this is the command modifier for the **ENT-CRS-***rr* command. This required field will only have one of the following values:

- STS1 This specifies that an STS-1 cross-connection be established. Applicable in DDM-2000 OC-3 and OC-12 ring and linear releases.
- STS3C This specifies that an STS-3c cross-connection be established. Applicable in DDM-2000 OC-12eleases starting from 5.0 and DDM-2000 OC-3 releases starting from 11.0.
- VT1 This specifies that a VT-1.5 cross-connection be established. Applicable in DDM-2000 OC-3 ring and linear releases and DDM-2000 FiberReach Wide-Band Shelf (WBS) rleases.

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

src_aid Source access identifier. The *src_aid* is a required parameter and must address a valid STS-1/STS-3c/VT-1.5 channel or a port of the NE in order to be accepted.

For the valid *aid*s for NE, see Table 11-1 of the appropriate User Service Manual.

ALL is not allowed in the *src_aid* for this command.

dest_aid Destination access identifier. The *dest_aid* is a required parameter and must address a valid STS-1/STS-3c/VT-1.5 channel or a port of the NE in order to be accepted.

For the valid *aid*s for NE, see Table 11-1 of the appropriate User Service Manual.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R3.1 and FiberReach 1.0, **ALL** is not allowed in the *dest_aid* for this command.

ctag Correlation tag. This is included in the command by the user and is repeated by the NE 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 and will 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); valid for DDM-2000 OC-3, and OC-12 systems.

2WAYPR This value is allowed only for ring systems. This requests two-way add/drop or pass-through cross-connection between the source and destination in a path switched ring be established (this is the default value for ring systems); valid for DDM-2000 OC-3, OC-12 and FiberReach systems.

2WAYBR This value is allowed only for ring systems. This requests a Drop-and-Continue cross-connection between the source and destination be established; valid for DDM-2000 OC-3 and OC-12 systems.

COV This value is allowed only in OC-12 release 5.0 and beyond ring systems, when the *modifier* is STS3C. This requests that two independent STS-3c signals received from the two receive fibers of a single OC-3 or IS-3 LS interface be added independently to the two directions of a single STS-3C channel (timeslot) in the OC-12 ring.

RTV This value is allowed only in OC-12 release 5.0 and beyond ring systems, when the *modifier* is STS3C. This requests that two independent STS-3c signals received from the two directions of a single STS-3c channel on the OC-12 ring be dropped independently to the two transmit fibers of a single OC-3 or IS-3 LS interface while also continuing those signals on the ring.

LOCKED This value is allowed only in the DDM-2000 ring systems (OC-3 release 9, FiberReach R1.0 and after). This requests that a single channel received from only one rotation of the path switched ring (determined by the **RING** *spec_block* parameter) addressed by the *src_aid* or *dest_aid* be dropped independently to the low-speed channel addressed by the other *aid* in the input command. This *cct* is not allowed in OC-12 systems.

If the *cct* value is null, the default value of **2way** will be used if the NE addressed by the *tid* in the input command is a linear system and **2waypr** if it is a ring system.

- **2WAY** will be supported in DDM-2000 OC-3 R6.1 and OC-12 R2.1 and in all later linear releases.
- **2WAYPR** and **2WAYBR** will be supported in DDM-2000 OC-3 R7.1 and OC-12 R3.1 and in all later ring releases.
- **LOCKED** will be supported in DDM-2000 OC-3 R9.0 and in all later ring releases.
- **2WAYPR**, and **LOCKED** will be supported in DDM-2000 FiberReach R1.0 and in all later ring releases.
- **COV**, and **RTV** will be supported in DDM-2000 OC-12 R5.0 and all later ring releases.

spec_block Specific block. This parameter field is used for most basic capabilities of the **ENT-CRS-***rr* command, as specified in Bellcore TR-199, Issue 2. 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 will appear at most once within the specific block for a single **ENT-CRS-***rr* 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.

Since the **2WAYBR** and **LOCKED** cross-connections can be set up from either of the two rings that make up a complete path switched ring, the user will be required to specify the ring to set up the drop from. In DDM-2000 OC-3 and FiberReach 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. In DDM-2000 OC-12 rings, the main-b-1 receive fiber has been designated to carry Ring 1 and the main-b-2 receive fiber has been designated to carry Ring 2.

RING In DDM-2000 OC-3 R7.0, 7.1 and FiberReach 1.0, if the *cct* is **2WAYBR** or **LOCKED**, then this specific block parameter must be specified. It must have one of the following two values:

M1 Specifies that the cross-connection must be set up for Ring 1 to drop-and-continue.

`M2` Specifies that the cross-connection must be set up for Ring 2 to drop-and-continue.

It is worth noting, for **2WAYBR** cross-connections, that eventhough the **Ring** parameter is settable for each VT1 path in an OC-3 system, due to a 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 above limitation does not apply to **STS1** or **STS3C** cross-connections.

In DDM-2000 OC-12 R3.1, if the *cct* is **2WAYBR**, then this specific block parameter must be specified. It must have one of the following two values:

`MB1` Specifies that the cross-connection must be set up for Ring 1 to drop-and-continue.

`MB2` Specifies that the cross-connection must be set up for Ring 2 to drop-and-continue.

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 OUTPUT PARAMETERS** section. The requirements listed there apply to this command also.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example establishes a two-way (add/drop) cross-connection between an STS-1 channel in the high speed OC-n interface (which will be OC-3 in general but can also be OC-1 starting from DDM-2000 OC-3 release 9.1 and OC-12 starting from DDM-2000 OC-3 release 11.0) "m-2" and a low speed port "b" as follows:

```
ent-crs-sts1:ATT-PF-2000-3:m-2,b:123456;


IP 123456
<


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

The following DDM-2000 OC-3 (ring system earlier than R7.1) example establishes a two-way pass-through cross-connection for the VT-1.5 channel in the high speed OC-3 lines ("m-2-5-4") in a DDM-2000 OC-3 Path Switched Ring.

```
ent-crs-vt1:ATT-PF-2000-3:m-2-5-4,m-2-5-4:Z89abc:2waypr;


IP Z89abc
<


   ATT-PF-2000-3 93-11-26 16:53:22
M  Z89abc COMPLD
;
```

The same command will have the following input format in OC-3 releases 7.1 and beyond:

```
ent-crs-vt1:ATT-PF-2000-3:m-2-5-4,m-2-5-4:Z89abc::2waypr;
```

Notice that there are 2 colons between the *ctag* of "Z89abc" and the *cct* of "2waypr".

The following FiberReach example establishes a two-way (add/drop) cross-connection between a VT-1.5 channel in the high speed OC-1 line ("m-1-1-2") and a low speed port ("b-1-3") as follows:

```
ent-crs-vt1:ATT-PF-2000-3:m-1-1-2,b-1-3:Z89abc;


IP 123456
<


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

The following FiberReach example establishes a two-way pass-through cross-connection between a VT-1.5 channel in one of the high speed OC-1 lines ("m-1-1-2") and the corresponding VT-1.5 channel in the other OC-1 line ("m-1-1-2"):

```
ent-crs-vt1:ATT-PF-2000-3:m-1-1-2,m-1-1-2:Z89abc::2waypr;


IP 123456
<


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

The following DDM-2000 OC-3 (ring system earlier than R7.1) example establishes a **2WAYBR** cross-connection between a low speed port ("b-6-2") and a VT-1.5 channel in the high speed OC-3 line ("m-1-1-1") from Ring 1 as follows:

```
ent-crs-vt1:ATT-PF-2000-3:b-6-2,m-1-1-1:654321:2waybr:ring=m1;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

The same command will have the following input format in OC-3 releases 7.1 and beyond:

```
ent-crs-vt1:ATT-PF-2000-3:b-6-2,m-1-1-1:654321::2waybr:ring=m1;
```

If there had been another VT1 **2WAYBR** path already established in this OC-3 system with the **Ring** parameter set to m2, the command would not have COMPLD at the DDM-2000. A DENY would have resulted instead.

The following example establishes a two-way (add/drop) cross-connection between a low speed port ("c-2") and an STS-1 channel in the high speed OC-12 line ("mb-6") in a DDM-2000 OC-12 ring system:

```
ent-crs-sts1:ATT-PF-2000-3:c-2,mb-6:654321::2waypr;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

The following example establishes a two-way (add/drop) cross-connection between the OC-3 interface in the function slot "d" and the STS-3c channel in the high speed OC-12 line ("mb-4") in a DDM-2000 OC-12 ring system:

```
ent-crs-sts1:ATT-PF-2000-3:d-1,mb-4:654321::2waypr;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

If there had been no OC-3 interface in the function slot "d" or if any of mb-4, mb-5, mb-6, d-1, d-2, and d-3 were already involved in another cross-connection, or if the OC-3 interface had been set up for an application other than 1+1, then the command would not have completed.

The following example establishes a drop and continue cross-connection between the OC-3 interface in the function slot "fn-b" and the STS-3c channel in the high speed OC-12 line ("mb-10") in a DDM-2000 OC-12 ring system:

```
ent-crs-sts1:ATT-PF-2000-3:b-1,mb-10:654321::2waybr:ring=mb1;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

If there had been no OC-3 interface in the function slot "fn-b" or if any of mb-10, mb-11, mb-12, b-1, b-2, and b-3 were already involved in another cross-connection, or if the OC-3 interface had been set up for an application other than 1+1, then the command would not have completed.

The following OC-3 (ring system starting from release 11.0) example establishes a pass-through STS-3c cross-connection between the STS-3c channels in the OC-12 interfaces in the main slots occupying STS-1 time slots m-7, m-8 and m-9:

```
ent-crs-sts3c:ATT-PF-2000-3:m-7,m-7:654321::2waypr;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

If there had been no OC-12 interfaces in both main slots or if any of m-7, m-8, or m-9 were already involved in another cross-connection, then the command would not have completed.

The following example establishes a COV STS-3c cross-connection between the OC-3 interface in the function slot "b" and the STS-3c channel in the high speed OC-12 line ("mb-10") in a DDM-2000 OC-12 ring system:

```
ent-crs-sts3c:ATT-PF-2000-3:b-1,mb-10:654321::COV;


IP 654321
<


   ATT-PF-2000-3 93-11-26 16:54:33
M  654321 COMPLD
;
```

If there had been no OC-3 interface in the function slot "b" or if any of mb-10, mb-11, mb-12, b-1, b-2, and b-3 were already involved in another cross-connection, or if the OC-3 interface had been set up for an application other than **`0by1`**, then the command would not have completed.

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to this command also. In addition to the non-message-specific error found in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses are those that DDM-2000 checks for each condition.

If the NE receives an **ENT-CRS-***rr* command with the same parameter specified more than once (with the exception of DDM-2000 OC-3, OC-12 and FiberReach ring systems in which the source and destinations must be the same and both the source and destination aids must point to main slots for pass-through cross-connections), the following error response is returned:

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

If DDM-2000 OC-12 (R3.1) receives an **ENT-CRS-***rr* command with a command code modifier other than STS1, the following error response is returned:

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

In DDM-2000 OC-12 R5.0, if DDM-2000 OC-12 receives an **ENT-CRS-***rr* command with a command code modifier other than STS1 and STS3C, the following error response is returned:

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

If DDM-2000 OC-3 (R11.0) receives an **ENT-CRS-*rr*** command with a command code modifier other than STS1 or VT1, the following error response is returned:

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

If DDM-2000 OC-3 receives an **ENT-CRS-*rr*** command with a command code modifier other than STS3C, STS1 or VT1, the following error response is returned:

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

If a FiberReach (R1.0) receives an **ENT-CRS-*rr*** command with a command code modifier other than VT1, the following error response is returned:

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

If the NE receives an **ENT-CRS-*rr*** 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/STS-3c/VT-1.5 channel in the high speed OC-n line or a single low speed port or channel, 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 DDM-2000 OC-3 (R6.1) 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:

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

If a DDM-2000 OC-3 (R9.0) system receives an **ENT-CRS-***VT1* command with either the *src_aid* or *dest_aid* value pointing to a VT1 channel on an OC-1 line while the corresponding OC-1 line is in the NMON state, the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, one of the addressed
      channels is on a line in a valid state */
;
```

In DDM-2000 OC-3 R6.1, if a linear DDM-2000 receives an **ENT-CRS-***rr* command with a *cct* value other than null or **2WAY**, the following error response is returned:

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

In DDM-2000 OC-3 R9.0, if a ring DDM-2000 system system receives an **ENT-CRS-***rr* command with a *cct* value other than null, **2WAYPR**, **2WAYBR**, or **LOCKED**, the following error response is returned:

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

In DDM-2000 OC-12 R5.0, if a ring system receives an **ENT-CRS-***rr* command with a *cct* value other than null, **2WAYPR**, **2WAYBR**, **COV**, or **RTV**, the following error response is returned:

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

If a FiberReach system receives an **ENT-CRS-***rr* command with a *cct* value other than null or **2WAYPR**, or **LOCKED** the following error response is returned:

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

In DDM-2000 OC-3 7.0, 7.1 and OC-12 R3.1, if a ring system receives an **ENT-CRS-***rr* command with a *cct* value set to **2WAYPR**, but the source and destination AIDs representing two different HS time slots of the ring, the following error response is returned:

```
   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, whereas cross-connecting the VT m-1-1-1 to m-1-1-1 will not be considered pass-through cross-connection.

In DDM-2000 OC-3 7.0, 7.1 and OC-12 R3.1, if a ring system receives an **ENT-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:

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

In DDM-2000 OC-3 R6.1, if a ring system receives an **ENT-CRS-***rr* command with a *cct* value set to **2WAYBR** or **LOCKED** but without the **RING** parameter set in the *spec_block*, the following error response is returned:

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

In DDM-2000 FiberReach R1.0, if the system receives an **ENT-CRS-***rr* command with a *cct* value set to **LOCKED** but without the **RING** parameter set in the *spec_block*, the following error response is returned:

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

In DDM-2000 OC-12 R3.1, if a ring system receives an **ENT-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:

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

In DDM-2000 OC-3 R7.0, 7.1 and OC-12 R3.1, if a ring system receives an **ENT-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 set to 2WAYBR */
;
```

In DDM-2000 OC-3 R9.0, if a ring system receives an **ENT-CRS-***rr* command with **RING** parameter in the *spec_block* with the *cct* set to a value other than **2WAYBR** or **LOCKED**, 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 or LOCKED */
;
```

In DDM-2000 FiberReach R1.0, if a ring system receives an **ENT-CRS-***rr* command with **RING** parameter in the *spec_block* with the *cct* set to a value other than **LOCKED**, 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 LOCKED */
;
```

In DDM-2000 OC-3 R9.0 and FiberReach R1/0, if the NE receives an **ENT-CRS-***rr* command with the **RING** parameter in the *spec_block* whose value is other than m1, or m2, the following error response is returned:

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

In DDM-2000 OC-12 R3.1, if the NE receives an **ENT-CRS-***STS1* command with the **RING** parameter in the *spec_block* whose value is other than mb1, or mb2, the following error response is returned:

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

In DDM-2000 OC-3 R7.0, if a ring system receives an **ENT-CRS-VT1** command with the *cct* set to **2WAYBR** and with **RING** parameter in the *spec_block* whose value is valid but conflicts with the **Ring** parameter value already set for another **VT1** path, the following error response is returned:

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

In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0 and OC-12 R3.1, if DDM-2000 receives an otherwise valid **ENT-CRS-***rr* command for which the system does not support either any cross-connection or the specified cross-connection type between the *src_aid* and *dest_aid*s, then the following error response is returned:

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

For example no cross-connections are supported between fn-a and fn-b in an OC-3 system.

As another example, LOCKED and 2WAYBR pass-through cross connections are not allowed.

As yet another example, STS-3c add/drop cross-connections are not allowed in a DDM-2000 OC-3 R11.0 system. Only STS-3c pass-through cross-connections are allowed if the main slots are equipped with OC-12 HS interfaces.

If the NE receives an otherwise valid **ENT-CRS-***rr* command but for which, the DDM-2000 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 */
;
```

Following list provides some sample cases, where the above error would result:

- DDM-2000 OC-3, OC-12 or FiberReach WBS system receives an otherwise valid cross-connection command, but the slot pair addressed by at least one of the *aid*s in the input command is equipped with a mix of incompatible circuit packs
- DDM-2000 OC-12 R5.0 system receives an ENT-CRS-STS3C command with a function slot *aid* that does not have an OC-3 or IS-3 CP in it
- DDM-2000 OC-12 R5.0 system receives an ENT-CRS-STS3C command while the addressed system has MAIN-B slots and/or both of the TSI slots unequipped

If DDM-2000 OC-12 (R5.0) receives an otherwise valid **ENT-CRS-STS3C** command with *cct* parameter set to 2WAYBR but the OC-3 or IS-3 LS interface addressed by either the *src_aid* or the *dest_aid* is provisioned for **0by1** application, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, Provisioned LS interface application
      does not allow requested cross connection */
;
```

If DDM-2000 OC-12 (R5.0) receives an otherwise valid **ENT-CRS-STS3C** command with *cct* parameter set to **COV** or **RTV** but the OC-3 or IS-3 LS interface addressed by neither the *src_aid* nor the *dest_aid* is provisioned for **VIDEO** application, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, Provisioned LS interface application
      does not allow requested cross connection */
;
```

If DDM-2000 OC-12 (R5.0) receives an otherwise valid **ENT-CRS-STS1** command with *cct* parameter set to 2WAYBR but the LS interface addressed by either the *src_aid* or the *dest_aid* is provisioned for **0by1** application, the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, Provisioned LS interface application
      does not allow requested cross connection */
;
```

In DDM-2000 R6.1, 7.0, 7.1, 11.0 and OC-12 R 3.1, if the system receives an otherwise valid **ENT-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 (e.g. DDM-2000 OC-3 system receives and ENT-CRS-STS1 command, but the STS1 addressed by one of *src_aid* or *dest_aid* is already VT cross-connected, or a DDM-2000 OC-12 R5.0 system receives an ENT-CRS-STS3C command but the one of the STS-1s in the STS-3c groups addressed by either the source or destination aid is already STS1 cross-connected, or a DDM-2000 OC-3 R11.0 system equipped with OC-12 HS interfaces receives a pass-through ENT-CRS-STS3C command but the one of the STS-1s in the STS-3c groups addressed

by either the source or destination aid is already STS1 cross-connected), the following error response is returned:

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

If DDM-2000 receives an otherwise valid **ENT-CRS-***rr* command but for which, the 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:

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

If DDM-2000 receives an otherwise valid **ENT-CRS-STS3C** command but the STS-3c feature option has not been enabled at the addressed system, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, feature option not enabled */
;
```

In DDM-2000 OC-3 R11.0, if the system receives an otherwise valid **ENT-CRS-***rr* command but the entered command, if executed, would exceed its cross-connection capacity, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, cross-connect
      capacity is not available */
;
```

In DDM-2000 OC-3 R11.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots
      must be equipped with compatible OLIU packs */
;
```

RELATED TL1 MESSAGES

DLT-CRS-*rr*
RTRV-CRS-*rr*
REPT DBCHG

NAME

ENT-FEAT: Enter Feature

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- Fiber Reach **1.0**

INPUT FORMAT

ENT-FEAT:*tid*::*ctag*::*feature-option*,*action*;

DESCRIPTION

The **ENT-FEAT** command can be initiated to configure the network element (NE) for feature options that are licensed for use.

NOTE:
This command is restricted to privileged users.

INPUT PARAMETERS

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

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

feature-option For the **ENT-FEAT** command, *feature-option* is the feature option available to user. Detailed information on features supported in different releases is available in the DDM-2000 OC-3, OC-12 and FiberReach User Service Manuals under the Commands and Reports Section in the description of the **set-feat** command. The *feature-option* has one of the following values:

- `sts3c` This feature allows STS-3c service (concatenated signals) to be supported. For DDM-2000 OC-3, it is only supported with linear releases.
- `vtpm` This feature provides performance-monitoring of cross-connected VT1.5 services
- `ds1pm` This feature provides performance-monitoring of cross-connected (dropped) DS1 services in ring systems.

action *Action* is the action the user wants to perform on the listed feature, It takes one of the following values:

`enabled` This enables a feature option. This action will also unblock the use of commands needed by this feature.

`disabled` This disables a feature option. This action will also block the use of commands needed by this feature. It may also reprovision some parameters. The user may be required to reprovision the shelf before disabling a feature.

OUTPUT FORMAT

If the NE fully complies with the **ENT-FEAT** request, and a previously disabled feature is being enabled, the following normal completion response is returned:

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
/* ACCESS TO, AND USE OF THIS <feature-option> FEATURE IS PERMITTED
   ONLY IF SPECIFICALLY AND EXPRESSLY AUTHORIZED UNDER THE RELEVANT
   DDM-2000 SOFTWARE AGREEMENT BETWEEN LUCENT TECHNOLOGIES AND CUSTOMER.  */
;
```

If the NE fully complies with the **ENT-FEAT** request, and no new feature is being enabled, the following normal completion response is returned:

```
IP 123456
<

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

If the **ENT-FEAT** command does not alter the already provisioned setting, the NE will not deny the command. Instead the system will respond with the normal completion message (shown above).

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **ENT-FEAT** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows an **ENT-FEAT** command that enables the STS-3c feature:

```
ENT-FEAT:LT-PF-2000::123456::sts3c,enabled;
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
/* ACCESS TO, AND USE OF THIS <sts3c> FEATURE IS PERMITTED ONLY
   IF SPECIFICALLY AND EXPRESSLY AUTHORIZED UNDER THE RELEVANT
   DDM-2000 SOFTWARE AGREEMENT BETWEEN LUCENT TECHNOLOGIES AND CUSTOMER.  */
;
```

The following example shows an **ENT-FEAT** command that disables performance monitoring of cross-connected VT1.5 services in ring systems:

```
ENT-FEAT:LT-PF-2000::123456::vtpm,disabled;
IP 123456
<

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

The following example shows an **ENT-FEAT** command that enables performance monitoring of cross-connected (dropped) DS1 services in ring systems:

```
ENT-FEAT:LT-PF-2000::123456::ds1pm,enabled;
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
/* ACCESS TO, AND USE OF THIS <ds1pm> FEATURE IS PERMITTED ONLY
   IF SPECIFICALLY AND EXPRESSLY AUTHORIZED UNDER THE RELEVANT
   DDM-2000 SOFTWARE AGREEMENT BETWEEN LUCENT TECHNOLOGIES AND CUSTOMER.  */
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **ENT-FEAT** command, also.

If an **ENT-FEAT** command is entered by a non-privileged user, the following error response is given:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  PICC
/* Privilege, Illegal Command Code */
;
```

If an **ENT-FEAT** command is entered with a feature-option of sts3c, and the following conditions have not been met:

- For an OC-12 system, the set-oc3 (or ENT-OC3) "concat" must be set to "disable" for all addresses.
- For an OC-3 system, the set-oc3 (or ENT-OC3) "concat" must be set to "disable" for the fn-c address.

Then the following error response is given:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  SNVS
/* Status, Not in Valid State. Reprovision system before disabling sts3c */
;
```

If an **ENT-FEAT** command is entered for a feature not supported by the system identified by the TID, the following error response is given:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
/* Input Data Not Valid, Specified Feature not Supported */
;
```

For DDM-2000 OC-3 R8.0, 9.0 and later, OC-12 R4.0, 5.0 and later, and Fiber Reach R1.0 and later, the NE returns the following error response if the *action* value is missing or invalid:

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

For DDM-2000 OC-3 R9.1 and OC-12 R5.1, if this command is entered and no TGS packs are equipped, there is no place to store a backup copy of the feature options. The command will be denied with the following message:

```
   sid date time
M  ctag DENY
   EQWT
   /* EQuipage, Wrong Type */
   /* No change in provisioning - both timing slots are unequipped */
;
```

For FiberReach R2.1 and later, if this command is entered and no main OLIUs are equipped, there is no place to store a backup copy of the feature options. The command will be denied with the following message:

```
   sid date time
M  ctag DENY
   EQWT
   /* EQuipage, Wrong Type */
   /* No change in provisioning - both main slots are unequipped */
;
```

RELATED TL1 MESSAGES

RTRV-FEAT

NAME

ENT-FECOM: Enter-Far End Communications

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **13.0** and later
- OC-12 Release **7.0** and later
- FiberReach Release **3.0** and later

INPUT FORMAT

ENT-FECOM:*tid*:*aid*:*ctag*[:::*spec_block*];

DESCRIPTION

The **ENT-FECOM** command can be initiated by users to provision the section data communications channel (DCC) and/or IAO LAN interface.

This command is available only to privileged users.

INPUT PARAMETERS

tid	Target identifier. This is the name of the Network Element (NE) to which the command is addressed.
aid	AID. The AID identifies the DCC address to which the command is to be applied. For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later with an IAO LAN interface, the AID can be an IAO LAN address. See Table 3-8.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.
spec_block	Specific Parameter Block. The system level attributes to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using a *name=value,name=value,...* type construct with no constraints on the order of parameters. Constructs such as *name1=value1, name2=, name3=, name4=, name5=value5,...* are acceptable and in this example only the parameters *name1* and *name5* will be changed at the NE. If the current value of the parameter *name1* is already *value1* in the above example, *name1* will not be changed.

For the **ENT-FECOM** command, the *spec_block* may contain one or more of the following parameters:

COM This parameter indicates whether communication over a specified dcc is enabled or disabled. The valid values are **enabled** or **disabled**. The default value is **enabled**.

For DDM-2000 OC-3 R13.0 and OC-12 R7.0, this parameter can be used with an IAO LAN AID in order to enable or disable the IAO LAN.

SIDE **SIDE** sets the DCC identity for the DCC(s) addressed to either **network_side** or **user_side**. When the value is the same on both ends of the DCC, an alarm will be active.

If a **ENT-FECOM** command is issued and this parameter is not provided, the current values for this parameter will be unchanged.

NOTE:
The description of the CIT user interface command in the User Service Manual describes the default values for this parameter.

LANRESET For DDM-2000 OC-3 R13.0 and OC-12 R7.0, **LANRESET** can only have the value **y(Yes)**, and is only applicable when used with an IAO LAN AID. This will reset the IAO LAN.

OUTPUT FORMAT

If the NE fully complies with the **ENT-FECOM** request, the following normal completion response is returned.

```
IP ctag
<

sid date time
M ctag COMPLD
;
```

If the **ENT-FECOM** command does not alter the existing attributes, the NE will not deny the command. Instead the system will respond with the completion message (shown above).

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **ENT-FECOM** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a command **ENT-FECOM** for a DDM-2000 FiberReach System R3.0:

```
ENT-FECOM:LT-PF-2000:dcc-a1-1:CTAG:::COM=enabled,SIDE=ns;

IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  CTAG COMPLD
;
```

The following example shows a command **ENT-FECOM** for a DDM-2000 OC-3 R13.0 System (for rings):

```
ENT-FECOM:LT-PF-2000:dcc-m1:CTAG:::COM=enabled,SIDE=ns;

IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  CTAG COMPLD
;
```

The following example shows a command **ENT-FECOM** for a DDM-2000 FiberReach System R3.0:

```
ENT-FECOM:LT-PF-2000:mb1:CTAG:::COM=enabled,SIDE=ns;

IP 123456
<

   LT-PF-2000 97-10-26 16:42:11
M  CTAG COMPLD
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **ENT-FECOM** command, also.

If the NE receives a **ENT-FECOM** command with the same parameter specified more than once, the following error response is returned:

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

If the NE receives an **ENT-FECOM** command with an invalid **COM** parameter, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid COM parameter */
;
```

If the NE receives an **ENT-FECOM** command with an invalid **SIDE** parameter, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid SIDE parameter */
;
```

If the NE receives an **ENT-FECOM** command with with a valid **SIDE** parameter but also specifying **AID=LAN**, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, inconsistent AID parameter */
;
```

In DDM-2000 OC-3 R13.0 and OC-12 R7.0, if the NE receives a **ENT-FECOM** command with an invalid **LANRESET** parameter, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid LANRESET parameter */
;
```

If the NE receives an **ENT-FECOM** command with an **AID=LAN** and an invalid value for the **LANRESET** (valid values are **"Yes"** and **null**) parameter, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid LANRESET parameter */
;
```

If the NE receives an **ENT-FECOM** command with an **AID** value NOT **=LAN** and a valid **LANRESET** value (valid values are **"Yes"** and **null**), the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, inconsistent AID parameter */
;
```

If the NE receives an **ENT-FECOM** command with a spec_block parameter that is not allowed for the given AID, the following error message is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, parameter settings inconsistent with AID */
;
```

RELATED TL1 MESSAGES

RTRV-FECOM

NAME

ENT-NCT: Set NCT Characteristics

Support for this command is *only* available for DDM-2000 Multiplexers, equipped with OC-3 ring Release 13.5 (for the TRCU3 application).

NOTE:
This command is valid only when one or more function unit slots are equipped with the BNP1 (NCT optical link interface) or BNP2 (NCT2 optical link interface) circuit pack.

INPUT FORMAT

ENT-NCT:*tid*:*[aid]*:*ctag[*:::*spec_block]*;

DESCRIPTION

This command sets several characteristics (parameters) of a specified NCT or NCT2 line pair.

This TL1 command is available only to the privileged users.

INPUT PARAMETERS

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

aid Access identifier. This identifies the NCT line pair(s). Its value must be a valid NCT/2 line pair AID or **all**.

The default is **all**.

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

spec_block Specific Parameter Block. The system level attributes to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using a *name=value, name=value,...* type construct with no constraints on the order of parameters. Constructs such as *name1=value1, name2=, name3=, name4=, name5=value5,...* are acceptable and in this example only the parameters *name1* and *name5* will be changed at the NE. If the current value of the parameter *name1* is already *value1* in the above example, *name1* will not be changed.

The *spec_block* may contain one or more of the following parameters:

encts This parameter specifies whether to enable end-to-end control messaging. The valid values are no (default) and yes.

cts ControlTimeslot specifies the timeslot to be used as the end-to-end message conduit. The value of this parameter has a range of 0 to 255. The default value is 0. This parameter is allowed only if **encts=yes**.

tcts TRCU3 Control TimeSlot. This parameter specifies the timeslot to be used as the message conduit between this DDM system and the 5ESS equipment at the far end of this NCT link. The value of this parameter has a range of 0 to 255 The default value is 0.

mode Mode specifies whether this system is at a host or remote The valid values are host (default) and remote.

If the *spec_block* is null, the currently effective attributes at the NE system prevail.

OUTPUT FORMAT

If the NE fully complies with this command, the following completion response is returned.

```
IP ctag
<

   sid date time
M  ctag COMPLD
;
```

If the command does not alter the existing system level attributes, the NE will not deny the command. Instead the system will respond with the completion

message (shown above).

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-nct:LT-PF-2000:system:123456:::encts=yes;

IP 123456
<

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

ERROR RESPONSE

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

If a NE receives this command with a **encts** value that is not valid, the following error response is returned:

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

If a NE receives this command with a **cts** value that is not valid, the following error response is returned:

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

If a NE receives this command with a **tcts** value that is not valid, the following error response is returned:

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

If a NE receives this command with a **mode** value that is not valid, the following error response is returned:

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

If a NE receives this command with a spec_block parameter that is not supported, the following error response is returned:

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

If a NE receives this command with a value specified for the **cts** parameter, but **encts** has not been set to yes, the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, system Not in Valid State, CTS can only be set if ENCTS=yes */
;
```

RELATED TL1 MESSAGES

RTRV-NCT

NAME

ENT-OSACMAP: Enter OS application context ID map

This command is available starting in DDM-2000 OC-3 Release 8.0 (for linear systems), and DDM-2000 OC-3 Release 9.0 and OC-12 Release 5.0 (for rings). This command will be available in a future DDM-2000 FiberReach release.

INPUT FORMAT

ENT-OSACMAP:*tid*:*aid*:*ctag*::[*vc*]:*spec_block*;

DESCRIPTION

This command creates entries in the X.25 subnetwork application context map. This map lists the permanent virtual circuits (PVCs) and switched virtual circuit (SVC) available in the X.25 channel and maps them to operation systems (OS) application contexts. For the SVC, it lists the data terminal equipment (DTE) calling addresses used by the various OS application contexts. Defaults for the PVCs are provided, which should apply to most situations.

NOTE 1:
When security is enabled, this command is available to privileged users only.

NOTE 2:
While this command is allowed at all network elements in the subnetwork, only the table at the active GNE node is valid. The maps at inactive GNE nodes can be modified, but they have no effect.

This command causes the NE's affected virtual circuit to be reset. This will drop all currently active logins on that virtual circuit.

INPUT PARAMETERS

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

aid Access identifier.

The *aid* can only have the value **ALL**.

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.

vc Virtual circuit. This parameter is the virtual circuit type X.25 attachment for the OS. It takes one of the following values:

PVC permanent virtual circuit.

SVC switched virtual circuit (default value).

spec_block Specific Parameter Block. Parameters within *spec_block* are specified using *name=value,name=value* with no constraint on the order of the parameters.

The *spec_block* contains the following:

SNPA SNPA is the X.25 subnetwork point of attachment address for the OS. It is either the PVC logical channel number (LCN) 1, 2, 3, 4, 5, 6, 7, 8, or 9 or it is the SVC Data Terminal Equipment (DTE) calling address, which is 1 to 15 digits. Up to nine VCs can be mapped to any combination of PVCs and SVCs (that is, PVCs could be removed and replaced by SVCs). This is a required parameter.

ACID For DDM-2000 OC-3 Release 8.0, 9.0 to 9.1, 11.0, OC-12 Release 5.0 to 5.1. OS application context ID. This is a string of up to twenty-three alphanumeric characters, which is the application context ID to be assigned to a particular SNPA address. Each OS has a value of ACID assigned. Default values exist for OS applications supported by DDM-2000. Supported values are:

TL1CR (Assigned to PVC "1" as default value).

TL1MAINTENANCE (Assigned to PVC "2" as default value).

TL1MEMORYADMINISTRATION (Assigned to PVC "3" as default value).

TL1TEST

TL1OTHER1

TL1OTHER2

The default ACID value for all SVCs is TL1PEERCOMM. (ACID can not be assigned the value TL1PEERCOMM by the user. ACID is NOT a required parameter. When ACID is unassigned for the SVCs by the user, the system will assign the value TL1PEERCOMM.)

OS application context ID. This is a string of up to twenty-three alphanumeric characters, which is the application context ID to be assigned to a particular SNPA address. Each OS has a value of ACID assigned. Default values exist for OS applications supported by DDM-2000. Supported values are:

TL1PEERCOMM	(Assigned to PVC "1" and all SVCs as default value in DDM-2000 OC-3 release 9.8, 13.0 and later, DDM-2000 OC-12 release 7.0 and later).
TL1MAINTENANCE	(Assigned to PVC "2" as default value).
TL1MEMORYADMINISTRATION	(Assigned to PVC "3" as default value).
TL1CR	
TL1TEST	
TL1OTHER1	
TL1OTHER2	

Note that the **TL1CR** ACID will never report any TL1 autonomous messages.

If the **ACID** parameter is missing from the *spec_block*, the default value is whatever is currently already in the table.

The same ACID can be mapped to more than one virtual circuit.

OUTPUT FORMAT

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

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

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

```
ent-osacmap:LT-PF-2000:all:123456::svc:acid=tl1cr,snpa=12345678901234;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

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

The Network Element returns the following error response if the *aid* value is missing, or invalid.

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

The network element returns the following error response if the **vc** value is invalid.

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

The network element returns the following error response if the **SNPA** value in the *spec_block* is invalid or missing.

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

The network element returns the following error response if the **ACID** value in the *spec_block* is invalid or if it is missing and not already mapped in the table.

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

The network element returns the following error response if a user attempts to enter an additional SNPA (LCN/DTE calling address), when the maximum supported number already exists.

```
   sid date time
M  ctag DENY
   SLEM
   /* Status, List Exceeds Maximum, maximum SNPA entries already reached */
;
```

RELATED TL1 MESSAGES

DLT-OSACMAP

RTRV-OSACMAP

NAME

ENT-*rr*: Provision a given type of transmission object entity in a Network Element (NE).

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1, 7.0, 7.1
- OC-12 Release 2.1, 3.1
- FiberReach Release 1.0

INPUT FORMAT

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

DESCRIPTION

When the NE receives an **ENT-***rr* command, it will provision the addressed entity according to the parameter settings in the command.

The provisioned values will remain active until modified (for example, by another TL1 command **ENT-***rr* or by the corresponding NE CIT command).

The NEs support several CIT commands for provisioning the attributes of a given object entity. They are addressed by using several optional parameters in one TL1 command. Refer to the applicable command pages in the User Service Manual for the appropriate NE for further discussion about the functions of those CIT commands.

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R11.0, 6.1, 7.0, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, this isthe command modifier for the **ENT-***rr* command. The *modifier* is a required field and must only have one of the following values:

- `T1` This is for the DS1 level external interfaces including T1 extensions; Applicable to DDM-2000 OC-3 and FiberReach systems
- `T3` This is for the DS3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- `EC1` This is for the electrical STS1 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- `OC1` This is for the optical OC-1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems

0C3	This is for the optical OC-3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
0C12	This is for the optical OC-12 level external interfaces; Applicable to DDM-2000 OC-12 system and to DDM-2000 OC-3 system starting with R11.0.
STS1	This is for the dropped STS-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems
STS3C	This is for the dropped STS-3c channels in OC-12 (starting with R5.0).
VT1	This is for the dropped VT-1 channels; Applicable to DDM-2000 OC-3 and FiberReach systems

For all of the remaining parameters, it is implied that the *modifier* must match the entity addressed by *aid* and that all parameters set by the command must be applicable to the *modifier* type.

tid In DDM-2000 OC-3 R6.1, 7.0, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Target identifier. This is the name of the NE to which the command is addressed. The *tid* is a required parameter.

aid Access identifier. This is the address of the entity for which the **ENT-***rr* command is intended. The *aid* is a required parameter and must reference a valid entity of the NE in order to be accepted.

For the valid *aid*s for DDM-2000 FiberReach, OC-3 and OC-12 systems, see Table 11-1 in the appropriate versions of the User Service Manual.

ALL is not allowed in the *aid* for this command except for the stated specific cases.

In DDM-2000 OC-3 R7.1, and FiberReach R1.0, **ALL** is the only allowed *aid* when the *modifier* is **VT1** and the *spec_block* only contains the parameter **SFTHR** or when the *modifier* is **STS1** and the *spec_block* only contains the parameter **SFTHR** and/or **SFAIL**.

ALL is the only allowed *aid* when the *modifier* is **STS1** or **STS3C** and the *spec_block* only has the parameter **SFTHR**.

ctag In DDM-2000 OC-3 R6.1, 7.0, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0: Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages. The *ctag* is a required parameter.

spec_block Specific block. This parameter field is used for most primary capabilities of the **ENT-***rr* command, as specified in Bellcore TR-199, Issue 2. This parameter block is optional but is allowed only when the *pst* parameter is not specified. Parameters set within the *spec_block* are positionally independent and are set using a name defined construct of: PARAMETER=*value*. The *spec_block* will have none or some of the following parameters set within it in a comma separated list. Furthermore, each parameter listed below will appear at most once within the *spec_block* for a single **ENT**-*rr* command. The parameters are listed in no specific order.

For each of the parameters below there is listed one or more parameter values. The use of the word "null" in the descriptions here implies that the parameter does not appear or appears with no value (e-g. AIS=,BPV=,) in the command. If a parameter is null in the *spec_block*, its value remains unchanged as a result of the **ENT**-*rr* 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 T1, DS1 or DS3 port(s) addressed by the *aid*. When the *modifier* is T3, the value received by the NE for this parameter is used only if the **LINECDE** is CCHAN†. In the case of DS3, setting **AIS**=Y, also will make the NE insert DS3 AIS toward the DSX-3 when it enters the OC-N signal fail or STS path AIS state incoming from the fiber. This parameter will be null or have one of the following values:

- Y Insert AIS. This is the default value for DS1s and T1 extensions
- N Do not insert AIS. This is the default value for DS3s.

When the *modifier* is T1, and **BPV** is set to Y, the **AIS** parameter value will be ignored, and NE will internally set **AIS**=.

AISNC Alarm Indication Signal Notification Code for Non-Service Affecting conditions. This parameter is not allowed when the *modifier* is

---

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

not OC1, OC3, OC12, STS3C, STS1 or VT1. This parameter is used to set the alarm level that will be used to indicate an incoming line or path AIS that is not service affecting. This parameter can be null or have one of the following values. When this parameter is null or unspecified in the input command, the non-service affecting alarm level currently provisioned for the specified address will prevail.

CR Applies only when the *modifier* is OC1, OC3, or OC12

MJ Applies only when the *modifier* is OC1, OC3, or OC12

MN Applies only when the *modifier* is OC1, OC3, OC12, STS3C, STS1, and VT1

NA Applies only when the *modifier* is OC1, OC3, or OC12

NR Applies only when the *modifier* is STS1, STS3C or VT1

AISNCSA Alarm Indication Signal Notification Code for Service Affecting conditions. This parameter is not allowed when the *modifier* is not STS3C, STS1 or VT1. This parameter is used to set the Alarm Level that will be used to indicate an incoming path AIS that is service affecting. This parameter can be null or have one of the following values. When this parameter is null or unspecified in the input command, the service affecting alarm level currently provisioned for the specified address will prevail.

CR Applies only when the *modifier* is STS3C or STS1 and the addressed channel is a ring channel

MJ Applies only when the *modifier* is VT1 and the addressed channel is a ring channel

MN Applies only when the *modifier* is STS3C, STS1, or VT1 and the addressed channel is a non-ring channel

NA Applies only when the *modifier* is STS3C, STS1, or VT1 and the addressed channel is a ring channel

NR Applies only when the *modifier* is STS3C, STS1, or VT1 and the addressed channel is a non-ring channel

BPV In DDM-2000 OC-3 R6.1, 7.0, 7.1 and FiberReach R1.0, 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 T1 or DS1 ports addressed by the *aid*. This parameter is valid only when the *modifier* is T1 and consequently to DDM-2000 OC-3 and FiberReach systems. This parameter will be null or have one of the following values:

N Do not send all zeroes. This is the default value.

Y Setting the **BPV** 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 T1 extension or DS1 as it would have done if it had directly received the default BPVs.

CONCAT In DDM-2000 OC-3 R6.1 and OC-12 R2.1, this parameter is valid only when the *modifier* is OC3. This parameter is used to specify the concatenation mode of the OC-3 line in an OC-3 or OC-12 system to be independent channels or an STS-3c channel. This parameter is valid only for linear OC-3 and OC-12 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 OC-3 line are independent.

enabled If the concatenation mode is enabled

— in the case of an OC-3 system, the three STS-1 channels recovered from the OC-3 signal in the `MAIN` slots are passed as STS-3c signal to the `FN-C` where they are reconstructed back into an OC-3 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 <-> c-1; m-2 <-> c-2; m-3 <-> c-3`* and

— in the case of an OC-12 releases 2.1, 2.2, and 4.0 the three STS-1 channels of the STS-3c signal are recovered from the OC-12 signal are passed as an STS-3c signal to the addressed function unit slots where they are converted to an OC-3c signal. Both the addressed function unit and MAIN-B slots must be equipped before the **`CONCAT`** mode can be `enabled`.

Starting with R5.0 of OC-12 system, the **`ENT-CRS-`**`STS3C` command is supported. Consequently, the execution of an STS3C Cross-Connect to the function slot containing an OC-3 interface obviates the need for the use of **`ENT-OC3`** command with this **`CONCAT`** parameter to prepare that OC-3 interface for carrying the STS-3c service.

APPLICATION In DDM-2000 OC-12 R3.1, this parameter is valid when the *modifier* is OC3 and when the NE addressed by the *tid* in the input command is an OC-12 ring system. This parameter is used to specify the protection mode of the OC-3 LS interface in an OC-12 system as 1+1 protected (for linear extensions) or 0x1 protected (ring extensions) or set for video applications. This parameter and may be null or may have only one of the following values:

- `0X1` This sets the line protection mode to 0x1. In this case, the signals in the two OC-3 lines of the protected OC-3 CP pair are independent of one another and they are both unprotected. In this configuration, the OC-3 lines will be connected to DDM-2000 OC-3 ring shelf which will perform protection switching at the path level. This is the default value.
- `1+1` In DDM-2000 OC-12 R5.0, this sets the line protection mode to be 1+1. In this case, the same signal is transmitted on both transmit lines of the protected OC-3 CP pair and the OC-3 signal from the better one of the two receive lines is selected. In this configuration, the OC-3 lines will be connected to DDM-2000 OC-3 linear shelf which will perform line protection switching.
- `VIDEO` This sets the line for video application. In this case, the signals in the two OC-3 lines of the protected OC-3 CP pair are independent of one another and they are both unprotected. In this configuration, the OC-3 lines will be connected to a video server.

EXPTRC Expected incoming path trace message. This is allowed only when the *modifier* is STS1. This parameter sets the STS1 path trace that is expected in the J1 bytes of the path overhead of the specified STS1 channel.

Any string of 62 alphanumeric characters and the special characters specified in the *User Service Manual* of the appropriate product enclosed within a pair quotes (") is considered a valid trace message. Character position 63 and 64 are fixed with *<cr>* and *<lf>* respectively and are not specifiable by the user.

If the user specifies a string less than 62 characters, then the NE will pad the user provided string with the ASCII null character to complete the 62 character string and the *<cr>* and *<lf>* characters in the character position 63 and 64.

In the input **ENT-STS1** command, the user may specify **EXPTRC** in the *spec_block* by itself or together with **TRC**. But no other parameters may be specified in the *spec_block* of the same input command. The user will be required to issue another **ENT-STS1** command with parameters other than **EXPTRC** and **TRC** in the *spec_block*.

FMT

In DDM-2000 OC-3 R6.1, 7.0, 7.1and FiberReach R1.0, this parameter is used to specify the DS1 digital signal format incoming from the DSX-1 to the specified T1 or DS1 port(s). This parameter is valid only when the *modifier* is T1 and consequently to DDM-2000 OC-3 and FiberReach systems and only if the specified T1 or DS1 port is equipped with a T1EXT or DS1 PM Circuit Pack. This parameter will 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.

In DDM-2000 OC-3 R7.1, 7.2, 8.0, 9.0 and OC-12 R3.1, 4.0, 5.0, this parameter is used to specify the DS3 performance monitoring scheme to be used on the signal incoming from the HS fiber and DSX to the specified DS3 port(s). This parameter is valid for the *modifier* T3 only if

the **LINECDE** is not set to CCHAN. This parameter will be null or have one of the following values:

PBIT PBIT scheme is used for DS3 PM. This is the default value.

FMBIT FMBIT scheme is used for DS3 PM.

CPBIT C-bit parity scheme is used for end-to-end DS3 path PM. This value of CPBIT for **FMT** parameter is not allowed when the **FRAME** parameter has been set to M13 for the same DS3 port.

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

FRAME In DDM-2000 OC-3 R9.0and OC-12 R5.0, this parameter is used only when the *modifier* is T3. **FRAME** specifies the framing format of the DS3 signal at the specified port. This parameter can have a value of

M13 to specify that the DS3 signal is M13 formatted with the C-bits serving the traditional stuffing function, or

CBIT to specify that the DS3 signal is C-bit formatted with the C-bits serving the end-to-end path functions.

M13 is the default value. This **FRAME** parameter has close relationship with the **FMT** parameter. Specifically, the value of CPBIT for **FMT** parameter is not allowed when the **FRAME** parameter has been set to M13 for the same DS3 port.

KBYTE In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, and OC-12 R2.1, 3.1, this parameter is used only when the *modifier* is OC3 or OC12. **KBYTE** specifies the usage of the K byte overhead for Synchronization Messages. Both the sending and receiving messages are affected. Note that this parameter is no longer used in Ring Releases starting with OC-3 R9.1 and OC-12 Release 5.1. This parameter is valid on both linear and ring OC-3 and OC-12 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.

SYNCMSG In DDM-2000 OC-3 R9.1 and OC-12 R5.1, Synchronization Messaging. This parameter is available for Ring Releases starting with OC3 Release 9.1 and OC-12 Release 5.1. Synchronization messaging allows timing to be reconfigured in a netowrk upon a node or fiber failure. The parameter value is one of the following:

kbyte This is the default value. When this option is selected, both K2 and S1 byte sync messaging are transmitted, but only K2 byte is received and interpretted for sync messaging.

sbyte When S1 byte is selected, only the S1 byte is sent and received for sync messaging. K2 byte will always send a "DO Not Use" message.

disabled When this option is selected, interpretation of both K2 and S1 bytes will be disabled and hence a "Do Not Use" message will be transmitted on both at all times.

LINECDE DS1 and DS3 Line Coding. When the *`modifier`* is `T3`, the *`LINECDE`* parameter is used in combination with the *`AIS`* and *`PBIT`* parameters to determine the DDM-2000 VMR mode.*

`NOOVRD` This parameter value is allowed only when the *`modifier`* value is `T1`. Hence it applies only to DDM-2000 OC-

---

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

3 and FiberReach systems. This will allow the line coding provisioned by the switch setting on the T1 extension or DS1 circuit pack to be effective. This is the default value.

`AMI` This parameter value is allowed only when the *`modifier`* value is `T1`. Hence it applies only to DDM-2000 OC-3 and FiberReach systems. In order to monitor coding violations of the DS1 signal at the port(s) addressed by the *`aid`* other than bipolar violations, the *`LINECDE`* parameter must be set to `AMI`. This will override the line coding provisioned by the switch setting on the T1 extension or DS1 circuit pack.

`B8ZS` This parameter value is allowed only when the *`modifier`* value is `T1`. Hence it applies only to DDM-2000 OC-3 and FiberReach systems. In order to operate the T1 or DS1 port(s) addressed by the *`aid`* monitoring bipolar violations, the *`LINECDE`* parameter must be set to `B8ZS`. This will override the line coding provisioned by the switch setting on the T1 extension or DS1 circuit pack.

`B3ZS` This parameter value is allowed only when the *`modifier`* value is `T3`. In order to operate the DS3 port(s) addressed by the *`aid`* monitoring P-bit violations (either `VMR` or `VM` mode), the *`LINECDE`* parameter must be set to `B3ZS`. This is the default value for DS3s.

`CCHAN` This parameter value is allowed only when the *`modifier`* value is `T3`. In order to operate the DS3 port(s) addressed by the *`aid`* in clear channe mode, (either `CC w/AIS` or `CC w/o AIS` mode), the *`LINECDE`* parameter must be set to `CCHAN`.

`NTFCNCDE` Notification code. The `NTFCNCDE` 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 will

be null or have one of the following values:

CR Critical Alarm. This is the default value if the *modifier* value is T3 and EC1. It is not allowed when the *modifier* value is T1.

MJ Major Alarm.

MN Minor Alarm.

NA Not alarmed. This is the default value if the *modifier* value is T1.

PBIT In DDM-2000 OC-3 R6.1, 7.0, 7.1 and OC-12 R2.1, 3.1: DS3 P-bit correction. 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 DDM-2000 VMR mode. The **PBIT** parameter has an effect only when the **LINECDE** is not set to CCHAN for the specified DS3 port.

ON In order to monitor and remove P-bit violations in the DS3 signal addressed by the *aid* (VMR mode), *PBIT* parameter must be set to ON. This is the default value.

OFF In order to only monitor and not remove the P-bit violations in the DS3 signal addressed by the *aid* (VM mode), the *PBIT* 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 DDM-2000.

DDM-2000 DS3 Port VMR Provisioning (using **ENT**-*rr*)

VMR Mode	LINECDE	AIS	PBIT
VMR	B3ZS	No Effect	ON
VM	B3ZS	No Effect	OFF
CC w/ AIS	CCHAN	Y	No Effect
CC w/o AIS	CCHAN	N	No Effect

PMMD

In DDM-2000 OC-3 R6.1, 7.0, 7.1, 7.2, 8.0, 9.0, OC-12 R3.1, 4.0, 5.0 and and FiberReach R1.0: Performance Monitoring Mode. This parameter is allowed only when the *modifier* is T1 or T3. The *PMMD* parameter specifies if PM must be enabled or not for the port addressed by the *aid*. When the *modifier* is T1, this parameter is allowed for T1 or DS1 port(s) equipped with T1 extension or DS1 Performance Monitoring Circuit Pack(s). This parameter will be null or have a one of the following values:

- OFF — PM turned off. This is the default value when the *modifier* is T1.
- ON — PM turned on. This is the default value when the *modifier* is T3.

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

RADIO

This parameter is allowed by DDM-2000 OC-3 MegaStar systems and takes on the valuesof yes or no to specify whether there is a Radio Frequency Unit (RFU) is connected to the SONET subsystem through an IS-3 interface. *aid*s of main and fn-c are valid for linear systems and *main-1* and *main-2* are valid for ring systems.

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 *aid*. When the *modifier* is STS1, STS3C, or VT1, this parameter only applies to dropped (as opposed to pass-through) signals. When the *modifier* is OC1, OC3, or OC12, and the addressed OC-N line supports a path switched ring, the *aid* must address a single line. The failure threshold will be applied to both lines in the line pair, however. This parameter will be null or have one of the following values:

- 0 — This sets the path signal degrade protection switch and signal degrade alarm threshold at a BER of 0 in path protection switched rings. This value is allowed only when the addressed NE is an OC-3 system and the *modifier* is STS1 or VT1. Selecting this value for **SFTHR** effectively disbles the path signal

degrade monitoring and consequently signal degrade alarming and signal degrade based path protection switching.

-3 This sets the signal failure threshold at a BER of $10 sup -3$. This value is valid only when the *modifier* is T1 or T3 and for the *modifier* of EC1 when the system addressed by the *tid* field is an DDM-2000 OC-12 system.

-5 This sets the signal failure threshold at a BER of $10 sup -5$. This value is allowed for the *modifier*s OC1, OC3, STS1, STS3C, VT1, EC1 or OC12.

-6 This sets the signal failure threshold at a BER of $10 sup -6$. This value is allowed for the *modifier*s T1, T3, EC1, OC1, OC3, OC12, STS1, STS3C and VT1.

-7 This sets the signal failure threshold at a BER of $10 sup -7$. This value is allowed for the *modifier*s T1, EC1, OC1, OC3, OC12, STS1, STS3C and VT1.

-8 This sets the signal failure threshold at a BER of $10 sup -8$. This value is allowed for *modifier*s T1, EC1, OC1, OC3, OC12, STS1, STS3C, and VT1.

-9 This sets the signal failure threshold at a BER of $10 sup -9$. This value is allowed for *modifier* is EC1, OC1, OC3, OC12 STS1, and STS3C.

SFAIL STS-1 Signal Failure threshold at which VT-1.5 AIS will be inserted on non-path terminating paths including pass-through paths in VT path switched rings and at which the STS path switching will occur for STS path switched rings. Consequently, this parameter is allowed only when the *modifier* is STS1 and the command is addressing a ring system. Further, the addressed NE must be either an OC-3 or FiberReach system. This parameter is set at the NE level (i.e. affecting all STS-1s in the

addressed system) and hence **ALL** is the only *aid* allowed. This parameter will be null or have one of the following values:

-3 This sets the threshold at a BER of $10 sup -3$. This is the default value.

-6 This sets the threshold at a BER of $10 sup -6$.

TRC Outgoing path trace message. This is allowed only when the *modifier* is STS1. This parameter sets the STS1 path trace that is to be transmitted in the J1 bytes of the path overhead of the specified STS1 channel. The syntax and the *spec_block* related requirements specified earlier for **EXPTRC** also apply to **TRC**.

pst Primary State. This parameter is used to set the primary state of the T1, DS1, DS3, and EC1 low speed port(s), STS1, STS3C and VT1 channel(s) and OC3 and OC1 line(s) addressed by the *aid* field. DDM-2000 OC-3, OC-12 and FiberReach systems do not support the setting of secondary states using the **ENT-***rr* command. This optional parameter is allowed only when the *spec_block* parameter is not specified.

In DDM-2000 OC-3 R6.1, 7.0, 7.1 and OC-12 R2.1, 3.1, when the EC1 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 OC-3 system is High Speed or when the STS1 signal set for VT1 cross-connection.

DDM-2000 OC-3, OC-12 and FiberReach systems allow for user provisioning of 2 primary states for the low-speed ports: AUTO and NMON. When a 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 default primary state. When a 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 (eg., SET-STATE-*rr*).

OOS-MA-AS Out of service, memory administration, assigned. This is the default *pst* state, and in the terminology of DDM-2000 OC-3, OC-12 and

FiberReach systems, is known as AUTO.

OOS Out of service (*"for Memory Administration"* implied). This *pst* value will effectively place the addressed low-speed port in the service state known in terminology of DDM-2000 OC-3, OC-12 and FiberReach as NMON.

DDM-2000 OC-3 R6.2, 7.0, 7.1, OC-12 R2.2, 3.1, and FiberReach R1.0 systems allow for user provisioning of 2 primary states for the channels: AUTO and NMON. When a 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 default state for channels. When STS1, STS3C, 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 default *pst* state, and in the terminology of DDM-2000, 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 DDM-2000 terminology as NMON.

In DDM-2000 OC-3 R9.0, the systems allow for user provisioning of 2 primary states for the OC-1 lines: IS and NMON. When an OC1 line is provisioned in the IS state, it will automatically alarm upon detecting loss of valid input OC-1 signal. IS is the default primary state. When an OC1 line is provisioned in the NMON state, the monitoring of incoming signals is disabled. The line exits this state to the IS state through either another **ENT-**OC1 command or via the corresponding CIT command (eg., **SET-STATE-**OC1).

IS In Service. This is the default *pst* state.

OOS Out of service (*"for Memory Administration"* implied). This *pst* value will effectively place the addressed OC-1 line in the service state known in terminology of DDM-2000 as NMON.

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 DDM-2000.

Setting OC-1 line state is disallowed in DDM-2000 FiberReach OC-1 WBS systems.

DDM-2000 OC-12 systems allow for user provisioning of 2 primary states for the OC-3 lines: IS and NMON. When an OC3 line is provisioned in the IS state, it will automatically alarm upon detecting loss of valid input OC-3 signal. IS is the default primary state. When an OC3 line is provisioned in the NMON state, the monitoring of incoming signals is disabled. The line exits this state to the IS state through either another **ENT-**OC3 command or via the corresponding CIT command (eg., **SET-STATE-**OC3).

IS In Service. This is the default *pst* state.

OOS Out of service (*"for Memory Administration"* implied). This *pst* value will effectively place the addressed low-speed port in the service state known in terminology of DDM-2000 as NMON.

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 DDM-2000.

The line state provisioning is allowed only for the OC-3 lines in the function units of OC-12 systems and the OC-1 line state provisioning is allowed only for the OC-1 lines in DDM-2000 OC-3 systems.

OUTPUT FORMAT

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

OUTPUT PARAMETERS

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

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example sets the DDM-2000 OC-3 low speed DS3 port address "a" provisioning as follows:

— Signal Failure Threshold of $10 sup -3$
— DS3 Failure Alarm Level of MN
— VMR Mode of CC w/o AIS

```
ent-t3:ATT-PF-2000:a:123456:::AIS=N,NTFCNCDE=MN,SFTHR=-3,LINECDE=CCHAN;


IP 123456
<


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

The following example sets the DDM-2000 OC-3 low speed DS3 port address "a" provisioning as follows:

— Primary State of NMON

```
ent-t3:ATT-PF-2000:a:123456::::OOS;


IP 123456
<


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

The following DDM-2000 OC-3 and FiberReach example sets the DDM-2000 low speed T1 or DS1 port address "a-1-2" provisioning as follows:

— Signal Failure Threshold of $10 sup -3$
— DS1 Failure Alarm Level of MJ
— Insert AIS toward fiber for incoming DS1 LOS
— Do not send all zeroes to DLC
— Line Code is B8ZS
— Monitor DS1 PM near and far-ends

```
ent-t1:ATT-PF-2000:a-1-2:Z890Ab:::AIS=Y,BPV=N,FMT=ESF,NTFCNCDE=MJ,
LINECDE=B8ZS,PMMD=ON,SFTHR=-3;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 example sets the DDM-2000 low speed DS3 port address "b" provisioning as follows:

— Signal Failure Threshold of $10 sup -3$
— DS3 Failure Alarm Level of MJ
— Line Code is B3ZS
— Monitor performance using the F&M bit scheme

```
ent-t3:ATT-PF-2000:b:Z890Ab:::AIS=Y,FRAME=M13,FMT=FMBIT,NTFCNCDE=MJ,
LINECDE=B3ZS,PMMD=ON,SFTHR=-3;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 example sets the DDM-2000 low speed STS1 port address "b" provisioning as follows:

— Signal Failure Threshold of $10 sup -7$
— EC1 Failure Alarm Level of MJ

```
ent-ec1:ATT-PF-2000:b:Z890Ab:::NTFCNCDE=MJ,SFTHR=-7;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following linear DDM-2000 OC-3 example sets the OC-3 interface attributes at the address "fn-c" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$
— K-Byte used for proprietary Synchronization messaging
— Concatenation enabled

```
ent-oc3:ATT-PF-2000:fn-c:Z890Ab:::CONCAT=ENABLED,KBYTE=ENABLED,SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following linear DDM-2000 OC-3 MegaStar example sets the OC-3 interface attributes at the address "fn-c" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$
— RFU is connected to the fn-c.

```
ent-oc3:ATT-PF-2000:fn-c:Z890Ab:::SFTHR=-9,RADIO=yes;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 host for OC-1 extensions example sets the OC-1 interface attributes at the address "fn-b-1-1" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$

```
ent-oc1:ATT-PF-2000:fn-b-1-1:Z890Ab:::SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

Note that the signal failure threshold is applied to both fn-b-1-1 and fn-b-2-1.

The following DDM-2000 OC-3 host for OC-1 extensions example sets the OC-1 interface primary state to NMON at the address "fn-b-1-2" as follows:

```
ent-oc1:ATT-PF-2000:fn-b-1-2:Z890Ab::::oos;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 FiberReach sets the OC-1 interface attributes at the address "main-1" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$

```
ent-oc1:ATT-PF-2000:main-1:Z890Ab:::SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

Note that the signal failure threshold is applied to both main-1 and main-2.

The following ring DDM-2000 OC-3 example sets the OC-3 interface attributes at the address "main-1" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$
— K-Byte used for proprietary Synchronization messaging

```
ent-oc3:ATT-PF-2000:main-1:Z890Ab:::KBYTE=ENABLED,SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following ring DDM-2000 OC-3 example sets the OC-3 interface attributes at the address "main-1" provisioning as follows:

— Signal Failure Threshold of $10 sup -9$
— S-Byte used for proprietary Synchronization messaging

```
ent-oc3:ATT-PF-2000:main-1:Z890Ab:::SYNCMSG=sbyte,SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

Note that if the OC-3 system supports a ring configuration, the signal failure threshold is applied to both main-1 and main-2.

The following ring DDM-2000 OC-12 R5.0 example sets the OC-3 interface state at the address "fn-a-1" to NMON:

```
ent-oc3:ATT-PF-2000:fn-a-1:Z890Ab::::OOS;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 example sets the Signal degrade protection switching threshold for all VT-1.5 channels to $10 sup -8$. Since only an *aid* of "all" is allowed, execution of this command will affect the signal fail thresholds of ALL VT-1.5 channels in the addressed OC-3 system including the currently existing VT-1.5 channels.

— Signal Failure Threshold of $10 sup -8$

```
ent-vt1:ATT-PF-2000:all:Z890Ab:::SFTHR=-8;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 example sets the STS-1 Signal Fail Alarm/path protection switching/downstream VT AIS insertion threshold at $10 sup -6$ and a signal degrade threshold at $10 sup -8$. Since only an *aid* of "all" is allowed, execution of this command will affect all STS-1 channels in the addressed system including the currently existing STS-1 channels.

```
ent-sts1:ATT-PF-2000:all:Z890Ab:::SFTHR=-8,SFAIL=-6;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 example sets the expected STS-1 path trace for the STS-1 channel at the address m-2:

```
ent-sts1:ATT-PF-2000:m-2:Z890Ab:::EXPTRC="C501_HCCG_BLTMMD11_BLTMMD12";


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-3 example sets for the VT-1.5 ring channel a-1-1:

— Alarm Level for the non-service affecting path AIS of NA
— Alarm Level for the service affecting path AIS of MJ

```
ent-vt1:ATT-PF-2000:a-1-1:Z890Ab:::AISNC=NA,AISNCSA=MJ;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-12 example sets for the OC-3 line fn-a:

— Alarm Level for the non-service affecting line AIS of NA

```
ent-oc3:ATT-PF-2000:fn-a:Z890Ab:::AISNC=NA;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-12 (Release 5.0 and 6.0 and later) example sets the Signal Fail Alarm and protection switching threshold for all STS-3c channels to $10 sup -9$. Since only an *aid* of "all" is allowed, execution of this command will affect the signal fail thresholds of ALL STS-3c channels in the addressed OC-12 system including the currently existing STS-3c channels.

— Signal Failure Threshold of $10 sup -9$

```
ent-sts3c:ATT-PF-2000:all:Z890Ab:::SFTHR=-9;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

The following DDM-2000 OC-12 (R5 and 6 and beyond) example sets the Channel State to NMON. The channel state, unlike the signal fail threshold will affect only the addressed STS-3c channel. In the following example, the affected STS-3c channel is "mb-4":

— Primary state of NMON

```
ent-sts3c:ATT-PF-2000:mb-4:Z890Ab::::OOS;


IP Z890Ab
<


   ATT-PF-2000 93-10-26 16:45:23
M  Z890Ab COMPLD
;
```

ERROR RESPONSE

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

In addition to the non-message-specific error found in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses are those that the NE checks for each condition.

If the NE receives a **ENT-***rr* command with both the *spec_block* and *pst* parameter, the following error response is returned to the user:

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

In the **ENT-STS1** command the *spec_block* may either contain the trace parameters **EXPTRC**, and **TRC** or the other parameters applicable to the **STS1** *modifier* but not together. If the NE receives a **ENT-STS1** command with the *spec_block* parameters **EXPTRC** and/or **TRC** mixed in with other parameters, the following error response is returned to the user:

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

If the NE receives a **ENT-***rr* command with the same parameter repeated (more than once) in the *spec_block*, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, parameter multiply defined */
;
```

If the NE receives an **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 */
;
```

In DDM-2000 OC-3 R11.0, if the system receives an **ENT-***rr* command with a command code modifier other than `T1, T3, EC1, OC1, OC3, OC12, STS1` or `VT1`, the following error response is returned to the user:

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

In DDM-2000 OC-12 R5.0, if the system receives an **ENT-*rr*** command with a command code modifier other than T3, EC1, OC3, OC12, STS1, or STS3C, the following error response is returned to the user:

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

In DDM-2000 FiberReach R1.0, if the system receives an**ENT-*rr*** command with a command code modifier other than T1, OC1, STS1 or VT1, the following error response is returned to the user:

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

If the NE receives a **ENT-*rr*** command without an *aid* value, with an *aid* that is not supported by the NE for any *modifier* or with an *aid* value that is invalid for the *modifier* provided (i.e., because the *aid* refers to a different type of entity than is specified by the *modifier*, or in the case where the *modifier* is **VT1, STS1** or **STS3C** and the *spec_block* contains only the parameter **SFTHR** but the *aid* is not **ALL**), 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 modifier */
;
```

If the NE receives a **ENT-***rr* command with otherwise valid *spec_block* parameter values, but inconsistent with the *modifier* provided as detailed below the following error response is returned to the user:

[1] setting DS3 parameters **FRAME**, or **PBIT**, or DS3 parameter values **NTFCNCDE**=CR, **LINECDE**=B3ZS or CCHAN, in an **ENT-***T1* command,

[2] setting DS1 parameter **BPV** or setting the parameter **LINECDE** to DS1 values of NOOVRD, AMI, or B8ZS in an **ENT-**T3 command

[3] setting the parameters **KBYTE** when the *modifier* is not OC3 or OC12,

[4] setting the parameter **CONCAT** when the *modifier* is not OC3,

[5] setting the parameter **CONCAT** when the *modifier* is OC3 but the *aid* is not fn-c,

[6] setting the parameter **APPLICATION** in an OC-3 system *modifier* is not OC1, or setting this parameter in an OC-12 system when the *modifier* is not OC3,

[7] setting the parameter **RADIO** in an OC-3 MegaStar system when the *modifier* is not OC3,

[8] setting the *spec_block* parameters other than **SFTHR**, **AISNCSA** and **AISNC** when the *modifier* is VT1,

[9] setting the *spec_block* parameters other than **SFTHR**, **AISNCSA**, **AISNC**, **EXPTRC**, and **TRC** when the *modifier* is STS1, or STS3C,

[10] setting the **PST** parameter when the *modifier* is OC12,

[11] setting the **PST** parameter when the *modifier* is OC1, but the system addressed by the *tid* is not an OC3 or SLC-2000 system,

[12] setting the **PST** parameter when the *modifier* is OC3, but the system addressed by the *tid* is not an OC12 system,

[13] setting **SFTHR** to -9 when the *modifier* is VT1,

[14] setting the **SFTHR** to 0 when the *modifier* is not STS1 or VT1,

[15] setting the **SFTHR** to 0 when the addressed NE is DDM-2000 OC-12,

[16] setting **SFTHR**=-3 when the *modifier* is EC1 in an OC-3 system or when the *modifier* is STS1, VT1, OC3, OC1, or OC12,

[17] setting **AISNC**=NR when the *modifier* is OC12, OC1 or OC3,

[18] setting **AISNC** to other than MN or NR when the *modifier* is STS1 or VT1 and when the addressed system is a ring system

[19] setting **AISNCSA** to other than CR or NA when the *modifier* is STS1 when the addressed system is a ring system or to other than MN or NR when the addressed system is a linear system,

[20] setting **AISNCSA** to other than MJ or NA when the *modifier* is VT1 when the addressed system is a ring system or to other than MN or NR when the addressed system is a linear system,

[21] setting **SFAIL** when the *modifier* is not STS1 and when the addressed system is not a ring system,

[22] setting **KBYTE** when the *modifier* is OC1.

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

In DDM-2000 OC-3 R8.0, if the linear system receives an **ENT-***rr* command with the *modifier* STS1 or VT1 with the parameter **AISNC** in the *spec_block*, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, AISNC not allowed in linear systems for paths */
;
```

In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R 5.0, if the system receives an **ENT-***rr* command with the *modifier* OC12, OC3, or OC1 with the parameter **AISNCSA** in the *spec_block*, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, AISNCSA not allowed for lines */
;
```

In DDM-2000 FiberReach R1.0, if the WBS receives an **ENT-***rr* command with the parameters **AISNC** and **AISNCSA** each by itself or together in the *spec_block*, the following error response is returned to the user:

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

In DDM-2000 OC-3 R6.1, 7.0, 7.1, if the system receives an **ENT-*rr*** command with the *modifier* EC1 and with the *pst* parameter while the addressed STS1 port on the DDM-2000 OC-3 system is in the HS mode, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State */
;
```

In DDM-2000 OC-3 R7.1, OC-12 R7.1, OC-12 R3.1 and FiberReach R1.0, if the NE receives an **ENT-*rr*** command with a modifier of either STS3C, STS1 or VT1 and with a *aid* normally valid with *spec_block* parameters or **pst** but there is no STS-3c, STS-1 or VT-1.5 channel at the specified address, then the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, address points to a non-existent channel */
;
```

In DDM-2000 OC-3 R7.1, 11.0, OC-12 R3.1, 5.0, and FiberReach R1.0, if the addressed channel is a component of a higher level channel (e.g. VT-1.5 being addressed is actually a part of an existing STS-1 channel or the STS-1 channel being addressed is actually a part of an existing STS-3c channel) then the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, the specified address
      is not properly cross-connected */
;
```

In DDM-2000 OC-3 R6.1, 7.0, 7.1 and FiberReach R1.0, if the NE receives a **ENT-***rr* command with *LINECDE* value that is not supported by the NE or not valid for the specified *modifier*, the following error response is returned to the user:

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

IN DDM-2000 OC-3 R6.1, 7.0, 7.1 and OC-12 R2.1, 3.1, if the NE receives an **ENT-***rr* command with a *PBIT* value that is not supported by the NE, the following error response is returned to the user:

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

In DDM-2000 OC-3 R6.1, 7.0, 7.1, and FiberReach R1.0, if the NE receives a **ENT-**T1 command with a **FMT** value that is null or not supported by the NE for the specified *aid* in the system, the following error response is returned to the user:

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

In DDM-2000 R7.1, 7.2, 8.0, 9.0 and OC-12 R3.1, 4.0, 5.0, if the NE receives a **ENT-**T3 command with a **FMT** value that is not supported by the NE or that the FMT is invalid since **LINECDE** has been set to **CCHAN**, or that the **FMT** is set to CBIT when the **FRAME** is explicitly set or defaulted to M13, the following error response is returned to the user:

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

In DDM-2000 OC-3 R9.0, 11.1, 13.0 and OC-12 R5.0, if the NE receives an **ENT-**T3 command with a **FRAME** value that is not supported by the NE the following error response is returned to the user:

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

In DDM-2000 OC-3 R6.1, 7.0, 7.1 and FiberReach R1.0, if the NE receives an **ENT-**T1 command with a **PMMD** value that is not supported by the NE for the specified *aid* in the system, the following error response is returned to the user:

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

In DDM-2000 OC-3 R7.1, 7.2, 8.0, 9.0 and OC-12 R3.1, 4.0, 5.0, if the NE receives a **ENT-**T3 command with a **PMMD** value that is not supported by the NE or that the PMMD is invalid due to other parameters specified in the input command (e.g. LINECDE=CCHAN in an **ENT-**T3 command) or currently active for the specified *aid* in the system, the following error response is returned to the user:

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

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

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

In DDM-2000 OC-12 R3.1, if the NE receives an **ENT-***rr* command with a *modifier* of OC3 and with an *APPLICATION* value that is not supported by the NE, the following error response is returned to the user:

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

In DDM-2000 OC-3 R9.0 and OC-12 R5.0, if the NE receives an **ENT-*rr*** command with a ***modifier*** of STS1 and with **EXPTRC** value that does not conform to the syntax requirements, then the following error response is returned to the user:

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

In DDM-2000 OC-3 R9.0 and OC-12 R5.0, if the NE receives an **ENT-*rr*** command with a ***modifier*** of STS1 and with **TRC** value that does not conform to the syntax requirements, then the following error response is returned to the user:

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

If the NE receives a **ENT-***rr* command with a `null` or **PST** value that is not supported by the NE, the following error response is returned to the OS:

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

If the NE receives a **ENT-***rr* command with an otherwise valid *aid* value but for which the corresponding slot is not equipped at all, the following error response is returned to the user:

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

In DDM-2000 OC-3 R6.1, OC-12 R2.1 and FiberReach R1.0, if the NE receives an **ENT-***rr* command which is otherwise valid but the appropriate feature has not been enabled at the system, then the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, feature option not enabled */
;
```

In DDM-2000 OC-3 R7.1 and OC-12 R3.1, if the NE receives an **ENT-***rr* command with a *KBYTE* value of `disabled` and sync autoreconfiguration is enabled and the addressed line is a potential timing source, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, sync autoreconfiguration is enabled */
;
```

In DDM-2000 OC-3 R11.0, if the NE receives an otherwise valid **ENT-***rr* command but for which the corresponding slot is not equipped properly (e.g. path trace setting being attempted in a DDM-2000 OC-3 on an STS-1 channel that is not cross-connected to a BBG4B CP, or path trace setting being attempted in a DDM-2000 OC-12 on an STS-1 channel that is not cross-connected to a BBG11B CP), the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, addressed entity not properly equipped */
;
```

In DDM-2000 OC-3 R11.0, if the NE receives an otherwise valid **ENT-***rr* command but the main slot pair contains dissimilar circuit packs, such as in upgrade situations, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must
      be equipped with compatible OLIU packs */
;
```

RELATED TL1 MESSAGES

RTRV-*rr*
REPT DBCHG
RTRV-PTHTRC

NAME

ENT-SYNCN: Enter Synchronization

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 (for linear systems),
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

LINEAR SYSTEMS – LINE TIMED:

For DDM-2000 OC-3 R8.0 (BBF2 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*]]];

For BBF2B pack type:
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,*omd*]]];

For DDM-2000 OC-3 R8.0 (BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],[*omd*][,*auto*]]];

In DDM-2000 OC-3 R8.0, when using the BBF2B TGS circuit pack, the *src* parameter is used to select the optical line for *shelf* timing or DS1 output mode.

RING SYSTEMS – LINE TIMED:

For DDM-2000 OC-12 R5.0 and 7.0 (BBF2 or BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,,*auto*]]];

For DDM-2000 OC-12 R5.1 and later (BBF2B pack type) and OC-12 R7.0 and later (BBF4 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],,[*auto*][,*aisthres*]]];

For DDM-2000 OC-3 R11.1, 13.0 and 9.0 (BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],[*omd*][,*auto*]]];

For DDM-2000 OC-3 R9.1 and later (BBF2B pack type) and OC-3 R13.0 and later (BBF4 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],[*omd*],[*auto*][,*aisthres*]]];

For DDM-2000 FiberReach R1.0:
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*]]];

For DDM-2000 FiberReach R 2.2, 3.1:
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],[*auto*]]];

In DDM-2000 OC-3 R11.1, 13.0, 9.0 and OC-12 R5.0, 7.0, when using the BBF2B TGS or BBF4 TG3 circuit pack, the *src* parameter is used to select the optical line for *shelf* timing.

For DDM-2000 OC-3 R11.1, 13.0, and 9.0, if the BBF2B TGS or BBF4 TG3 circuit pack is used and hardware provisioned for DS1 output in SYNC OUT mode and if the *src* is provisioned for FN-C, then the *omd* parameter may be used.

LINEAR SYSTEMS – EXTERNAL TIMING:

For DDM-2000 OC-3 8.0 (BBF2 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*]]];

For BBF2B pack type:
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,*omd*]]];

For DDM-2000 OC-3 R8.0 (BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,*omd*]]]; (BBF2B pack type)

When using the BBF2B TGS circuit pack, the *src* parameter is used to select the optical line for the DS1 output mode.

RING SYSTEMS – EXTERNAL TIMING:

For DDM-2000 OC-3 R11.1, 13.0, 9.0 (BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,*omd*]]];

For DDM-2000 OC-3 Release 9.1 and later (BBF2B pack type) and OC-3 Release 13.0 and later (BBF4 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*],[*omd*][,,*aisthres*]]];

For DDM-2000 OC-3 R5.0, 7.0 (BBF2B pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*][,*src*]]];

For DDM-2000 OC-12 R5.1 and later (BBF2B pack type) and OC-12 R7.0 and later (BBF4 pack type):
ENT-SYNCN:*tid*:*aid*:*ctag*[:[:[*mdsw*],[*src*][,,,*aisthres*]]];

For DDM-2000 OC-3 R11.1, 13.0, 9.0, if the BBF2B TGS or BBF4 TG3 circuit pack is used and hardware provisioned for DS1 output in SYNC OUT mode and if the *src* is provisioned for FN-C, then the *omd* parameter may be used.

NOTE:
For DDM-2000 OC-3 R11.1, 13.0, 9.0 and OC-12 R5.0, 7.0, for all applications, if the BBF2B TGS or BBF4 TG3 circuit pack is hardware provisioned for DS1 output in SYNC OUT mode, the *src* parameter is also used to select the optical line for DS1 output.

DESCRIPTION

NOTE 1:
In DDM-2000 OC-3, this command is available to privileged users only.

NOTE 2:
Prior to DDM-2000 OC-3 R9.1, line timing from OC-1 OLIU circuit packs, whether from Main or Function unit slots is not provided. Starting with release 9.1, line timing from OC-1 line #1 on 27-type OLIU circuit packs in main slots is supported.

In DDM-2000 OC-3 R11.1, 13.0, 8.0, 9.0 and OC-12 R5.0, 7.0 Network Elements (NEs), this command provisions the synchronization mode switching, synchronization source, and output mode of timing signals when the TGS or TG3 circuit pack hardware is provisioned to be externally timed, internally timed, or line timed.

In DDM-2000 FiberReach R1.0, NEs, this command provisions the synchronization mode switching, and synchronization source of timing signals when the 26-type or 28-type (R2.2, 3.1 and later) OLIU's timing hardware is provisioned to be line timed.

Each product can be provisioned to one of these timing modes:

- For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Free running from an internal oscillator.
- For DDM-2000 OC-3 R11.1, 13.0, 8.0, 9.0: Line timed from an incoming optical interface. This timing reference is used to generate all outgoing signals. If the optical line is protected, the line selected for transmission is also the line selected as the timing reference. If equipped with TGS or TG3 circuit pack, the line in Function Unit C selected for transmission can optionally be selected for the timing reference.
- For DDM-2000 OC-12 R5.0 and FiberReach R1.0: Line timed from an incoming optical interface. This timing reference is used to generate all outgoing signals. If the optical line is protected, the line selected for transmission is also the line selected as the timing reference.
- For DDM-2000 OC-3 R11.1, 13.0, 8.0, and 9.0, OC-12 R5.0 and 7.0: External timing from a DS1 reference signal. Each TGS or TG3 circuit pack receives one DS1 reference signal which it monitors and from which it recovers a clock signal. The recovered clock is cross-fed to the companion TGS or TG3 circuit pack on the same shelf. If a DS1 reference failure is detected on one TGS or TG3 circuit pack, the other will take the reference from the companion TGS or TG3 on the same shelf.

These timing modes are supported by both the BBF2 and BBF2B TGS circuit packs, and the BBF4 TG3 circuit pack. The BBF2B circuit pack can be used in any BBF2 application and is preferred for use in ring applications.

Use of this command may affect timing for other NEs of the timing network.

INPUT PARAMETERS

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

aid Access identifier. This identifies the associated facility. The *aid* can only have the value **ALL**.

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

mdsw For DDM-2000 OC-3 R8.0 and 9.0, OC-12 R5.0: Mode switching. It may have one of the following values:

REVERTIVE Revertive mode switching (default value). If the system switches to holdover timing mode due to a failure of the timing references, it will automatically switch back to the provisioned timing mode (`External` or `LineTimed`) after one of the references becomes good.

NONREVERTIVE Nonrevertive mode switching. If the system switches to holdover timing mode due to a failure of the timing references, it will not automatically switch back to either `External` or `LineTimed` mode after the reference becomes good. The **SET-SYNCN** command must be used to restore the system to the provisioned timing mode (`External` or `LineTimed`).

For DDM-2000 FiberReach R1.0: Mode switching. It may have one of the following values:

REVERTIVE Revertive mode switching (default value). If the system switches to holdover timing mode due to a failure of the timing references, it will automatically switch back to the provisioned timing mode (`LineTimed`) after one of the references becomes good.

NONREVERTIVE Nonrevertive mode switching. If the system switches to holdover timing mode due to a failure of the timing references,

it will not automatically switch back to `LineTimed` mode after the reference becomes good. The **SET-SYNCN** command must be used to restore the system to the provisioned timing mode (`LineTimed`).

src For DDM-2000 OC-3 R8.0 and 9.0: Synchronization source. This parameter selects the line from which shelf line-timing and/or the DS1 synchronization output will be derived. **Src** may have one of the following values:

MAIN Linear Releases (default)

MAIN-1 Ring Releases (default)
Starting with release 9.1, if main-1 contains a 27-type OLIU, this value selects OC-1 line #1.

MAIN-2 Ring Releases
Starting with release 9.1, if main-2 contains a 27-type OLIU, this value selects OC-1 line #1.

FN-C Linear Releases and rings optical extensions

For DDM-2000 OC-12 R5.0, 7.0: Synchronization source. This parameter selects the line from which shelf line-timing and/or the DS1 synchronization output will be derived. For linear releases, the BBF2 or BBF2B TGS circuit pack may be used. For ring releases, the BBF2 or BBF2B TGS or BBF4 TG3 (Release 7.0 and later) circuit packs may be used. **Src** may have one of the following values:

MAIN-B Linear Releases (default)

MAIN-B-1 Ring Releases (default)

MAIN-B-2 Ring Releases

For DDM-2000 FiberReach R1.0: Synchronization source. This parameter selects the line from which shelf line-timing will be derived. **Src** may have one of the following values:

MAIN-1 (default)

MAIN-2

omd For DDM-2000 OC-3 R8.0 and 9.0: Output mode. When a line protection switch occurs, **omd** determines whether the source of the DS1 synchronization output will always be derived from the active receive OC-3 line or is locked to a specified line, whether it is active or not. This parameter may have one of the following values:

LOCK1 Lock to line 1

LOCK2 Lock to line 2

TRACK Track transmission to active receive line (Default for linear applications or for ring applications when *src* is fn-c).

Output mode. This parameter is only available with OC-12 linear releases. When a line protection switch occurs, **omd** determines whether the source of the DS1 synchronization output will always be derived from the active receive OC-12 line or is locked to a specified line, whether it is active or not. This parameter may have one of the following values:

LOCK1 Lock to line 1

LOCK2 Lock to line 2

TRACK Track transmission to active receive line (default).

aisthres For DDM-2000 OC-3 R11.1, 13.0, 9.1, and OC-12 R5.1, 7.0: AISThreshold. This parameter is available with OC-3 Release 9.1, OC-12 Release 5.1 and later ring releases. It is applicable to the BBF2B and BBF4 circuit pack types only.

This parameter sets the incoming synchronization message quality level of the active reference upon receiving of which AIS signal is transmitted on the DS1 output of the BBF2B TGS or BBF4 TG3 circuit packs. As long as the incoming quality level number is at or greater than the provisioned level, AIS will be transmitted.

This parameter is listed in ascending quality order and may have one of the following values:

LEVEL5 This is the default value. Send DS1 AIS for incoming quality level 5 (K2: Internal Clock, S1: Traceable SONET Clk) or greater (i.e, quality level 6 or 7).

LEVEL4 Send DS1 AIS for incoming quality level 4 (K2: Stratum 3, S1: Traceable Stratum 3) or greater.

LEVEL3 Send DS1 AIS for incoming quality level 3 (K2: Stratum 2, S1: Traceable Stratum 2) or greater.

LEVEL2 Send DS1 AIS for incoming quality level 2 (K2: Sync Quality Unknown, S1: Sync Trace Unknown) or greater.

auto For DDM-2000 OC-3 R8.0 and 9.0 and OC-12 R5.0: SyncAutoreconfiguration allows the system to choose the best timing source to use when it is provisioned for Line Timing. Automatic Protection Switching takes place to the standby timing source when the active source fails. The switch is nonrevertive, and there will not be an automatic switch back when the failed source becomes good.

For DDM-2000 OC-3 R8.0 and 9.0: When SyncAutoreconfiguration is enabled, the system automatically reconfigures between line timing sources **main** and **fn-c** in linear systems, and **main-1**, **main-2**, and **fn-c** in ring systems. Use the **SET-SYNCN** command to manually switch to the other timing source.

For DDM-2000 OC-12 R5.0: When SyncAutoreconfiguration is enabled, the system automatically reconfigures between line timing sources **main-b-1** and **main-b-2**. Use the **SET-SYNCN** command to manually switch to the other timing source.

This is available with OC-12 ring applications only.

For DDM-2000 FiberReach R1.0: When equipped with 26-type OLIU, SyncAutoreconfiguration is always **ENABLED**. The system automatically reconfigures between line timing sources **main-1** and **main-2**. The **SET-SYNCN** command may be used to manually switch to the other timing source.

For DDM-2000 FiberReach R2.2, 3.1, when equipped with 28-type OLIU, SyncAutoreconfiguration is **DISABLED** by default. Since **main-1** and **main-2** will also be a source option, the **SET-SYNCN** command may be used to manually switch to the other timing source.

For DDM-2000 OC-3 R8.0, 9.0, and OC-12 R5.0: *auto* may have one of the following values.

ENABLED SyncAutoreconfiguration is active.

DISABLED SyncAutoreconfiguration is not active.

NOTE:
Editor's NOTE: Following newly-added section was in the Issue 3 Draft (March 1998) review copy from another source file and not commented out. Include here or leave out ?

spec_block For DDM-2000 FiberReach R1.0, when equipped with 26-type OLIU, SyncAutoreconfiguration is always **ENABLED**. The system automatically reconfigures between line timing sources **main-1** and **main-2**. Use the **SET-SYNCN** command to manually switch to the other timing source.

For DDM-2000 FiberReach Release 2.2, 3.1, when equipped with 28-type OLIU, SyncAutoreconfiguration is **DISABLED** by default.Since **main-1** and **main-2** will also be a source option, the **SET-SYNCN** command may be used to manually switch to the other timing source.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the requested command does not alter the existing condition, the NE shall respond with the COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

For OC-3:

```
ent-syncn:LT-PF-2000:all:123456::revertive,main-1,,disabled;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

For OC-12:

```
ent-syncn:LT-PF-2000:all:123456::revertive,main-b-1,,disabled;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

For FiberReach:

```
ent-syncn:LT-PF-2000:all:123456::revertive,main-1;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, or invalid.

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

The NE returns the following error response if the *mdsw* value is invalid.

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

The NE returns the following error response if the *src* value is invalid.

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

The NE returns the following error response if the *omd* value is invalid.

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

For DDM-2000 OC-3 R9.1 and OC-12 R5.1, the NE returns the following error response if the *aisthres* value is invalid.

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

For DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, the NE returns the following error response if the *auto* value is invalid.

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

If hardware provisioning switches are set for FreeRunning timing mode, execution of this command will be denied with the following message:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, system provisioned for free-running */
;
```

For DDM-2000 OC-3 R8.0 and 9.0, prior to release 9.1, if:

- the slot selected as a timing source (MAIN or FN-C) is not equipped with an OC-3 OLIU or
- the *src* and **omd** parameter values selected refer to a slot that is not equipped or not properly equipped or
- the **omd** is provisioned with a *LOCKX* value for a slot that is not properly equipped,

then the command request will be denied and the following denial message will be displayed:

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

NOTE:
Release 9.1 adds support for line timing from OC-1 line #1 in 27-type OLIU circuit packs in MAIN slots.

For DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, if this command is entered and both timing slots are empty, the command will be denied with the following message:

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not EQuipped, both timing slots are unequipped */
;
```

For DDM-2000 FiberReach R1.0, if this command is entered and both main slots are empty, the command will be denied with the following message:

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not EQuipped, both main slots are unequipped */
;
```

In DDM-2000 OC-3 R8.0, 8.1, 9.0, 9.1, and FiberReach R2.2, 3.1, for SyncAutoreconfiguration in DDM-2000 OC-3, several other parameters must be set before this feature can be enabled. If these parameters are not set, the SyncAutoreconfiguration request will be denied with the following message:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, <message reason> */
;
```

Valid reasons include the following:

- k byte messages disabled
- Sync messages disabled (For OC-3 R8.1, 9.1 and later)
- shelf not line timed
- sync output mode set to lock

For SyncAutoreconfiguration in DDM-2000 OC-12 R5.0 and 5.1, several other parameters must be set before this feature can be enabled. If these parameters are not set, the SyncAutoreconfiguration request will be denied with the following message:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, <message reason> */
;
```

Valid reasons include the following:

- k byte messages disabled
- Sync messages disabled (For OC-12 R5.1 and later ring releases)
- shelf not line timed

For DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, in a linear application, if the TGS slots are equipped with BBF2 circuit packs, and if *src*, **omd**, or **auto** parameters are provisioned, the request will be denied with the following message:

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

For DDM-2000 OC-3 R8.0, 9.0, in a ring application, if the TGS slots are equipped with BBF2-type circuit packs and FN-C is selected as the timing source, the command request will be denied with the following message:

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

When SyncAutoreconfiguration is enabled, if the OutputMode is selected as **LOCKX**, the command will be denied with the following message:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, sync autoreconfiguration is enabled */
;
```

For DDM-2000 OC-3 R11.0 and FiberReach R1.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must be
      equipped with compatible OLIU packs */
;
```

RELATED TL1 MESSAGES

RTRV-SYNCN

SET-SYNCN

NAME

ENT-SYS: Set Network Element (NE) name and other system level parameters.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release**6.2** and OC-12 Release**2.2** (for linear systems)
- OC-3 Release**7.1** and OC-12 Release**3.1** (for rings)
- FiberReach R1.0

INPUT FORMAT

ENT-SYS:*tid*:*[aid]*:*ctag[*:::*spec_block]*;

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, changing the **x25ps** parameter associated with a currently active X.25 interface will reset that X.25 interface. This will result in all active TL1 logins to be automatically dropped. All established VCs on the affected X.25 link will have to be reestablished. Also, the operation of other nodes in the ring may be affected.

DESCRIPTION

NOTE:
This TL1 command is available only to privileged users.

The **ENT-SYS** command can be initiated by users to modify system attributes associated with the NE at the system level, but is not associated with any particular facility or equipment unit. When this command is successfully executed, only the attributes specified in the command will be changed; those NE level attributes not in the command will remain as before. Moreover, the command will be executed only when the entered command actually modifies the attributes at the NE.

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.

For DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, when a NE receives an **ENT-SYS** command from a user, the NE will modify its system level attributes with the received attributes if they are different from the currently effective attributes at the system.

Up to and including DDM-2000 OC-3 R7.1 and OC-12 R3.1, when executed to modify the **gne** designation, this command causes the NE to restart the 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, the command will be executed only when the entered command actually

modifies the attributes at the NE. Restarting the program will also cause the NE to drop user links including the one through which this command is received preventing the NE from sending a COMPLD response back to the initiator of the command.

In DDM-2000 OC-3 R7.1 to R9.1, R11, and OC-12 R3.1 to R5.1, when executed to modify one or more of the applicable parameters from the list of **dcc, dsne, site, ne, shelf, cort, tblink, tbrem**, and **tbaddr**, this command causes the NE to restart the 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. Restarting the program will also cause the NE to drop user links including the one through which this command is received preventing the NE from sending a COMPLD response back to the initiator of the command.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, when executed to modify one or more of the applicable parameters from the list of **dcc, shelf**, and **cort**, this command causes the NE to restart the program.

In FiberReach R1.0 to R2.0, if the command changes **dcc, site, ne, cort, tblink, tbrem**, or **tbaddr** designation, the NE will restart its program.

In FiberReach R3.0 and later, if the command changes **dcc** or **cort** designation, the NE will restart its program.

INPUT PARAMETERS

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

aid Access identifier. The *aid* value must be only one of the following values:

system or null This specifies that system parameters are to be modified. The factory default is **system**.

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

spec_block Specific Parameter Block. The system level attributes to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using a *name=value, name=value,...* type construct with no constraints on the order of parameters.

Constructs such as *name1=value1, name2=, name3=, name4=, name5=value5,...* are acceptable and in this example only the parameters *name1* and *name5* will be changed

at the NE. If the current value of the parameter *name1* is already *value1* in the above example, *name1* will not be changed.

For the **ENT-SYS** command, the *spec_block* may contain one or more of the following parameters:

new_tid New Target Identifier. The **new_tid** is the new name of the NE to which the command is addressed.

Refer to the **RTRV-HDR INPUT PARAMETERS** section. The character set requirements for *tid* listed there apply to the **new_tid** also.
The **tid** will be printed at the beginning of the output of all commands. For proper operation of TL1 interfaces, the **tid** must be unique for each NE within a given DCC domain.

NOTE:
Changing the **TID** (system name) does not change the NE address, which is determined by the NSAP but does affect proper TL1 message reporting.

dsne In DDM-2000 R7.2, 8.0 and OC-12 R5.0, Directory Service-Network Element. **dsne** has a value of yes or no. yes indicates that the system specified by the *tid* is a Directory Service-Network Element (DS-NE).

The DS-NE is where a map listing all active nodes in the network is maintained.

In DDM-2000 R7.2, 8.0, OC-12 R5.0, and FiberReach R1.0: For releases with OSI on DCC, one and only one NE may be designated as the **dsne** within each DCC domain.

In FiberReach (R1.0), NEs cannot be provisioned as the **dsne**. Thus, the only acceptable value for this parameter on a FiberReach system is no or null.

In DDM-2000 OC-3 R13.0, OC-12 R7.0 and FiberReach 3.0, and later, the **dsne** parameter becomes obsolete.

gne In DDM-2000 R6.2, 7.1 and OC-12 R2.2, 3.1, Gateway Network Element. **gne** has a value of yes or no. yes indicates that the system specified by the *tid* is a Gateway Network Element.

The factory default value for this parameter is `no`. The **gne** must be set to `yes` to enable the physical TL1/X.25 interface. When TL1 is used, only one NE in the subnetwork may be designated as the **gne**; otherwise TL1 messages will be lost.

Beyond DDM-2000 OC-3 R7.1 and OC-12 R3.1, where the multiple GNE capability is provided, the **gne** parameter becomes obsolete.

agne In DDM-2000 R7.2, 8.0, OC-12 R5.0, and FiberReach R1.0: Alarm Gateway Network Element, **agne** has a value of `yes` or `no`. `yes` indicates that the system specified by the *tid* is an Alarm Gateway NE.

The factory default value for this parameter is `no`. For proper operation of the NE status features, at least one NE in each Alarm Group must be designated as an **agne**.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **agne** parameter becomes obsolete.

almgrp In DDM-2000 R7.2, 8.0, OC-12 R5.0 and FiberReach R1.0, the **almgrp** [also known as SONET Maintenance Sub-Branch or SMSB] has an integer value between *1* and *255* (inclusive.) The local NE will exchange remote alarm information with all other NEs in the maintenance subnetwork which share the same **almgrp** value. All NEs in the given DCC domain (subnetwork), whether nearby or not, that have the same **almgrp** number are members of the same group.

In DDM-2000 R7.2, 8.0, OC-12 R5.0, the factory default **almgrp** number for DDM-2000 and FiberReach systems is 255.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **almgrp** parameter becomes obsolete.

x25ps In DDM-2000 R6.2, 7.1, OC-12 R2.2, 3.1: X.25 Packet Size. **x25ps** may be set to a value of `256` or `128`. This parameter determines the TL1 packet size for the X.25 interface. The factory default is `256`.

Changing the X.25 Packet Size parameter at an NE with active X.25 link will cause that X.25 link to be reset and all active TL1 logins will be automatically dropped. All established SVCs on the affected X.25 link will have to be reestablished.

crs Cross Connect Mode. This parameter may be set to `default` or `manual`.

`default` The `default` mode sets default cross connections. Please refer to the appropriate Network Element User Service Manuals for a list of default and valid manual cross-connections.

`manual` In the `manual` mode, all cross connections must be entered manually, using the **ENT-CRS-STS1, ENT-CRS-VT1, DLT-CRS-STS1** and **DLT-CRS-VT1** commands. In ring applications this parameter is set to `manual` and cannot be changed.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, the **crs** parameter becomes obsolete.

dcc In DDM-2000 OC-3 R7.1 and later: DCC mode used in this complex ring system. The allowed values are

distinct The shelf is part of a normal path switched ring network. The DCCs for the ring "m1" and ring "m2" are distinct and will have different messages on each DCC. This is the factory default for ring systems.

identical The shelf is connected to an OC-12 R3.1 to 3.2 **dual0x1** OC-12 network. The DCCs for ring "m1" and ring "m2" are connected to a single DCC on a selected OC-12 function unit which sends identical messages to each ring.

NOTE:
The value **identical** should be used in an OC-3 system only when interworking with OC-12 R3.1 systems.

In DDM-2000 OC-3 R9.0, and later, the **dcc** parameter becomes obsolete.

site In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0 and FiberReach R1.0, this is the numeric identification (1-32) used by all NEs at the same location or site. The factory default value is 32.

For DDM-2000 OC-3 R9.1 and later, OC-12 R5.1 and later and FiberReach R2.1 and later, this is the numeric identification (1-64) used by all NEs at the same location or site. The factory default value is 64.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **site** parameter becomes obsolete.

ne For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0 and FiberReach 1.0, this is the numeric identification (1-5) of the system at a site. The factory default value is 5. NEs at the same site must have unique NE settings.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **ne** parameter becomes obsolete.

shelf For DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, this is the numeric identification (1-8) of the system in a bay arrangement at a site. The shelf parameter is used by the local CIT interface to identify which system to connect to the CIT. The factory default value is 1. NEs at the same site must have unique **shelf** settings to ensure proper operation.

NOTE:
The shelf parameter is not provisionable on FiberReach R1.0 systems.

almbmp For DDM-2000 OC-3 R11.1, 13.0, this **almbmp** parameter enables the shelf to escalate non-service affecting alarms to service affecting.

enabled The shelf will escalate a non-service affecting alarm on a standby unit to service affecting if its associated working unit enters a service affecting alarm state. The standby unit may be any protected element in the shelf: a path, line or circuit pack. Enabling this parameter will generate additional TL1 message traffic when the non-service affecting alarms escalate to service affecting.

disabled The shelf does not escalate a non-service affecting alarm on a standby unit. The default value is **disabled**.

cort For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0 and FiberReach 1.0, this **cort** parameter for "CO" (Central Office) or "RT" (Remote Terminal) identifies the system as having characteristics of a CO or RT.

The allowed values are **co** or **rt**. **rt** is the factory default value. The value of this parameter controls the TBOS Display Type, the operations of the Miscellaneous Discretes, and the external fan control.

NOTE:
As long as FiberReach is served from a DDM-2000, the user should not provision it as a **co**.

tbaddr This TBOS Address parameter sets the TBOS display address (1-8) of the NE. This address is used if the TBOS link is enabled. The factory default value is 1 but must be changed if it conflicts with existing settings of other enabled TBOS displays.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **tbaddr** parameter becomes obsolete.

tblink **TBOSLink sets the TBOS link function. The allowed values are:**

normal The NE has a TBOS link, but does not provide any backup functions. Of all the shelves connected to the TBOS link, only one may be set to **primary** and only one may be set to **secondary**. The remaining NEs (up to 6) should be set to **normal**.

primary The NE is serving as the primary TBOS backup and will respond for any other NE on the same TBOS link if the polled NE fails to respond to the telemetry remote poll within 50 msec. The primary backup NE will respond for the nonresponsive NE by reporting TBOS point 59 (communication failure) and reporting all other TBOS points polled in the display as clear.

`secondary` The NE serving as the secondary TBOS backup and responds the same as the primary TBOS backup, except the secondary backup does not respond to polls for other NEs until about 100 msec. after the poll is received. If after about 100 msec. neither the polled NE nor the primary backup NE has responded to the telemetry remote poll, the secondary TBOS backup NE will respond for the nonresponsive NE.

`noTBOS` No TBOS interface is directly connected to the shelf. This is the factory default value.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **`tblink`** parameter becomes obsolete.

`tbrem` In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0 and FiberReach 1.0, (CBTBOSRemote sets the TBOS Remote reporting status. TBOS Remote may be set to the following values:

`enabled` The shelf will report all its status and alarm conditions to other shelves via the SONET DCC.

`disabled` The shelf will not report its status and alarm conditions to other shelves. This is the factory default value. This option is used when there are more than 8 NEs in the SONET subnetwork.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **`tbrem`** parameter becomes obsolete.

`idle` IdleChannelSignal determines whether or not an AIS or Unequipped signal should be inserted toward the SONET line in VT1.5 and STS-1 channels that are not cross-connected. The value may be `ais` (default) or `unequipped`.

`ais` When idle is set to `ais`, STS-1 or VT1.5 AIS is inserted towards the SONET line from SONET interfaces (OLIUs and STS1Es) if the channel is not cross-connected or, if a low speed

slot is not equipped but the function unit is STS-1 cross-connected.

unequipped When idle is set to `unequipped`, the STS-1 or VT1.5 Unequipped signal is inserted towards the SONET line from SONET interfaces (OLIUs and STS1Es) if the channel is not cross-connected or, if a low speed slot is not equipped but the function unit is STS-1 cross-connected.

If the *spec_block* is null, the currently effective attributes at the NE system prevails.

OUTPUT FORMAT

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if the NE fully complies with the **ENT-SYS** request, the following completion response is returned.

```
IP ctag
<

   sid date time
M  ctag COMPLD
;
```

If the **ENT-SYS** command does not alter the existing system level attributes, the NE will not deny the command. Instead the system will respond with the completion message (shown above). An example of this is when the system addressed by the *tid* is already a designated **gne** and **ENT-SYS** command is received to set that system as a **gne**.

OUTPUT PARAMETERS

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, the output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**.

EXAMPLE INPUT/OUTPUT

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, the following example shows a command to change the cross connect mode to manual in a linear DDM-2000 system:

```
ent-sys:LT-PF-2000:system:123456:::crs=manual;


IP 123456
<

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

In DDM-2000 OX-3 R7.2, 8.0 and OC-12 R5.0, the following example shows a command to modify the **system** name to 1-BROAD-STREET-CO and make the NE the DS-NE:

```
ent-sys:LT-PF-2000:system:123456:::new_tid=1-BROAD-STREET-CO,dsne=yes;

IP 123456
<

   1-BROAD-STREET-CO 93-10-26 16:42:11
M  123456 COMPLD
;
```

NOTE:
Changing the **dsne** designation has caused the system to restart the program causing the response to the command to be incomplete.

For DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, the following example shows a command to modify the X.25 Packet Size:

```
ent-sys:LT-PF-2000::123456:::x25ps=128;

IP 123456
<

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

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **ENT-SYS** command, also.

If a NE receives an **ENT-SYS** command with a **new_tid** value that is not valid, or with a value that is the same as that for some other NE in that subnetwork, the following error response is returned:

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

In DDM-2000 OC-3 R7.2, 8.0 and OC-12 R5.0, if a NE receives an **ENT-SYS** command with a **dsne** value other than yes or no, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, the **dsne** parameter becomes obsolete.

If a FiberReach R1.0 System receives an **ENT-SYS** command with a **dsne** value other than no, the following error response is returned:

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

In FiberReach R3.0 and later, the **dsne** parameter becomes obsolete.

In DDM-2000 OC-3 R7.2, 8.0, OC-12 R5.0 and FiberReach R1.0, if an NE receives an **ENT-SYS** command with an **agne** value other than **yes** or **no**, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and beyond, the **agne** parameter becomes obsolete.

In DDM-2000 OC-3 R7.2, 8.0, OC-12 R5.0 and FiberReach R1.0, if a Network Element receives an **ENT-SYS** command with **almgrp** set to a numeric value other than between 1 and 255, or a non-numeric value, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **almgrp** parameter becomes obsolete.

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if an NE receives an **ENT-SYS** command with a **gne** value other than yes or no, the following error response is returned:

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

Beyond DDM-2000 OC-3 R7.2, OC-12 R5.0, where the multiple GNE capability is provided, the **gne** input parameter becomes obsolete.

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if a NE receives an **ENT-SYS** command with a **gne** value that causes a "duplicate GNE" condition in the subnetwork, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

Beyond DDM-2000 OC-3 R7.2, OC-12 R5.0, where the multiple GNE capability is provided, the **gne** input parameter becomes obsolete.

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if an NE receives an **ENT-SYS** command with a **x25ps** value other than 256 or 128, the following error response is returned:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid X25PS */
;
```

If a NE that does not support **crs** mode setting receives an **ENT-SYS** command with a **crs** attribute, the following error response is returned:

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

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0 and FiberReach R1.0, if a NE that does not support **gne** receives an **ENT-SYS** command with a **gne** parameter, the following error response is returned:

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

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if a NE that does not support **x25ps** receives an **ENT-SYS** command with a **x25ps** parameter, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, If an NE receives an **ENT-SYS** command with a parameter it no longer supports (for example **dsne**, **agne**, **almgrp**, **crs**, **ne**, **tbaddr**, **tblink**, or **tbrem**), the following error response is returned:

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

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if a NE that does not support **dirn** receives an **ENT-SYS** command with a **dirn** parameter, the following error response is returned:

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

If an NE receives an **ENT-SYS** command with a **crs** value other than `manual` or `default`, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, the **crs** parameter becomes obsolete.

In DDM-2000 OC-3 R6.2, 7.1 and OC-12 R2.2, 3.1, if a NE receives an **ENT-SYS** command with a **crs** value of `default`, while the current cross connect mode at the NE is set to `manual` and cross-connections other than the default cross connections existing in the system, the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, system Not in Valid State */
;
```

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, if an NE receives an **ENT-SYS** command with a **crs** value of default, while the current cross connect mode at the NE is set to manual and cross-connections other than the default cross connections existing in the system, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, the **crs** parameter becomes obsolete.

In DDM-2000 OC-3 R7.1, the NE returns the following error response if the **dcc** value is invalid:

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

If an **ENT-SYS** 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 */
;
```

If a NE receives an **ENT-SYS** command with a spec_block parameter attribute that does not match the *aid*, or that parameter is not supported by the particular software release in the receiving system, the following error response is returned:

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

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if a NE receives an **ENT-SYS** command with a **site** value that is invalid, or a non-numeric value, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **site** parameter becomes obsolete.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if an NE receives an **ENT-SYS** command with an **ne** value that is invalid, or a non-numeric value, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **ne** parameter becomes obsolete.

In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, if an NE receives an **ENT-SYS** command with **shelf** set to a numeric value other than between 1 and 8, or a non-numeric value, the following error response is returned:

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

In DDM-2000 OC-3 R11.1 and 13.0, if an NE receives an **ENT-SYS** command with **almbmp** set to an invalid value, the following error response is returned:

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

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if an NE receives an **ENT-SYS** command with **cort** set to a value other than **co** or **rt**, the following error response is returned:

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

If an NE receives an **ENT-SYS** command with **tbaddr** set to a numeric value other than between 1 and 8, or a non-numeric value, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **tbaddr** parameter becomes obsolete.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if an NE receives an **ENT-SYS** command with **tblink** set to a value other than **normal, primary, secondary** or **notbos**, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **tblink** parameter becomes obsolete.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if a NE receives an **ENT-SYS** command with **tbrem** set to a value other than **enabled** or **disabled**, the following error response is returned:

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

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the **tbrem** parameter becomes obsolete.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if a NE receives an **ENT-SYS** command with **idle** set to a value other than **ais** or **unequipped**, the following error response is returned:

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

If an NE receives an **ENT-SYS** command with **sec1** or **sec2** set to a character string more than 69 characters, the following error response is returned:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid SEC1/SEC2 */
;
```

The **sec1** and **sec2** parameters are not settable in DDM products.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, if a NE receives an **ENT-SYS** command while the DS-NE serving the DCC domain is in a busy state (i.e. handling initial registration), the following error response is returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, system Not in Valid State, DIB is currently locked,
      try again later */
;
```

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the DS-NE becomes obsolete.

Some of these parameters are backed up on the TGS packs. Starting with OC-3 R9.1 and OC-12 R5.1, an attempt to provision any of these parameters with no TGS packs equipped will be denied with the following message:

```
   sid date time
M  ctag DENY
    SNVS
    /* Status, Not in Valid State */
    /* at least one TGS pack needed to provision selected parameters  */
;
```

Some of these parameters are backed up on the main OLIU packs. Starting with FiberReach R2.1, an attempt to provision any of these parameters with no OLIU packs equipped will be denied with the following message:

```
   sid date time
M  ctag DENY
    SNVS
    /* Status, Not in Valid State */
    /* at least one main OLIU needed to provision selected parameters  */
;
```

RELATED TL1 MESSAGES

RTRV-SYS

SET-SID

NAME

ENT-TL1MSGMAP: Enter TL1 Message Mapping

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

ENT-TL1MSGMAP:*tid*::*ctag*::*acid*,*msgtype*,*action*;

DESCRIPTION

NOTE:
This TL1 command is available to privileged users only.

ENT-TL1MSGMAP instructs an NE to map TL1 autonomous message types to an OS type (ACID). This allows an OS type to receive only certain types of autonomous messages, or none at all.

INPUT PARAMETERS

tid Target identifier. This is the name of the Network Element (NE) 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.

acid Application Context ID. This defines the OS type. You can define what types of autonomous messages each OS type can receive. The supported values of *acid* are:

TL1MAINTENANCE	This identifies the *maintenance* OS type.
TL1MEMORYADMINISTRATION	This identifies the *memory administration* OS type.
TL1TEST	This identifies the *testing* OS type.
TL1PEERCOMM	This identifies the OS type for peer TL1 communications. This value is used for incoming X.25 SVC DTE calling addresses that do not match any of the user-provisioned

X.25 SVC DTE calling addresses.

TL1OTHER1 This identifies an other OS type.

TL1OTHER2 This identifies an OS type for future use.

msgtype Message Type. This is one of the supported classes of TL1 messages that the system generates. These message types are not reported to the OS unless they are enabled and associated to an *acid*. The message types are one of these values:

ALM REPT ALM — To report the occurrence of alarms at the NE.

ENV REPT ALM ENV — To report the occurrence of environmental alarms at the NE.

CON REPT COND — To periodically report the active status conditions at the NE.

DB REPT DBCHG —
To report provisioning changes especially port and cross-connection provisioning commands at the NE.

action This is either **ENABLED** or **DISABLED**. If it is **ENABLED**, the *msgtype* is associated to the OS.

For DDM-2000 OC-3 Release 9.0, DDM-2000 OC-12 Release 5.0, FiberReach 2.0, and earlier, the following is the table of default mappings.

TL1 Autonomous Message Map

acid	**ALM**	**ENV**	**CON**	**DB**	**EVT**	**PM**	**SW**
TL1MAINTENANCE	×	×	×		×	×	×
TL1MEMORYADMINISTRATION				×			
TL1TEST							
TL1PEERCOMM							
TL1OTHER1	×	×	×	×	×	×	
TL1OTHER2							

× - enabled
<blank> - disabled

In DDM-2000 OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1, the following is the

table of default mappings.

TL1 Autonomous Message Map

acid	**ALM**	**ENV**	**CON**	**DB**	**EVT**	**PM**	**SW**
TL1MAINTENANCE	×	×	×		×	×	×
TL1MEMORYADMINISTRATION				×			
TL1TEST							
TL1PEERCOMM							
TL1OTHER1	×	×	×	×	×		×
TL1OTHER2							

× - enabled
<blank> - disabled

Each message type can be assigned to more than one *acid*. However, if more than one assignment is made, a 9600 or higher baud X.25 link is recommended to handle the additional message traffic.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the **ENT-TL1MSGMAP** command does not alter the existing TL1 message mappings, the NE provides a normal completion response.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to the **ENT-TL1MSGMAP** command, also.

EXAMPLE INPUT/OUTPUT

```
ent-tl1msgmap:LT-PF-2000::123456::tl1maintenance,alm,disabled;

IP 123456
<

   LT-PF-2000 94-03-31 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-TL1MSGMAP** command, also.

The Network Element returns the following error response if the *acid* value is missing or invalid:

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

The Network Element returns the following error response if the *msgtype* value is missing or invalid:

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

The Network Element returns the following error response if the *action* value is missing or invalid:

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

RELATED TL1 MESSAGES

RTRV-TL1MSGMAP

DLT-OSACMAP

ENT-OSACMAP

RTRV-OSACMAP

RTRV-TL1MSGMAP

NAME

ENT-ULSDCC: Enter Upper Layer Section DCC

Support for this command is available for DDM-2000 Multiplexers in:

- OC-3 Release 8.0 - 11.x
- OC-12 Release 5.x only
- FiberReach Release 2.x only

NOTE:
Starting with DDM-2000 OC-3 Release 13.0, OC-12 Release 7.0, FiberReach Release 3.0, and all subsequent TARP-based releases, this command is replaced by two separate commands, **ENT-ULSDCC-L3** and **ENT-ULSDCC-L4**.

INPUT FORMAT

ENT-ULSDCC:*tid*:*aid*:*ctag*:::[*spec_block*];

DESCRIPTION

NOTE:
This command is available to privileged users only.

This command is available to provision the user-settable parameters in Layer 3 of the OSI stack. Layer 3 parameters include the user-settable fields of the NSAP address.

CAUTION:
The use of this command to change the NSAP address of the target NE may disrupt DCC communications, including possible isolation of NEs as well as the target NE, and could result in silent failures. There is no need to use this command in these releases.

CAUTION:
When this command changes one of the fields of the Layer 3 NSAP address, it causes the target NE to restart its program. This action will erase all of the performance monitoring data and the history file and all active OI applications will be terminated. If possible, the NE will reinitialize the date and time. Otherwise, the date and time will assume original values.

All Layer 3 parameters that can be provisioned using **ENT-ULSDCC** that are needed for the operation of the NE have original values. Hence, it is not necessary to provision these parameters for the NE to operate in a subnetwork.

The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in Figure 1.

Figure 1. NSAP Structure

NSAP Field:	AFI	IDI	IDI PAD	DFI	Organization ID	RES	RD	Area	System Identifier	SEL
Bytes:	1	2		1	3	2	2	2	6	1
Default Value: (hex)	39	840	F	80	000000	0000	0000	0000	none	00
	not provisionable				user provisionable				not provisionable	

The AFI, IDI and IDI PAD fields are not user provisionable. Together, they form the Initial Domain Part (IDP) of the NSAP. They are always stored as Binary Coded Decimal values of *"39" hex*, *"840" hex*, and *"F" hex*, respectively, to indicate that the ISO DCC syntax shall be used [and DFI (DSP Format Identifier where the field is "80" hex and cannot be changed)].

The Organization ID, Reserved (RES), Routing Domain (RD) and Area fields are user provisionable when setting the NSAP of the target NE (i.e., the NE identified by the *tid* parameter).

The Organization ID field is a three-byte field that identifies the Network Services Provider and is assigned by ANSI.

The use of the Reserved field is currently not defined and has an original value of "0000" hex.

The Routing Domain field is a two-byte (4-digit hexadecimal) field that may be used to distinguish different routing domains.

The Area field is a two-byte (4-digit hexadecimal) field that is intended to be used to assign NEs to different areas in a partitioned subnetwork. A partitioned subnetwork consists of NEs in multiple areas connected by Level 1 Intermediate Systems (ISs).

Each NE is programmed with a unique System Identifier at the factory. This six-byte (12-digit hexadecimal) field of the NSAP guarantees that the NSAP for each NE is unique.

The Select (SEL) field is currently not user provisionable. Its purpose is to differentiate multiple NSAP addresses associated with the same End system. It's value is not fixed but is set in a PDU according to its usage. It is set to "AF" hex when TARP is run over CLNP. It has a value of "1D" hex when TP4 is run over

CLNP. It may be set to "00" hex for other uses. When retrieved and displayed, it will always be shown as "00" hex.

INPUT PARAMETERS

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

aid Access identifier.
The *aid* can only have the value **ALL**.

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

spec_block Specific Parameter Block. The parameters to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using *name=value, name=value,...* with no constraints on the order of the arrangement of parameters. Constructs such as *name1=value1, name2=, name3=value3,...* are acceptable, and in this example only the parameters *name1* and *name3* will be attempted to be changed.

If the current value of the parameter *name1* is already *value1* in the above example, then *name1* will not be changed. If a null value is provided for a parameter, (e.g., *name=)*, the value will not be changed.

Any *spec_block* parameter may appear only once in the command line. If the same parameter is in the command line more than once, the command is denied and an error message is returned.

If the *spec_block* is null, the current attributes at the NE remain in effect.

The *spec_block* may contain one or more of the following parameters:

L3ORG NSAP Organization ID field. This is a 3-byte (6-digit hexadecimal) field used to provision into the NSAP address the allocated Company Code assigned by the ANSI-administered USA Registration Authority for OSI Organization Names.

This parameter may have a value in the range from **0** to **"ffffff"** hex. The original value for this

parameter is **"000000"** hex.

L3RES NSAP Reserved field. This is a 2-byte (4-digit hexadecimal) field that currently has not been assigned a specific purpose by the SONET standards. Until the standard use of this field has been defined, users should not assign a value that is different from the original value.

This parameter may have a value in the range from **0** to **"ffff"** hex. The original value for this parameter is **"0000"** hex.

L3ROU NSAP Routing Data fields. This is a 4-byte (8-digit hexadecimal) parameter that covers two logical 2-byte (4-digit hexadecimal) fields of the NSAP address. They are:

Routing	This field identifies a unique Routing Domain within an administrative domain.
Area	This field identifies the Area within the Routing Domain to which the NSAP address belongs.

The format for this parameter is "**L3ROU=***rrrraaaa*". where "*rrrr*" is the 2-byte (4-digit hexadecimal) NSAP Routing Domain and "*aaaa*" is the 2-byte (4-digit hexadecimal) NSAP Area.

This parameter may have a value in the range from **0** to **"ffff"** hex. The original value for this parameter is **"00000000"** hex.

OUTPUT FORMAT

If the NE fully complies with the request, the following completion message is returned and the target NE is reset:

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

If the requested command provisions parameters that have the same values as those currently provisioned, the command does not alter the existing parameter values and the NE responds with a COMPLD message and the target NE does not reset.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

The following example shows the provisioning of the NSAP Organization ID field on the target NE:

```
ENT-ULSDCC:LT-PF-2000:all:123456:::l3org=000000;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

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

If an error is detected in any of the command parameters, the entire command is denied; there is no partial completion of the command.

If there are errors in more than one command parameter, an error is detected and reported in only one of the parameters. The parameter for which the error is detected may not be the first parameter in the command that is in error.
The NE returns the following error response if the *aid* value is missing or invalid:

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

Any parameter may be in the *spec_block* only once and may not be repeated. The Network Element returns the following error response if a parameter is repeated in the *spec_block:*

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

The NE returns the following error response if the **L3ORG** syntax is invalid:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3ORG */
;
```

The NE returns the following error response if the **L3RES** syntax is invalid:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3RES */
;
```

The NE returns the following error response if the **L3ROU** syntax is invalid:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3ROU */
;
```

RELATED TL1 MESSAGES

RTRV-ULSDCC

NAME

ENT-ULSDCC-L3: Enter Upper Layer Section DCC - Layer 3

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

ENT-ULSDCC-L3:*tid*:[*aid*]:*ctag*:::[*spec_block*];

DESCRIPTION

NOTE:
This command is available to privileged users only.

CAUTION:
Errors in the use of this command may disrupt DCC communications, including possible isolation of Network Elements (NEs) including the target NE, and could result in silent failures. Command parameters should only be changed by users who are authorized to provision the SONET subnetwork for subnetwork partitioning purposes.

CAUTION:
When this command changes any of the fields of the OSI Network Layer 3 NSAP address or when it enables or disables the target NE as a Level 2 IS, it causes the target NE to reset its controllers. This action erases all of the performance monitoring data, the history file and any data in the TARP Data Cache and Loop Detection Buffer, and all active OI applications will be terminated. If possible, the NE will reinitialize the date and time. Otherwise, the date and time will assume original values.

ENT-ULSDCC commands are used to provision parameters of Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between NEs as specified by the International Standards Organization (ISO).

ENT-ULSDCC-L3 is used to provision the user-settable parameters in Layer 3 of the OSI stack. Layer 3 parameters include user-settable fields of the Network Services Access Point (NSAP) address and enable/disable Level 2 Intermediate System (IS) capability.

All Layer 3 parameters that can be provisioned using **ENT-ULSDCC-L3**, that are needed for the operation of the NE, have original values. Hence, it is not necessary to provision these parameters unless subnetwork partitioning is required to support large subnetworks.

The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in Figure 1.

Figure 1. NSAP Structure

NSAP Field:	AFI	IDI	IDI PAD	DFI	Organization ID	RES	RD	Area	System Identifier	SEL
Bytes:	1	2		1	3	2	2	2	6	1
Default Value: (hex)	39	840	F	80	000000	0000	0000	0000	none	00
	not provisionable				user provisionable				not provisionable	

The AFI, IDI and IDI PAD fields are not user provisionable. Together, they form the Initial Domain Part (IDP) of the NSAP. They are always stored as Binary Coded Decimal values of *"39" hex*, *"840" hex*, and *"F" hex,* [and *"80" hex],* respectively, to indicate that the ISO DCC syntax shall be used [and DFI (DSP Format Identifier where the field is "80" hex and cannot be changed)].

The Organization ID, Reserved (RES), Routing Domain (RD) and Area fields are user provisionable when changing the NSAP of the target NE (i.e., the NE identified by the *tid* parameter)*.

NOTE:
Changing any of these NSAP fields changes the NE's area address. Only the Area field should be changed typically, and then only to partition a subnetwork.

The Organization ID field is a three-byte (6-digit hexadecimal) field that may be used to identify the network service provider and is assigned by ANSI.

The use of the Reserved field is currently not defined, and it has an original value of "0000" hex.

---

* The System Identifier field is provisionable when entering a TARP Manual Adjacency NSAP and when entering an NSAP into the TARP Data Cache (TDC) using **ENT-ULSDCC-L4,** but the System Identifier is not provisionable when setting the NSAP of the target NE in this command.

The Routing Domain field is a two-byte (4-digit hexadecimal) field that may be used to distinguish different routing domains.

The Area field is a two-byte (4-digit hexadecimal) field that is intended to be used to assign NEs to different areas in a partitioned subnetwork. A partitioned subnetwork consists of NEs in multiple areas connected by Level 2 Intermediate Systems (ISs).

Each NE is programmed with a unique System Identifier at the factory. This six-byte (12-digit hexadecimal) field of the NSAP guarantees that the NSAP for each NE is unique.

The Select (SEL) field is currently not user provisionable. Its purpose is to differentiate multiple NSAP addresses associated with the same End System. Its value is not fixed but is automatically set in a PDU according to its usage. It is set to "AF" hex when TARP is run over CLNP. It has a value of "1D" hex when TP4 is run over CLNP. It may be set to "00" hex for other uses. When retrieved and displayed, it is always shown as "00" hex.

INPUT PARAMETERS

tid — Target identifier. This is the name of the NE to which the command is addressed.

aid — Access identifier. The *aid* value may be **ALL** or null. Specifying the *aid* is optional.

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

spec_block — Specific Parameter Block. The parameters to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using *name=value, name=value,...* with no constraints on the order of the arrangement of parameters. Constructs such as *name1=value1, name2=, name3=value3,...* are acceptable, and in this example only the parameters *name1* and *name3* will be attempted to be changed. If the current value of the parameter *name1* is already *value1* in the above example, then *name1* will not be changed. If a null value is provided for a parameter, (e.g., *name=)*, the value will not be changed.

Any *spec_block* parameter may appear only once in the command line. If the same parameter is in the command line more than once, the command is denied and an error message is returned.

If the *spec_block* is null, the current attributes at the NE

remain in effect.

The *spec_block* may contain one or more of the following parameters:

L3ORG NSAP Organization ID field.

This is a 3-byte (6-digit hexadecimal) field which may be used to provision into the NSAP address the allocated Network Service Provider Company Code assigned by the ANSI-administered USA Registration Authority for OSI Organization Names.

This parameter may have a value in the range from **0** to **"ffffff"** hex. The original value for this parameter is **"000000"** hex.

L3RES NSAP Reserved field.

This is a 2-byte (4-digit hexadecimal) field that currently has not been assigned a specific purpose by the SONET standards. Until the standard use of this field has been defined, users should not assign a value that is different from the original value.

This parameter may have a value in the range from **0** to**"ffff"** hex. The original value for this parameter is**"0000"** hex.

L3RD NSAP Routing Domain.

This is a 2-byte (4-digit hexadecimal) field that identifies a unique Routing Domain within an administrative domain.

Standard use of the NSAP Routing Domain field has not been defined in the SONET standards. Until the standard use of this field has been defined, users should not assign a value that is different from the original value.

This parameter may have a value in the range from **0** to**"ffff"** hex. The original value for this parameter is**"0000"** hex.

L3AREA NSAP Area field.

This field identifies the Area within the Routing Domain to which the NSAP address belongs.

The format for this parameter is "**L3AREA**=*l3area*" where *l3area* is the 2-byte (4-digit hexadecimal) NSAP Area field.

This parameter may have a value in the range from **0** to**"ffff"** hex. The original value for this parameter is**"0000"** hex.

L3LV2IS Enable or Disable the NE specified by the *tid* parameter as a Level 2 IS. The format for this parameter is "**L3LV2IS=***l3lv2is*".

This parameter may take the value **enable** or **disable**. Changes from **enable** to **disable** may take up to 20 minutes to be reflected in **RTRV-MAP-NEIGHBOR** and **RTRV-MAP-NETWORK** reports.

The original value of *l3lv2is* is **disable**.

OUTPUT FORMAT

If the NE fully complies with the request, the following completion message is returned and the target NE is reset:

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

If the requested command provisions parameters that have the same values as those currently provisioned, the command does not alter the existing parameter values and the NE responds with a COMPLD message, and the target NE does not reset.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

The following example shows the provisioning of the NSAP Area field which involves a reset of the target NEs controllers.

```
ENT-ULSDCC-L3:LT-PF-2000:all:123456:::l3area=000001;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:11
M  123456 COMPLD
;
```

The following example shows the provisioning of the Level 2 IS parameter and the provisioning of the NSAP Area field, which involves a reset of the target NEs controllers.

```
ENT-ULSDCC-L3:LT-PF-2000::192837:::l3lv2is=enable,l3area=1;

IP 123456
<

LT-PF-2000 98-04-23 13:12:16
M  123456 COMPLD
;
```

ERROR RESPONSES

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

If an error is detected in any of the command parameters, the entire command is denied; there is no partial completion of the command.

If there are errors in more than one command parameter, an error is detected and reported in only one of the parameters. The parameter for which the error is detected may not be the first parameter in the command that is in error.

The NE returns the following error response if the *aid* value is invalid.

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

Any parameter may be in the *spec_block* only once and may not be repeated. The NE returns the following error response if a parameter is repeated in the *spec_block.*

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

The NE returns the following error response if the **L3ORG** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3ORG */
;
```

The NE returns the following error response if the **L3RES** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3RES */
;
```

The NE returns the following error response if the **L3RD** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3RD */
;
```

The NE returns the following error response if the **L3AREA** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3AREA */
;
```

The NE returns the following error response if the **L3LV2IS** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L3LV2IS */
;
```

RELATED TL1 MESSAGES

RTRV-ULSDCC-L3

NAME

ENT-ULSDCC-L4: Enter Upper Layer Section DCC Layer 4

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

ENT-ULSDCC-L4:*tid*:[*aid*]:*ctag*:::[*spec_block*];

DESCRIPTION

NOTE:
This command is available to privileged users only.

ENT-ULSDCC commands are used to provision parameters of Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between SONET Network Elements (NEs) as specified by the International Standards Organization (ISO).

ENT-ULSDCC-L4 is used to provision the user-settable parameters in Layer 4 of the OSI stack. User-settable Layer 4 parameters include:

- TARP PDU lifetime parameter
- TARP timers
- TARP Loop Detection Buffer timers
- TARP Data Cache (TDC) enable/disable
- TARP Manual Adjacencies
- TARP Data Cache (TDC) entries

All Layer 4 parameters that can be provisioned using **ENT-ULSDCC-L4**, that are needed for the operation of the NE, have original values. Hence, it is not necessary to provision these parameters for the NE to operate in a subnetwork.

Provisioning TARP Manual Adjacencies and entries into the TARP Data Cache (TDC) require the entry of an NSAP address. The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in Figure 1.

Figure 1. NSAP Structure

NSAP Field:	AFI	IDI	IDI PAD	DFI	Organization ID	RES	RD	Area	System Identifier	SEL
Bytes:	1	2		1	3	2	2	2	6	1
Default Value: (hex)	39	840	F	80	000000	0000	0000	0000	none	00
	not provisionable				user provisionable				not provisionable	

The AFI, IDI and IDI PAD fields are not user provisionable. Together, they form the Initial Domain Part (IDP) of the NSAP. They are always stored as Binary Coded Decimal values of *"39" hex*, *"840" hex*, *"F" hex* [and *"80" hex*], respectively, to indicate that the ISO DCC syntax shall be used [and DFI (DSP Format Identifier where the field is "80" hex and cannot be changed)].

The Organization ID, Reserved (RES), Routing Domain (RD), Area, and System Identifier fields are provisionable when entering a TARP Manual Adjacency NSAP and when entering an NSAP into the TARP Data Cache (TDC).

The Organization ID field is a three-byte (6-digit hexadecimal) field that may be used to identify the network service provider and is assigned by ANSI.

The use of the Reserved field is currently not defined, and it has an original value of "0000" hex.

The Routing Domain field is a two-byte (4-digit hexadecimal) field that may be used to distinguish different routing domains.

The Area field is a two-byte (4-digit hexadecimal) field that is intended to be used to assign NEs to different areas in a partitioned subnetwork. A partitioned subnetwork consists of NEs in multiple areas connected by Level 2 Intermediate Systems (ISs).

Each NE is programmed with a unique System Identifier at the factory. This six-byte (12-digit hexadecimal) field of the NSAP guarantees that the NSAP for each NE is unique.

The Select (SEL) field is currently not user provisionable. Its purpose is to differentiate multiple NSAP addresses associated with the same End System. Its value is not fixed but is automatically set in a PDU according to its usage. It is set to "AF" hex when TARP is run over CLNP. It has a value of "1D" hex when TP4 is run over CLNP. It may be set to "00" hex for other uses. When retrieved and displayed, it is always shown as "00" hex.

INPUT PARAMETERS

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

aid Target Access identifier. The *aid* value may be **ALL** or null. Specifying the *aid* is optional.

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

spec_block Specific Parameter Block. The parameters to be modified are specified inside the *spec_block*. Parameters within *spec_block* are specified using *name=value, name=value,...* with no constraints on the order of the arrangement of parameters. Constructs such as *name1=value1, name2=, name3=value3,...* are acceptable, and in this example only the parameters *name1* and *name3* will be attempted to be changed.

If the current value of the parameter *name1* is already *value1* in the above example, then *name1* will not be changed. If a null value is provided for a parameter, (e.g., *name=)*, the value will not be changed.

Any *spec_block* parameter may appear only once in the command line. If the same parameter is in the command line more than once, the command is denied and an error message is returned.

If the *spec_block* is null, the current attributes of the NE remain in effect.
The *spec_block* may contain one or more of the following parameters:

L4TLIF This parameter sets the TARP lifetime parameter in TARP PDUs originated by the target NE (i.e., the NE identified by the *tid* parameter). The TARP lifetime specifies the maximum number of hops allowed for a TARP PDU. When this number of hops is exceeded, the TARP PDU will not be forwarded. The format for this parameter is "**L4TLIF=***l4tlif*".

This parameter may have a value in the range from **1** to **65535**. An error message will be returned if a value of **0** is entered.

The original value of *l4tlif* is **100**.

Manually specifying a NE to be logically adjacent to the target NE, i.e., the NE indicated by the *tid* parameter, for TARP propagation purposes requires the specification of the adjacent NE's NSAP address. The NSAP, which is 20 bytes long (40-digit hexadecimal), is composed of a number of separate fields, most of which have default values. Thus, to simplify the entry of the NSAP address, the NSAP is entered via a number of separate TARP Manual Adjacency NSAP parameters.

The following parameters, **L4AJORG**, **L4AJRES**, **L4AJRD**, **L4AJAREA** and **L4AJSYS**, are used to specify the user settable NSAP fields required to enter a TARP Manual Adjacency. The complete NSAP is entered into a list of entered TARP Manual Adjacencies.

Multiple TARP Manual Adjacencies are entered using multiple occurrences of **ENT-ULSDCC-L4**. The maximum number of TARP Manual Adjacencies is 2.

The NSAP System ID field, **L4AJSYS**, which is unique for each NE, is the only parameter that is required to enter a TARP Manual Adjacency. This parameter does not have a default value. If this parameter is specified, then any of the other user settable NSAP field parameters that are not specified and NSAP fields that are not settable by the user (the NSAP *IDP, DFI* and *SEL* fields) are set to their appropriate values in the TARP Manual Adjacency list.

For the *IDP* and *DFI* fields, these values are the equivalent NSAP fields of the target NE. Since the *SEL* field may take different values depending on its use, it is set to "00" hex in the TARP Manual Adjacency list and is displayed as "00" hex. If one or more TARP Manual Adjacency provision parameters are specified but **L4AJSYS** is not specified, then a TARP Manual Adjacency is not entered, and an error message is returned.

NOTE:
When using this command to enter or change the NSAP address of a TARP Manual Adjacency, there is syntax checking but no validation checking of the entered data. An incorrectly entered NSAP address field for a TARP Manually Adjacency will result in failure of TARP propagation with that NE from the target NE.

L4AJORG This parameter is used to provision the NSAP Organization ID field of the TARP Manual Adjacency.

If **L4AJORG** is specified, then **L4AJSYS** must also be specified for the TARP Manual Adjacency to be entered.

The format for this parameter is "**L4AJORG**=*l4ajorg*" where *l4ajorg* is the 3-byte (6-digit hexadecimal) NSAP Organization ID field of the TARP Manual Adjacency. The default value for this parameter is value of the NSAP Organization ID of the target NE.

L4AJRES This parameter is used to provision the NSAP Reserved field of the TARP Manual Adjacency.

If **L4AJRES** is specified, then **L4AJSYS** must also be specified for the TARP Manual Adjacency to be entered.

The format for this parameter is "**L4AJRES**=*l4ajres*" where *l4ajres* is the 2-byte (4-digit hexadecimal) NSAP Reserved field of the TARP Manual Adjacency. The default value for this parameter is the value of the NSAP Reserved field of the target NE.

L4AJRD This parameter is used to provision the NSAP Routing Domain field of the TARP Manual Adjacency.

If **L4AJRD** is specified, then **L4AJSYS** must also be specified for the TARP Manual Adjacency to be entered. The format for this parameter is "**L4AJRD**=*l4ajrd*" where *l4ajrd* is the 2-byte (4-digit hexadecimal) NSAP Routing Domain field of the TARP Manual Adjacency. The default value for this parameter is value of the NSAP Routing Domain of the target NE.

L4AJAREA This parameter is used to provision the NSAP Area field of the TARP Manual Adjacency.

If **L4AJAREA** is specified, then **L4AJSYS** must also be specified for the TARP Manual Adjacency to be entered.

The format for this parameter is "**L4AJAREA**=*l4ajarea*" where *l4ajarea* is the 2-byte (4-digit hexadecimal) NSAP Area field of the TARP Manual Adjacency. The default value for this parameter is the value of the NSAP Area field of the target NE.

L4AJSYS This parameter is used to provision the NSAP System Identifier field of the TARP Manual Adjacency.

L4AJSYS must be specified for the TARP Manual Adjacency to be entered.

The format for this parameter is "**L4AJSYS** =*l4ajsys*" where *l4ajsys* is the 6-byte (12-digit hexadecimal) NSAP System Identifier of the TARP Manual Adjacency. There is no default value.

L4T1TM This parameter is used to provision the TARP Timer T1. T1 is the maximum time waiting for a response to a TARP Type 1 request PDU (search within the area). The format for this parameter is "**L4T1TM=***l4t1tm*".

This parameter may have a value in the range from **1** to **3600** seconds.

The original value of *l4t1tm* is **15** seconds.

L4T2TM This parameter is used to provision the TARP Timer T2. T2 is the maximum time waiting for a response to a TARP Type 2 request PDU (search outside of the area). The format for this parameter is "**L4T2TM=***l4t2tm*".

This parameter may have a value in the range from **1** to **3600** seconds.

The original value of *l4t2tm* is **25** seconds.

L4T3TM This parameter is used to provision the TARP Timer T3 . T3 is the maximum time waiting for a response to an Address Resolution request (Type 5, i.e., requesting the TID when the NSAP address is known). The format for this parameter is "**L4T3TM=***l4t3tm*".

This parameter may have a value in the range from **1** to **3600** seconds.

The original value of *l4t3tm* is **40** seconds.

L4T4TM This parameter is used to provision the TARP Timer T4. Timer T4 starts when T2 expires. It is used for error recovery. The format for this parameter is "**L4T4TM=***l4t4tm*".

This parameter may have a value in the range from **1** to **3600** seconds.

The original value of *l4t4tm* is **20** seconds.

L4LFTM In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach R3.0, and later, this parameter is used to provision the TARP Loop Detection Buffer Flush Timer. This parameter sets the time period for flushing the TARP Loop Detection Buffer. The format for this parameter is "**L4LFTM=***l4eftm*".

This parameter may have a value in the range from **1** to **1440** minutes.

The original value of *l4lftm* is **5** minutes.

L4ETDC This parameter is used to Enable or Disable the TDC. The format for this parameter is "**L4ETDC=***l4etdc*".

This parameter may take the value **enable** or **disable**. The original value is **enable**.

When this parameter is used to enable the TDC, the TDC shall be flushed.

NOTE:
Since this parameter results in the flushing of the TDC, manual entries should not be put into the TDC in the same instance of **ENT-ULSDCC-L4**.

NOTE:
If it is necessary to flush the TDC and the TDC has previously been provisioned as "enabled", executing **ENT-ULSDCC-L4** with "**L4ETDC=***enable*" will have no effect since it will appear as an attempt to provision a parameter to its current value. To flush the TDC, it must first be provisioned to "disable", then provisioned again to "enable".

Flushing the TDC using this command will remove all entries, including entries that were manually entered.

The following set of parameters are used to enter data manually into the TDC. An entry in a TDC consists of three parameters: the NSAP address, the Target Identifier (TID) and the address type of a NE. The NSAP, which is 20 bytes (40-digit hexadecimal), is composed of a number of separate fields, most of which have default values. Thus, to simplify the entry of the NSAP address, the NSAP is entered via a number of separate TDC NSAP parameters.

The following parameters, **L4TDCORG**, **L4TDCRES**, **L4TDCRD**, **L4TDCAREA** and **L4TDCSYS**, are used to specify the user settable NSAP fields required to enter data into the TDC.

The NSAP System ID field, **L4TDCSYS**, which is unique for each NE, is the only parameter required to specify the NSAP portion of a TDC entry. This parameter does not have a default value.

If this parameter is specified, then any of the other user settable NSAP field parameters that are not specified and NSAP fields that are not settable by the user (the NSAP *IDP, DFI* and *SEL* fields) are set to their appropriate values in creating the NSAP portion of the TDC entry. For the *IDP* and *DFI* fields, these values are the equivalent NSAP fields of the target NE. Since the *SEL* field may take different values depending on its use, it is set to "00" hex in the TDC NSAP entry and is displayed as "00" hex.

If one or more TDC provisioning parameters are specified but **L4TDCSYS** is not specified, then an entry is not made into the TDC and an error message is returned.

Along with the TDC NSAP parameters, the parameter **L4TDCTID** is required to enter a set of data into the TDC. Both the NSAP parameters and **L4TDCTID** need to be specified for the action to be taken. These parameters enter a single row of data into the TDC. Multiple rows of data are entered using multiple occurrences of **ENT-ULSDCC-L4**.

If the set of specified NSAP and the TID, (as specified by the **L4TDCTID** parameter) does not already exist in the TDC, then the data is added to the TDC. If the NSAP-TID pair already exist in the TDC, then no action is taken.

The TDC stores three parameters for each entry, the NSAP, TID and the TARP address type (identified as "tar-pro" in Bellcore GR253). The address type is not user provisionable and it is not included in the parameter set for this command. When entering an entry in the TDC, the address type field is set to its default value ('FE' hex).

The TDC is a circular buffer with a maximum number of entries. The maximum is 110 entries. When a new entry with a unique TID would result in the maximum number being exceeded, the new entry replaces the oldest entry. Thus, while there is no limit on the number of entries that may be manually entered, new entries may be displacing older entries without any error notification.

L4TDCORG This parameter is used to provision the NSAP Organization ID field of the TDC entry.

If **L4TDCORG** is specified, then **L4TDCSYS** and **L4TDCTID** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCORG**=*l4tdcorg*" where *l4tdcorg* is the 3-byte (6-digit hexadecimal) NSAP Organization ID field of the NE to be manually entered into the TDC. The default value for this parameter is the NSAP Organization ID of the target NE.

L4TDCRES This parameter is used to provision the NSAP Reserved field of the TDC entry.

If **L4TDCRES** is specified, then **L4TDCSYS** and **L4TDCTID** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCRES**=*l4tdcres*" where *l4tdcres* is the 2-byte (4-digit hexadecimal) NSAP Reserved field of the NE to be manually entered into the TDC. The default value for this parameter is the NSAP Reserved field of the target NE.

L4TDCRD This parameter is used to provision the NSAP Routing Domain of the TDC entry.

If **L4TDCRD** is specified, then **L4TDCSYS** and **L4TDCTID** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCRD**=*l4tdcrd*" where *l4tdcrd* is the 2-byte (4-digit hexadecimal) NSAP Reserved field of the NE to be manually entered into the TDC. The default value for this parameter is the NSAP Routing Domain of the target NE.

L4TDCAREA This parameter is used to provision the NSAP Area field of the NE to be manually entered into the TDC.

If **L4TDCAREA** is specified, then **L4TDCSYS** and **L4TDCTID** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCAREA**=*l4tdcarea*" where *l4tdcarea* is the 2-byte (4-digit hexadecimal) NSAP Area field of the NE to be manually entered into the TDC. The default value for this parameter is the NSAP Area field of the target NE.

L4TDCSYS This parameter is used to provision the NSAP System Identifier field of the TDC entry.

L4TDCSYS must be specified for the entry to be made in the TARP Data Cache.

If **L4TDCSYS** is specified, then **L4TDCTID** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCSYS**=*l4tdcsys*" where *l4tdcsys* is the 6-byte (12-digit hexadecimal) NSAP System Identifier field of the NE to be manually entered into the TDC. There is no default value.

L4TDCTID

This parameter is used to provision the Target Identifier (TID) of the TDC entry.

L4TDCTID must be specified for the entry to be made in the TDC.

If **L4TDCTID** is specified, then **L4TDCSYS** must also be specified for the entry to be made in the TDC.

The format for this parameter is "**L4TDCTID=***l4tdctid*" where *l4tdctid* is the TID of the NE associated with the TDC NSAP address parameters that are specified. **L4TDCTID** has a maximum of 20 characters. There is no default value.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the requested command provisions parameters that have the same values as those currently provisioned, the command does not alter the existing parameter values and the NE responds with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

EXAMPLE INPUT/OUTPUT

The following example shows the provisioning of a TARP Manual Adjacency :

```
ENT-ULSDCC-L4:LT-PF-2000::123456:::l4ajsys=08006A112345;

IP 123456
<

LT-PF-2000 98-04-23 13:12:16
M  123456 COMPLD
;
```

The following example shows the provisioning of multiple TARP parameters:

```
ENT-ULSDCC-L4:LT-PF-2000::987654:::l4tlif=50,l4tdcsys=08006A154321,
l4tdctid=LT-PF2001;

IP 987654
<

LT-PF-2000 98-04-23 13:12:16
M  987654 COMPLD
;
```

ERROR RESPONSES

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

If an error is detected in any of the command parameters, the entire command is denied; there is no partial completion of the command.

If there are errors in more than one command parameter, an error is detected and reported in only one of the parameters. The parameter for which the error is detected may not be the first parameter in the command that is in error.

The NE returns the following error response if the *aid* value is invalid.

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

Any parameter may be in the *spec_block* only once and may not be repeated. The NE returns the following error response if a parameter is repeated in the *spec_block.*

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

The NE returns the following error response if the **L4TLIF** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TLIF */
;
```

The NE returns the following error response if the **L4AJORG** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJORG */
;
```

The NE returns the following error response if the **L4AJRES** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJRES */
;
```

The NE returns the following error response if the **L4AJRD** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJRD */
;
```

The NE returns the following error response if the **L4AJAREA** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJAREA */
;
```

The NE returns the following error response if the **L4AJSYS** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4AJSYS */
;
```

If **L4AJORG**, **L4AJRES**, **L4AJRD** and/or **L4AJAREA** are specified without specifying **L4AJSYS**, the NE returns the following error response:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, L4AJSYS is required to specify
      the TARP Manual Adjacent NSAP */
;
```

If the **L4AJSYS** specified is the same as the NSAP System Identifier value of the target NE, the following error response is returned:

```
   sid date time
M  ctag DENY
   SDNC
   /* Status, Data Not Consistent */
   /* Local SYSID is not valid for TARP Manual Adjacencies */
;
```

If the TARP Manual Adjacency list has the maximum number of entries and **L4AJSYS** is specified, the following error response is returned:

```
   sid date time
M  ctag DENY
   SLEM
   /* Status, List Exceeds Maximum */
   /*  Maximum Number of TARP Manual Adjacencies Already Exists */
;
```

The NE returns the following error response if the **L4T1TM** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4T1TM */
;
```

The NE returns the following error response if the **L4T2TM** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4T2TM */
;
```

The NE returns the following error response if the **L4T3TM** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4T3TM */
;
```

The NE returns the following error response if the **L4T4TM** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4T4TM */
;
```

The NE returns the following error response if the **L4LFTM** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4LFTM */
;
```

The NE returns the following error response if the **L4TDCORG** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCORG */
;
```

The NE returns the following error response if the **L4TDCRES** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCRES */
;
```

The NE returns the following error response if the **L4TDCRD** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCRD */
;
```

The NE returns the following error response if the **L4TDCAREA** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCAREA */
;
```

The NE returns the following error response if the **L4TDCSYS** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCSYS */
;
```

If **L4TDCORG**, **L4TDCRES**, **L4TDCRD** and/or **L4TDCAREA** are specified without specifying **L4TDCSYS**, the NE returns the following error response:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, L4TDCSYS is required to specify the TDC NSAP */
;
```

If either **L4TDCSYS** is specified without specifying **L4TDCTID** or **L4TDCTID** is specified without specifying **L4TDCSYS**, the NE returns the following error response:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, both L4TDCSYS and L4TDCTID are required*/
;
```

The NE returns the following error response if the **L4TDCTID** syntax is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4TDCTID */
;
```

The NE returns the following error response if the **L4ETDC** value is invalid.

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, invalid L4ETDC */
;
```

RELATED TL1 MESSAGES

DLT-ULSDCC-L4

RTRV-ULSDCC-L4

NAME

ENT-USER-SECU: Enter User Security

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

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 (NE) to which the command is addressed.
uid	This is the User Identifier of a user. For DDM-2000 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 NE 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 (white space is ignored). In addition, ",", ":", and ";" are not allowed in the *pid* in order not to confuse with the TL1 delimiters. Refer to Table 3-12 at the end of this section for a list of valid characters.

uap User Access Privilege. It takes one of the following values:

GENERAL	This indicates that the user has a general login. A general login has access to all the system functional capabilities except security, access, system initialization and software installation functions.
MAINTENANCE	Beginning with DDM-2000 OC-3 R9.1, OC-12 R5.1, FiberReach R2.1. and later, this indicates that the user has a maintenance login. Maintenance users can only execute commands that access the system, extract reports and execute maintenance functions through a specific set of commands. No privileged commands may be executed by maintenance users.
REPORTS	This indicates that the user has a reports only login. A reports only user has access to the **RETRIEVE-** (except **RTRV-USER-SECU**), **ACT-USER**, **ED-PID** and **OPR-ACO** TL1 command/response messages.

NOTE:
The **privileged** value is not allowed for this parameter since privileged users cannot be created in the NE.

OUTPUT FORMAT

If the NE 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:LT-PF-2000:kjlee:123456::pass12+,,general;

IP 123456
<

   LT-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 NE receives an **ENT-USER-SECU** command with an existing *uid* (user identifier) that is not that user's own *uid*, the following error response is returned:

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

If the NE receives an **ENT-USER-SECU** command when it already has reached its maximum user logins, the following error response is returned:

```
   sid date time
M  ctag DENY
   SLEM
   /* Status, List Exceeds Maximum */
;
```

If the NE 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 NE 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
   PIUI
   /* Privilege, Illegal User Identity, invalid UID */
;
```

If the NE 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 NE receives an **ENT-USER-SECU** command with an invalid *pid* (password) value, the following error response is returned:

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

If the NE 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 */
;
```

If the NE 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
   PIUC
   /* Privilege, Illegal User Code, invalid UAP */
;
```

If the NE receives an **ENT-USER-SECU** command from a non-privileged user, the following error response is returned:

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

RELATED TL1 COMMANDS

DLT-USER-SECU

ED-USER-SECU

RTRV-USER-SECU

NAME

INH-MSG: Inhibit Message.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

INH-MSG-*modifier:tid:[aid]:ctag[::,,];*

DESCRIPTION

CAUTION:
This command will suppress all TL1 autonomous indications of failures.

NOTE:
This command is available only to privileged users.

INH-MSG commands are initiated by users to inhibit transmission of all autonomous TL1 messages from a Network Element (NE).

When a NE receives an **INH-MSG** command, the NE inhibits transmission of all of its autonomous messages, if autonomous message reporting has not already been inhibited.

When autonomous message reporting is inhibited, the NE reports an abnormal status condition in an autonomous REPT EVT message.

This REPT EVT message, containing the abnormal status condition report, would be the last autonomous message sent before the **INH-MSG** command takes effect.

While autonomous message reporting is inhibited, the NE continues to respond fully to all command messages, specifically **RTRV-ALM** and **RTRV-COND**.

All new autonomous messages are inhibited. All autonomous messages that are in queue prior to the normal completion of the **INH-MSG** command are reported.

INPUT PARAMETERS

modifier Modifier. The *modifier* value must be **ALL**.

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

aid Access identifier. The *aid* value must be **all** or null (default=**all**), because the entire system is affected.

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

OUTPUT FORMAT

If the NE fully complies with the **INH-MSG-ALL** request, the following normal completion response is returned:

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

If the network element receives an **INH-MSG-ALL** command message from a user when autonomous message reporting had already been inhibited, 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

```
inh-msg-all:LT-PF-2000::123xyz;

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

ERROR RESPONSE

Refer to the **RTRV-HDR** error response 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, anything other than **all** or null, the following error response is returned:

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

RELATED TL1 MESSAGES

ALW-MSG

REPT EVT

NAME

INIT-REG: Initialize Register

Support for this command is available for DDM-2000 Multiplers, startingwith:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

INIT-REG-modifier:*tid*:[*aid*]:*ctag*::,,,,*tmper*[,,];

DESCRIPTION

CAUTION:
Performance monitoring data collected to date for the selected register(s) will be deleted as a result of this command.

INIT-REG-ALL commands can be initiated to request the Network Element to initialize all *current* day and/or all *current* 15-minute performance-monitoring (PM) storage registers.
PM registers for previous day and previous 15-minute time periods are not affected.

INPUT PARAMETERS

modifier Modifier. In DDM-2000 FiberReach R1.0, the *modifier* value must be **ALL**.

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

aid For **INIT-REG-ALL**:
Access identifier. Because *all* current daily and/or 15-minute PM registers are initialized, the *aid* value must be **all** or null (default = **all**).
For **INIT-REG-OLINE**:

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.

tmper For **INIT-REG-ALL**:
Time period. This requests that PM registers for a specified time interval be initialized. This parameter must have one of the following values:

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 15-minute *and* daily PM registers be initialized.

OUTPUT FORMAT

If the Network Element fully complies with the initialize register 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

```
INIT-REG-ALL:LT-PF-2000:all:123456::,,,,15-MIN;

IP 123456
<

   LT-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 **INIT-REG** command, also.

If the NE receives an **INIT-REG** command with a command 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 NE receives an **INIT-REG** command with an invalid *aid* value the following error response is returned:

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

If the NE receives an **INIT-REG-ALL** command 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 */
;
```

RELATED TL1 MESSAGES

RTRV-PM

RTRV-TH

SCHED-PMREPT

SET-TH

NAME

INIT-SYS: Initialize System

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for ring systems)

Support for this command is also available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for ring systems)
- FiberReach Release 1.0.

INPUT FORMAT

For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0:

INIT-SYS*:tid:aid:ctag;*

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, and FiberReacxh R1.0:

INIT-SYS*:tid:aid:ctag::ph;*

DESCRIPTION

CAUTION:
Execution of this command may affect service.

This command can be used in three ways, depending on the setting of the *aid* and the *ph* parameter. The three ways are explained below:

1) The most comprehensive initialization occurs when the *aid* is set to all and the phase parameter (*ph*) is set to **9**. In this case, used only at the end of a system installation before turning up the system, Provisionable parameters are set to default values and the system controller executes its full power-up sequence. The command **INIT-SYS** with the **all** *aid* should NOT be used on an in-service system when the **ph** is set to 9 (equivalent in effect and behavior to the CIT *init-sys* command). Execution of this command at any Network Element (NE) will also affect the OS communication with that NE and all OS users logged into that Network Element will be logged out. If the NE is the GNE, then users will not be able to log into systems on the subnetwork, as the GNE setting goes back to "no".

NOTE:
The system will also show transient DCC failures that are recorded in the Alarm and History reports. This is a normal, expected system behavior.

2) To clear a system problem, the **INIT-SYS** can be used with the phase parameter set to 3 and with *aid* set to **sysctl** or the **RESET** command can be used from the NE native User Interface with exactly the same effect, resetting the system software without changing parameters.

3) When a sysctl is replaced on an in-service system, **init-sys** can be used with the phase parameter set to 9 and aid set to sysctl to restore the system level parameters in the sysctl to their default values. This is equivalent to pushing the UPD/INIT pushbutton within 10 seconds of processor startup sequence, and should be used only when the sysctl is being replaced.

NOTE:
This command is available to privileged users only. General users may use the native user interface to reset the systems software without changing provisioned parameters (equivalent to using **INIT-SYS** with the phase parameter set to 3).

INPUT PARAMETERS

tid Target identifier. This is the name of the NE to which the command is addressed. The *tid* is a required parameter.

aid Access identifier. *aid* can have two values, **all** or **sysctl**. *aid* is a required parameter. When the phase parameter is set to 3, only the *aid* value **all** is allowed (causing the system software to be reset). When the phase parameter is set to 9, *aid* may have the following values:

sysctl The address **sysctl** can be used after a system controller is replaced on a 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 SYSCTL to their default values. manual pages.

all The address **all** is used only at the end of an installation before turning over the system. This ensures that all parameters in the system have the proper default values before any system-specific provisioning is done.

ctag Correlation tag. This is included in the command by the TL1 user and is repeated by the NE in the response to allow the TL1 user to associate the command and response messages. The *ctag* is a required parameter.

ph Phase. This field specifies the level of the system initialization. This parameter must be one of the following values:

9 This is the highest phase of initialization and specifies a re-initialization of system parameters and a re-start of systems software. When the *aid* is set to all, this command is used only at the end of installation of a new system and is never used on an in-service system. With *aid* set to sysctl, the command is used when a sysctl is being replaced on an in-service system.

3 This is an interim level of initialization that resets the system software without affecting the setting of parameters. It does cause the history and performance monitoring data to be lost.

OUTPUT FORMAT

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

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The parameters listed there apply to the **INIT-SYS** command also.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example initializes its SYSCTL.

```
init-sys:LT-PF-2000:sysctl:123456::9;


IP 123456
<
```

NOTE:
Since a full system initialization (phase parameter set to 9) initializes the SYSCTL or the entire system, it will drop all user sessions including the one on the X.25 interface, and COMPLD message may or may not be conveyed back to the TL1 user.

The following DDM-2000 OC-3 example resets the system software, but does not affect the value of parameters that have been set.

```
init-sys:LT-PF-2000:sysctl:123456::3;


IP 123456
<
```

NOTE:
Since a full system initialization occurs in the entire system, it will drop all user sessions including the one on the X.25 interface.

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **INIT-SYS** command also.

If the NE receives a **INIT-SYS** command without an *aid* or with an *aid* other than **all** or **sysctl**, or with an *aid* set to a value other than **all** when the phase is set to 3, 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 NE receives an **INIT-SYS** command with a missing or unsupported *ph* value, the following error response is returned:

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

RELATED COMMANDS

None

NAME

OPR-ACO: Operate Alarm Cutoff

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

OPR-ACO-*modifier*:*tid*:[*aid*]:*ctag*;

DESCRIPTION

NOTE:
This command is available also to maintenance and reports-only users.

OPR-ACO commands can be initiated to request the Network Element (NE)to operate the alarm cutoff (ACO) to silence the audible office alarms. Alarms remain silent until a new alarm condition arises.

NOTE:
In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and all subsequent TARP based releases, TBOS and Parallel Telementry are not supported. As a result, all alarms are local alarms; there are no remote alarms. **OPR-ACO** therefore serves to cutoff local alarms only.

The ACO function applies to all NEs with the same site number.

For example, to support combined DDM-2000 OC-3 and OC-12 applications.

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
- In non-TARP based releases prior to DDM OC-3 R13.0, OC-12 R7.0, FiberReach R3.0,
- In DDM-2000 non-TARP based releases prior to DDM OC-3 R13.0, DDM OC-12 R7.0, FiberReach R3.0, clear all parallel telemetry outputs except the system ID and ACO outputs.

In DDM-2000 non-TARP based releases prior to DDM OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, this command is equivalent to pushing the ACO button on the user panel, activating the TBOS ACO control point, or activating the parallel telemetry ACO input

INPUT PARAMETERS

modifier Modifier. The *modifier* value must be **ALL**.

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

aid Access identifier. Because the ACO function applies to the whole system, the *aid* value must be **all** or null (default = **all**).

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 operate ACO request, the following normal completion response is returned:

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

If the Network Element receives a valid **OPR-ACO** command, but no alarm condition exists or existing alarms have already been ACO'ed, 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-ALL:LT-PF-2000:all:123456;

IP 123456
<

   LT-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 **OPR-ACO** command, also.

If the Network Element 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 Network Element 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 */
;
```

RELATED TL1 MESSAGES

None.

NAME

OPR-EXT-CONT: Operate-External-Control

This message is generically defined for Lucent Technologies PF2000 products. Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** and OC-12 Release **4.0** (for linear systems)
- OC-3 ring Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach **1.0**

INPUT FORMAT

OPR-EXT-CONT:*tid*:*aid*:*ctag*::*dur*;

DESCRIPTION

The **OPR-EXT-CONT** command can be initiated by users to operate an external discrete control, such as a relay activation, a fan, a light or sprinkler. Bellcore's description of this command utilizes the *conttype* parameter to enable the operation of multiple controls of the same type (e.g. all sprinklers) to be operated. PF-2000 products implement this TL1 command with TBOS controls or parallel telemetry and are not associated with types but only with physical locations. Thus the *conttype* parameter has no meaning for PF-2000 products and is not included in the Lucent Technologies PF2000 version of this TL1 command. Aid cannot be CONT-ALL. DDM-2000, FiberReach and SLC-2000 controls are only operated continuously (the value of *dur* can only be CONTS, and any other value generates an error message). FT-2000 ADR controls can be operated continuously or momentarily. (*dur* can be CONTS or MNTRY) and defaults to MNTRY.

INPUT PARAMETERS

tid

Target identifier. This is the name of the Network Element (NE) to which the command is addressed.

aid

Access identifier. The *aid* identifies the external miscellaneous discrete control for which a description is being provisioned. The *aid* value cannot be null and cannot be CONT-ALL.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *{set-attr-cont}* addresses.

ctag

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

dur

The *dur* parameter is used by Bellcore to specify the duration of the external discrete control operation. Since DDM-2000, FiberReach, and SLC-2000 controls operate until they are released, "momentary" operation is meaningless and this parameter is expected to be continuous (CONTS). A momentary (MNTRY) or null value should result in an error message.

OUTPUT FORMAT

If the NE fully complies with the **OPR-EXT-CONT** request, the following normal completion response is returned.

```
IP 123456
<


  LT-PF-2000 94-06-01 12:23:46
M 123456 COMPLD
;
```

If the **OPR-EXT-CONT** command does not alter the existing attributes, i.e., the control referenced by the aid is already being operated, the Network Element will not deny the command. The system will respond with the completion message shown above.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **OPR-EXT-CONT** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a command for a PF-2000 system to operate discrete control 1.

```
OPR-EXT-CONT:LT-PF-2000:CONT-1:123456::conts;

IP 123456
<

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

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **OPR-EXT-CONT** command, also.

If an **OPR-EXT-CONT** command is received with an invalid access identifier, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IIAC
  /* Input, Invalid Access Identifier */
;
```

If an **OPR-EXT-CONT** command is received with an invalid duration parameter, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
  /* Input, Data Not Valid, invalid DUR */
;
```

If a **SET-ATTR-CONT** command is entered for a system whose SYSCTL CO/RT switch is set to CO, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  ENSI
  /* Equipage, Not equipped for Setting specified Information */
  /* Environmental controls can be provisioned only in RT systems. */
;
```

RELATED TL1 COMMANDS

RTRV-ATTR-CONT

RLS-EXT-CONT

RTRV-ALM

NAME

OPR-LPBK-*rr*: Operate Low-Speed (LS) Terminal and Facility Loopbacks.

support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (ring systems)
- FiberReach Release 1.0

INPUT FORMAT

In DDM-2000 Oc-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberRaeach R1.0: **OPR-LPBK**-*modifier:tid:aid:ctag[::];*

In DDM-2000 Oc-3 R8.0, 9.0, OC-12 R5.0, and FiberRaeach R2.1: **OPR-LPBK**-*modifier:tid:aid:ctag[::,,,lpbktype];*

DESCRIPTION

CAUTION:
Execution of this command may affect service.

This command can be initiated by a user to request the Network Element (NE) to operate a manual terminal or facility loopback at the specified LS interface. This command will be used during pre-service testing of facilities and during fault diagnostics.

NOTE:
This command is available to all general and maintenance users.

The loopback request remains active until released (for example, by the TL1 command **RLS-LPBK**-*rr* command or by the appropriate Network Element Craft Interface Device (CID) command or until overridden by a Network Element reset or initialization.

INPUT PARAMETERS

modifier This is a required modifier to the **OPR-LPBK** message and may only have the following values:

T1 This requests a loopback on a DS1 or T1 LS interface.

T3 This requests a loopback on a DS3 LS interface.

EC1 In DDM-2000 OC-3 R6.1, 7.1 and OC-12 R2.1, 3.1, this requests a loopback on an EC1 LS interface.

tid Target identifier. This is the name of the network element to which the command is addressed. The *tid* is a required parameter.

aid Access identifier. *aid* determines the Low Speed Port for which the loop back is being requested. *aid* is a required parameter.

ALL is not allowed in the *aid* value for the **OPR-LPBK**-*rr* command.

ctag Correlation tag. This is included in the command by the TL1 user and is repeated by the Network Element in the response to allow the TL1 user to associate the command and response messages. The *ctag* is a required parameter.

lpbktype

In DDM-2000 Oc-3 R8.0, 9.0, OC-12 R5.0, and FiberRaeach R2.1: pback Type. This is an optional parameter. But when this parameter is used, the two ":"s and three ","s between the *ctag* and *lpbktype* are required. This parameter indicates the type of the loopback being operated. Valid values of type are:

FACILITY Facility loopback. The signal is looped back toward the facility.

TERMINAL Terminal loopback. The signal is looped back toward the HS fiber of the terminal. This is the default value.

OUTPUT FORMAT

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

If the requested loopback command does not alter the existing loopback condition, the NE shall not DENY the command. Instead the NE shall respond with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **OPR-LPBK**-*rr* command also.

EXAMPLE INPUT/OUTPUT

The following example requests a terminal loopback at the DS1 or T1 port a-

1-1.

```
opr-lpbk-t1:LT-PF-2000:a-1-1:123456;


IP 123456
<


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

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **OPR-LPBK**-*rr* command also.

If the NE receives an **OPR-LPBK** command with a *modifier* other than that supported by the NE, the following error response is returned:

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

If the Network Element receives an **OPR-LPBK** command without an *aid* or with an *aid* other than that supported by the Network Element, the following error response is returned:

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

If the Network Element receives an **OPR-LPBK** with an otherwise valid *aid* value but for which the corresponding equipment not present the following error response is returned:

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

If the Network Element receives an **OPR-LPBK** with an otherwise valid *aid* value but the command could not be completed by the Network Element, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

In DDM-2000 OC-3 6.2, 7.2 and earlier, DDM-2000 OC-12 3.1 and earlier, FiberReach 2.0 and earlier, if the Network Element receives an **OPR-LPBK** with an otherwise valid *aid* value but with the *lpbktype* parameter, then the following error response is returned:

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

In DDM-2000 Oc-3 R8.0, 9.0, OC-12 R5.0, and FiberRaeach R2.1: If the NE receives an **OPR-LPBK-***rr* command with an invalid *lpbktype* parameter value, the following error response is returned:

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

If the Network Element receives a **OPR-LPBK-*rr*** command with a valid *aid* value but the command could not be completed by the Network Element because there is the other type of loopback active at that *aid*, the following error response is returned:

```
   sid date time
M  ctag DENY
   SAOP
   /* Status, Already OPerated
      loopback active in the opposite direction.
   */
;
```

If the Network Element receives a **OPR-LPBK-*rr*** command with a valid *aid* value but for which the corresponding equipment is not present, the following error response is returned:

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not Equipped
   The circuit pack inserted in the addressed slot is of the wrong type
   or the addressed slot is not equipped.  Install the correct circuit
   pack type in the addressed slot before re-entering this command.
   */
;
```

RELATED COMMANDS

RLS-LPBK-*rr*

NAME

OPR-PROTNSW-OC12: Operate OC-12 Low Speed Optical Line Protection Switch

modifier

OC48

OC3

OC12

STS3

STS1

tid

aid

Refer to Table 7-7 at the end of this section for a list of valid low speed slot addresses.

ctag

sc

INH

LOCKOUT

FRCD

MAN

dirn

RELATED TL1 COMMANDS/MESSAGES

NAME

OPR-SYNCNSW: Operate Synchronization Switch

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 4.0
- OC-12 Release 2.0

INPUT FORMAT

In DDM-2000 OC-3 R6.0, OC-12 R2.0, and earlier only: **OPR-SYNCNSW:**[*tid*]::*ctag*::*sc*;
In DDM-2000 OC-3 R6.1, OC-12 R2.1, and earlier only: **OPR-SYNCNSW:***tid*::*ctag*::*sc*;

DESCRIPTION

NOTE:
This command is available to maintenance users starting with DDM-2000 OC3 R9.1, OC-12R5.1, and FiberReach R2.1.

OPR-SYNCNSW is initiated by an OS or OS user to request DDM-2000 to operate a manual DS1 synchronization input reference protection switch or to inhibit DS1 synchronization input reference protection switching.

When DDM-2000 receives an **OPR-SYNCNSW** command from the OS, DDM-2000 shall operate the requested protection switching request.

The inhibit, but *not* manual, protection switching requests shall remain active until released (for example, by TL1 command **RLS-SYNCNSW** or UIR command SWITCH-SYNC with SyncFunction parameter value "reference" and priority parameter value "reset").

Manual protection switches shall remain in effect until overridden by another manual protection switching request (for example, by another **OPR-SYNCNSW** with *sc* value MAN or UIR command SWITCH-SYNC with SyncFunction "reference"), or until overridden by automatic protection switching.

OPR-SYNCNSW (and the companion command **RLS-SYNCNSW**) could have been modified to support DDM-2000 OC-3 Ring R5 remote manual loop-timed synchronization reference switching via TL1, but the need goes away entirely when DDM-2000 OC-3 Ring R7 supports automatic synchronization restoration. Thus, remote CIT access suffices in the interim.

INPUT PARAMETERS

tid Target Identifier (TID)

ctag Correlation Tag

sc Switch Command (although TR-833, Issue 4, uses *switchto*): DDM-2000 shall accept and perform the following requests:

- INH — This requests that protection switching be inhibited, freezing 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 from the active reference to the standby reference provided the standby reference is good and protection switching is not inhibited.

OUTPUT FORMAT

If DDM-2000 fully complies with the protection switching request, the following output message shall be returned to the OS:

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

EXAMPLE INPUT/OUTPUT

```
OPR-SYNCNSW:SITE7NE1::1025::INH;

IP 1025
<

  SITE7NE1 70-01-01 03:36:44
M  1025 COMPLD
;
```

ERROR RESPONSES

In addition to the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses apply to **OPR-SYNCNSW** commands, also.

DDM-2000 shall check and provide error responses for the following error conditions in the order listed.

Initially, if DDM-2000 receives an **OPR-SYNCNSW** command with a non-null command code modifier (including any extra hyphens (-)), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IICM
   /* Invalid Command, DDM-2000 does not support
      Command = xxxxxxxxxxxxxxx *
;
```

where xxxxxxxxxxxxxxx is the first 16 characters of the command received.

where xxxxxxxxxxxxxxx is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

If DDM-2000 receives an **OPR-SYNCNSW** command with a non-null *aid* value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   INUP
   /* Input, no AID value allowed *
;
```

Initially, if DDM-2000 receives an **OPR-SYNCNSW** command with an invalid *sc* value (that is, anything other than INH or MAN), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, SC (or SWITCHTO) = INH or MAN (no default) *
;
```

In DDM-2000 OC-3 R6.1, 7.1 and OC-12 R2.1, 3.1, unlike previous releases, if the system receives an **OPR-SYNCNSW** command with an invalid *sc* value (that is, anything other than INH or MAN), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, SC (or SWITCHTO) = INH or MAN (no default) */
;
```

If DDM-2000 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 shall be returned to the OS:

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

If DDM-2000 receives an **OPR-SYNCNSW** command which is otherwise valid, but DS1 synchronization references are not equipped (including *un*protected equipage), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SSRD
   /* Status, Switch Request Denied, DS1 synchronization
      references not equipped */
;
```

If DDM-2000 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 (i.e., *inhibit*) exists,
2. or the standby reference is unavailable (i.e., in the case of a manual protection switch request, the standby reference is failed)

(thus, this command request is not performed), the following error response shall be 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 */
;
```

RELATED TL1 MESSAGES

RLS-SYNCNSW

NAME

REPORT ALARM: REPORT ALARM

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 2.1, OC-12 Release 1.1 (for linear systems)
- OC-3 Release 5.0, OC-12 Release 1.1 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

REPT ALM messages are generated by a network element to report the occurrence of an event that requires immediate attention by the craft at the OS. Alarm messages have alarm severity associated with them.

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

Reporting of TL1 REPT ALM messages shall be based on the same alarm masking hierarchy that applies to the DDM-2000/**SLC**-2000 user interface, per **R-MTC-1010** (and **S-MTC-1010** (see masking figures)).

OUTPUT FORMAT

```
   <SID> <date> <time>
a b REPT ALM z
   "[c]:d,e,f,[g],[h],[i],[j][,[k],[l][,m]][:[n],[o][,p[,q]][:[r][,s]]]";
```

LIST OF OUTPUT PARAMETERS

a = ALMCDE

b = ATAG

z = message modifier

c = AID

d = NTFCNCDE

e = CONDTYPE

f = SRVEFF

g = OCRDAT

h = OCRTM

i = LOCN

j = DIRN

k = MONVAL

l = THLEV

m = TMPER

n = CONDDESCR

o = AIDDET

p = OBSDBHVR

q = EXPTDBHVR

r = DGNTYPE

s = TBLISLT

DESCRIPTION OF OUTPUT PARAMETERS

a = ALMCDE:

ALMCDE is the alarm code and shall have one of the following values:

*C	- Critical alarm
**	- Major alarm
*	- Minor alarm
A	- Automatic message (non-alarm)

The ALMCDE (alarm severity) is provisionable for incoming signal failures, and other conditions (see Section 2.8 of the DDM-2000 SRD).

The ALMCDE value of "A " shall be used only to report alarm clears.

Alarm clear messages are not required for *transient* alarm conditions.

b = ATAG:

z = message modifier:

Message modifier EQPT, as in REPT ALM EQPT, shall be used to report equipment alarms.

Message modifier "rr", e.g., "T3" as in REPT ALM T3, shall be used to report facility alarms. The supported values of "rr" are specified in Table C.1.

Message modifier COM, as in REPT ALM COM, shall be used to report alarms that are not equipment or facility alarms, e.g., section DCC channel failures.

c = AID:

If the message modifier is EQPT or "rr", then the AID of the equipment or facility for which an alarm is being reported shall be specified in the REPT ALM message.

If message modifier is COM, AID shall be null (with the exceptions noted in Table C.5.0).

Refer to the description of the new TR-833, Issue 4, requirement that AID not be null, near the end of Section C.1 of this Appendix.

d = NTFCNCDE:

NTFCNCDE is the notification code and shall have one of the following values:

CR	- Critical alarm
MJ	- Major alarm
MN	- Minor alarm
CL	- Cleared alarm

DDM-2000/**SLC**-2000 shall generate one message per alarm.

The same alarm level (when it is critical, major or minor) shall be specified in the ALMCDE and NTFCNCDE parameters.

e = CONDTYPE:

All CONDTYPE values that shall be used by DDM-2000/**SLC**-2000 in REPT ALM messages are listed in Table C.2.0.

All CONDTYPE values that should be used by DDM-2000/**SLC**-2000 in REPT ALM messages are listed in Table C.2.1.

f = SRVEFF:

SRVEFF is the effect on service and shall have one of the following values:

SA	- Service-affecting condition
NSA	- Nonservice-affecting condition

The identification of alarm conditions as service-affecting or nonservice affecting shall be done consistently for DDM-2000's/**SLC**-2000's user interface, TBOS and TL1/X.25 OS interface reporting.
Possible exceptions to the consistency between the user interface and TL1/X.25 are specified in Table C.5.0 for DDM-2000 OC-12 Regenerators.

g = OCRDAT; h = OCRTM:

The OCRDAT and OCRTM parameters shall be used as specified in the General Section of this Appendix.

For DDM-2000/**SLC**-2000 REPT ALM messages, CONDTYPE "T-x" (where x is a PM MONTYPE parameter type from Tables C.3.0 or C.3.1) shall not be used, and parameters MONVAL and TMPER shall always be null.

For REPT ALM messages reporting incoming signal failure or degrade, the system shall use CONDTYPE T-BERL or T-BERP (from Table C.2.0) and THLEV equal to the positive exponent of the BER threshold exceeded.

n = CONDDESCR:

The CONDDESCR field shall be used in all REPT ALM messages.

The value of the CONDDESCR parameter shall be the same (except enclosed within a pair of escaped quotes (\")) as is included for the reported alarm condition in the Description field of the local RETRIEVE-ALARM (and STATUS) report in the DDM-2000/**SLC**-2000 UIR.

The intent of using the CONDDESCR parameter is to convey the meaning of the message more completely and in a more user-friendly way than the other parameters alone provide.

s = TBLISLT:

If a reported condition is isolated to the reported AID, the TBLISLT parameter shall be used with value ISLTD to indicate that the AID identifies the circuit pack that should be replaced by craft to correct the reported condition. Otherwise, the TBLISLT parameter shall be null, e.g.,

for incoming facility failures, DCC failures, and most PM TCAs.

For each alarm condition reported to the OS via a REPT ALM message, a corresponding REPT ALM clearance message shall be generated when the alarm condition clears.

To report the clearance of an alarm, DDM-2000/**SLC**-2000 shall use ALMCDE = A and NTFCNCDE = CL. SRVEFF shall be the same as in the original alarm message. CONDDESCR shall be the same as the "Event Description" field of the DDM-2000/**SLC**-2000 UIR RETRIEVE-HISTORY report (enclosed within a pair of escaped quotes (\")) for the cleared alarm condition. All other parameters, except TBLISLT (which shall be null), OCRDAT and OCRTM, shall be the same as in the alarm message that is being reported as cleared.

Alarm conditions that further degrade shall NOT be cleared immediately. An alarm clear message for a given AID and CONDTYPE shall NOT be output unless ALL alarms associated with that AID and CONDTYPE are clear.

If alarm conditions degrade further, an immediate clear message is not appropriate, instead the new alarm condition should be reported to the OS. The above requirement is necessary to assure that NMA doesn't incorrectly clear existing alarms. NMA automatically clears alarms by matching REPT ALM messages with NTFCNCDE = CL and the same SID, AID and CONDTYPE as the original alarm message(s). The same does NOT apply to REPT EVT messages.

RELATED TL1 MESSAGES

REPT ALM ENV

REPT EVT

NAME

REPORT ALARM ENVIRONMENT: REPORT ALARM ENVIRONMENT

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 2.1, OC-12 Release 1.1 (for linear systems)
- OC-3 Release 5.0, OC-12 Release 1.1 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

REPT ALM ENV messages are generated autonomously by the network elements to inform the OS of the occurrence of an environmental alarm.

If a DDM-2000/**SLC**-2000 miscellaneous discrete environmental point defaults to or is provisioned to have an alarm level of critical, major or minor, the occurrence (and clearance) of that miscellaneous discrete environmental point shall be reported in a REPT ALM ENV message.

OUTPUT FORMAT

```
   <SID> <date> <time>
a b REPT ALM ENV
   "c:d,e,[f],[g][,h]";
```

LIST OF OUTPUT PARAMETERS

a = ALMCDE

b = ATAG

c = AID

d = NTFCNCDE

e = ALMTYPE

f = OCRDAT

g = OCRTM

h = ALMMSG

Message modifiers, e.g., EQPT, "rr" or COM, are not used with REPT ALM ENV messages.

DESCRIPTION OF OUTPUT PARAMETERS

a = ALMCDE:

ALMCDE is the alarm code and shall have one of the following values:

*C	- Critical alarm
**	- Major alarm
*	- Minor alarm
A	- Automatic message

The ALMCDE (alarm severity) is provisionable for miscellaneous discrete environmental points, and other conditions (see Section 2.8 of the DDM-2000 SRD).

The ALMCDE value of "A " shall be used only to report miscellaneous discrete environmental alarm clears.

b = ATAG:

c = AID:

The AID value shall be the miscellaneous discrete environmental point AID, e.g., env-1, env-2,...

DDM-2000 and **SLC**-2000 have only 14 *user settable* miscellaneous discrete environmental alarm/status points.

d = NTFCNCDE:

NTFCNCDE is the notification code and shall have one of the following values:

CR	- Critical alarm
MJ	- Major alarm
MN	- Minor alarm
CL	- Cleared alarm

DDM-2000/**SLC**-2000 shall generate one message per miscellaneous discrete environmental alarm.

The same alarm level (when it is critical, major or minor) shall be specified in the ALMCDE and NTFCNCDE parameters.

e = ALMTYPE:

The value of the ALMTYPE parameter shall be `MISC` (as specified in Table C.2.0).

f = OCRDAT; g = OCRTM:

The OCRDAT and OCRTM parameters shall be used as specified in the General Section of this Appendix.

h = ALMMSG:

The value of the ALMMSG parameter shall be the user-provisioned text (enclosed within a pair of escaped quotes (\")) associated with the miscellaneous discrete environmental alarm point whose condition is reported. (See Section 2.4.3.2 [O-OPS-1300] of the DDM-2000 SRD).

The text of the ALMMSG parameter shall be output as specified for the Description field of the UIR RETRIEVE-ALARM (and STATUS) report.

The ALMMSG field (the text description, not counting the escaped quotes) can not exceed 40 characters (per TR-833, Issue 3, p. 12.3-221 (and Issue 4, p. 237)).

User documentation should recommend that the user provisioned text description (or at least the most significant portion of the description) be included in the first characters to assure that the text is visible in the Description field of the local DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report.

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

To report the clearance of a miscellaneous discrete environmental alarm, DDM-2000/**SLC**-2000 shall use ALMCDE = `A` , NTFCNCDE = `CL`, and ALMMSG shall be the same as the "Event Description" field of the DDM-2000**SLC**-2000 UIR RETRIEVE-HISTORY report (enclosed within a pair of escaped quotes (\")) for the cleared alarm condition. All other parameters shall be the same as in the miscellaneous discrete environmental alarm message that is being reported as cleared.

RELATED TL1 MESSAGES

`REPT ALM`

`REPT EVT`

NAME

REPT COND: Report Condition

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

REPT COND messages are generated periodically and autonomously 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.

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

OUTPUT FORMAT

If there are no active status conditions to report, the following report is output:

```
   sid date time
A  atag REPT COND
;
```

If there are active status conditions to report, the following report is output:

```
   sid date time
A  atag REPT COND modifier
   "aid:ntfcncde,condtype,srveff,ocrdat,ocrtm,,,,\"conddescr\""
;
```

OUTPUT PARAMETERS

sid Source identifier (or Target identifier, *tid*). This is the system name.

date Date output message is generated. This has the format YY-MM-DD (year-month-day).

time Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).

A This indicates the message is sent autonomously.

atag Automatic tag. The *atag* is used for message sequencing. The number is incremented by one for each autonomous message sent by the NE, on a per-OS-type basis. The NE uses only whole numbers from 000 through 999.

modifier This is the message modifier to the REPT COND message and has one of the following values:

COM Common. This applies to the whole NE.

EC1 This is for the electrical STS1 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems.

EQPT This reports an equipment-related condition.

OC1 This is for the optical OC-1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems.

OC3 This is for the optical OC-3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems

OC12 This is for the optical OC-12 level external interfaces; Applicable to DDM-2000 OC-12 system

STS1 This is for the dropped STS-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems

T1 This is for the DS1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems

T3 This is for the DS3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems

VT1 This is for the dropped VT-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems

The *modifier* value is null only if there aren't any active status conditions to report.

STS3 This reports a facility-related condition at the synchronous transport signal level 3.

STS1 This reports a facility-related condition at the synchronous transport signal level 1.

T3 This reports a facility-related condition at the DS3 level.

T1 This reports a facility-related condition at the DS1 level.

The *modifier* value is null only if there aren't any active status conditions to report.

aid Access identifier. This is the address of the equipment component or facility for which a status condition is being reported.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

ntfcncde
Notification code. This parameter value is always NA (not alarmed) for status conditions.

condtype
Condition type.
The values for this parameter are listed in Table 3-12 at the end of this section.

srveff Service effect. This indicates the effect of the reported condition on service. This parameter value is always NSA (non-service-affecting) for status conditions.

ocrdat Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).

ocrtm Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).

conddescr

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 Table 3-8 at the end of this section.

EXAMPLE INPUT/OUTPUT

```
   LT-PF-2000 93-10-01 06:00:00
A  810 REPT COND COM
   "env-1:NA,MISC,NSA,10-01,01-03-29,,,,\"environment1\""
;
```

RELATED TL1 MESSAGES

REPT ALM

REPT EVT

RTRV-ALM

RTRV-AO

RTRV-COND

NAME

REPT DBCHG: Report Database Change

Support for this message is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

DESCRIPTION

REPT DBCHG messages are generated by a Network Element (NE) to report database changes that have occurred as a result of line termination and cross-connection provisioning commands.

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-***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. The system will report this as if the **ENT-***rr* command had been entered.

Change in a cross-connection for a SONET signal path:

Any time 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-connections

In DDM-2000 OC-3 R6.2, 7.1, any time a SONET STS-1 cross-connection is converted to 28 VT1.5 cross-connections by a **CNVT-CRS**, command on the CIT interface, a REPT DBCHG message is generated indicating the 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 28 **ENT-CRS-VT1** commands.

OSI/TARP Provisioning: In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach R3.0, any time the **ENT-ULSDCC** or **DLT-ULSDCC** command is entered on the OS-NE interface, or the equivalent command is entered via the CIT, and successfully executed, a REPT DBCHG message is generated indicating the new settings.

When the **ENT-ULSDCC-L3** command is entered to change one or more NSAP fields of the target NE, or to set the target NE as a Level 2 IS, the system controllers will reset. A REPT DBCHG message is attempted before the controller resets.

System initialization:

Any time the **INIT-SYS** command is entered on the OS/NE or CIT interface, a REPT DBCHG message is attempted before the system resets.

Controller reset:

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

UPDATE:

Any time the UPDATE function is asserted, a REPT DBCHG message is transmitted.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, and FiberReach R1.0, the following additional TL1 and equivalent CIT commands will trigger a REPT DBCHG message:

Command	Special Notes
ENT-FEAT	
ENT-TL1MSGMAP	May result in REPT DBCHG reporting being turned off on the virtual circuit.
ENT-OSACMAP	The affected virtual circuits reset.
ENT-SYNCN	
ENT-SYS	May cause system reset and/or will/may cause TL1 session to be dropped
ENT-ULSDCC	Causes system reset when NSAP fields are changed or NE is set as an IS-IS Level 2 router.
SET-ATTR-ALM	
SET-ATTR-CONT	
SET-ATTR-ENV	
SET-TH	
ENT-CID-SECU	
SET-X25	Causes session to be dropped when packet size is changed.

In DDM-2000 OC-3 13.0, OC-12 R7.0, and FiberReach R3.0, the following additional TL1 and equivalent CIT commands will trigger a REPT DBCHG message:"

Command	Special Notes
ENT-FEAT	
ENT-TL1MSGMAP	May result in REPT DBCHG reporting being turned off on the virtual circuit.
ENT-OSACMAP	The affected virtual circuits reset.
ENT-SYNCN	
ENT-SYS	May cause system reset and/or will/may cause TL1 session to be dropped
ENT-ULSDCC	Causes system reset when NSAP fields are changed or NE is set as an IS-IS Level 2 router.
DLT-ULSDCC	
SET-ATTR-ALM	
SET-ATTR-CONT	
SET-ATTR-ENV	
SET-TH	
ENT-CID-SECU	
SET-X25 when packet size is changed.	Causes session to be dropped

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

sid Source identifier (or Target identifier, *tid*). This is the system name.

date Date output message is generated. This has the format YY-MM-DD (year-month-day).

time Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).

A This indicates the message is sent autonomously.

atag Automatic tag. The *atag* is used for message sequencing. The number is incremented by one for each autonomous message sent by the NE, on a per-OS-type basis. The NE uses only whole numbers from 000 through 999.

umb Update Mangement 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 mangement 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 recorded in the history log for the database change record.

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 *ctag*, the **SOURCE** field contains this non-null **ctag** 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, or by a TBOS control input, or a button push caused the database change, the Command Code Block contains the equivalent TL1 command which would have had to have been entered to make the change. The format is shown above in **R-REPTDBCHG-200**.

In DDM-2000 OC-3 Release 9.8, and beginning with DDM-2000 OC-3 Release 13.0, OC-12 Release 7.0, and FiberReach 3.0, TBOS control inputs are no longer supported.

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.

In DDM-2000 OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1, if a plug-in insertion caused the database update, the command code parameter is set equal to PLUGIN.

For controller reset, the *ccb* is equal to RESET. For the UPDATE function, the *ccb* is 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. The AIDs are separated by a comma.

In DDM-2000 OC-3 R9.1, OC-12 R5.1, and FibwerReach R2.1, for circuit pack insertions, this field contains the AID of the slot, and the pst parameter of the state_block contains the value of the state, IS.

For line termination provisioning changes, this field contains the AID of the line which was provisioned.

For system initialization, RESET, and UPDATE events, the AID field is null.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

com_block Common Block. In DDM-2000 OC-3 R9.0, OC-12 R5.0, and FiberReach R1.0, 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: `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.

If the database change is a result of system initialization command, the phase parameter (*ph*) of the command is reported in the *spec_block* as `PH=`*value*, where `PH` can assume the following values: 9 and 3 as defined in the **`INIT-SYS`** 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. It contains the following parameters in the order shown:

pst Primary State.

EXAMPLE INPUT/OUTPUT

All DDM-2000 OC-3 examples pertain to DDM-2000 OC-3 Release 6.1 and 7.1 and later unless otherwise noted.

All DDM-2000 OC-12 examples pertain to DDM-2000 OC-12 Release 2.1 and 3.1 and later unless otherwise noted.

The following message is sent when a cross connect is established by a TL1 user between STS-1 number 1 from the main slot to STS-1 number 2 on the C mux group:

```
   LT-PF-2000 93-10-01 08:00:00
A  888 REPT DBCHG
   "TIME=07-59-20,DATE=93-10-01,SOURCE=123456:ENT-CRS-STS1:m-1,c-2"
;
```

The following message is sent when a cross connect is established by a CIT user between STS-1 number 2 from the main slot to STS-1 number 1 on the A mux group:

```
   LT-PF-2000 93-10-01 08:00:00
A  888 REPT DBCHG
   "TIME=07-59-20,DATE=93-10-01:ENT-CRS-STS1:m-2,a-1"
;
```

The following message is sent when the **ENT-T3** command from a TL1 user has been completed for a DS3 port in the C mux group:

```
   LT-PF-2000 93-10-01 08:00:00
A  888 REPT DBCHG
   "TIME=07-59-20,DATE=93-10-01,SOURCE=123456:ENT-T3:c::AIS=Y,
    LINECDE=CCHAN,NTFCNCDE=CR,PBIT=ON"
;
```

The following message is sent when a cross connect is established (by a TL1 or CIT user) between STS-1 number 1 from the main slot to DS3 number 2 on the C mux group:

```
   LT-PF-2000 93-10-01 08:00:00
A  888 REPT DBCHG
   "TIME=07-59-20,DATE=93-10-01,SOURCE=123456:ENT-CRS-STS1:mb-1,c-2"
;
```

The following message is sent when the **ENT-T3** command from a TL1 user has been completed for a DS3 port in the C mux group:

```
   LT-PF-2000 93-10-01 08:00:00
A  888 REPT DBCHG
   "TIME=07-59-20,DATE=93-10-01,SOURCE=123456:ENT-T3:c-3::AIS=Y,
    LINECDE=CCHAN,NTFCNCDE=CR,PBIT=ON"
;
```

RELATED TL1 COMMANDS

DLT-CRS-*rr*
ENT-CRS-*rr*
ENT-ROLL-*rr*
ENT-*rr*
INIT-SYS
RESET
RTRV-AO
SET-ATTR-*rr*
UPD-SYS
ENT-ULSDCC
DLT-ULSDCC

NAME

REPORT EVENT: REPORT EVENT

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 2.0, OC-12 Release 1.0 (for linear systems)
- OC-3 Release 7.1, OC-12 Release 4.0 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

REPT EVT messages are generated autonomously by the network elements to report events that do not require alarmed notifications, e.g., to indicate a maintenance condition of the network element or to report a status change of the network element. DDM-2000/**SLC**-2000 will report processor resets, DS3 OOF, performance monitoring threshold crossings (PM TCAs), protected line AIS, DS3 AIS, path AIS (initially), yellow, FERF, CIT login/logout, and alarm-level-provisionable *status* conditions via REPT EVT messages.

DDM-2000 OC-3 R2 and OC-12 R1 support alarm-level provisioning for incoming DS1 and DS3 signal failures and miscellaneous discrete environmental conditions. DDM-2000 OC-3 R5 and OC-12 R2.1 support alarm-level provisioning for incoming EC1 signal failures, also. DDM-2000 OC-3 R7.1 and OC-12 R4.0 may support alarm-level provisioning for incoming OC-N line signal degrade conditions, also.

In the future, REPT EVT messages may be used to notify the OS of changes to any of the non-alarm conditions. In the future, REPT EVT messages may include *all* changes to status conditions included in the DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report.

If an event with a user-provisionable alarm level (e.g., DDM-2000's incoming signal failures and miscellaneous discrete environmental *status* conditions) defaults to or is provisioned as having a non-alarm (NA) alarm level, the occurrence of that event shall be reported in a REPT EVT message.

Reporting of TL1 REPT EVT messages shall be based on the same alarm (and status) masking hierarchy that applies to the DDM-2000/**SLC**-2000 user interface, per **R-MTC-1010** (and **S-MTC-1010** (see masking figures)).

In the future, *all* status events, including those without user-provisionable alarm levels, that default to or are provisioned as having a non-alarm (NA) alarm level should be reported via REPT EVT messages.

The changes of state of miscellaneous discrete environmental points (that are provisioned to be non-alarmed) shall be reported in REPT EVT messages.

All OC-N line protection switches shall be reported to the OS in REPT EVT messages as facility events (see TR-833, Issue 3, p. 12.3-241 (and Issue 4, p. 257)), i.e., using message modifier "rr." The associated circuit pack protection switch, e.g., of the DDM-2000 OLIUs, shall not be autonomously reported separately.

When a bidirectional protection switch occurs, the DDM-2000s/**SLC**-2000s at both ends of the OC-N line will report the the switch to the OS. This is necessary for OC-N lines crossing maintenance area or company boundaries, in which case each DDM-2000/**SLC**-2000 may be reporting to a different OS.

Automatic *equipment* protection switches shall be communicated to the OS by REPT SW messages.

Each PM TCA shall be reported in a separate REPT EVT message.

OUTPUT FORMAT

```
   <SID> <date> <time>
A  a REPT  EVT z
   "[b]:c,[d],[e],[f],[g],[h],[i],[j][,k][:[l],[m][,n[,o]][:p[,q]]]";
```

LIST OF OUTPUT PARAMETERS

a = ATAG

z = message modifier

b = AID

c = CONDTYPE

d = CONDEFF

e = OCRDAT

f = OCRTM

g = LOCN

h = DIRN

i = MONVAL

j = THLEV

k = TMPER

l = CONDDESCR

m = AIDDET

n = OBSDBHVR

o = EXPTDBHVR

p = DGNTYPE

q = TBLISLT

DESCRIPTION OF OUTPUT PARAMETERS

a = ATAG:

The fractional portion of the ATAG parameter should be used to correlate the two REPT EVT messages indicating the occurrence and clearing of a standing condition (SC).

The fractional portion of the ATAG parameter should be used to correlate REPT EVT messages with REPT ALM messages when the status condition reported by REPT EVT is caused by the alarm condition reported by REPT ALM.
The best example of this case is the correlation of a REPT EVT message reporting a protection switch with the REPT ALM message reporting the alarm condition that triggered the protection switch.

z = message modifier:

Message modifier EQPT, as in REPT EVT EQPT, shall be used to report equipment-related events.

Message modifier "rr", e.g., T3, as in REPT EVT T3, shall be used to report facility-related events. The supported values of "rr" are specified in Table C.1.

Message modifier COM, as in REPT EVT COM, shall be used to report timing synchronization mode switches.

Message modifier COM, as in REPT EVT COM, shall be used to report changes of state of miscellaneous discrete environmental *status* conditions, communication failures, controller resets, and allow autonomous OS messages.

Message modifier COM, as in REPT EVT COM, shall be used to report CIT login, unsuccessful login attempt, and logout *status* conditions.

Message modifier COM, as in REPT EVT COM, shall be used to report TL1 autonomous message output buffer overflow as a *status* condition.

Message modifier COM, as in REPT EVT COM, shall be used to report remote software download program installation and completion of the same as a *status* condition.

b = AID:

If message modifier is EQPT or "rr", then the AID of the equipment or facility for which an event is being reported shall be specified in the REPT EVT message.

If message modifier is COM, AID shall be null (with the possible exceptions noted in Table C.5.0).

Refer to the description of the new TR-833, Issue 4, requirement that AID not be null, near the end of Section C.1 of this Appendix.

c = CONDTYPE:

All CONDTYPE values that shall be used by DDM-2000/**SLC**-2000 in REPT EVT messages are listed in Table C.2.0.

All CONDTYPE values that should be used by DDM-2000 /**SLC**-2000 in REPT EVT messages are listed in Table C.2.1.

d = CONDEFF:

CONDEFF indicates the effect of the event on the condition and shall be one of the following values:

CL	Standing Condition Cleared
SC	Standing Condition Raised
TC	Transient Condition

Each event in DDM-2000/**SLC**-2000 is defined to result either in a Standing Condition (SC) or in a Transient Condition (TC).

The only events that are defined to result in a Transient Condition (TC) shall be Threshold Crossing Alerts (TCAs), non-revertive protection switches, processor resets, *un*successful login attempts, and TL1 autonomous message output buffer overflow. All other events shall be defined to result in a Standing Condition (SC).

Standing Condition (SC) is defined as a condition that is active for an extended period of time and can be retrieved later by the OS using the RTRV-COND or RTRV-ALM command. Transient Condition (TC) is defined

to be a condition that does not change the basic condition of a network element for an extended period of time. (See TR-833, Issue 3, p. 12.3-228 (and Issue 4, p. 244)).

If a REPT EVT message reports an event that results in a standing status condition in DDM-2000/**SLC**-2000, i.e., parameter CONDEFF = SC, then another REPT EVT message shall be used to report when the standing condition no longer exists.

If status conditions degrade further, e.g., from a status condition to an alarm condition, a status clear message is not appropriate, instead the new alarm condition would be reported to the OS.

To report the clearance of a standing status condition, DDM-2000/**SLC**-2000 shall use ALMCDE = A , CONDTYPE the same as the one used in the original report, CONDEFF = CL, and CONDDESCR shall be the same as the "Event Description" field of the DDM-2000/**SLC**-2000 UIR RETRIEVE-HISTORY report (enclosed within a pair of escaped quotes (\")) for the cleared status condition. All other parameters, except TBLISLT (which shall be null), OCRDAT and OCRTM, shall be the same as in the status message that is being reported as cleared.

The use of CONDDESCR in REPT EVT messages to indicate the clearance of status conditions that cause standing conditions (SC) is especially important because REPT EVT messages do not have ALMCDE and NTFCNCDE parameters.

In TR-833, Issue 4, Supplement 1, Bellcore added the above requirement to mimic *alarm* clears. That is, use the same CONDTYPE as in the REPT EVT message reporting the status condition originally and use CONDEFF value CL (to indicate the status condition is cleared). Previously, in TR-833, Issue 3, standing conditions were cleared with CONDTYPE = NORMAL and CONDEFF = SC.

If a REPT EVT message communicates an event that results in a transient condition in DDM-2000/**SLC**-2000, i.e., the parameter CONDEFF = TC, no associated REPT EVT clear message is necessary.

e = OCRDAT; f = OCRTM:

The OCRDAT and OCRTM parameters shall be used as specified in the General Section of this Appendix.

When a PM TCA occurs, the following parameters shall be included in the associated REPT EVT message.

— c = CONDTYPE:

CONDTYPE shall be "T-x" where x is a PM MONTYPE parameter type from Table C.3.0, for which a TCA has occurred.

CONDTYPE should be "T-x" where x is a PM MONTYPE parameter type from Table C.3.1, for which a TCA has occurred.

— g = LOCN:

LOCN shall be null, except to report *far-end* PM TCAs such as for DS1 PM *far-end* TCAs, in which case, LOCN = `FEND`.

— i = MONVAL:

MONVAL shall be the measured value of that MONTYPE parameter.

— j = THLEV:

THLEV shall be the threshold level for the above MONTYPE parameter.

— k = TMPER:

TMPER shall be the accumulation time period for the above MONTYPE parameter, i.e., either `15-MIN` or `1-DAY`.

l = CONDDESCR:

The CONDDESCR field shall be used in all `REPT EVT` messages.

The value of the CONDDESCR parameter shall be the same (except enclosed within a pair of escaped quotes (\")) as is included for the reported condition in the Description field of the DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report.

q = TBLISLT:

If a reported condition is isolated to the reported AID, the TBLISLT parameter shall be used with value `ISLTD` to indicate that the AID identifies the circuit pack that should be replaced by craft to correct the reported condition. Otherwise, the TBLISLT parameter shall be null, e.g., for incoming facility failures, DCC failures, and most PM TCAs.

Initially, all DDM-2000/**SLC**-2000 conditions requiring circuit pack replacement will be reported as alarms, i.e., `REPT ALM`.

RELATED TL1 MESSAGES

```
REPT ALM

REPT ALM ENV

REPT SW
```

NAME

REPT PM: Report Performance Monitoring

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

DESCRIPTION

REPT PM messages are generated to report performance-monitoring (PM) data from the Network Element.

The PM reports are output as specified in the related TL1 command **SCHED-PMREPT**. The **SCHED-PMREPT** command establishes the schedule and PM data criteria for the REPT PM messages.

All PM data that is available on-demand via **RTRV-PM** commands can be scheduled via **SCHED-PMREPT** commands and reported via REPT PM messages, also.

The information content of each line of 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 is output:

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

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 ">" indicating a partial message.

When an interrupted message is resumed, the NE repeats the message header lines, that is,

```
   sid date time
A  atag REPT PM modifier
```

REPT PM messages may be interrupted to output an autonomous REPT ALM or REPT EVT message or to simply fit the output report within an X.25 packet.

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.

OUTPUT PARAMETERS

sid Source identifier (or Target identifier, *tid*). This is the system name.

date Date output message is generated. This has the format YY-MM-DD (year-month-day).

time Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).

A This indicates the message is sent autonomously.

atag Automatic tag. The *atag* is used for message sequencing. The number is incremented by one for each autonomous message sent by the Network Element, on a per-OS-type basis.
The Network Element uses only whole numbers from 000 through 999.

modifier This is the message modifier to the REPT PM message and has one of the following values:

- EC1 This is for the electrical STS1 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- OC1 This is for the optical OC-1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems
- OC3 This is for the optical OC-3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- OC12 This is for the optical OC-12 level external interfaces; Applicable to DDM-2000 OC-12 system
- STS1 This is for the dropped STS-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems
- T1 This is for the DS1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems
- T3 This is for the DS3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- VT1 This is for the dropped VT-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems

aid Access identifier. This is the address of the EC1, OC-1, OC-3 or OC-12 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which PM data is being reported.
Path and line PM data for the DS3 signal incoming from the DSX-3 will be displayed with a port address (a,b-3,...). Path PM data for the DS3 signal incoming from the fiber, will be displayed with a channel address (m-1, mb-10,...).
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

montype 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 3-9 located at the end of this section.

monval Monitored value. This is the measured value of the parameter specified in *montype*.

vldty Validity indicator. This identifies the validity of the PM data and may have the following value:

PRTL Data is partial, accumulated over some portion of the reported time period (*tmper*). 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.

If the validity indicator is null, the data is valid.

locn Location. This parameter has the value FEND for *far*-end DS1 PM data only (DDM-2000 OC-3 only). For *near*-end PM data, *locn* is not reported.

tmper Time period. This parameter has the value 15-MIN or 1-DAY.

mondat 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 *mondat* is the current date, then *mondat* is not reported.

montm 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 *tmper* is 1-DAY, *montm* is not reported.

EXAMPLE OUTPUT

```
LT-PF-2000 93-10-01 12:05:00
A  812 REPT PM T3
   "b:CVP,1,,,,15-MIN,,11-45"
   "b:CVP,1,,,,15-MIN,,11-30"
   "b:CVP,1,,,,15-MIN,,11-15"
   "b:CVP,1,,,,15-MIN,,11-00"
;
```

RELATED TL1 MESSAGES

RTRV-PM

RTRV-PMSCHED

SCHED-PMREPT

NAME

REPT SW: Report Switch

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).

DESCRIPTION

REPT SW messages are generated autonomously to report *equipment* (that is, circuit pack) protection switches.

Equipment protection switches associated with OC-N *line* protection switches are *not* reported.

REPT SW messages are generated autonomously to report *automatic* equipment protection switches *only*.

OUTPUT FORMAT

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

OUTPUT PARAMETERS

sid	Source identifier (or Target identifier, *tid*). This is the system name.
date	Date output message is generated. This has the format YY-MM-DD (year-month-day).
time	Time output message is generated. This has the format HH:MM:SS (hours:minutes:seconds).
A	This indicates the message is sent autonomously.

atag Automatic tag. The *atag* is used for message sequencing. The number is incremented by one for each autonomous message sent by the Network Element, on a per-OS-type basis.
The NE uses only whole numbers from 000 through 999.

actid Active access identifier. This is the *slot* address of the *active* circuit pack as a result of the protection switch.
Refer to Tables 3-6 and 3-7 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 as a result of the protection switch.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *slot* addresses.

EXAMPLE OUTPUT

```
   LT-PF-2000 93-10-26 16:42:11
A  123 REPT SW
   "fn-a-1,fn-a-2"
;
```

RELATED TL1 MESSAGES

REPT COND

REPT EVT

RTRV-AO

RTRV-COND

SW-TOPROTN

SW-TOWKG

NAME

RLS-EXT-CONT: Release External Control

This message is generically defined for Lucent Technologies PF2000 products. Support for this comand is available for DDM-2000 Multiplexers starting with:

- OC-3 Release **8.0** and OC-12 Release **4.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- Fiber Reach **1.0**

INPUT FORMAT

RLS-EXT-CONT:*tid*:*aid*:*ctag*::[*dur*];

DESCRIPTION

The **RLS-EXT-CONT** command can be initiated by users to release an external miscellaneous discrete control, such as a generator, a fan, a light, or a sprinkler. Miscellaneous discrete controls are operated by the OPR-EXT-CONT command.

INPUT PARAMETERS

tid

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

aid

Access identifier. The *aid* identifies the external miscellaneous discrete control for which a description is being provisioned. The *aid* value can not be null and cannot be CONT-ALL.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *{set-attr-cont}* addresses.

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.

dur

The dur parameter is used by Bellcore to specify the duration of the external miscellaneous discrete control release. For example, a control that has been continuously operated can be momentarily released. Lucent Technologies PF2000 products are only released continuously - so this should be null (defaulting to continuous) or CONTS (continuous).

OUTPUT FORMAT

If the NE fully complies with the **RLS-EXT-CONT** request, the following normal completion response is returned:

```
IP 123456
<


  LT-PF-2000 94-06-01 12:23:46
M 123456 COMPLD
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **RLS-EXT-CONT** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a command for a PF-2000 system to release miscellaneous discrete control 1.

```
RLS-EXT-CONT:LT-PF-2000:CONT-1:123456::;

IP 123456
<

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

The following example shows a command for a linear PF-2000 system to release miscellaneous discrete control 4.

```
RLS-EXT-CONT:LT-PF-2000:CONT-4:123456::;

IP 123456
<

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

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RLS-EXT-CONT** command, also.
If an **RLS-EXT-CONT** command is received with an invalid access identifier, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IIAC
  /* Input, Invalid Access Identifier */
;
```

If an **RLS-EXT-CONT** command is received with an invalid duration parameter, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
  /* Input, Data Not Valid, invalid DUR */
;
```

If this command is issued for a *tid* identifying a NE that is "CO" and not "RT", the following error message should be generated:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  ENEQ
  /* Equipage, Not EQuipped */
;
```

If an **RLS-EXT-CONT** command is enter on a control that is already released, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  SARL
  /* Status, Already Released */
;
```

If the NE receives a **RLS-EXT-CONT** command with an otherwise valid set of

input parameter values, but the command could not be completed by the NE, the following error response is returned to the user:

```
   LT-PF-2000 94-04-12 23:11:54
M  123456 DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

RELATED TL1 COMMANDS

RTRV-ATTR-CONT

OPR-EXT-CONT

RTRV-ALM

SET-ATTR-CONT

NAME

RLS-LPBK-*rr*: Release Low-Speed (LS) Terminal and Facility Loopbacks.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for ring systems)
- FiberReach Release 1.0

INPUT FORMAT

In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0: **RLS-LPBK-***modifier:tid:aid:ctag[::,,,lpbktype];*

DESCRIPTION

CAUTION:
Execution of this command may affect service.

NOTE:
This command is available to all general and maintenance users.

This command can be initiated by a user to request the Network Element (NE) to release a manual terminal or facility loopback at the specified LS interface. This command will be used during pre-service testing of facilities and during fault diagnostics.

When the Network Element receives an **RLS-LPBK**-*rr* command from the user, the Network Element will release a terminal or facility loopback on the specified LS interface.

INPUT PARAMETERS

modifier This is a required modifier to the **RLS-LPBK** message and may only have the following values:

T1 In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R1.0, 2.0, this requests release of a loopback on a DS1 or T1 LS interface.

T3 In DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, and FiberReach R3.1, this requests release of a loopback on a DS3 LS interface.

EC1 In DDM-2000 OC-3 R6.1, 7.1 and OC-12 R2.1, 3.1, this requests release of a loopback on an EC1 LS interface.

tid Target identifier. This is the name of the network element to which the command is addressed. The *tid* is a required parameter.

aid Access identifier. The *aid* determines the Low Speed Port which the loopback release is being requested. *aid* is a required parameter.

ALL is not allowed in the *aid* value for the **RLS-LPBK**-*rr* command.

ctag Correlation tag. This is included in the command by the TL1 user and is repeated by the Network Element in the response to allow the TL1 user to associate the command and response messages. The *ctag* is a required parameter.

lpbktype In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, this is an optional parameter. But when this parameter is used, the two ":"s and three ","s between the *ctag* and *lpbktype* are required. This parameter indicates the type of the loopback being released. Valid values of *lpbktype* are:

FACILITY Facility loopback (Signal is looped back toward the facility).

TERMINAL Terminal loopback (Signal is looped back toward the HS fiber of the terminal). This is the default.

If no *lpbktype* is provided, the NE interprets the *lpbktype* to be **TERMINAL**.

In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, this parameter is allowed only when the *modifier* is **EC1**.

OUTPUT FORMAT

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

If the requested loopback release command does not alter the existing condition, the NE shall not DENY the command. Instead the NE shall respond with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **RLS-LPBK**-*rr* command also.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-12 example requests releasing a terminal loopback at the EC1 port a-1

```
rls-lpbk-ec1:LT-PF-2000:a-1:123456;


IP 123456
<


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

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **RLS-LPBK**-*rr* command also.

If the NE receives a **RLS-LPBK** command with a *modifier* other than that supported by the Network Element, the following error response is returned:

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

If the NE receives a **RLS-LPBK** command without an *aid* or with an *aid* other than that supported by the Network Element, the following error response is returned:

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

If the NE receives a **RLS-LPBK** with an otherwise valid *aid* value but for which the corresponding equipment not present, the following error response is returned:

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

If the NE receives a **RLS-LPBK** with an otherwise valid *aid* value but the command could not be completed by the Network Element, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

If the NE receives an otherwise valid **RLS-LPBK-**rr command, where *rr* is **T1** or **T3**, but with the *lpbktype* parameter, then the following error response is returned:

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

In DDM-2000 OC-3 R8.0, 9.0 and OC-12 R5.0, if the NE receives a **RLS-LPBK-EC1** command with an invalid *lpbktype* parameter, the following error response is returned:

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

If the Network Element receives a **RLS-LPBK-***rr* command when one of the following conditions is present:

- the LNCTL slot is in the AUTO state,
- the LNCTL has been removed, or
- the LNCTL has failed,

the following error response is returned:

```
<cr><lf>
<lf>
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, LNCTL missing or failed */
;
```

RELATED TL1 COMMANDS

OPR-LPBK-*rr*

NAME

RLS-PROTNSW: Release Protection Switch

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 4.0, 7.0
- OC-12 Release 2.0

INPUT FORMAT

In DDM-2000 OC-3 R6.0, OC-12 R2.0, and earlier only: **RLS-PROTNSW-***modifier***:**[*tid*]**:***aid*:*ctag*[**::***dirn*]**;**
In DDM-2000 OC-3 R6.1, OC-12 R2.1, and earlier only: **RLS-PROTNSW-***modifier***:***tid*:*aid*:*ctag*[**::***dirn*]**;**

DESCRIPTION

NOTE:
This command is available to maintenance users starting with DDM-2000 OC-3 R9.1 and OC-12 R5.1.

RLS-PROTNSW is initiated by an OS or OS user to request DDM-2000 to release (clear) any existing forced, lockout or inhibit protection switching requests on the specified 1+1-protected linear OC-N line pair (and for rings, a VT1.5 or STS1 path pair).

When DDM-2000 receives a **RLS-PROTNSW-OC**N command from the OS, DDM-2000 shall release (clear) any existing forced, lockout or inhibit protection switching requests on the specified 1+1-protected *linear* OC-N line pair.

RLS-PROTNSW commands shall *not* cause previous manual protection switching requests to revert (for example, a previous TL1 command **OPR-PROTNSW** with switch command (*sc*) value MAN or UIR command SWITCH-LINE with priority parameter value "manual" for linear OC-N lines).

DDM-2000 provides unidirectional line protection switching. A **RLS-PROTNSW-OC**N command affects only the addressed pair of *incoming* linear OC-N signals. It does not affect which of the pair of *transmitted* OC-N signals is selected by the far end.

When DDM-2000 receives a **RLS-PROTNSW-STS1** command from the OS, DDM-2000 shall release (clear) any existing forced, lockout or inhibit protection switching requests on the specified STS1 path pair in ring applications.

When DDM-2000 receives a **RLS-PROTNSW-VT1** command from the OS, DDM-2000 shall release (clear) any existing forced, lockout or inhibit protection switching requests on the specified VT1.5 path pair in ring applications.

The **RLS-PROTNSW** command may be enhanced for DDM-2000 OC-3 Ring R7 and DDM-2000 OC-12 Ring R3 or later release to include VT1.5 and STS1 path protection switching, also, but those requirements are not included in detail yet.

INPUT PARAMETERS

modifier Command code modifier: The DDM-2000 shall accept, and perform the request for, only the supported OC-N line facility types (e.g., "rr" = OC3 and OC12).

tid Target Identifier (TID)

aid Access Identifier (AID): The DDM-2000 shall accept, and perform the request for, only the supported linear OC-N line pair AIDs (e.g., main (except rings), main-b (except rings), fn-a, fn-b, fn-c, and fn-d).

DDM-2000 OC-12 function units with dual 0x1 OC3 lines are exceptions, also.

ctag Correlation Tag

dirn Direction: The DDM-2000 shall accept, and perform the request for, only the direction value RCV or null.

Because DDM-2000 provides unidirectional protection switching, a null direction value shall default to RCV.

OUTPUT FORMAT

If DDM-2000 fully complies with the protection switching release request, the following output message shall be returned to the OS:

```
   sid date time
M  ctag MPLD
;
```

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

In addition to the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses apply to **RLS-PROTNSW** commands, also.

DDM-2000 shall check and provide error responses for the following error conditions in the order listed.

Initially, if DDM-2000 receives a **RLS-PROTNSW** command with a command code modifier other than OC3 or OC12, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IICM
   /* Command code modifier must be OC3 (or OC12) *
;
```

In DDM-2000 OC-3 R6.1, 7.1 and OC-12 R2.1, 3.1, unlike previous releases, if the NE receives a **RLS-PROTNSW** command with a command code modifier other than OC3 or OC12, the following error response shall be returned to the OS:

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

If the DDM-2000 receives a **RLS-PROTNSW** command without an *aid* value or with an *aid* value that is invalid for a DDM-2000 1+1-protected linear OC-N line pair, the following error response shall be returned to the OS:

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

Initially, if the DDM-2000 receives a **RLS-PROTNSW** command with an invalid *dirn* value (that is, anything other than RCV or null), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, DIRN = RCV or null (default DIRN = RCV) */
;
```

In DDM-2000 OC-36.1, 7.1 and OC-12 R2.1, 3.1, unlike previous releases, if the NE receives a **RLS-PROTNSW** command with an invalid *dirn* value (that is, anything other than RCV or null), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, DIRN = RCV or null (default DIRN = RCV) */
;
```

If DDM-2000 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 shall be returned to the OS:

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

If DDM-2000 receives a **RLS-PROTNSW** command with an otherwise valid *aid* value but for which the corresponding slots are not equipped with compatible OC-N OLIU circuit packs (including *un*protected equipage), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SSRD
   /* Status, Switch Request Denied, OLIUs not equipped */
;
```

The use of error code SSRD for this error condition is specified in anticipation of using error code ENPS (Equipage, Not equipped with Protection Switching) for equipment protection switching commands in the future.

If DDM-2000 receives an otherwise valid **RLS-PROTNSW** command, but for which, no inhibit, lockout or forced protection switching request already exists, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SNSR
   /* Status, no inhibit, lockout or forced switching request exists */
;
```

The intent of this requirement was to provide useful feedback to the user and to be consistent with the DDM-2000 user interface.

RELATED TL1 MESSAGES

OPR-PROTNSW

RLS-SYNCNSW: Release Synchronization Switch

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 4.0
- OC-12 Release 2.0

INPUT FORMAT

DDM-2000 OC-3 R6.0, OC-12 R2.0, and earlier only: **RLS-SYNCNSW:**[*tid*]**::***ctag;*
DDM-2000 OC-3 R6.1, OC-12 R2.1, and later: **RLS-SYNCNSW:***tid***::***ctag;*

DESCRIPTION

NOTE:
This command is available to maintenance users starting with DDM-2000 OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1.

RLS-SYNCNSW is initiated by an OS or OS user to request DDM-2000 to release (clear) an existing inhibit of DS1 synchronization input reference protection switching.

When DDM-2000 receives a **RLS-SYNCNSW** command from the OS, DDM-2000 shall release any existing inhibit of DS1 synchronization input reference protection switching.

RLS-SYNCNSW commands shall *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 UIR command SWITCH-SYNC with priority parameter value "manual").

INPUT PARAMETERS

tid Target Identifier (TID)

ctag Correlation Tag

OUTPUT FORMAT

If DDM-2000 fully complies with the protection switching release request, the following output message shall be returned to the OS:

```
   sid date time
M  ctag MPLD
;
```

EXAMPLE INPUT/OUTPUT

```
RLS-SYNCNSW:SITE7NE1::1026;

IP 1026
<

 SITE7NE1 70-01-01 03:39:55
M  1026 COMPLD
;
```

ERROR RESPONSES

In addition to the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses apply to RLS-SYNCNSW commands, also.

DDM-2000 shall check and provide error responses for the following error conditions in the order listed.

In DDM-2000 OC-3 R4.0, initially, if the NE receives a **RLS-SYNCNSW** command with a non-null command code modifier (including any extra hyphens (-)), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IICM
   /* Invalid Command, DDM-2000 does not support Command = xxxxxxxxxxxxxxx */
;
```

where xxxxxxxxxxxxxxxx is the first 16 characters of the command received.

In DDM-2000 OC-3 R6.1, 7.1 and OC-12 R2,0, 2,1, 3,1, unlike previous releases, if the NE receives a **RLS-SYNCNSW** command with a non-null command code modifier (including any extra hyphens (-)), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, Network Element does not support
      Command = xxxxxxxxxxxxxxx */
;
```

where xxxxxxxxxxxxxxxx is the first 16 characters, or up to the end-of-message semicolon (;) if less than 16 characters, of the command received.

If DDM-2000 receives a **RLS-SYNCNSW** command with a non-null *aid* value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   INUP
   /* Input, no AID value allowed */
;
```

If DDM-2000 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 shall be returned to the OS:

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

If DDM-2000 receives an otherwise valid **RLS-SYNCNSW** command, but for which, no inhibit protection switching request already exists, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SNSR
   /* Status, no inhibit switching request exists */
;
```

The intent of this requirement was to provide useful feedback to the user and to be consistent with the DDM-2000 user interface.

RELATED TL1 MESSAGES

OPR-SYNCNSW

NAME

RTRV-ALM: Retrieve Alarm

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 2.1
- OC-12 Release 1.1
- FiberReach Release 1.0.

INPUT FORMAT

In DDM-2000 OC-3 R6.0, OC-12 R2.0, OC-12 Regenerator R2.0, and earlier only: **RTRV-ALM**[-z]:[a]:[b]:c::[d],[e],[f],[g],[h][,i];
In DDM-2000 OC-3 R6.1, OC-12 R2.1, and later: **RTRV-ALM**-z:a:[b]:c::[d],[e],[f],[g],[h][,i];

DESCRIPTION

NOTE:
This command is available to maintenance users starting with DDM-2000 OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1.

RTRV-ALM command messages are initiated by OS users to retrieve all active alarm and status (DDM-2000 OC-3 R2 only) conditions from a Network Element (NE).

This command retrieves all active alarm and status (DDM-2000 OC-3 R2.0 only) conditions, in a line-by-line format very similar to the autonomous (**REPT**) messages used to report alarm and status conditions upon occurrence.

In DDM-2000 OC-3 R2.1, OC-12 R1.1, and FiberReach R1.0, in response to the **RTRV-ALM** command message DDM-2000 shall generate an output message that includes *all* alarm and status (DDM-2000 OC-3 R2 only) conditions associated with the DDM-2000, initially including the active miscellaneous discrete environmental alarm (DDM-2000 OC-3 R6.0, R7.0, OC-12 R2.0, R3.0, and earlier) and status (DDM-2000 OC-3 R2.0 only) conditions, unless the RTRV-ALM command message specifies that the response be limited to the specified AID or notification code (NTFCNCDE).

In DDM-2000 OC-3 R2.1, 6.1, 7.1, OC-12 R1.1, and FiberReach R1.0, the RTRV-ALM response message shall include the same alarm and status (DDM-2000 OC-3 R2 only) conditions that are included in the DDM-2000 UIR RETRIEVE-ALARM (and STATUS) report, except alarm and status conditions reflecting far-end activity, communication failure status conditions (i.e., loss of communication between the GNE and one or more remote DDM-2000s), and miscellaneous discrete environmental alarms (DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, R3.1, and later).

Only alarm and status (DDM-2000 OC-3 R2 only) conditions pertaining to the DDM-2000 to which the TL1 RTRV-ALM command is addressed (by TID) will be included in the TL1 RTRV-ALM response message. The UIR RETRIEVE-ALARM (and STATUS) report is expected to include at most one line indicating a communication failure status even if more than one of the remote network elements is non-communicative. The DDM-2000 UIR RETRIEVE-NETWORK MAP report will indicate *which* remote NEs are non-communicative.

In DDM-2000 FiberReach R1.0 any alarm condition reported upon occurrence by an autonomous REPT ALM or REPT ALM ENV (initially only) message and, DDM-2000 OC-3 R2 only, any status condition reported upon occurrence by an autonomous REPT EVT message with CONDEFF = SC (Standing Condition), which is active when a RTRV-ALM message is received shall be included in the RTRV-ALM response message

For DDM-2000 OC-3 R2.0 only, status conditions, may be included in the TL1 RTRV-ALM response message that are not reported to the OS in autonomous REPT EVT messages, but miscellaneous discrete environmental *controls* are not included in any TL1 RTRV-ALM response messages.

After the DDM-2000-OC-3-R2-only RTRV-ALM implementation, *no* status conditions shall be included in any RTRV-ALM response messages.

Because including status conditions in the RTRV-ALM response message was found to adversely affect NMA, those status conditions included in the RTRV-ALM response for DDM-2000 OC-3 R2 only will be migrated to the RTRV-COND response message instead.

INPUT PARAMETERS

modifier

The command code modifier will typically have one of the following values: EQPT, "rr", COM, or ALL.

In DDM-2000 OC-3 R2.1, OC-12 R1.1, OC-12 Regenerator R2.0 and FiberReach R1.0, initially, the system shall accept and limit the response to the RTRV-ALM command to the equipment (if z = EQPT), to the specified facility type (if z = "rr", e.g., T3), to the common equipment (if z = COM), or include everything (if z = ALL, null or other).

For example, if a RTRV-ALM-STS1 command is received, DDM-2000 would only include conditions with AIDTYPE = STS1 (which does not include EC-1 conditions with AIDTYPE = EC1) in the response message.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1, and FiberReach R1.0, as in previous releases, DDM-2000 shall accept and limit the response to the RTRV-ALM command to the equipment (if z =

EQPT), to the specified facility type (if z = "rr", e.g., T3), to the common equipment (if z = COM), or include everything (if z = ALL). The difference in this requirement is that DDM-2000 shall *not* accept null or other than the supported values.

In DDM-2000 OC-3 R6.1, 7.0, OC-12 R2.1, 3.1, and FiberReach R1.0, unlike previous releases, if the command code modifier is null or other than the supported values, DDM-2000 shall *not* provide a normal command response (**R-RTRVALM-210**).

tid

b = AID:

DDM-2000 shall accept and limit the information included in the RTRV-ALM response message based on the slot AID, if any, included in the command message.

The AID parameter will specify the slot AID for which the current alarm and status (DDM-2000 OC-3 R2 only) conditions are requested.

If the AID parameter value is invalid or conflicts with the command code modifier, DDM-2000/**SLC**-2000 shall ignore the AID value and respond to the OS without limiting the output response based on the input AID value.

If command code modifier is COM, ALL, null or other, DDM-2000/**SLC**-2000 shall respond to the OS without limiting the output response based on the input AID value, if any.

If command code modifier is COM or ALL, AID is expected to be null.

CTAG:

NTFCNCDE:

NTFCNCDE is the notification code and can have any of the following values: "CR", "MJ", "MN".

If NTFCNCDE is valid, the DDM-2000/**SLC**-2000 response to the OS, as determined by the preceding input parameters, shall be further limited to only the specified NTFCNCDE.

The AID and the NTFCNCDE parameters are used as filters to restrict the total set of alarm conditions retrieved.

CONDTYPE; SRVEFF; LOCN; DIRN; TMPER:

DDM-2000 is not required to support the CONDTYPE, SRVEFF, LOCN, DIRN and TMPER parameters for RTRV-ALM commands.

If a RTRV-ALM message is received with non-null values for CONDTYPE, SRVEFF, LOCN, DIRN or TMPER parameters, DDM-2000/**SLC**-2000 shall still respond to the OS without limiting the output response based on those input parameter values.

OUTPUT FORMAT

If there are no conditions to report:

```
   <SID> <date> <time>
M c COMPLD;
```

If there are conditions to report:

```
   <SID> <date> <time>
M c COMPLD
[  "[j][,k]:l,m,n,[o],[p],[q],[r][,s][:[t],[u][,v[,w]][:[x][,y]]"]...
  "[j][,k]:l,m,n,[o],[p],[q],[r][,s][:[t],[u][,v[,w]][:[x][,y]]";
```

Each line reporting an active alarm or status (DDM-2000 OC-3 R2 only) condition shall be output in the same order as the UIR RETRIEVE-ALARM (and STATUS) report.

LIST OF OUTPUT PARAMETERS

c = CTAG

j = AID

k = AIDTYPE

l = NTFCNCDE

m = CONDTYPE (or ALMTYPE)

n = SRVEFF (or CONDEFF, DDM-2000 OC-3 R2 only)

o = OCRDAT

p = OCRTM

q = LOCN

r = DIRN

s = TMPER

t = CONDDESCR (or ALMMSG)

u = AIDDET

v = OBSDBHVR

w = EXPTDBHVR

x = DGNTYPE

y = TBLISLT

DESCRIPTION OF OUTPUT PARAMETERS

CTAG:

The following parameter values shall be included/repeated as applicable to the condition reported in each separate line in the body of the response message:

AID:

AID shall be the Access Identifier of the reported condition. AID may only be null if AIDTYPE = `COM`.

AIDTYPE:

AIDTYPE is the type of access identifier and shall have one of the following values (the same as the valid values of the message modifier included in the input command, except when the message modifier is

ALL):

EQPT	- Equipment
rr	- Facility (see Table C.1)
COM	- Common

The DDM-2000 implementation is apparently initially using AIDTYPE = COM to report miscellaneous discrete environmental alarms (and status, DDM-2000 OC-3 R2 only) in RTRV-ALM responses.

NTFCNCDE:

NTFCNCDE is the notification code and shall have one of the following values:

CR	- Critical alarm
MJ	- Major alarm
MN	- Minor alarm
NA	- not alarmed status condition (DDM-2000 OC-3 R2 only).

CONDTYPE (or ALMTYPE for miscellaneous discrete environmental alarms, initially only):

CONDTYPE (or ALMTYPE) is the condition type (or alarm type) and shall have the applicable value from Table C.2.0.

CONDTYPE (or ALMTYPE) is the condition type (or alarm type) and should have the applicable value from Table C.2.1.

n = SRVEFF (or, DDM-2000 OC-3 R2 only, CONDEFF for status conditions, including miscellaneous discrete environmental status conditions):

SRVEFF is the effect on service and shall have one of the following values:

SA	- Service-affecting alarm condition, immediate action required
NSA	- Nonservice-affecting alarm condition, action may be required
SC	- Nonservice-affecting standing status condition (DDM-2000 OC-3 R2 only).

CONDEFF = TC (nonservice-affecting transient status condition) is not applicable to RTRV-ALM response messages.

OCRDAT: OCRTM:

The OCRDAT and OCRTM parameters shall be used as specified in the General Section of this Appendix.

TMPER:

TMPER is the accumulation time period for performance monitoring parameters and shall always be null for DDM-2000/**SLC**-2000 for RTRV-ALM responses.

CONDDESCR (or ALMMSG for miscellaneous discrete environmental alarms, initially only):

CONDDESCR (or ALMMSG) is the detailed text description of the condition and shall have the same value as the description (CONDDESCR or ALMMSG) in the autonomous REPT message used to report the condition upon its occurrence. (That description is also the same as is used in the DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report.)

The CONDDESCR (or ALMMSG) text description shall be enclosed within a pair of escaped quotes (\").

TBLISLT:

The TBLISLT parameter shall have the same value as the TBLISLT parameter in the autonomous REPT message used to report the subject condition upon its occurrence.

ERROR RESPONSES

Initially, if a command message is parsed by DDM-2000/**SLC**-2000 enough to recognize it as a RTRV-ALM command message and a valid CTAG is recognized, DDM-2000/**SLC**-2000 shall respond with *all* active alarm conditions. That is, no additional (beyond the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1) error response messages shall apply.

Unlike previous releases, if DDM-2000/**SLC**-2000 receives a RTRV-ALM command with a command code modifier other than EQPT, a supported "rr" value, COM, or ALL, the following error response shall be returned to the OS:

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

Error response added per MR 5931, then error code changed from IICM and error text changed per MR 6464. This is the same error check and response for RTRV-ALM-**rr** and RTRV-ALM-ENV commands.

RELATED TL1 COMMANDS

REPT-ALM
REPT-ALM-ENV

NAME

RTRV-ALM-ENV: Retrieve Alarm Environment

Support for this command is available starting in DDM-2000 OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems), and DDM-2000 OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).

Support for this command is available starting in DDM-2000 FiberReach Release 1.0.

INPUT FORMAT

RTRV-ALM-ENV:*tid*:[*aid*]:*ctag*::[*ntfcncde*][,*almtype*];

RTRV-ALM-ENV:*tid*:[*aid*]:*ctag*::[*ntfcncde*][,];

DESCRIPTION

RTRV-ALM-ENV commands can be initiated to retrieve active environmental alarm conditions from the Network Element.
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.

NOTE:
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.

aid Access identifier. This is the address of the environmental point(s), for example, **env-1** or **env-all**, for which the current alarm conditions are requested. The *aid* value may also be **all** or null (each of which is effectively equivalent to **env-all**).
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *environmental alarm* addresses.

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.

ntfcncde Notification code. This is the alarm level for which the current environmental alarms are requested, and it may have one of the following values:

CR Critical alarm

MJ Major alarm

MN Minor alarm.

The default is to retrieve *all ntfcncde* values.

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 alarm type values specified in Bellcore TR-833, Issue 5, Appendix F, are recommended, but the Network Element accepts any alarm type value consisting of 1 - 10 alphanumeric characters and/or dashes. The *almtype* default is **MISC**.

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,almtype,ocrdat,ocrtm,\"almmsg\""
   .   .   .   .   .   .   .
   .   .   .   .   .   .   .
   .   .   .   .   .   .   .
  "aid:ntfcncde,almtype,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

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

aid Access identifier. This is the address of the environmental alarm point being reported.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *environmental alarm* addresses.

ntfcncde Notification code. This is the alarm level and has one of the following values:

- CR Critical alarm
- MJ Major alarm
- MN Minor alarm.

almtype Alarm type.

ocrdat Occurrence date. This indicates the date of the condition being reported and has the format MM-DD (month-day).

ocrtm Occurrence time. This indicates the time of the condition being reported and has the format HH-MM-SS (hours-minutes-seconds).

almmsg Alarm message. This is the text description of the reported condition. (The default is environmentn.)
Refer to Table 3-8 at the end of this section.

EXAMPLE INPUT/OUTPUT

```
RTRV-ALM-ENV:LT-PF-2000:all:123456::MN;

IP 123456
<

   LT-PF-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 **RTRV-HDR** error responses section. The error responses listed there apply to the **RTRV-ALM-ENV** command, also.

If the Network Element receives a **RTRV-ALM** command with an invalid command modifier, the following error response is returned:

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

If the Network Element receives a **RTRV-ALM-ENV** command with an invalid *aid* value, the following error response is returned:

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

If the Network Element receives a **RTRV-ALM-ENV** command with an invalid *ntfcncde* value, the following error response is returned:

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

If the Network Element receives a **RTRV-ALM-ENV** command with an invalid *almtype* value, the following error response is returned:

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

RELATED TL1 MESSAGES

REPT ALM ENV

RTRV-ALM

SET-ATTR-ENV

NAME

RTRV-AO: Retrieve Autonomous Output

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

RTRV-AO:*tid*:[*aid*]:*ctag*[:::*spec_block*];

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-AO commands can be initiated to request the Network Element (NE) 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 (VC), over which the command is received. The output is limited to the autonomous TL1 messages that are assigned to the same OS-type.

The NE saves autonomous TL1 messages in a separate file for each OS-type, thus the response to a **RTRV-AO** command is retrieved from the file for the *same OS-type only* that the **RTRV-AO** command came in on.

The 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 (for example, X.25 failures) or internal (for example, autonomous TL1 message output buffer overflow, no current login for the OS-type, or inhibited autonomous TL1 message reporting) conditions.

The NE saves a copy of each autonomous TL1 message to which an *atag* value is assigned per OS-type.

Whenever the *atag* sequence is reset for an OS-type, for example, due to system initialization or processor reset, the **RTRV-AO** log file for that OS-type is cleared.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, and FiberReach R1.0, the NE saves copies of at least the 50 most recent autonomous TL1 messages for any OS-type capable of receiving autonomous messages, except for FiberReach, where the number is 40.

INPUT PARAMETERS

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

aid Access identifier. Because the **RTRV-AO** log file is not filtered by *aid*, the *aid* value must be **all** or null (default = **all**).

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

spec_block

Specific block. Parameters included within the specific block are positionally independent and are specified using a name-defined construct of: PARAMETER=*value*. 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, **ATAGSEQ=**,**MSGTYPE=**) in the command. The parameters are listed in alphabetic order.

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 specified by using "**&&**" (double ampersands), for example, "**ATAGSEQ=10&&20**" specifies *atag* values "010, 011, 012, ..., 020".

The NE'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 *atag* "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".

The NE's support of wrap-around ranges indicates that the order of input of *atag* values in ranges is significant.

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 NE's **RTRV-AO** log file, the NE 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. 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 following response is returned:

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

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, or if the **MSGTYPE** value does not match the TL1 autonomous message types provisioned for the OS-types of the current login session, the Network Element provides a normal completion response.

If there are autonomous messages to report, the following output report is returned:

```
   sid date time
M  ctag COMPLD
/*
complete autonomous messages except without the 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:LT-PF-2000::123456:::ATAGSEQ=10&011;

IP 123456
<

   LT-PF-2000 94-10-26 16:42:11
M  123456 COMPLD
/*

   LT-PF-2000 96-08-18 10:30:02
*  010 REPT ALM EQPT
   "tg-1:MN,SYNCCLK,NSA,10-25,10-30-00:\"TG3 failure\":,ISLTD"

   LT-PF-2000 94-08-18 10:30:03
A  011 REPT SW
   "tg-1,tg-2"

*/
;
```

```
RTRV-AO:LT-PF-2000::123456:::ATAGSEQ=11&012;

IP 123456
<

   LT-PF-2000 96-08-18 16:42:11
M  123456 COMPLD
/*

   LT-PF-2000 94-08-18 10:30:02
*  011 REPT EVT OCHNL
   "ochnl-1a:SNRSD,SC,10-25,10-30-00:\"TG3 failure\":,ISLTD"

   LT-PF-2000 94-08-18 10:30:03
A  012 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 NE 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, invalid modifier */
;
```

If the Network Element receives a **RTRV-AO** 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 */
;
```

If the Network Element 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 NE 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 */
;
```

If the Network Element receives a **RTRV-AO** command with an invalid **MSGTYPE** value, (that is, an autonomous TL1 message type that the NE doesn't support), the following error response is returned:

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

RELATED TL1 MESSAGES

REPT *modifier*

NAME

RTRV-ATTR-ALM: Retrieve Attribute Alarm

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** and OC-12 Release **4.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach Release **1.0**

INPUT FORMAT

RTRV-ATTR-ALM:*tid*::*ctag*;

DESCRIPTION

The **RTRV-ATTR-ALM** command can be initiated by general users to retrieve the values that have been set for incoming signal alarm delay (almdel), the alarm clear delay interval (clrdel) and power minor alarm (pmn), These parameters are explained in more detail below.

NOTE:
This command is available to all users.

INPUT PARAMETERS

tid

Target identifier. This is the name of the Network Element (NE) to which the command is addressed.

ctag

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

OUTPUT FORMAT

If the NE fully complies with the RTRV-ATTR-ALM request, the following normal completion response is returned.

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD
   "almdel=AlarmDelay","clrdel=ClearDelay","pmn=PMN"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

almdel — *almdel* is the value of the AlarmDelay (incoming signal alarm delay) parameter in seconds. It represents the time that the network element will wait, after it finds an incoming signal condition, before reporting it.

clrdel — *clrdel* is the value of the ClearDelay (alarm clear delay) parameter in seconds. It represents the time the network element will wait after a condition clears before reporting the changed condition.

pmn — *pmn* is the value of the PMN parameter which represent the alarm level conveyed when a minor power alarm occurs. The value of *pmn* is switch provisioned on the SYSCTL if the BBG5 SYSCTL is employed in the NE. If the BBG8 SYSCTL circuit pack is employed, the *pmn* parameter is provisioned with the **SET-ATTR-ALM** command. When the BBG5 is employed, the provisioned data is followed by *(hw)* as is shown in the sample output which follows.

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-ATTR-ALM** command for a PF-2000 system where the AlarmDelay parameter has been provisioned to 10 seconds, the ClearDelay parameter has been provisioned to 5 seconds, and the PMN parameter has been hardware provisioned via the switch setting of a BBG5 SYSCTL:

```
RTRV-ATTR-ALM:LT-PF-2000::123456;


IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "almdel=10",  "clrdel=5",  "pmn=MJ(hw)"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-ATTR-ALM** command, also.

RELATED TL1 COMMANDS/MESSAGES

SET-ATTR-ALM

NAME

RTRV-ATTR-CONT: Retrieve Attribute Control

This message is generically defined for Lucent Technologies PF2000 products. Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** and OC-12 Release **4.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach **1.0**

INPUT FORMAT

RTRV-ATTR-CONT:*tid*:*aid*:*ctag*[:[:[:]]];

DESCRIPTION

The **RTRV-ATTR-CONT** command can be initiated by general users to retrieve the provisioned description(s) associated with an external control device or devices. These descriptions are used for information purposes when a user seeks to operate or release external miscellaneous discrete controls. For example, The user may want to verify that aid=CONT-1 is associated with a fan (and not a sprinkler) before operating it.

NOTE:
This command is available to all users.

INPUT PARAMETERS

tid	Target identifier. This is the name of the Network Element (NE) to which the command is addressed.
aid	Access identifier. The aid identifies the external miscellaneous discrete control for which attributes are being retrieved. The *aid* value can not be null. Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *{rtrv-attr-cont}* addresses.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the NE fully complies with the RTRV-ATTR-CONT request, the following normal completion response is returned.

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "aid:conttype"
   ...
   "aid:conttype"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Parameters that specifically apply to this command response are defined below.

tid Target Identifier. This is the system name.

aid The aid identifies the external control for which the provisioned names are being retrieved. When *aid* is equal to CONT-ALL, the output is sorted by *aid*, with CONT-1 and its description printed first and CONT-2 second, etc.

conttype The control type is the user provisioned description for the control identified by the aid.

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-ATTR-CONT** command to retrieve all the provisioned names for miscellaneous discrete controls for a PF-2000 system:

```
RTRV-ATTR-CONT:LT-PF-2000:CONT-ALL:123456::;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cont-1:startPump"
   "cont-2:startGenerator"
   "cont-3:startlights"
   "cont-4:control4"
;
```

The following example shows a **RTRV-ATTR-CONT** command to retrieve the description of the first miscellaneous discrete control for a PF-2000 system:

```
RTRV-ATTR-CONTR:LT-PF-2000:CONT-1:123456::;

IP 123456
<

   ATT-FT-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cont-1:startpump"
;
```

The following example shows a **RTRV-ATTR-CONT** command to retrieve the second miscellaneous discrete control's provisioned name for a PF-2000 system:

```
RTRV-ATTR-CONT:LT-PF-2000:CONT-2:123456::;

IP 123456
<

   LT-PF-2000 94-10-26 16:42:11
M  123456 COMPLD
   "cont-2:startsprinkler"
;
```

The following example shows a **RTRV-ATTR-CONT** command to retrieve the fourth miscellaneous discrete control for a PF-2000 system:

```
RTRV-ATTR-CONT:LT-PF-2000:CONT-4:123456:;


IP 123456
<

   LT-PF-2000 94-10-26 16:42:11
M  123456 COMPLD
   "cont-4:startlights"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-ATTR-CONT** command also.

If a **RTRV-ATTR-CONT** command is received with an invalid access identifier, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IIAC
  /* Input, Invalid Access Identifier */
;
```

If a **RTRV-ATTR-CONT** command is received with an invalid access identifier (i.e. something other than *cont-1* through *cont-4* or *cont-all*), the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IIAC
  /* Input, Invalid Access Identifier, AID missing or
inconsistent with modifier value */
;
```

If a **RTRV-ATTR-CONT** command is entered for a system whose SYSCTL CO/RT switch is set to CO, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  ENRI
  /* Equipage, Not equipped for Retrieving specified Information */
;
```

RELATED TL1 COMMANDS

RTRV-ATTR-CONT

OPR-EXT-CONT

RLS-EXT-CONT

RTRV-ALM

NAME

RTRV-ATTR-ENV: Retrieve Attribute Environment

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.2 and OC-12 Release 2.2 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

INPUT FORMAT

RTRV-ATTR-ENV:*tid*:*aid*:*ctag*[::,];

DESCRIPTION

RTRV-ATTR-ENV commands can be initiated 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 (NE).

Because environmental input points are only supported at remote (RT) Network Elements (NE), this command is only allowed at NEs with CO/RT set to "RT". Refer to the TL1-Related Provisioning section.

NOTE:
This command is available to all users.

INPUT PARAMETERS

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

aid Access identifier. This is the address of the environmental points for which attributes are requested.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *environmental alarm input* addresses. Note that *env-all* is not allowed as an AID value for this command.

A null value is not permitted with this parameter.

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

OUTPUT FORMAT

If the NE fully complies with the retrieve attribute environment request, the following normal completion response is returned:

```
IP 123456
<
   sid date time
M  ctag COMPLD
   "aid:ntfcncde,almtype,\"almmsg\""
         .         .         .         .
         .         .         .         .
         .         .         .         .
   "aid:ntfcncde,almtype,\"almmsg\""
;
```

OUTPUT PARAMETERS

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

aid Access identifier. This is the address of the environmental point for which the attributes are reported.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *environmental alarm input* addresses.

ntfcncde Notification code. This is the alarm level associated with the addressed environmental point, and has one of the following values:

- **CR** Critical alarm
- **MJ** Major alarm
- **MN** Minor alarm
- **NA** Not alarmed.

almtype Alarm type. This is the TL1 alarm type, also referred to as the TL1 condition type, associated with the addressed environmental point. The alarm type values specified in Bellcore TR-833, Issue 5, Appendix F, are recommended, but the Network Element accepts any alarm type value consisting of 1 - 10 alphanumeric characters and/or dashes.

almmsg Alarm message. This is the condition description associated with the addressed environmental point. The description is an alphanumeric string, upper-case and lower-case characters with no spaces, up to 26 characters. The description is enclosed within a

pair of escaped quotes (\").

Refer to Table 3-8 at the end of this section.

EXAMPLE INPUT/OUTPUT

```
RTRV-ATTR-ENV:LT-PF-2000:env-10:123456;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "env-10:MJ,HITEMP,\"HighTemperature\""
;
```

ERROR RESPONSES

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

If the NE receives a **RTRV-ATTR** command with an invalid command modifier, the following error response is returned:

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

If the NE receives a **RTRV-ATTR-ENV** command but that NE does not have its CO/RT set to "RT", the following error response is returned:

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

If the NE receives a **RTRV-ATTR-ENV** command with an invalid *aid* value, the following error response is returned:

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

RELATED TL1 MESSAGES

REPT ALM ENV

REPT COND

REPT EVT

RTRV-ALM-ENV

RTRV-COND

SET-ATTR-ENV

NAME

RTRV-ATTR-rr: Retrieve Attribute

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

INPUT FORMAT

RTRV-ATTR-modifier:*tid:[aid]:ctag[::,,,,];*

DESCRIPTION

RTRV-ATTR-rr command instructs a Network Element (NE) to retrieve the notification code associated with incoming signal failure events.

The incoming signal failure events are described for the **SET-ATTR-rr** command.

This attribute also governs whether the event notification is alarmed (reported via REPORT ALARM) or not alarmed (reported via REPORT EVENT).

NOTE:
This command is available to all users.

INPUT PARAMETERS

modifier This is the command code modifier and must 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 (DDM-2000 OC-3, FiberReach, and SLC-2000 only).
- **T3** This requests attributes for the DS3 level.

aid Access identifier. This is the address of the DS1 or DS3 port or EC1 line for which the attributes are requested. The *aid* value may be **all** or null (default = **all**), also.

NOTE:
For valid *aid* values, see the equivalent CIT command specification.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.
An *aid* value of **all** or "null" is only valid if the second modifier is equal to **ALL**. Otherwise the *aid* value must match the signal rate specified in the second modifier.

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

OUTPUT FORMAT

If there aren't any attributes to report, the following normal completion response is returned:

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

If there are attributes to report, the following output report is returned:

```
   sid date time
M  ctag COMPLD
   "aid,aidtype:ntfcncde,,locn,dirn"
         .        .        .        .
         .        .        .        .
         .        .        .        .
   "aid,aidtype:ntfcncde,,locn,dirn"
;
```

Applicable output lines are ordered as follows:

1. By OC12 data.
2. By OC3 data.
3. By STS-1 data.
4. By T3 data.
5. By EC1 data.
6. By VT1 data.
7. By T1 data.

OUTPUT PARAMETERS

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

aid Access identifier. This is the address of the DS1 or DS3 port or EC1 line for which the attribute is reported.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

aidtype Access identifier type. This has one of the following values:

- EC1 This reports attributes for the electrical carrier signal level 1.
- T1 This reports attributes for the DS1 level (DDM-2000 OC-3, FiberReach, and SLC-2000 only).
- T3 This reports attributes for the DS3 level.

ntfcncde Notification code. This is the alarm level associated with the addressed DS1 or DS3 port or EC1 line, and has one of the following values:

CR	Critical alarm
MJ	Major alarm
MN	Minor alarm
NA	Not alarmed.

locn Location. This parameter always has the value NEND.

dirn Direction. This parameter always has the value RCV.

EXAMPLE INPUT/OUTPUT

The *aid* value included in the following example is a DDM-2000 OC-3 example *aid*:

```
RTRV-ATTR-T3:LT-PF-2000:a:123456;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "a,T3:CR,,NEND,RCV"
;
```

In DDM-2000 FiberReach R3.1, the *aid* value is included in the following example:

```
RTRV-ATTR-T3:LT-PF-2000:f-1:123456;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "f-1,T3:CR,,NEND,RCV"
;
```

ERROR RESPONSES

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

If the NE receives a **RTRV-ATTR** command with an invalid command modifier, the following error response is returned:

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

If the NE receives a **RTRV-ATTR-rr** command with an invalid *aid* value, the following error response is returned:

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

If the NE receives a **RTRV-ATTR-rr** command with a valid *aid* value but the NE is not equipped with any equipment in any of the addressed slots, the following error response is returned:

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

If the Network Element receives a **RTRV-ATTR-rr** command with a valid *aid* value but the NE is equipped with the wrong type of circuit pack (for example, a MXRVO pack instead of a DS3 pack), the following error response is returned:

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

RELATED TL1 MESSAGES

SET-ATTR-rr

ENT-rr

RTRV-rr

NAME

RTRV-CID-SECU: Retrieve Channel IDentifier Security

Support for this command is available starting in DDM-2000 OC-3 linear Release **8.0**, DDM-2000 OC-3 ring Release **9.0**, FiberReach Release **1.0**, and OC-12 Release **5.0**.

INPUT FORMAT

RTRV-CID-SECU:*tid*::*ctag*[:[:]];

DESCRIPTION

The **RTRV-CID-SECU** command can be initiated by privileged users only to retrieve the CIT and DCC port security and timeout information.

Starting with DDM-2000 OC-12 Release 7.0, DDM-2000 OC3 R13.0, and DDM-2000 FiberReach R3.0, this command lists the users currently logged into the network element via each port.

INPUT PARAMETERS

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

aid

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 RTRV-CID-SECU request, the following normal completion response is returned.

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD
   "aid:state:tmout"
    .    .    .
    .    .    .
    .    .    .
    .    .    .
   "aid:state:tmout"
;
```

Starting with DDM-2000 Release 13.0, DDM-2000 OC-12 Release 7.0, and DDM-2000 FiberReach Release 3.0, the normal completion response is being changed to include the active users currently logged in to the NE. If the NE is a GNE, users logged in to the NE via the X.25 PVCs and SVCs are shown with an identifier which distinguishes them (see description below). Users are listed with the communications channel they are on, except in the case of TL1 users coming in via the DCC; As it is not possible to determine which DCC channel these users are on, they are listed separately with the notation "dcc". Users coming in through a dcc channel using the CIT based remote login are associated with a particular dcc channel and are shown. If the NE is not a GNE, no X.25 information is relevant and none is provided.

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD
   "cit1:state:tmout[:uid]"
   "cit2:state:tmout[:uid]"
   "dcc:state:tmout[:uid]"
    .    .    .
    .    .    .
   "dcc:state:tmout:[uid]"
  ["tl1-dcc:uid"
    .    .    .
   "tl1-dcc:uid"]
  ["vc:snpa:uid"
    .    .    .
   "vc:snpa:uid"]
;
```

Starting with DDM-2000 Release 13.0, DDM-2000 OC-12 Release 7.0, and DDM-2000 FiberReach Release 3.0, the normal completion response is being changed to include the active users currently logged in to the NE. Users are listed with the communications channel they are coming over, except in the case of TL1 users coming in via the DCC. It is not possible to determine which DCC channel these users are coming over, so they are listed separately with the notation "dcc".

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD
   "cit1:state:tmout[:uid]"
   "cit2:state:tmout[:uid"
   "dcc:state:tmout[:uid]"
    .    .    .
    .    .    .
   "dcc:state:tmout[:uid]"
  ["tl1-dcc:uid"
    .    .    .
   "tl1-dcc:uid"]
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

aid

state The *state* is the security state being set for the CIT or DCC interface identified by the *TID* and *aid* parameters. Allowable values are "is" (In Service or enabled), "oos" (out of service or disabled), "lo" (Lockout) and null. When *state* is null, it is set to "oos", the default value.

tmout The *tmout* is the time out parameter. The time out parameter gives the time (0 to 120 minutes) before an inactive session is automatically terminated. The default value is 15 minutes. A 0 value indicates that the timeout has been disabled and is followed by "(disabled)" in the output in order to make that state clear. It is only applicable to CIT or dcc interfaces.

uid The uid parameter is the user id parameter. It lists the active user id of the user (if any) logged on to the port identified by the *aid* parameter.

VC Virtual circuit. This parameter is the virtual circuit type X.25 attachment for the OS. Its values are:

PVC permanent virtual circuit.

SVC switched virtual circuit.

SNPA SNPA Address is the X.25 SubNetwork Point of Attachment address for the OS. It is either the PVC Logical Channel Number (LCN) or it is the SVC Data Terminal Equipment (DTE) calling address, which is 1 to 15 digits.

Up to nine VCs can be mapped to any combination of PVCs, and SVCs. (i.e: the allocation of PVCs can be removed and replaced by SVCs).

The report is sorted first by *VC*, and then by *SNPA*.

spec_block

tmout

portstat

porttype

baudrate

chan

ostype

calladdr

gnetid

uid

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-CID-SECU** command for a PF-2000 system (in this case an OC-3). Security is enabled on all of the DCC's and the time out has been disabled.

RTRV-CID-SECU:LT-PF-2000::123456;

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cit-1:is:15"
   "cit-2:is:15"
   "dcc-m:is:0(disabled)"
   "dcc-a:is:0(disabled)"
   "dcc-b:is:0(disabled)"
   "dcc-c:is:0(disabled)"
;
```

The following example shows a **RTRV-CID-SECU** command for a PF-2000 system (in this case an OC-3). Security has been set to Lockout on all of the DCC's and the time out has been set to 60 seconds.

RTRV-CID-SECU:LT-PF-2000::123456;

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cit-1:oos:15"
   "cit-2:oos:15"
   "dcc-m:lo:60"
   "dcc-a:lo:60"
   "dcc-b:lo:60"
   "dcc-c:lo:60"
;
```

The following example shows a **RTRV-CID-SECU** command for a PF-2000 system (in this case an OC-3). Security has been set to Lockout on all of the DCC's and the time out has been set to 60 seconds. One user is connected via the CIT and two are coming in through the dcc. The NE is the GNE and has X.25 communications enabled. No OS or other user is currently logged into this NE via the last X.25 virtual circuit listed. The NE, in its GNE capacity may be routing messages received over that channel to other NEs via the DCC.

RTRV-CID-SECU:LT-PF-2000::123456;

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cit-1:is:15:user1"
   "cit-2:oos:15"
   "dcc-m:lo:60:user2"
   "dcc-a:lo:60:user3"
   "dcc-b:lo:60"
   "dcc-c:lo:60"
   "dcc:user5"
   "dcc:user6"
   "PVC:1:user7"
   "PVC:2:user8"
   "PVC:3:user9"
   "SVC:SNPA=146782229996:user10"
;
```

The following example shows a **RTRV-CID-SECU** command for a PF-2000 system (in this case an OC-12). Security has been enabled on all of the DCC's and disabled on all of the CIT's. Time outs have been set to 15 minutes.

RTRV-CID-SECU:LT-PF-2000::123456;

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "cit-1:oos:15"
   "cit-2:oos:15"
   "dcc-mb:is:15"
   "dcc-a:is:15"
   "dcc-b:is:15"
   "dcc-c:is:15"
   "dcc-d:is:15"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-CID-SECU** command, also.

RELATED TL1 COMMANDS/MESSAGES

Bellcore's specification for this message is contained in TR-NWT-000835; **ENT-CID-SECU** is a related message.

NAME

RETRIEVE-CONDITION: RETRIEVE-CONDITION

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 4.0, OC-12 Release 2.0 (for linear systems)
- OC-3 Release 3.0, OC-12 Release 1.0 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

RTRV-COND command messages are initiated by OS users to request the network element to send to the OS the current state of every circuit pack slot and facility whose AID is specified in the command or the state of all the slots and facilities associated with the network element if the command is RTRV-COND-ALL.

The initial DDM-2000 implementation of RTRV-COND will involve a less-than-complete implementation of the RTRV-COND command message. The *complete* RTRV-COND implementation corresponds to the future *objectives* in this section. Because including status conditions in the RTRV-ALM response message was found to adversely affect NMA, those status conditions included in the RTRV-ALM response for DDM-2000 OC-3 R2 only will be migrated to the RTRV-COND response message instead. That is the extent of DDM-2000's initial RTRV-COND implementation and corresponds to the *requirements* in this section.

When DDM-2000/**SLC**-2000 receives a RTRV-COND command message from the OS, DDM-2000/**SLC**-2000 shall respond with separate lines reflecting the active status conditions, if any, for each facility and/or equipment AID requested. For each AID, DDM-2000/**SLC**-2000 shall report the current status condition type (CONDTYPE (TYPEREP per TR-833, Issue 4)) from Table C.2.0.

This command retrieves all active status conditions, in a line-by-line format very similar to the autonomous REPT EVT messages used to report the status conditions upon occurrence.

In response to the RTRV-COND command message DDM-2000/**SLC**-2000 shall generate an output message that includes *all* active status conditions associated with the DDM-2000/**SLC**-2000, including the active miscellaneous discrete environmental status conditions, unless the RTRV-COND command message specifies that the response be limited to the specified AID.

The RTRV-COND command response shall include the same active status conditions that are included in the DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report, except status conditions reflecting far-end activity and communication failure status conditions (i.e., loss of communication between the GNE and one or more remote DDM-2000s/**SLC**-2000s).

Only active status conditions pertaining to the DDM-2000/**SLC**-2000 to which the TL1 RTRV-COND command is addressed (by TID) will be included in the TL1 RTRV-COND response message. The UIR RETRIEVE-ALARM (and STATUS) report is expected to include at most one line indicating a communication failure status even if more than one of the remote network elements is non-communicative. The DDM-2000/**SLC**-2000 UIR RETRIEVE-NETWORK MAP report will indicate *which* remote network elements are non-communicative.

Apparently, as of DDM-2000 OC-3 R3, DDM-2000 OC-12 R1, and DDM-2000 OC-12 Regenerator R2, the TL1 RTRV-COND response only includes status conditions that are reported in TL1 autonomous messages for conditions whose alarm level is user-provisionable, i.e., DS1, DS3, EC1 and miscellaneous discrete environmental status conditions, *not all* status conditions, thus this requirement is not currently met. Yellow and AIS status conditions *might* be included, also. DDM-2000 OC-3 R5 adds the DS1 synchronization reference and OC-3 R6 the OCn line protection switch status standing conditions (SC) (except protection switch resets).

Any status condition reported upon occurrence by an autonomous REPT EVT message with CONDEFF = SC (Standing Condition), which is active when a RTRV-COND message is received shall be included in the RTRV-COND response message (except communication failures as noted in the previous requirement).

Active status conditions may be included in the TL1 RTRV-COND response message that are not reported to the OS in autonomous REPT EVT messages, but miscellaneous discrete environmental *controls* are not included in any TL1 RTRV-COND response messages.

When DDM-2000/**SLC**-2000 receives a RTRV-COND command message from the OS, DDM-2000/**SLC**-2000 should respond with separate lines for each facility and/or equipment AID requested. For each AID, DDM-2000/**SLC**-2000 should report the current state condition type from Table C.4.

The state condition types in Table C.4 are different than the condition types used in the autonomous REPT ALM and REPT EVT messages and in the responses to RTRV-ALM command messages (those condition types are specified in Tables C.2.0 and C.2.1).

Using state condition types in RTRV-COND response messages enables DDM-2000/**SLC**-2000 to report the status of components of DDM-2000/**SLC**-2000 that are operating normally and thus do not appear in response to the RTRV-ALM command message, e.g., IS-NR-ACT. Also, state condition types enable DDM-2000/**SLC**-2000 to report protection switching status and the provisioned state of facilities and equipment.

NOTE:
This command is available to maintenance users starting with DDM-2000 OC3 R9.1, OC-12R5.1, and FiberReach R2.1.

INPUT FORMAT

RTRV-COND[-z]:[a]:[b]:c::[d],[e],[f][,g];
(DDM-2000 OC-3 R6.0, OC-12 R2.0, OC-12 Regen. R2, and earlier only)

RTRV-COND-z:a:[b]:c::[d],[e],[f][,g];
(DDM-2000 OC-3 R6.1, OC-12 R2.1, and later)

Command modifier (z) required per MR 5931, and
TID (a) required per DDM-2000 MR 6463.

LIST OF INPUT PARAMETERS

z = command code modifier

a = TID

b = AID

c = CTAG

d = CONDTYPE (TYPEREQ per TR-833, Issue 4)

e = LOCN

f = DIRN

g = TMPER

DESCRIPTION OF INPUT PARAMETERS

z = command code modifier:

The command code modifier will typically have one of the following values: EQPT, "rr", COM, or ALL.

Initially, DDM-2000/**SLC**-2000 shall accept and limit the response to the RTRV-COND command to the equipment (if z = EQPT), to the specified facility type (if z = "rr", e.g., T3), to the common equipment (if z = COM), or include everything (if z = ALL, null or other).

For example, if a RTRV-COND-STS1 command is received, DDM-2000/**SLC**-2000 would only include status conditions with AIDTYPE = STS1 (which does not include EC-1 conditions with AIDTYPE = EC1) in the response message. (z = EQPT is allowed even though there may not be any such equipment status conditions initially, the need may arise in the future, e.g., for equipment protection switch status.)

As in previous releases, DDM-2000/**SLC**-2000 shall accept and limit the response to the RTRV-COND command to the equipment (if z = EQPT), to the specified facility type (if z = "rr", e.g., T3), to the common equipment (if z = COM), or include everything (if z = ALL). The difference in this requirement is that DDM-2000/**SLC**-2000 shall *not* accept null or other than the supported values.
This change in requirements is based on USWest's specific request (less emphasis on DDM-2000/**SLC**-2000 user-friendliness, thus better TR-833 compliance will be achieved).

Unlike previous releases, if the command code modifier is null or other than the supported values, DDM-2000/**SLC**-2000 shall *not* provide a normal command response.

a = TID:

b = AID:

DDM-2000/**SLC**-2000 shall accept and limit the information included in the RTRV-COND response message based on the slot AID, if any, included in the command message.

The AID parameter will specify the slot AID for which the current status conditions are requested. Note, the use of *slot* AIDs is based on the DDM-2000/**SLC**-2000 user interface (for RETRIEVE-ALARM consistency).

If the AID parameter value is ALL, invalid, or conflicts with command code modifier, DDM-2000/**SLC**-2000 shall ignore the AID value and respond to the OS without limiting the output response based on the input AID value.

If command code modifier is COM, ALL, null or other, DDM-2000/**SLC**-2000 shall respond to the OS without limiting the output response based on the input AID value, if any.

If command code modifier is COM or ALL, AID is expected to be null or ALL, respectively.

c = CTAG:

d = CONDTYPE (TYPEREQ per TR-833, Issue 4); e = LOCN; f = DIRN; g = TMPER:

DDM-2000/**SLC**-2000 is not required to support CONDTYPE (TYPEREQ per TR-833, Issue 4), LOCN, DIRN and TMPER parameters for RTRV-COND commands.

If a RTRV-COND message is received with non-null values for CONDTYPE (TYPEREQ per TR-833, Issue 4), LOCN, DIRN or TMPER parameters, DDM-2000/**SLC**-2000 shall still respond to the OS without limiting the output response based on those input parameter values.

NORMAL OUTPUT FORMAT

If there are no conditions to report:

<SID> <date> <time>
M c COMPLD;

If there are conditions to report:

<SID> <date> <time>
M c COMPLD
["[h][,i]:[j],k,[l],[m],[n],[o],[p][,q],[r]"]...
"[h][,i]:[j],k,[l],[m],[n],[o],[p][,q],[r]";

Each line reporting an active status condition shall be output in the same order as the UIR RETRIEVE ALARM (and STATUS) report.

LIST OF OUTPUT PARAMETERS

h = AID

i = AIDTYPE

j = NTFCNCDE

k = CONDTYPE (TYPEREP per TR-833, Issue 4)

l = SRVEFF

m = OCRDAT

n = OCRTM

o = LOCN

p = DIRN

q = TMPER

r = CONDDESCR

DESCRIPTION OF OUTPUT PARAMETERS

c = CTAG:

The following parameter values shall be included/repeated as applicable to the status condition reported in each separate line in the body of the response message:

h = AID:

AID shall be the Access Identifier of the reported status condition. AID may only be null if AIDTYPE = COM.

Refer to the description of the new TR-833, Issue 4, requirement that AID not be null, near the end of Section C.1 of this Appendix.

i = AIDTYPE:

AIDTYPE is the type of access identifier and shall have one of the following values (the same as the valid values of the message modifier included in the input command, except when the message modifier is ALL):

EQPT	- Equipment (even though there may not be any such equipment status conditions initially, the need may arise in the future, e.g., for equipment protection switch status)
rr	- Facility (see Table C.1)
COM	- Common

j = NTFCNCDE:

NTFCNCDE is the notification code and shall have the value NA.

NTFCNCDE is the notification code and should have one of the following values, also:

CR	- Critical alarm
MJ	- Major alarm
MN	- Minor alarm
NR	- Not Reported when the event occurs, i.e., normal in-service status conditions.

k = CONDTYPE (TYPEREP per TR-833, Issue 4):

CONDTYPE is the status condition type and shall have the applicable value from Table C.2.0.

CONDTYPE is the state condition type and should have the applicable value from Table C.4.

l = SRVEFF:

SRVEFF is the effect on service and shall have the following value:

NSA	- Nonservice-affecting status condition, action may be required

SRVEFF is the effect on service and should have one of the following values, also:

SA	- Service-affecting alarm condition, immediate action required
NSA	- Nonservice-affecting alarm or status condition, action may be required

m = OCRDAT; n = OCRTM:

The OCRDAT and OCRTM parameters shall be used as specified in the General Section of this Appendix.

q = TMPER

The TMPER parameter shall always be null for RTRV-COND responses.

r = CONDDESCR:

CONDDESCR is the detailed text description of the status condition and shall have the same value as the description (CONDDESCR) in the autonomous REPT EVT message used to report the condition upon its occurrence. (That description is also the same as is used in the DDM-2000/**SLC**-2000 UIR RETRIEVE-ALARM (and STATUS) report, and would be applicable to any status conditions that may not be reported in an autonomous REPT EVT message upon occurrence.)

The CONDDESCR text description shall be enclosed within a pair of escaped quotes (\").

ERROR OUTPUT

Initially, if a command message is parsed by DDM-2000/**SLC**-2000 enough to recognize it as a RTRV-COND command message and a valid CTAG is recognized, DDM-2000/**SLC**-2000 shall respond with *all* active status conditions. That is, no additional (beyond the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1) error response messages shall apply.

Unlike previous releases, if DDM-2000/**SLC**-2000 receives a RTRV-COND command with a command code modifier other than EQPT, a supported "rr" value, COM, or ALL, the following error response shall be returned to the OS:

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

RELATED TL1 MESSAGES

REPT ALM

REPT ALM ENV

REPT EVT

NAME

RETRIEVE-CROSSCONNECT-rr: RETRIEVE-CROSSCONNECT-rr

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1
- OC-12 Release 4.0
- FiberReach Release 1.0.

DESCRIPTION

RTRV-CRS-*rr*: Retrieve STS-1/STS-3c/VT-1.5 cross-connection associated with the specified access identifier. Support for this command is available starting in DDM-2000, OC-3 Release 6.1, OC-12 Release 4.0 and FiberReach R1.0

RTRV-CRS-*rr* command can be initiated by a TL1 user to have the NE to retrieve VT-1.5, STS1 (in releases 2.2, 3.1 and later releases) and STS-3c (in release 3.1 and later releases) cross-connections in the case of FiberReach, STS-1/STS-3c/VT-1.5 cross-connections in the case of DDM-2000 OC-3, and STS-1 and STS-3c cross-connections in DDM-2000 OC-12 Add/Drop or Ring systems. Cross-connections in DDM-2000 are always two-way in the sense that each cross-connection represents both transmit and receive.

Refer to the ENT-CRS-*rr* command description for details on the restrictions on cross-connections in the DDM-2000 Add/Drop Rings Terminal for Path Protection Switched Rings.

When the NE receives a **RTRV-CRS-***rr* command, it will retrieve the cross-connections of the specified level (STS-1/STS-3c/VT-1.5) associated with the specified entity.

If main slot 1 and slot 2 are equipped with different pack types (i.e. during upgrade), the report will include data for what is considered at the time as the valid system pack type.

NOTE:
This command is available to maintenance users starting with DDM-2000 OC3 R9.1, OC-12R5.1, and FiberReach R2.1.

INPUT FORMAT

RTRV-CRS-*modifier*:*tid*:*aid*:*ctag*;

DESCRIPTION OF INPUT PARAMETERS

modifier This is the message modifier for the **RTRV-CRS-***rr* message and may only have one of the following values:

STS1 This specifies that an STS-1 cross-connection be retrieved. Applicable in DDM-2000 OC-3 and OC-12 ring and linear releases, and FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases.

STS3C
This specifies that an STS-3c cross-connection be retrieved. Applicable in DDM-2000 OC-12 releases starting from 5.0, DDM-2000 OC-3 releases starting from 11.0, and FiberReach Wide-Band Shelf releases starting from 3.1. (Applicable only when the shelf is equipped with 28-type OLIU circuit packs in its Main unit slots, and 22-type OLIU circuit packs in its function unit slots.)

VT1 This specifies that a VT-1.5 cross-connection be retrieved. Applicable in DDM-2000 OC-3 ring and linear releases and DDM-2000 FiberReach Wide-Band Shelf (WBS) rleases.

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

aid Access identifier. The *aid* is a required parameter and must address a valid STS-1/STS-3c/VT-1.5 channel in the high speed OC-n line or low speed port or channel of the DDM-2000 in order to be accepted. For the valid *aid*s for OC-3 and OC-12 systems, see the appropriate versions of the DDM-2000 User Service Manual.

ctag Correlation tag. This is included in the command by the user and is repeated by DDM-2000 in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

When "all" option is used in the *aid* field of the input command, the DDM-2000 will report each cross-connection just once. (i.e. DDM-2000 will not report a cross-connection and then repeat the same cross-connection once again with the *src_aid* and *dest_aid* reversed)

If DDM-2000 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 OUTPUT PARAMETERS** section. The requirements listed there apply to this command also.

src_aid Source access identifier. This is the AID of the STS-1/STS-3c/VT-1.5 line channel or low speed port or channel specified in the **RTRV-CRS-***rr* command.

dest_aid Destination access identifier. This is the destination address of the STS-1/STS-3c/VT-1.5 channel in the high speed OC-n line or low speed port or channel that is cross connected to the *src_aid*.

cct Cross-connection type. This parameter specifies the type of cross-connection for DDM-2000, and will have 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.

LOCKED This value is returned only by DDM-2000 OC-3 ring systems (release 9 and later) and FiberReach systems. This specifies a locked cross-connection in which a single channel received from only one rotation of the path switched ring (specified by the **RING** parameter) is dropped to a low speed channel.

COV This value is reported only by OC-12 release 5.0 and beyond ring systems, when the *modifier* is STS3C. This represents that two independent STS-3c signals received from the two receive fibers of a single OC-3 or IS-3 LS interface are being added independently to the two directions of a single STS-3C channel (timeslot) in the OC-12 ring.

RTV This value is reported only in OC-12 release 5.0 and beyond ring systems, when the *modifier* is STS3C. This represents that two independent STS-3c signals received from the two directions of a single STS-3c channel on the OC-12 ring are being dropped independently to the two transmit fibers of a single OC-3 or IS-3 LS interface while also continuing those signals on the ring.

RING If the cct is **2WAYBR** or **LOCKED**, then this parameter will be specified. It will have one of the following two values:

M1 Ring 1

M2 Ring 2

If the cct is **2WAYBR**, then this parameter will be specified. It will have one of the following two values:

MB1 Ring 1

MB2 Ring 2

EXAMPLE INPUT/OUTPUT

The following example illustrates the retrieval of a two-way (add/drop) cross-connection associated with the STS-1 channel in the high speed OC-3 line m-2:

```
rtrv-crs-sts1:ATT-DDM-2000-3:m-2:123456;


IP 123456
<


   ATT-DDM-2000-3 93-11-26 16:42:11
M  123456 COMPLD
   "m-2,b::2WAY"
;
```

The following example illustrates the retrieval of a non-existent cross-connection associated with the STS-1 channel in the high speed OC-3 line m-2:

```
rtrv-crs-sts1:ATT-DDM-2000-3:m-2:123456;


IP 123456
<


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

The following example illustrates the retrieval of a two-way pass-through cross-connection associated with the VT-1.5 line channel m-2-5-6 in a DDM-2000 OC-3 Path Switched Ring.

```
rtrv-crs-vt1:ATT-DDM-2000-3:m-2-5-4:Z89abc;


IP Z89abc
<


   ATT-DDM-2000-3 93-11-26 16:53:22
M  Z89abc COMPLD
   "m-2-5-4,m-2-5-4::2WAYPR"
;
```

The following example illustrates the retrieval of a two-way pass-through cross-connection associated with the VT-1.5 line channel m-1-5-6 in a FiberReach system:

```
rtrv-crs-vt1:ATT-DDM-2000:m-1-5-6:Z89abc;


IP Z89abc
<


   ATT-DDM-2000 93-11-26 16:53:22
M  Z89abc COMPLD
   "m-1-5-6,m-1-5-6::2WAYPR"
;
```

The following example retrieves a drop-and-continue cross-connection associated with a low speed port b-6-2 in an OC-3 system:

```
rtrv-crs-vt1:ATT-DDM-2000-3:b-6-2:654321;


IP 654321
<


   ATT-DDM-2000-3 93-11-26 16:54:33
M  654321 COMPLD
   "b-6-2,m-1-1-1::2WAYBR:RING=M1"
;
```

The following example retrieves a RTV cross-connection associated with a low speed channel b-1 (within an OC-3 interface) in an OC-12 system:

```
rtrv-crs-sts3c:ATT-PF-2000:b-1:654321;


IP 654321
<


   ATT-PF-2000 93-11-26 16:54:33
M  654321 COMPLD
   "b-1,mb-4::RTV"
;
```

The following example retrieves a drop-and-continue cross-connection associated with a low speed port b-2 in an OC-12 system:

```
rtrv-crs-sts1:ATT-DDM-2000:b-2:654321;


IP 654321
<


   ATT-DDM-2000 93-11-26 16:54:33
M  654321 COMPLD
   "b-2,mb-1::2WAYBR:RING=MB2"
;
```

The following example retrieves a two-way (add/drop) cross-connection associated with a low speed port c-2 in a DDM-2000 OC-12 ring system (recall that there is no DDM-2000 OC-12 linear system that supports Add/Drop):

```
rtrv-crs-sts1:ATT-DDM-2000:c-2:654321;


IP 654321
<


   ATT-DDM-2000 93-11-26 16:54:33
M  654321 COMPLD
   "c-2,mb-6::2WAYPR"
;
```

The following example retrieves all STS-1 cross-connections in a DDM-2000 OC-12 ring system as follows (Note that the HS channels mb-8 and mb-9 and the LS channels b-2, b-3, c-2, and c-3 have no associated cross-connections. Note also that it is implied that function slot d is unequipped):

```
rtrv-crs-sts1:ATT-DDM-2000:all:654321;


IP 654321
<


   ATT-DDM-2000 93-11-26 16:54:33
M  654321 COMPLD
   "mb-1,mb-1::2WAYPR"
   "mb-2,mb-2::2WAYPR"
   "mb-3,a-1::2WAYPR"
   "mb-4,b-1::2WAYPR"
   "mb-5,c-1::2WAYPR"
   "mb-6,a-2::2WAYPR"
   "mb-7,a-3::2WAYPR"
   "mb-10,mb-10::2WAYPR"
   "mb-11,mb-11::2WAYPR"
   "mb-12,mb-12::2WAYPR"
;
```

The following example retrieves a STS-3c cross-connection associated with a low speed channel b (within an OC-3 interface) in an OC-12 system:

```
rtrv-crs-STS3C:ATT-DDM-2000:b:654321;


IP 654321
<


   ATT-DDM-2000 93-11-26 16:54:33
M  654321 COMPLD
   "b,mb-10::RTV"
;
```

The following example retrieves all of the STS-3c cross-connections in an OC-3 R11.0, or later, system equipped with OC-12 HS interfaces:

```
rtrv-crs-STS3C:ATT-DDM-2000:all:654321;


IP 654321
<


   ATT-DDM-2000 93-11-26 16:54:33
M  654321 COMPLD
   "m-4,m-4::2WAYPR"
   "m-10,m-10::2WAYPR"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to this command also. In addition to the non-message-specific error found in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses are those that DDM-2000 checks for each condition.

If DDM-2000 OC-12 receives an **RTRV-CRS-***rr* command with a command code modifier other than STS1 or *STS3C*, the following error response is returned to the user:

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

If DDM-2000 OC-3 receives an **RTRV-CRS-***rr* command with a command code modifier other than STS3C, STS1 or VT1, the following error response is returned :

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

If a FiberReach system receives an **RTRV-CRS-*rr*** command with a command code modifier other than VT1, the following error response is returned :

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

If a FiberReach system receives an **RTRV-CRS-*rr*** command with a command code modifier other than VT1, or STS1, the following error response is returned :

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

If a FiberReach system receives an **RTRV-CRS-***rr* command with a command code modifier other than VT1, STS1, or STS3C, the following error response is returned :

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

If the NE receives an **RTRV-CRS-***rr* command with a command code modifier and an *aid* combination not supported by the system, (for example, **RTRV-CRS-***STS3c* command sent to an DDM-2000 OC-12 system which does not have 24G-U OLIU in Main) the following error response is returned :

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

If the NE receives a **RTRV-CRS-***rr* command with an *aid* that is incorrect or not supported by the system, then following error response is returned :

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

DEPARTURE FROM TR-199 Issue 2

Following summarizes departures from TR-199 Issue 2:

- *Spec_block* data parameter RING not in TR-199 Issue 2 has been defined and used here.
- *cct*s **COV** and **RTV** not in TR-199 Issue 2 have been defined and used here.

RELATED TL1 MESSAGES

ENT-CRS-rr

DLT-CRS-rr

NAME

RTRV-EQPT: Retrieve Equipment. This command displays the circuit pack type and version information.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

INPUT FORMAT

RTRV-EQPT*:tid:aid:ctag;*

DESCRIPTION

NOTE:
This command is available to all users.

This command is issued to the Network Element (NE) to retrieve the circuit pack and version number information for one or more slots. Starting with FiberReach Release 2.1, it provides information on the protection mode as well.

When the NE receives a **RTRV-EQPT** command from the user, the NE will display the circuit pack and version number information for the requested slot(s).

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. *aid* determines slot address whose equipage is to be reported.
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

In response to a valid **RTRV-EQPT** command, the following output report is returned to the user similar to the CIT/CIT-PC output.

```
   sid date time
M  ctag COMPLD
   "aid::spec_block"
       .       .       .       .       .       .       .
       .       .       .       .       .       .       .
   "aid::spec_block"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR** OUTPUT PARAMETERS section. The requirements listed there apply to the **RTRV-EQPT** command also. In addition, the following requirements pertaining to the output parameters also apply to **RTRV-EQPT**.

aid Access identifier. This is the address of the slot and shelf for which equipage is being reported.

spec_block

Specific block. This parameter field is used for returning the current equipage information for the slot or quad. 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.

It should be noted, however, that the Network Elements will return the parameter within the *spec_block* in the following order:

DDM-2000: TYPE, APP, SSN, CLEI, ECI, SLN, VRSN, PID

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.

In DDM-2000 OC-3 R6.1, 7.1, 9.0, 9.1 and OC-12 R2.1, 3.1, for shelves, this field contains the Equipment Code (ED-Code for DDM-2000 OC-3 systems).

`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.

`CLEI` The Common Language Equipment Identifier† 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.

`PID` The Program IDentification code identifies the version of the firmware on one or more socketed devices on the circuit pack.

`PROTMODE` In DDM-2000 FiberReach R2.1, the Protection Mode identifies whether the shelf is equipped for 1X1 or 1X7 protection. It is expressed in parameter value pairings as either PROTMODE=1X1 or PROTMODE=1X7. No aid is associated with this parameter. This information will appear only when the address range specified in the input command contains one or more low speed slots.

The NE will include in its response equipage information on only equipped slots.

---

† COMMON LANGUAGE is a registered trademark and CLEI, CLLI, and CLFI are trademarks of Bell Communication Research, Inc.

The NE 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.

If the circuit pack in an equipped slot is removed, declared failed, or replaced with a pack of different type, the TYPE of the provisioned (removed/failed) circuit pack is retained and reported in the normal fashion except in some specific cases where it is reported as specified elsewhere in this document. The CLEI value is lost and reported as a dash ("-") indicating that data is unavailable. The CLEI is reported other than a dash in some specific cases where error conditions are reported by the NE as specified elsewhere in this document.

Question marks (?) are used in the parameter value fields to indicate that the information is unknown (unrecognized circuit pack, unable to read version information from a circuit pack inserted into a slot in the AUTO state, for example).

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 correct 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 the information for a circuit pack since that LS CP never getting power prior to removal, then the TYPE field will be set to ? and the CLEI field will be set to CP_removed_version_information_unavailable

If the system cannot report complete the information for a circuit pack since that LS DS1 CP does not have a MXRVO or STS1E-HS pack in the corresponding function slot, then the CLEI field will be set to CP_not_allowed_-_eqpt

If the system cannot report complete the information for a circuit pack since that LS DS1 CP 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 the information for a circuit pack since that LS DS1 CP is present but not powered but was powered once, then the TYPE field will be set to the expected 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 the legal pack but the actual CP type and the database do not match, then the TYPE will be set to the expected pack type and the CLEI will be set to installed_CP_(*act_name*)_does_not_match_inventory.

If the DDM-2000 FiberReach R2.0 system detects a mismatch between the software and the mode of the installed protection assembly, then the CLEI will be set to installed_protection_assembly_does_not_match_mode.

If the DDM-2000 FiberReach R2.0 system has its software expects a protection assembly, but is not installed with one, then the CLEI will be set to no_protection_assembly_installed.

When the *aid* of the slot in the input command is SYSCTL, the Network Element will return the equipage information for both SYSCTL and OHCTL *aid*s.

The program version information is reported whenever the report includes information on a circuit pack on which a downloadable program is stored.

EXAMPLE INPUT/OUTPUT

The following example for DDM-2000 OC-3 R6.1, 7.1 requests the equipage in the entire system:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "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=680153,SLN=92MV04583664  PID=AEKCG"
   "main-1::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=93MV03577681"
   "main-2::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=92MV08570294"
   "fn-a-1::TYPE=DS3,APP=BBG4,SSN=S1-2,CLEI=SNCLBBBAAB,ECI=670496,SLN=89MV03680918"
   "fn-a-2::TYPE=DS3,APP=BBG4,SSN=S1-1,CLEI=SNCLBBBAAA,ECI=663938,SLN=90MV11065879"
   "fn-b-1::TYPE=MXRVO,APP=25MC,SSN=25Iss,CLEI=25CLEI,ECI=25CECI,SLN=25Ser"
   "fn-c-1::TYPE=MXRVO,APP=BBG2,SSN=S1-1,CLEI=SNCMAAOAAA,ECI=663642,SLN=90MV07010198"
   "ls-b-1::TYPE=DS1,APP=3MC,SSN=3Iss,CLEI=3CLEI,ECI=3CECI,SLN=3Ser"
   "ls-c-1::TYPE=DS1,APP=6MC,SSN=6Iss,CLEI=6CLEI,ECI=6CECI,SLN=6Ser"
   "sysctl::TYPE=SYSCTL,APP=BBG5,SSN=S2-2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
   VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
   "auxctl::TYPE=OHCTL,APP=BG7,SSN=S2-2,CLEI=DMPQ002AAA,ECI=676733,SLN=91MV07643421,
   VRSN=70.4.5,PIDa=AEGGH,PIDb=AADDS"
;
```

The following DDM-2000 OC-3 R9.1 example requests the equipage in the entire system where the system is equipped with a group 4 shelf:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "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=680153,SLN=92MV04583664  PID=AEKCG"
   "main-1::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=93MV03577681"
   "main-2::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=92MV08570294"
   "fn-a-1::TYPE=DS3,APP=BBG4,SSN=S1-2,CLEI=SNCLBBBAAB,ECI=670496,SLN=89MV03680918"
   "fn-a-2::TYPE=DS3,APP=BBG4,SSN=S1-1,CLEI=SNCLBBBAAA,ECI=663938,SLN=90MV11065879"
   "fn-b-1::TYPE=MXRVO,APP=25MC,SSN=25Iss,CLEI=25CLEI,ECI=25CECI,SLN=25Ser"
   "fn-c-1::TYPE=MXRVO,APP=BBG2,SSN=S1-1,CLEI=SNCMAAOAAA,ECI=663642,SLN=90MV07010198"
   "ls-b-1::TYPE=DS1,APP=3MC,SSN=3Iss,CLEI=3CLEI,ECI=3CECI,SLN=3Ser"
   "ls-c-1::TYPE=DS1,APP=6MC,SSN=6Iss,CLEI=6CLEI,ECI=6CECI,SLN=6Ser"
   "sysctl::TYPE=SYSCTL,APP=BBG5,SSN=S2-2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
   VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
   "auxctl::TYPE=OHCTL,APP=BG7,SSN=S2-2,CLEI=DMPQ002AAA,ECI=676733,SLN=91MV07643421,
   VRSN=70.4.5,PIDa=AEGGH,PIDb=AADDS"
   "shelf::TYPE=,APP=ED-8C724-30,SSN=G4,CLEI=,ECI=,SLN="
;
```

The following DDM-2000 OC-3 R9.1 example requests the equipage in the entire system, where the system is equipped with a group 3 shelf:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


  LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
  "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=680153,SLN=92MV04583664  PID=AEKCG"
  "main-1::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=93MV03577681"
  "main-2::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=92MV08570294"
  "fn-a-1::TYPE=DS3,APP=BBG4,SSN=S1-2,CLEI=SNCLBBBAAB,ECI=670496,SLN=89MV03680918"
  "fn-a-2::TYPE=DS3,APP=BBG4,SSN=S1-1,CLEI=SNCLBBBAAA,ECI=663938,SLN=90MV11065879"
  "fn-b-1::TYPE=MXRVO,APP=25MC,SSN=25Iss,CLEI=25CLEI,ECI=25CECI,SLN=25Ser"
  "fn-c-1::TYPE=MXRVO,APP=BBG2,SSN=S1-1,CLEI=SNCMAAOAAA,ECI=663642,SLN=90MV07010198"
  "ls-b-1::TYPE=DS1,APP=3MC,SSN=3Iss,CLEI=3CLEI,ECI=3CECI,SLN=3Ser"
  "ls-c-1::TYPE=DS1,APP=6MC,SSN=6Iss,CLEI=6CLEI,ECI=6CECI,SLN=6Ser"
  "sysctl::TYPE=SYSCTL,APP=BBG5,SSN=S2-2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
  VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
  "auxctl::TYPE=OHCTL,APP=BG7,SSN=S2-2,CLEI=DMPQ002AAA,ECI=676733,SLN=91MV07643421,
  VRSN=70.4.5,PIDa=AEGGH,PIDb=AADDS"
  "shelf::TYPE=,APP=ED-8C724-30,SSN=G3 or Earlier,CLEI=,ECI=,SLN="
;
```

The following DDM-2000 FiberReach example requests the equipage in the entire system:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "main-1::TYPE=OLIU,APP=26G-U,SSN=S1-1,CLEI=SNTRFBXDAA,ECI=200320,SLN=94MV11057853"
   "main-2::TYPE=OLIU,APP=26G-U,SSN=S1-1,CLEI=SNTRFBXDAA,ECI=200320,SLN=94MV11057859"
   "ls-a-1::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578358"
   "ls-a-2::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578458"
   "ls-c-1::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578458"
   "sysctl::TYPE=SYSCTL,APP=BBG8,SSN=S2-2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
   VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
   "auxctl::TYPE=USPNL"
   "::PROTMODE=1X1"
;
```

The following DDM-2000 FiberReach example requests the equipage in the

entire system, but the system is not equipped with a protection assembly:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "main-1::TYPE=OLIU,APP=26G-U,SSN=S1-1,CLEI=SNTRFBXDAA,ECI=200320,SLN=94MV11057853"
   "main-2::TYPE=OLIU,APP=26G-U,SSN=S1-1,CLEI=SNTRFBXDAA,ECI=200320,SLN=94MV11057859"
   "ls-a-1::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578358"
   "ls-a-2::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578458"
   "ls-c-1::TYPE=DS1,APP=BBF1B,SSN=S3-4,CLEI=SNCLAA1AAB,ECI=682891,SLN=92MV09578458"
   "sysctl::TYPE=SYSCTL,APP=BBG8,SSN=S2-2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
   VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
   "auxctl::TYPE=USPNL"
   "::PROTMODE=1X7,CLEI=no_protection_assembly_installed"
;
```

The following DDM-2000 OC-3 R6.1, 7.1 example requests the equipage in the entire system while a condition specified in the requirement exists in slot fn-a-2:

```
rtrv-eqpt:LT-PF-2000:all:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "tg-1::TYPE=TGS,APP=BBF2B,SSN=S1-1,CLEI=SNPQAJCAAA,ECI=680153,SLN=2MV09625458,PID=AEKCG"
   "main-1::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=93MV03577681"
   "main-2::TYPE=OLIU,APP=22F,SSN=S1-2,CLEI=FNUMG00CAB,ECI=680085,SLN=92MV08570294"
   "fn-a-1::TYPE=DS3,APP=BBG4,SSN=S1-2,CLEI=SNCLBBBAAB,ECI=670496,SLN=89MV03680918"
   "fn-a-2::TYPE=DS3,CLEI=illegal_CP_type"
   "fn-b-1::TYPE=MXRVO,APP=25MC,SSN=25Iss,CLEI=25CLEI,ECI=25CECI,SLN=25Ser"
   "fn-c-1::TYPE=MXRVO,APP=BBG2,SSN=S1-1,CLEI=SNCMAAOAAA,ECI=663642,SLN=90MV07010198"
   "ls-b-1::TYPE=DS1,APP=3MC,SSN=3Iss,CLEI=3CLEI,ECI=3CECI,SLN=3Ser"
   "sysctl::TYPE=SYSCTL,APP=BBG5,SSN=S2:2,CLEI=DMPQ00WAAA,ECI=676731,SLN=91MV04670097,
   VRSN=70.4.5,PIDa=AEGGK,PIDb=AADDS"
   "auxctl::TYPE=OHCTL,APP=BG7,SSN=S2-2,CLEI=DMPQ002AAA,ECI=676733,SLN=91MV07643421,
   VRSN=70.4.5,PIDa=AEGGH,PIDb=AADDS"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **RTRV-EQPT** command also.

If the NE receives a **RTRV-EQPT** command without an *aid* or with an invalid *aid* the following error response is returned to the user:

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

If the NE receives the **RTRV-EQPT** command with an *aid* that points to a slot that is not equipped, then the NE will return the following response to the user:

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

TL1 RELATED COMMANDS

None

NAME

RTRV-FEAT: Retrieve Feature

This message is generically defined for LUCENT Product Family 2000 (PF-2000) products. Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- Fiber Reach **1.0**

INPUT FORMAT

RTRV-FEAT:*tid*::*ctag*[:[:]]];

DESCRIPTION

The **RTRV-FEAT** command can be initiated to retrieve the list of active feature options enabled.

NOTE:
This TL1 command is available to all users.

INPUT PARAMETERS

tid	Target identifier. This is the name of the Network Element (NE) to which the command is addressed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the NE fully complies with the **RTRV-FEAT** request, the following normal completion response is returned.

```
IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "feature-option"
   ...
   "feature-option"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Parameters that specifically apply to this command response are defined below.

tid Target Identifier. This is the system name.

feature-option
This is the name of the feature enabled. Possible values are:

- `sts3c` This feature allows STS-3c service (concatenated signals) to be supported. For OC-3 systems, only linear releases are supported, starting with Release 8.0.
- `vtpm` This feature provides performance-monitoring of cross-connected VT1.5 services
- `ds1pm` This feature provides performance-monitoring of cross-connected (dropped) DS1 services in ring systems.
- `null` If no feature options are active, the parameter has a null value

EXAMPLE OUTPUT

The following example shows a DDM-OC3 linear system with sts3c (STS-3c Concatenation mode for transmission) enabled, ds1pm (performance monitoring of DS1 channels) enabled, and vtpm (performance monitoring of VT1.5 channels) enabled.

```
RTRV-FEAT:LT-PF-2000::123456:::;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "ds1pm"
   "vtpm"
   "sts3c"
;
```

The following example shows a DDM-OC3 system with no feature options enabled.

```
RTRV-FEAT:LT-PF-2000::123456:::;

IP 123456
<

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

The following example shows an OC12 system with sts3c (STS-3c Concatenation mode for transmission) enabled:

```
RTRV-FEAT:LT-PF-2000::123456:;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "sts3c"
;
```

For OC-3, the following example shows a FiberReach system with ds1pm (performance monitoring of DS1 channels) enabled and vtpm (performance monitoring of VT1.5 channels) enabled.

```
RTRV-FEAT:LT-PF-2000::123456:;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "ds1pm"
   "vtpm"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-FEAT** command also.

RELATED TL1 COMMANDS

ENT-FEAT

NAME

RTRV-FECOM: Retrieve Far End Communications

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach Release **1.0**

INPUT FORMAT

RTRV-FECOM:*tid*:[aid]:*ctag*[:[:]];

DESCRIPTION

The **RTRV-FECOM** command can be initiated to retrieve the provisioned state of a Network Element's (NE) section data communication channel (DCC) and/or IAO LAN interface.

NOTE:
This TL1 command is available to all users.

INPUT PARAMETERS

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

aid The default value is **dcc-all** when the aid is null.

For valid DCC (and IAO LAN) AID addresses, see Table 3-8.

Valid Linear Addresses: **dcc-{m,a,b,c,all}**
Valid OC-1 Ring Addresses: **dcc-{m,a,b,c}{1,2}-{1,2,all}**
Valid Addresses: **dcc-{m1,m2,all}**
Valid Ring Addresses (1+1): **dcc-{mb1,mb2,a,b,c,d,all}**
Valid Ring Addresses (dual 0x1): **dcc-all, dcc-{mb1,mb2,1,a2,b1,b2,c1,c2,d1,d2}**

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

OUTPUT FORMAT

If the NE fully complies with the RTRV-FECOM request, the following Far End communication output report is given; details on parameter values are given below:

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11

   "DCC-address:communications,side"
   .          .         .
   .          .         .
   "DCC-address:communications,side"
;
```

For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, with an IOA LAN interface, the following output report is given; details on parameter values are given below:

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11

   "DCC-address:communications,side"
   .          .         .
   .          .         .
   "DCC-address:communications,side"
   "LAN-address:communications"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below:

DCC-Address
- This parameter displays the address of the DCCs and IAO LAN for which information was requested. DCCs for unequipped ports are not listed.

Communications
- This parameter shows whether communications over the DCC is enabled or disabled. For DDM-2000 OC-3 R13.0, OC-12 R7.0, and later, this parameter also shows whether communications over the IAO LAN is enabled or disabled.

side - Side (network-side / user-side) are parameter settings available to identify the setting of each end of the DCCs in the NE. 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 the span may be designated as the network-side.

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-FECOM** command for a FiberReach system where the DCC communications for main-1 are enabled and the DCC communications for main-2 are disabled. Main-1 DCC has been set to user-side, and main-2 DCC has been set to network-side. Information is requested for all DCCs.

```
RTRV-FECOM:LT-PF-2000:dcc-all:123456;

IP 123456
<
   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD

   "dcc-m1:enabled,user-side"
   "dcc-m2:disabled,network-side"
;
```

The following example shows a **RTRV-FECOM** command for a OC-3 system where the DCC communications for main-1 and main-2 are enabled and the DCC communications for function unit c are enabled. Main-1 DCC has been set to user-side, and main-2 DCC has been set to network-side. Information is requested for all DCCs.

```
RTRV-FECOM:LT-PF-2000::123456;


IP 123456
<
   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD

   "dcc-m1:enabled,user-side"
   "dcc-m2:enabled,network-side"
   "dcc-c:enabled,network-side"
;
```

The following example shows a **RTRV-FECOM** command for a OC-3 system Information is requested for the IAO LAN.

```
RTRV-FECOM:LT-PF-2000:lan:123456;


IP 123456
<
   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD

   "lan:enabled"
;
```

ERROR RESPONSE

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

RELATED TL1 COMMANDS

ENT-FECOM

NAME

RTRV-HDR: Retrieve Header

Support for this comand is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 2.1
- OC-12 R1.1
- FiberReach R1.0

INPUT FORMAT

(DDM-2000 OC-3 Release 6.0, OC-12 Release 2.0, and earlier): **RTRV-HDR**:[*tid*]::*ctag*;

(DDM-2000 OC-3 Release 6.1, OC-12 Release 2.1, FiberReach R1.0, and later: **RTRV-HDR**:*tid*::*ctag*;

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-HDR commands can be initiated to request that the Network Element (NE) return a normal completion response.

This command may be used as a "keep-alive" signal.

INPUT PARAMETERS

tid Target identifier. This is the name of the NE to which the command is addressed. In DDM-2000 OC-3 R6.0, OC-12 R2.0, and earlier, when the *tid* entry is optional, if no *tid* is given, the command is interpreted to be addressed to the GNE.

In DDM-2000 OC-3 R7.2, 8.0. 9.0, OC-12 R5.0, and FiberReach R1.0, the *tid* is a case insensitive character string of up to 20 characters. The allowed ASCII characters are letters "A" through "Z" and "a" through "z", numbers "0" through "9", and special characters: "#" (pound), "%" (percent), "+" (plus), "-" (hyphen), and "." (period).

ctag Correlation tag. In DDM-2000 OC-3 R2.1, OC-12 R1.1, this is included in the command and is repeated by the NE in the response to associate the command and response messages.

Valid values for *ctag* include strings of up to 6 alphanumeric characters.

OUTPUT FORMAT

After receiving this command, the following normal completion response is returned:

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

OUTPUT PARAMETERS

sid	Source identifier (or Target identifier, *tid*). This is the system name.
date	Date output message is generated. This has the format YY-MM-DD (year-month-day).
time	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.
ctag	Correlation tag. This is included in the command and repeated by the Network Element in the response to associate the command and response messages.
COMPLD	This indicates that the command has been completed.

EXAMPLE INPUT/OUTPUT

```
RTRV-HDR:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 94-10-26 16:42:11
M  123456 COMPLD
;
```

ERROR RESPONSES

The following error conditions are not unique to the **RTRV-HDR** command but may apply to any TL1 command received by the Network Element. When the TL1 security feature is enabled, the GNE only responds for another addressed NE if the user is logged into the GNE; however, a user does not have to be logged into the GNE to get an error response from a remote NE.

In DDM-2000 OC3 R3.2, 6.0, OC-12 R1.2, 2.0, and FiberReach R1.0, if a Gateway Network Element (GNE) receives a command, but

1. its buffer is full,
2. it's undergoing initialization,
3. TL1 command processing is terminated *before any* of that command response is put in the TL1 command/response *output* buffer,
4. or In DDM-2000 OC-3 R11.x, OC-12 R5.x, and earlier only, when OSI is supported on the DCC and the GNE can not establish an OSI association with the addressed remote NE.

instead of returning an in-progress (IP) acknowledgement, the following repeat later acknowledgement is returned:

```
RL ctag
<
```

In DDM-2000 OC3 R3.2, 6.0, OC-12 R1.2, 2.0, if a GNE 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 (**;**), instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the GNE:

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

For DDM-2000 OC-3 Release 6.1, OC-12 Release 2.1, and later, if a GNE receives a command for which a *tid* value (non-null) is *required* but no *tid* value is included, instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the GNE:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, TID must be specified */
;
```

For DDM-2000 OC-3 Release 2.1, DDM-2000 OC-12 Release 1.1, and earlier, if a GNE receives a command but cannot parse the command for a *tid* value (a null *tid* value is acceptable), instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the GNE:

```
   sid date time
M  ctag DENY
   IICM
   /* Invalid Command, DDM-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.

In DDM-2000 OC-3 R2.1, OC-12 R1.1, and OC-12 Regenerator R2.0, and later, if a GNE receives a command with a syntactically incorrect *tid* value, instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the GNE:

```
   sid date time
M  ctag DENY
   IITA
   /* Invalid TID, unallowed characters or too long */
;
```

If a GNE receives a command (other than **RTRV-HDR**) with valid *tid* value but the addressed remote NE is temporarily unable to communicate with the GNE due to exhaustion of allocated resources at either the GNE or remote Network Element, instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the addressed NE:

```
   sid date time
M  ctag DENY
   SARB
   /* Status, All Resources Busy */
;
```

In DDM-2000 OC3 R2.1, OC-12 R1.1, and OC-12 Regenerator R2.0, if a GNE receives a command but cannot recognize a valid *ctag* value (including a missing end-of-message semicolon (**;**) when the *ctag* is the last supported input parameter, for example, **RTRV-HDR:***tid*::*ctag*"), instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the addressed NE:

```
   sid date time
M  0 DENY
   IICT
   /* Input Correlation Tag (CTAG) Invalid */
;
```

The *ctag* value "0" in the error response only applies if the input *ctag* is null or not discernible. If a non-null but invalid *ctag* is included in the command, the same *ctag* value is included in the error response.

For DDM-2000 OC-3 Release 11.x, OC-12 Release 5.x and earlier, if a DDM-2000 GNE receives a command with an unknown *tid* value (a *tid* value that does not exist in the GNE's subnetwork), instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the GNE:

```
   sid date time
M  ctag DENY
   IITA
   /* Unknown TID */
;
```

For DDM-2000 OC-3 Release 6.0, OC-12 Releases 2.0, and earlier, if a DDM-2000 GNE receives a command with valid *tid* and *ctag* values but the addressed remote NE is temporarily unable to communicate with the GNE, no error response or acknowledgement is returned.

The GNE was compatible with Bellcore's NMA 3.4.1 and earlier which interprets any response (even an acknowledgement) to a **RTRV-HDR** command as a keep-alive signal. However, to accommodate Bellcore's OPS/INE (which forced a change in NMA, also), the

following applies.

For DDM-2000 OC-3 Releases 6.1 to 11.x, and OC-12 Releases 2.1 to 5.x, and later, if a DDM-2000 GNE receives a command with valid *tid* and *ctag* values but the addressed remote NE is temporarily unable to communicate with the GNE, instead of returning an in-progress (IP) acknowledgement, the following error response is returned, using the *sid* value of the addressed remote NE:

```
   sid date time
M  ctag DENY
   IITA
   /* Remote communication failure */
;
```

For DDM-2000 OC-3 Release 6.0, OC-12 Release 2.0, and earlier, if the NE receives a TL1 command other than those supported, the following error response is returned, using the *sid* value of the addressed NE:

```
   sid date time
M  ctag DENY
   IICM
   /* Invalid Command, PF-2000 does not support Command = xxxxxxxxxxxxxxx */
;
```

where PF-2000 is the actual product name and *xxxxxxxxxxxxxxx* is the first 16 characters, or up to the end-of-message semicolon (**;**) if less than 16 characters, of the command received.

For DDM-2000 OC-3 Release 6.1, OC-12 Release 2.1, FiberReach R1.0, and later, if the NE receives a TL1 command other than those supported, the following error response is

returned, using the *sid* value of the addressed NE:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, Network Element does not
      support Command = xxxxxxxxxxxxxxx */
;
```

where *xxxxxxxxxxxxxxx* is the first 16 characters, or up to the end-of-message semicolon (**;**) if less than 16 characters, of the command received.

For DDM-2000 OC-3 R6.1, OC-12 R2.1, FiberReach R1.0, and later, when the TL1 security feature is enabled, if the NE receives a command requiring a privilege higher than that of the user issuing the command, the following error response is returned, using the *sid* value of the addressed NE:

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

For DDM-2000 OC-3 Release 5.0, OC-12 Release 1.0, and earlier, if a DDM-2000 GNE times out awaiting the response to a command addressed to another NE in the GNE's subnetwork, the following error response is returned, using the *sid* value of the addressed NE:

```
   sid date time
M  ctag DENY
   SDNR
   /* Command Timed Out */
;
```

For DDM-2000 OC-3 R4.0, OC-12 R2.0, and FiberReach R1.0, and OC-12 Regenerator R2.0, if the NE receives any TL1 command (except **RTRV-PM**) for which it is unable to complete the request due to internal system processing problems, the following error response is returned, using the *sid* value of the addressed NE:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

If DDM-2000 OC-3 Release 6.1, OC-12 Release 2.1, and FiberReach R1.0, and later, receive a command with a command code modifier other than those listed as allowable for the input parameter *modifier*, the following error response is returned, using the *sid* value of the addressed NE:

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

For DDM-2000 OC-3 R4.0, OC-12 R2.0, FiberReach R1.0, and OC-12 Regenerator R1.0, and later, if the NE receives a command with any extra (beyond the command-specific input format specification) null or non-null command parameter blocks (:), parameters (,), or termination characters (;), or if a command with a name-defined parameter block includes an invalid parameter *name* label, the following error response is returned:

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

The NE does accept and ignore some extra non-null entries in some **RTRV** commands only.

For DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, if a command is received that is longer than 488 characters, the following error response is returned:

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

Typically the TL1-GNE will be the first to determine a TL1 command is too long, thus will be responding for an RNE. In other cases, the TL1-GNE may support longer TL1 message lengths than the RNE, thus the RNE will determine a TL1 command is too long sometimes, too.

RELATED TL1 MESSAGES

None.

NAME

RTRV-LOG: Retrieve-Log

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

RTRV-LOG:*tid*::*ctag*;

DESCRIPTION

The **RTRV-LOG** command can be initiated by users to retrieve the history log for the Network Element (NE). This report contains up to 500 of the most recent events. Events include the start and end of alarm and status conditions, and all craft/OS input activities that affect or would affect the state of the network element, successfully completed or denied.

The history log displays the events in last in-first out order, and each event is time stamped.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If there is event data to report, the following output message is returned:

```
IP ctag
<

sid date time
M ctag COMPLD
  "aid:evtdate,evttime:[almlvl],evt_desc"
  "aid:evtdate,evttime:[almlvl],evt_desc"
     .      .
     .      .
     .      .
  "aid:evtdate,evttime:[almlvl],evt_desc"
;
```

If there is no event data to report, the following output message is returned:

```
IP ctag
<

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**. Additional parameters that specifically apply to this command response are defined below.

aid Access Identifier. The *aid* identifies the source of the event.

Refer to Tables 3-1. 3-2 and 3-3 for a list of valid addresses. The source of an event may also be a user login identifier.

evtdate Event Date. This is the date on which the event occurred. It is reported in MM-DD format, where 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.

Normally the events are displayed in order of date/time-stamp with the most recent event being displayed first and the oldest being displayed last. If the system clock is reset, however the date and time stamps may be displayed in monotonically decreasing order.

evttime Event Time. This is the time at which the event occurred. It is reported in HH-MM-SS format, 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.

Entries are aded to the history log **before** any applicable holdoff delays and **after** any applicable clear delays.

almlvl This is the alarm level of the system immediately after the event. It takes one of the following values.

- CR

  Alarm
- MJ

  Alarm
- MN

  Alarm
- ABN
  Abnormal Condition
- NE_ACTY
  Near End Activity
- FE_ACTY
  Far End Activity
- STATUS
  Status

If there is no alarm level to report, nothing is reported for this field.

The alarm level reported is not necessarily related to the event or condition described in the report entry. The alarm level reported is the highest alarm level active or pending in the system when the condition is reported.

evt_desc Event Description. This is a brief description of each event. The event description may be any of the alarm and status condition descriptions in Table 3-4 at the end

of this section or those included in the table that follows.

Also, all CIT and Tl1 commands that affect the state of the system (provisioning commands, protection switching commands, loopbacks, transmission tests and alarm tests) may appear in the report.

The following table lists the meaning and likely cause of each of the messages that appear in the maintenance history report.

In addition to the messages listed here, any of the messages that appear in the alarm and status report can appear in the history report to record the onset of alarm and status conditions.

Also, all CIT and TL1 commands that affect the state of the system (provisioning commands; protection switching commands; loopbacks; transmission, alarm, and telemetry tests) will appear in the report.

NOTE:
Any messages that appear in the RTRV-ALM report may also appear in the history report.

Table: RTRV-HSTY Descriptions

Description	Meaning
2nd CP required clrd	A second circuit pack has been inserted into the empty function unit slot. The BBF3 (DS1PM) or BBF6 (T1EXT) circuit pack requires both function unit slots in the group to be equipped.
-48V power/fuse good	A failed -48 volt power feeder or a failed fuse on the user panel has been repaired.
CP removed	A circuit pack has been removed from the specified slot.
3DS3 CP good	The failure of the specified circuit pack has cleared.
3DS3 CP inserted	A circuit pack was inserted into the shelf.
3STS1E CP inserted	A circuit pack was inserted into the shelf.
AC power failed-FE clrd	The AC power supply to a remote terminal cabinet has been restored.
AC power good	The AC power supply to the shelf has been restored.
AGNE communication good	An AGNE communication failure has been cleared. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0 In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore, since the "AGNE communication failure" is no longer detected in those releases.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
APS - CP failed	An automatic protection switch was done because the system detected a circuit pack failure.
APS - Fn failure	Starting with OC-3 Release 11.0, This means that there exists at least one local Hairpin Add-Drop cross-connect established between Fn-X and Fn-Y, where Fn-X contains a 27G2-U OLIU circuit pack. An automatic protection switch on the Main circuit packs (CPs) was done because the system detected a circuit pack failure/removal of a 27G2-U in Fn-X-1/2, which caused the Main packs to switch as well. **NOTE:** The APS of Mains did not take place in this case because of a Main CP failure
APS - OC3c Data intf failed	An automatic protection switch was done because the system detected a failure of the OC3C data interface on the BBG21 circuit pack. Use the rtrv-state-eqpt command to view the current state of this circuit pack.
APS - LAN Data intf failed	An automatic protection switch was done because the system detected a failure of one or more native mode LAN interfaces associated with the BBG21 circuit pack. Use the rtrv-state-eqpt command to view the current state of this circuit pack.
APS - automatic lock reset	The automatic protection switch lock for a DS1 or T1EXT circuit pack has been released.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
APS channel good	A failure of the SONET automatic protection switching channel has cleared.
APS - sig. degraded	An automatic protection switch was done because the system detected a degraded signal on the OC-N line or path.
APS - sig. failed	An automatic protection switch was done because the system detected a failure of the OC-N line or path (incoming AIS, loss of signal, or bit error rate higher than 10^{-3}).
auto switch	An automatic protection switch of a DS1 or T1EXT circuit pack is active. When the failure that caused the switch to be done clears, the switch will be reset automatically. Likely causes: Protected failure or removal of a DS1 or T1EXT CP.
auto sync. mode switch	An automatic protection switch of the synchronization mode is active. When the failure that caused the switch to be done clears, the switch will be reset automatically if automatic mode switching is enabled. (See the **set-sync** and **rtrv-sync** commands.)

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`BBF5 required in LS-4 clrd`	A BBF5 jumper pack has been inserted into low-speed slot 4 of a function group that has a pair of 27G2-U OLIUs installed in the corresponding function unit slots. The BBF5 is required for transmission cross-coupling between the 27G2-U OLIUs in group 3 (and earlier) shelves. If a function unit pair is equipped with the BBG21 native mode lan circuit packs (ELAN) a BBF5 in low-speed slot 4 is required to transmit status information between the working and standby circuit pack.
`BBF5 required in LS-8 clrd`	A BBF5 jumper pack has been inserted into low-speed slot 8 of a function group that has a pair of 27-type OLIUs installed in the corresponding function unit slots. The BBF5 is required for correct DCC operation for the 27-type OLIUs in group 3 (and earlier) shelves.
`CIT timeout`	A craft interface terminal (CIT) session was automatically terminated because there was no activity on the CIT for the provisioned time. (See the **`set-secu`** command.)
`communication good`	A communication failure has cleared. The system can now communicate, via the SONET section DCC, with another system with which it had previously lost communication. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0 In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore,since the "communication failure" is no longer detected in those releases.
`control`**`n`** `rlsd`	The system has released the specified miscellaneous discrete environmental control because it has been requested to do so through the serial telemetry or discrete telemetry interface. This message will appear only in a remote terminal. Any name may be provisioned in place of the `control`**`n`** part of this message.
`cpy-prog compl.`	The software copy procedure has been completed. This message will show at the source NE.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
disconnect	The craft interface terminal has been disconnected.
dlt-ulsdcc compl.	Starting with OC-3 Release 13.0 OC-12 Release 7.0 FiberReach Release 3.0 and later TARP releases, this event will indicate the deletion of provisionable parameters of Layer 4 (that is, deletion of TARP Adjacent NE from the Manual Adjacency list, deletion of a TARP Data Cache entry).
DS1 CP good	The failure of the specified circuit pack has cleared.
DS1 CP inserted	A circuit pack was inserted into the shelf.
DS1 port in service	A DS1 port was put in the in-service state. This happens automatically when an incoming signal is detected (coming from the DSX) unless the port has been provisioned to the not monitored state.
DS1 or T1 port in service	A DS1 or T1 port was put in the in-service state. This happens automatically when an incoming signal is detected (coming from the DSX or T1 interface) unless the port has been provisioned to the "not monitored" state.
DS1 sync. ref. port in service	A DS1 External timing reference was automatically put in the in-service state because an incoming DS1 signal was detected.
DS1PM CP good	The failure of the DS1PM circuit pack has cleared.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
DS1PM CP inserted	A DS1PM circuit pack was inserted into the shelf.
DS3 CP good	The failure of the DS3 CP has been cleared. This is applicable starting with FiberReach Release 3.1
DS3 CP inserted	A DS3 circuit pack was inserted into the shelf. This is applicable starting with FiberReach Release 3.1
TMUX CP good	The failure of the TMUX CP has been cleared.
TMUX CP inserted	A TMUX circuit pack was inserted into the shelf.
DS3 port in service	A DS3 port was put in the in-service state. This happens automatically when an incoming signal is detected (coming from the DSX) unless the port has been provisioned to the not monitored state. Starting with FiberReach Release 3.1, this event is applicable if the Function unit slots are equipped with DS3 circuit packs.
DSNE not reachable clrd	The DSNE not reachable alarm has been cleared and communication has been restored between the DSNE and other network elements in the subnetwork, or other NE(s) can now reach the DSNE. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0 In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore,since the "DSNE not reachable" is no longer detected in those releases.
duplicate DSNE clrd	One of the duplicate DSNE shelves has been reprovisioned to no longer be a DSNE. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0 In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore,since the "duplicate DSNE" is no longer detected in those releases.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`duplicate site/ne address clrd`	A shelf has been reprovisioned and no longer has the same site or NE address as any other shelf in the network. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0, In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore, since the "duplicate site/ne address" is no longer detected in those releases.
`duplicate TID clrd`	A shelf has been renamed and no longer has the same TID as any other shelf in the network. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0 In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore,since the "duplicate TID" is no longer detected in those releases.
`duplicate TBOS display clrd`	A shelf has been reprovisioned and no longer has the same TBOS display number as any other shelf in the network. In OC-3 Release 9.8, 13.0, In OC-12 Release 7.0, In FiberReach Release 3.0 and later TARP releases, this event will not appear in the history report anymore,since the "duplicate TBOS display" is no longer detected in those releases.
`EC1 port in service`	An EC1 port has been placed in the in-service state.
`ELAN CP good`	The failure of the specified native mode LAN interface circuit pack has cleared.
`ELAN CP inserted`	An ELAN circuit pack was inserted into the shelf in the specified slot.
`enable auto OS messages`	Autonomous OS message reporting has been enabled with theTL1 command **`alw-msg`**.
`environment`**`n`**` rlsd`	The specified miscellaneous discrete environment alarm input point has been released, indicating that an environmental alarm or status condition has cleared. This message will appear only in a remote terminal. Any name may be provisioned in place of the `environment`**`n`** part of this message.
`externalMinor clrd`	The external minor alarm condition has cleared.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
fan control relay good	The fan control relay on the SYSCTL CP was failed but is now operating properly to turn on the fans.
fan shelf good	A fault on the fan shelf has been cleared.
frequency error clrd	The frequency offset failure has been cleared.
holdover mode clrd	The system is no longer in holdover timing mode. It has switched from holdover mode to the provisioned timing mode (either LoopTimed or phaselocked to an External DS1 timing reference). (LoopTimed).
inc. DS1 good	A failure of the DS1 signal coming from the DSX or T1 interface is cleared.
inc. DS1 sync. ref. good	A failure of the External DS1 timing reference is cleared.
inc. (from fiber) DS3 AIS clrd	The system is no longer detecting DS3 AIS (alarm indication signal) in the DEMUX direction (that is, coming from the fiber). Starting with FiberReach Release 3.1, this event is applicable if the Function unit slots are equipped with DS3 circuit packs.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
inc. DS3 good	A failure of the DS3 signal coming from the DSX is cleared. Starting with FiberReach Release 3.1, this event is applicable if the Function unit slots are equipped with DS3 circuit packs.
inc. (from fiber) DS3 OOF clrd	A DS3 out-of-frame (OOF) condition in the DEMUX direction (coming from the fiber) is cleared. Starting with FiberReach Release 3.1, this event is applicable if the Function unit slots are equipped with DS3 circuit packs.
inc. EC1 FERF clrd	The system is no longer detecting an EC-1 far end receive signal failure (FERF) signal.
inc. EC1 good	A failure of the EC-1 signal has been cleared.
inc. (from DSX) DS3 AIS clrd	The system is no longer detecting DS3 AIS (alarm indication signal)in the MUX direction (that is, coming from the DSX-3). This is applicable to the TMUX (BBG20) circuit pack only.
inc. (from DSX) DS3 OOF clrd	A DS3 out-of-frame (OOF) condition in the MUX direction (coming from the DSX-3) is cleared. This is applicable to the TMUX (BBG20) circuit pack only.
inc. EC1 line AIS clrd	The EC-1 alarm indication signal (AIS) is no longer being received. A downstream failure has cleared.
inc. EC1 sig. degrade (BER) clrd	A failure of the specified EC-1 signal has cleared.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`inc. OC12 FERF clrd`	The system is no longer detecting the OC-12 far end receive failure (FERF) signal.
`inc. OC12 good`	A failure of the OC-12 signal from the DSX has been cleared.
`inc. OC12 LOP STS1 #`*`x`* `clrd`	The system is no longer detecting a loss-of-pointer (LOP) condition on the specified STS-1 signal.
`inc. OC12 sig. degrade clrd`	A failure of the specified OC-12 signal has cleared. OC-12 line AIS and/or OC-12 line FERF conditions may still be present on the specified OC-12 line. The OC-12 LOP condition may still be present for one or more of the STS-1 signals in the OC-12 line.
`inc. OC12 line AIS clrd`	The system is no longer detecting the OC-12 alarm indication signal (AIS) on the specified OC-12 line.
`inc. OC3 FERF clrd`	The system is no longer detecting the OC-3 far end receive failure (FERF) signal. This event is applicable starting with FiberReach 2.2 and 3.1, when the shelf is equipped with 28-type OLIUs in the Main unit slots.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`inc. OC3 good`	A failure of the OC-3 line has been cleared. This message is associated with the 28-type OLIUs in Main; available in FiberReach 2.2, 3.1 and later.
`inc. OC3 LOP STS1 #x clrd`	The system is no longer detecting a loss-of-pointer (LOP) condition on the specified STS-1 signal.
`inc. OC3 sig. degrade clrd`	A failure of the specified OC-3 signal has cleared. OC-3 line AIS and/or OC-3 line FERF conditions may still be present on the specified OC-3 line. The OC-3 LOP condition may still be present for one or more of the STS-1 signals in the OC-3 line. This message is associated with the 28-type OLIUs in Main; available in FiberReach 2.2, 3.1 and later.
`inc. OC3 line AIS clrd`	The system is no longer detecting the OC-3 alarm indication signal (AIS) on the specified OC-3 line. This message is associated with the 28-type OLIUs in Main; available in FiberReach 2.2, 3.1 and later.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`inc. OC1 FERF clrd`	The system is no longer detecting the OC-1 far end receive failure (FERF) signal.
`inc. OC1 good`	A failure of the OC-1 line has been cleared.
`inc. OC1 sig. degrade clrd`	A failure of the specified OC-1 signal has cleared. OC-1 line AIS and/or OC-1 line FERF conditions may still be present on the specified OC-1 line. The OC-1 LOP condition may still be present for the STS-1 signal in the OC-1 line.
`inc. OC1 line AIS clrd`	The system is no longer detecting the OC-1 alarm indication signal (AIS) on the specified OC-1 line.
`inc. STS1 AIS clrd`	The STS-1 alarm indication signal (AIS) is no longer being received. An upstream failure (in the MUX direction) has cleared.
`inc. STS1 LOP EC1 clrd`	A loss-of-pointer condition on the STS-1 signal of the EC-1 line has been cleared.
`inc. STS1 LOP OC12` *`slot`* `clrd`	The system is no longer detecting a loss-of-pointer (LOP) condition on the specified STS-1 signal.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`inc. STS1 LOP OC3 slot clrd`	The system is no longer detecting a loss-of-pointer (LOP) condition on the specified STS-1 signal. Starting with FiberReach Release 3.1, this event is applicable if the shelf is equipped with 28-type OLIUs in the Main unit slots, and 22-type OLIUs in the Function unit slots (used for 0X1 STS-3c).
`inc. STS1 LOP OC1 slot clrd`	The system is no longer detecting a loss-of-pointer (LOP) condition on the specified STS-1 signal.
`inc. STS1 sig. degrade clrd`	A failure of the specified STS-1 has cleared.
`inc. STS1 sig. failed clrd`	A failure of the specified STS-1 signal has cleared.
`inc. STS1 unequipped clrd`	A failure of the specified STS-1 signal has cleared.
`inc. STS1 yellow clrd`	The STS-1 yellow signal is no longer being received.
`inc. VT AIS clrd`	The VT alarm indication signal (AIS) is no longer being received. A downstream failure (in the MUX direction) has cleared
`inc. VT LOP clrd`	A loss-of-pointer condition on the VT1.5 signal has been cleared.
`inc. VT sig. degrade clrd`	Failure of the specified VT1.5 signal has cleared.
`inc. VT unequipped clrd`	A failure of the specified VT1.5 signal has cleared.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`inc. VT yellow clrd`	The VT yellow signal is no longer being received from the fiber (in the DEMUX direction).
`ins-prog compl.`	The software installation procedure has been completed. This message will show at the source NE.
`Intersubsystem link clrd`	In a *MegaStar* 2000 system, the active SONET subsystem can communicate with the RADIO subsystem.
`login:` *`login_id`*	A login session with a user's login identification has been started on the specified CIT port.
`login:` *`login_id DENY`*	A login session was attempted but denied because of an invalid login and password pair, or the system was in Lockout state.
`logout:` *`login_id`*	A login session with a user's login identification has ended on the specified CIT port.
`logout:` *`login_id DISCONNECT`*	A login session with a user's login identification has ended by a disconnect on the specified CIT port.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
low speed prot mode chgd to 1x1	The low-speed protection mode has been changed from 1x7to 1x1. This was accomplished by changing the low speed protection assembly and executing a system reset.
low speed prot mode chgd to 1x7	The low-speed protection mode has been changed from 1x1to 1x7. This was accomplished by changing the low speed protection assembly and executing a system reset.
ls prot assembly removed clrd	The alarm indicating that the system was reset with no low-speed protection assembly installed has been cleared.
ls prot mode not chgd clrd	The alarm indicating a failed attempt to change the low-speed protection mode has been cleared. If the low-speed protection mode has been changed, a separate history log event will document the change.
main-{1,2} protection switch	Equipment switching in a ring application has occurred due to equipment failure.
MXRVO CP good	The failure of the specified circuit pack has cleared.
MXRVO CP inserted	A circuit pack was inserted into the shelf.
NCT CP good	The failure of the specified circuit pack has cleared.
NCT CP inserted	A circuit pack was inserted into the shelf.
NCT2 CP good	The failure of the specified circuit pack has cleared.
NCT2 CP inserted	A circuit pack was inserted into the shelf.
OHCTL CP good	The internal equipment failure of the OHCTL circuit pack has cleared.
OLIU CP good	The failure of the specified circuit pack has cleared.
OLIU CP inserted	A circuit pack was inserted into the shelf.
protection CP different clrd	The alarm indicating that a low-speed protection slot contains a circuit pack that cannot protect all of the service slots has been cleared. Note that the condition that caused the alarm may not have been removed.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`remote session logout`	A remote CIT session (set up by the `rlgn` command) has been terminated. This may have been caused by normally logging out of the remotely accessed far end session, or once in the far end session, the user toggled back and logged out of the local session.
`remote session terminated`	A remote CIT session (set up by the `rlgn` command) has been abnormally terminated. This may have been caused by a failure of the controller, circuit pack failure, timeout, or any other abnormal termination at the far end NE.
`reset`	The system software program has been reset.
`rlgn:`*`login_id DENY`*	A remote login session was attempted but denied because of an invalid login and password pair, or the DCC connecting the remote system was in Lockout state.
`STS1 channel in service`	An STS1 channel was put in the in-service state. This happens automatically when a "good" signal is detected on the channel (neither AIS, unequipped signal, nor "loss of pointer" condition is present), unless the channel has been provisioned to the "not monitored" state.
`STS1E CP good`	The failure of the specified STS1E circuit pack has cleared.
`STS1E CP inserted`	An STS1E circuit pack was inserted into the shelf.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`switch reset`	— An automatic protection switch of a DS1 or T1EXT circuit pack been automatically reset. — The system has switched from holdover synchronization mode to the provisioned synchronization mode (`LoopTimed` or `phaselocked` to an `External` DS1 timing reference). (`LoopTimed`). or — A manually initiated protection switch has been reset (by the **`switch-sync`**, **`switch-line`**, **`switch-fn`**, or **`switch-ls`** command), or **`switch-tsi`** command), or by removing a CP from the shelf.
`sysctl crs map recovered`	A read failure of the cross-connection data base occurred during restart, but the backup copy was recovered and is being used.
`sysctl crs map initialized`	A read failure of the cross-connection data base occurred during restart, and recovery using backup copies also failed. The cross-connection map was initialized.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
`sysctl channel states initialized`	A read failure of the channel state date base occurred during restart, and recovery using backup copies also failed. The channel state data on SYSCTL was used.
`sysctl port states initialized`	A read failure of the port state data base occured during restart, and the recovery using backup copies also failed. The port state data on SYSCTL was used.
`T1EXT CP good`	The failure of the specified circuit pack has cleared.
`T1EXT CP inserted`	A circuit pack was inserted into the shelf.
`TID address map clrd`	An error indicating that the TID address map has exceeded the size of the DSNE database has been cleared. In TARP releases, this event will not appear in the history report anymore, since the it is no longer detected in those releases.

Table: RTRV-HSTY Descriptions (Contd)

Description	Meaning
TGS CP good	The failure of the specified circuit pack has cleared.
TG3 CP inserted	A circuit pack was inserted into the shelf.
TSI CP good	The failure of the specified circuit pack has cleared.
TSI CP inserted	A circuit pack was inserted into the shelf.
SYSCTL/PDC link good	The link between the SYSCTL and the PDC has been restored.
VT channel in service	A VT channel was put in the in-service state. This happens automatically when a "good" signal is detected on the channel (neither AIS, unequipped signal, nor "loss of pointer" condition are present), unless the channel has been provisioned to the "not monitored" state.
VTU CP good	The failure of the specified circuit pack has cleared.
VTU CP inserted	A circuit pack was inserted into the shelf.

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-LOG** command for a NE.

```
rtrv-log:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 98-10-26 16:42:11
M  123456 COMPLD
   "line-1w:10-26,06-20-20:,"line auto switch-cleared""
   "line-1w:10-26,06-10-20:CR,"incoming OC-48 LOF-cleared""
   "line-1w:10-26,05-40-41:CR,"line auto switch""
   "line-1w:10-26,05-40-40:CR,"Incoming OC-48 LOF""
   "LUC01:05-08,05-40-20:,"set-OC3:ls-1a""
;
```

ERROR RESPONSES

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

RELATED TL1 COMMANDS

None

NAME

RTRV-MAP: Retrieve Map.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.2 through 7.2 only and OC-12 Release 2.2 through 3.x only (for linear systems)
- OC-3 Release 7.1 through 7.2 only and OC-12 Release 3.1 through 3.x only (for rings)

INPUT FORMAT

RTRV-MAP*:tid::ctag[::];*

DESCRIPTION

This command is issued to a Network Element (NE) to retrieve the topological map of the subnetwork, including a list of the systems in the subnetwork, their connectivity to the local system, and the communication status to each system.

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. The *ctag* is a required parameter.

OUTPUT FORMAT

In response to a valid **RTRV-MAP** command, the following output report is returned:

```
   sid date time
M  ctag COMPLD
   "spec_block"
       .       .       .       .       .       .       .
       .       .       .       .       .       .       .
   "spec_block"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **RTRV-MAP** command also. In addition, the following requirements pertaining to the output parameters also apply to **RTRV-MAP**.

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 parameters are listed and explained below.
It should be noted, however, that the NE will return the parameters within the *spec_block* in the following order: **TID, CONNECTION, NEIGHBOR, DCCSTATUS, GNE**.

TID This field contains the Target Identifier of another system in the subnetwork.

CONNECTION This field indicates the address of the OC-3 or OC-12 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 can take on the values of Yes or No and indicates whether the identified system ia 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 can take on the value of failed to indicate the status of the Data Communications Channel from the local system. This field is

omitted from the output report if the **DCCSTATUS** is good for the identified systems.

GNE This field can take on the value of Yes or No to indicate the system identified by the **TID** field is serving as the TL1 GNE. This field is omitted for the 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; i.e. the node at which the command is entered.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example requests the map of the subnetwork that the local system is a part of:

```
rtrv-map:LT-PF-2000::123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "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=Site5NE1,CONNECTION=fn-c,NEIGHBOR=yes"
   "TID=Site2NE1,CONNECTION=fn-c,NEIGHBOR=no,DCCSTATUS=failed"
;
```

The following DDM-2000 OC-12 example requests the map of the subnetwork that the local system is a part of:

```
rtrv-map:LT-PF-2000::123456;


IP 123456
<


  LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
  "TID=local_system,GNE=y"
  "TID=Site7NE1,CONNECTION=mainb-1,NEIGHBOR=yes"
  "TID=Site3NE1,CONNECTION=mainb-2,NEIGHBOR=yes"
  "TID=Site4NE1,CONNECTION=mainb-2,NEIGHBOR=no"
  "TID=Site6NE1,CONNECTION=mainb-1,NEIGHBOR=no,DCCSTATUS=failed"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **RTRV-MAP** command also.

If the NE receives a **RTRV-MAP** with an otherwise valid set of input parameter values but the command could not be completed by the NE, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

RELATED TL1 COMMANDS

ENT-SYS

NAME

RTRV-MAP-NEIGHBOR: Retrieve Map Neighbor.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 for linear systems
- OC-3 Release 7.2 and OC-12 Release 5.0 for rings
- DDM-2000 FiberReach Release 1.0.

INPUT FORMAT

RTRV-MAP-NEIGHBOR*:tid::ctag;*

DESCRIPTION

NOTE:
This command is available to all users.

This command will retrieve a list of all Network Elements (NEs) that are immediate DCC and/or IAO LAN neighbors to the local NE.

The NE will return a report containing the Target IDentifiers (or TIDs) of every NE that is directly connected (via the DCC or IAO LAN) to that NE, including the connectivity between each one of those NE's and the local NE, as well as other information.

Beginning with DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, if this command is issued to an NE provisioned as a Level 1 IS, the report will list all neighboring NEs provisioned as Level 2 (if any) and/or Level 1 ISs within the local Area.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, if this command is issued to an NE provisioned as a Level 2 IS, the report will list all neighboring NEs provisioned as Level 2 (if any) and/or Level 1 ISs within the local Area as well as other Level 2 IS neighbors in other Areas. If this command is issued to an NE that is not provisioned as a Level 2 IS, the report will only list the neighboring NEs that are in its own area.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, if there is a DCC or IAO LAN failure between the local NE and its neighboring NE, the neighbor NE entry will not appear in the report.

In DDM-2000 OC-3 R11.x, OC-12 Release 5.x only, FiberReach Release 2.x and earlier, if the "DSNE not reachable" alarm condition exists, none of the NEs in the subnetwork can be identified as a DSNE. When this condition exists, remote operations and the neighbor map reporting continue operating using the local last known good information.

INPUT PARAMETERS

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

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

OUTPUT FORMAT

In response to a valid **RTRV-MAP-NEIGHBOR** command, the following output report is returned to the user:

```
   sid date time
M  ctag COMPLD
   "spec_block"
       .       .       .
       .       .       .
   "spec_block"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. The additional parameter that specifically applies to this command response is described below:

spec_block Specific parameter 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 parameters are listed and explained below.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the parameters within the *spec_block* will be in the following order for the local NE: TID, NSAP, LEVEL, PRODTYPE.

In DDM-2000 OC-3 R11.x, OC-12 R5.x, and FiberReach R2.x, and earlier, the NE will return the parameters within the *spec_block* in the following order for the local NE: TID, LINKSTATUS, PRODTYPE, THRU.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0 and later, the parameters will be in the following order for a remote NE: `TID, NSAP, THRU, LEVEL`.

In DDM-2000 OC-3 R11.x, OC-12 R5.x, and FiberReach R2.x, and earlier, the parameters will be in the following order for a remote NE: `TID, LINKSTATUS, PRODTYPE`.

`TID` In DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, and FiberReach R1.0, this is the Target Identifier of the NE. The TID in the first entry of the report will be the local NE. If the NE is unable to determine a TID for a reachable NSAP, the parameter/value will be "`TID=?`".

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach 3.0 and later, the TIDs for neighbors are determined by real-time TARP NSAP-to-TID queries even if TARP Data Cache is enabled. If some neighboring NEs have duplicate TIDs, they will both be listed in the report.

`LINKSTATUS` In DDM-2000 OC-3 R11.x, OC-12 R5.x and Fiberreach R2.x and earlier, this field can take on the values of `good`, `FAIL`, `DISABLED`, or `?` and indicates the status of the Data Communications Channel from the local system to the neighboring NE. This field can be omitted from the output report if the `LINKSTATUS` is `good` for the identified systems.

When the DCC link has failed, report entry for that neighbor NE will be shown using the last known good information.

If a node included in a subnetwork is already registered by the DSNE when LOS or DCC failure occurs between it and any other NE that the DSNE knows about, this event will cause either NE at any end of the failed DCC to show the other NE at the other end of the failed DCC in its **`RTRV-MAP-NEIGHBOR`** report using the last known good information and a "`LINKSTATUS=`*`fail`*`"` parameter/value.

If a link has been disabled from the local node with a **`SET-FECOM`** command, the neighboring node with the disabled link is shown in the report and the "`LINKSTATUS=`*`disabled`*`"` parameter/value is shown in the report. If a link

has been disabled from the neighbor node with a **SET-FECOM** command, the local node has no way of knowing this; the neighboring node is shown and the "LINKSTATUS=*fail*" parameter/value is shown in the report.

If the link status cannot be determined the neighboring node is shown and the "LINKSTATUS=?" parameter/value is shown in the report.

Beginning with DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the LINKSTATUS parameter becomes obsolete.

PRODTYPE — Product Type. In DDM-2000 OC-3 R11.x, OC-12 R5.x, FiberReach 2.x and earlier, this field identifies the product type of the local and remote NEs.

PF-2000 NEs only output the values for DDM-OC3, DDM-OC12, FbrRch, SLC-2000, and FT-2000. Any other value will be reported as a "?".

Beginning with DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, the product type is only reported for the local NE.

THRU — This field indicates the *aid* of the optical line or IAO LAN through which the local NE is connected to the neighboring NE.

This field is omitted for the local NE.

Beginning with DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, in the event a DCC failure between the local NE and an immediate neighbor occurs, the entry corresponding to that NE will not be included in the report.

LEVEL — In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, this field is a "2" if the local NE is provisioned as a Level 2 IS, and if not, whether each neighbor is the default Level 2 IS for the the local NE in a partitioned subnetwork.

If the local NE is provisioned as a Level 2 IS, all Level 2 IS neighbors are identified by a "2" also. Otherwise, this field is "1".

NSAP — In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0 and later, this field is the NSAP address of the NE. The 20 bytes of the NSAP are displayed using 40 hexadecimal digits.

Refer to the **ENT-ULSDCC-L3** or **ENT-ULSDCC-L4** command for the format of the NSAP.

The first entry in the output report represents the local NE; i.e. the NE to which the command is addressed. The other NEs in the report are ordered by the value of the THRU field as follows: high-speed AIDs, then low-speed AIDs, then IAO LAN AIDs, if any.

EXAMPLE INPUT/OUTPUT

In DDM-2000 OC-3 R11.x and earlier, the following example requests the map of the neighbors:

```
rtrv-map-neighbor:LT-PF-2000::123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=local_system,PRODTYPE=DDM-OC3"
   "TID=Site,PRODTYPE=DDM-OC3,THRU=main-1"
   "TID=Site6NE1,PRODTYPE=DDM-OC3,THRU=main-2"
   "TID=Site7NE1,PRODTYPE=DDM-OC3,THRU=fn-a"
   "TID=Site3NE1,PRODTYPE=DDM-OC3,THRU=fn-b"
   "TID=Site4NE1,PRODTYPE=DDM-OC3,THRU=fn-c"
;
```

In DDM-2000 OC-3 R5.x, the following example requests the map of the neighbors:

```
rtrv-map-neighbor:LT-PF-2000::123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=local_system,PRODTYPE=DDM-OC12"
   "TID=Site7NE1,PRODTYPE=DDM-OC12,THRU=main-b-1"
   "TID=Site3NE1,PRODTYPE=DDM-OC12,THRU=main-b-2"
   "TID=Site4NE1,LINKSTATUS=FAIL,PRODTYPE=DDM-OC3,THRU=fn-a"
   "TID=Site6NE2,PRODTYPE=DDM-OC3,THRU=fn-b"
   "TID=Site5NE2,PRODTYPE=DDM-OC3,THRU=fn-c"
   "TID=Site2NE1,LINKSTATUS=FAIL,PRODTYPE=DDM-OC3,THRU=fn-d"
;
```

In DDM-2000 OC-3 R13.0, and later, the following example requests the map of the neighbor NEs:

```
rtrv-map-neighbor:PF-2000::123456;


IP 123456
<


   PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=PF-2000,NSAP=39840F800000000000000000000008006a1ad06e00,LEVEL=2,PRODTYPE=DDM-OC3"
   "TID=Site7NE1,NSAP=39840F800000000000000000000008006a1ad06f00,THRU=main-1,LEVEL=1"
   "TID=Site3NE1,NSAP=39840F800000000000000000000000000e3a037200,THRU=main-2,LEVEL=1"
   "TID=R5,NSAP=39840F800000000000000000000000000e3a027300,THRU=lan,LEVEL=1"
   "TID=R6,NSAP=39840F800000000000000000000108006a1ad07f00,THRU=lan,LEVEL=1"
   "TID=R7,NSAP=39840F800000000000000000000200000e3a073200,THRU=lan,LEVEL=2"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **RTRV-MAP-NEIGHBOR** command, also.

If the NE receives a **RTRV-MAP-NEIGHBOR** with an otherwise valid set of input parameter values, but the command could not be completed by the NE, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

RELATED TL1 MESSAGES

ENT-SYS

RTRV-SYS

RTRV-MAP-NETWORK

NAME

RTRV-MAP-NETWORK: Retrieve Map Network.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 for linear systems
- OC-3 Release 9.0 and OC-12 Release 5.0 for rings
- FiberReach Release 1.0.

INPUT FORMAT

In DDM-2000 OC-3 R11.x, OC-12 R5.x FiberReach R2.x and earlier: **RTRV-MAP-NETWORK***:tid::ctag[:[:]];*

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later: **RTRV-MAP-NETWORK***:tid::ctag[::level2];*

DESCRIPTION

NOTE:
This command is available to all users.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach R3.0 and later, this command will retrieve a list of all reachable NEs (including Level 2 ISs) in the local area only in a partitioned subnetwork or reachable Level 2 IS NEs across all areas (if the local NE is provisioned to be a Level 2 IS in a partitioned subnetwork).

In DDM-2000 OC-3 R11.x, OC-12 R5.x, and FiberReach R2.x, and earlier, when the NE receives a **RTRV-MAP-NETWORK** command from the user, the NE will return a report containing names (Target IDentifiers, or TIDs) of other NEs in the subnetwork, as well as other information about the NEs.

Unlike **RTRV-MAP-NEIGHBOR**, an NE is listed only once in the report.

In DDM-2000 OC-3 R11.x, OC-12 R5.x, and FiberReach R2.x and earlier, if the "DSNE not reachable" alarm condition exists, none of the NEs in the subnetwork can be identified as a Directory Service Network Element (DSNE). When this condition exists, remote operations and the NE map reporting continue operating using the local last known good information.

INPUT PARAMETERS

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

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

For DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach R3.0, and later, the following parameter and values apply:

level2 Level 2. The valid values are:

WN (Default) The report will list the reachable NEs (including Level 2 ISs) in the local Level 1 area only.

WY The report will list the reachable Level 2 IS NEs across all areas, if the local NE is provisioned as a Level 2 IS.

OUTPUT FORMAT

In response to a valid **RTRV-MAP-NETWORK** command, the following output report is returned to the user:

```
   sid date time
M  ctag COMPLD
   "spec_block"
    .   .   .
    .   .   .
   "spec_block"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. The additional parameter that specifically applies to this command response is described below:

spec_block

Specific 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 parameters are listed and explained below.

In DDM-2000 OC-3 R11.x, OC-12 R5.x, and FiberReach R2.x, and earlier, the NE will return the parameters within the *spec_block* in the following order: TID, DCCSTATUS, PRODTYPE, NETYPE, ALARMGRP.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach 3.0 and later, the NE will return the parameters within the *spec_block* in the following order for the local NE: TID, NSAP, LEVEL, PRODTYPE.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach 3.0 and later, the parameters will be in the following order for the remote NE: TID, NSAP, LEVEL.

TID — This is the Target Identifier of each NE. If the local NE is unable to determine a TID for a reachable NSAP, the parameter/value will be "TID=?".

In DDM-2000 OC-3 R13.0, OC-12 R7.0, and FiberReach 3.0 and later, the TIDs for all NEs other than the local NE are determined by real-time TARP NSAP-to-TID queries. If some NEs have duplicate TIDs, they will both be listed in the report.

DCCSTATUS — In DDM-2000 OC-3 R.11.x, OC-12 R5.x, FiberReach R2.x, and earlier, this field can take on the value FAIL to indicate the communication status between the local system and each listed NE. DCCSTATUS is omitted if good for the identified systems

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and later, the DCCSTATUS parameter becomes obsolete.

For OC-3 R13.0, OC-12 R7.0, FiberReach R3.0 and earlier, the following parameter applies:

PRODTYPE — Product Type. This identifies the type of NE. The values are as follows:

- DDM-OC3 — This identifies the NE as a DDM-2000 OC-3.
- DDM-OC12 — This identifies the NE as a DDM-2000 OC-12.
- FbrRch — This identifies the NE as FiberReach.
- FT-2000 — This identifies the NE as an FT-2000.
- SLC-2000 — This identifies the NE as a SLC-2000.

DDM-2000 NEs only output the values specified above. A "?" (question mark) will be output for other product type values or if the data is unavailable for a particular NE.

For OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, this field only identifies the product type of the local NE. This field only appears in the first entry of the report.

NETYPE — In DDM-2000 OC-3 R11.x, OC-12 R5.x FiberReach R2.x and earlier, this field can take on the value DSNE to indicate if the system identified by the TID is serving as the Directory Service Network Element (DSNE). This field is omitted for the systems in the subnetwork that are not serving as **DSNE**.

Beginning with DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, the NETYPE parameter becomes obsolete.

ALARMGRP — In DDM-2000 OC-3 R11.x, OC-12 R5.x and FiberReach R2.x, and earlier, this field can take on integer values from 0 or 255 and indicates the Alarm Group, or SONET Maintenance Sub-Branch (SMSB), to which the listed NE belongs.

The Alarm Group identifies a set of NEs that exchange remote alarm information via one or more Alarm Gateway Network Elements.

In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and later, the ALARMGRP parameter becomes obsolete.

LEVEL — In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0 and later, this field is a "2" if the local NE is provisioned as a Level 2 IS, and if not, whether each remote NE identified by TID is the default Level 2 IS for the local NE. If the local NE is provisioned as a Level 2 IS, all Level 2 ISs across all areas may be identified by "2" also. Otherwise, this field is "1".

NSAP — In DDM-2000 OC-3 R13.0, OC-12 R7.0, FiberReach R3.0 and later: NSAP address of the NE. The 20 bytes of the NSAP are displayed using 40 hexadecimal digits.

Refer to the **ENT-ULSDCC-L3** or **ENT-ULSDCC-L4** command for the format of the NSAP.

The first entry in the output report represents the local system; i.e., the NE to which the command is addressed. In DDM-2000 OC-3 R13.0, OC-12 R7.0 and FiberReach R3.0, and later, the other entries in the report are ordered in sorted order of the TID parameter.

EXAMPLE INPUT/OUTPUT

In DDM-2000 OC-3 R11.x and earlier, the following example is a request for the list of NEs in the subnetwork.

```
rtrv-map-network:LT-PF-2000::123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=local_system,PRODTYPE=DDM-OC3,NETYPE=DSNE/AGNE,ALARMGRP=254"
   "TID=Site7NE1,PRODTYPE=DDM-OC3,ALARMGRP=254"
   "TID=Site3NE1,PRODTYPE=DDM-OC3,NETYPE=AGNE,ALARMGRP=254"
   "TID=Site4NE1,PRODTYPE=DDM-OC3,ALARMGRP=254"
   "TID=Site6NE1,PRODTYPE=DDM-OC3,ALARMGRP=252"
   "TID=Site5NE1,PRODTYPE=DDM-OC3,ALARMGRP=252"
   "TID=Site2NE1,DCCSTATUS=FAIL,PRODTYPE=DDM-OC3,ALARMGRP=252"
;
```

In DDM-2000 OC-12 R5.x, the following example is a request for the list of NEs in the subnetwork:

```
rtrv-map-network:LT-PF-2000::123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=local_system,PRODTYPE=DDM-OC12,ALARMGRP=177"
   "TID=Site7NE1,PRODTYPE=DDM-OC12,ALARMGRP=177"
   "TID=Site3NE1,PRODTYPE=DDM-OC12,NETYPE=DSNE,ALARMGRP=177"
   "TID=Site4NE1,DCCSTATUS=FAIL,PRODTYPE=DDM-OC12,ALARMGRP=177"
   "TID=Site6NE1,PRODTYPE=DDM-OC12,NETYPE=AGNE,ALARMGRP=177"
   "TID=Site4NE2,PRODTYPE=DDM-OC3,ALARMGRP=254"
   "TID=Site6NE2,PRODTYPE=DDM-OC3,ALARMGRP=252"
   "TID=Site5NE2,PRODTYPE=DDM-OC3,ALARMGRP=252"
   "TID=Site2NE1,DCCSTATUS=FAIL,PRODTYPE=DDM-OC3,ALARMGRP=252"
;
```

In DDM-2000 OC-3 R13.0, and later, the following example requests the list of NEs in the local area:

```
rtrv-map-network:PF-2000::123456;


IP 123456
<


   PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "TID=PF-2000,NSAP=39840F8000000000000000000008006a1ad06e00,LEVEL=2,PRODTYPE=DDM-OC3"
   "TID=R5,NSAP=39840F8000000000000000000000000e3a027300,LEVEL=1"
   "TID=R6,NSAP=39840F8000000000000000000008006a1ad07f00,LEVEL=1"
   "TID=R7,NSAP=39840F8000000000000000000000000e3a073200,LEVEL=1"
   "TID=Site3NE1,NSAP=39840F8000000000000000000000000e3a037200,LEVEL=2"
   "TID=Site7NE1,NSAP=39840F8000000000000000000008006a1ad06f00,LEVEL=1"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **RTRV-MAP-NETWORK** command, also.

RELATED TL1 MESSAGES

ENT-SYS

RTRV-SYS

RTRV-MAP-NEIGHBOR

NAME

RTRV-NCT: Retrieve NCT

Support for this command is available *only* for DDM-2000 Multiplexers equipped with OC-3 ring Release **13.5** (TRCU3 Release).

NOTE:
This command is valid only when one or more function unit slots are equipped with the BNP1 (NCT optical link interface) or BNP2 (NCT2 optical link interface) circuit pack.

INPUT FORMAT

RTRV-NCT:*tid*:*[aid]*:*ctag*;

DESCRIPTION

This command displays the configuration of NCT and NCT2 line(s).

NOTE:
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.

aid Access identifier. This identifies the NCT/2 line(s).

The default is **all**.

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 commands.

OUTPUT FORMAT

If there is information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "aid::ENCTS=x, CTS=x, TCTS=x, MODE=x"
         ...
   "aid::ENCTS=x, CTS=x, TCTS=x, MODE=x"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

aid — Access identifier of the NCT/2 line.

encts — If CTS messaging is enabled. Valid values are:

no

yes

cts — The provisioned control timeslot is a number between 0 and 255, or - if disabled.

tcts — The provisioned transmission control timeslot is a number between 0 and 255.

mode — Where the shelf is located. Valid values are:

host 5ESS host

remote remote terminal (EXM or ORM)

EXAMPLE OUTPUT

The following example illustrates command/response interaction with a DDM-2000 OC-3 system.

```
RTRV-NCT:LT-PF-2000::123456;

IP ctag
<

   sid date time
M  ctag COMPLD
   "fn-a::encts=no, cts=-, tcts=47, mode=host"
   "fn-b::encts=yes, cts=6, tcts=251, mode=remote"
   "fn-c::encts=yes, cts=0, tcts=0, mode=remote"
;
```

ERROR RESPONSES

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

RELATED TL1 COMMANDS/MESSAGES

ENT-NCT

NAME

RTRV-OSACMAP: Retrieve OS application context ID map

This command is available starting in DDM-2000 OC-3 Release 8.0 (for linear systems), and DDM-2000 OC-3 Release 9.0 and OC-12 Release 5.0 (for rings). This command will be available in a future DDM-2000 FiberReach release.

INPUT FORMAT

RTRV-OSACMAP:*tid*:*aid*:*ctag*;

DESCRIPTION

This command displays the Operation Systems Application Context Map information that is created by the **ENT-OSACMAP** command. This information provides association information between OS application contexts and X.25 channel assignments.

NOTE:
While this command is allowed at all network elements in the subnetwork, only the table at the active GNE node is valid. The maps at inactive GNE nodes can be displayed, but they have no effect.

NOTE:
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.

aid Access identifier.

The *aid* can only have the value **ALL**.

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 request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "ALL:VC:SNPA=x,ACID=x"
         ...
   "ALL:VC:SNPA=x,ACID=x"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also. Additional parameters that specifically apply to this command response are defined below.

VC Virtual circuit. This parameter is the virtual circuit type X.25 attachment for the OS. Its values are:

PVC permanent virtual circuit.

SVC switched virtual circuit.

SNPA SNPA Address is the X.25 SubNetwork Point of Attachment address for the OS. It is either the PVC Logical Channel Number (LCN) or it is the SVC Data Terminal Equipment (DTE) calling address, which is 1 to 15 digits.

Up to nine VCs can be mapped to any combination of PVCs, and SVCs. (i.e: the allocation of PVCs can be removed and replaced by SVCs).

ACID ACID is a string of up to twenty-three alphanumeric characters, which is the Application Context ID to be assigned to a particular SNPA Address. Each OS has a value of ACID assigned. Default values exist for OS applications supported by DDM-2000. The supported applications types are:

TL1MAINTENANCE

TL1MEMORYADMINISTRATION

TL1PEERCOMM

Starting in DDM-2000 OC-3 Release 9.8, 13.0 and later, OC-12 Release 7.0 and later.

TL1OTHER1

TL1OTHER2

TL1CR

TL1TEST

The report is sorted first by *VC*, and then by *SNPA*.

EXAMPLE INPUT/OUTPUT

```
rtrv-osacmap:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "ALL:PVC:SNPA=1,ACID=TL1MEMORYADMINISTRATION"
   "ALL:PVC:SNPA=2,ACID=TL1CR"
   "ALL:PVC:SNPA=3,ACID=TL1MAINTENANCE"
   "ALL:SVC:SNPA=146782229996,ACID=TL1OTHER1"
;
```

ERROR RESPONSES

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

The Network Element returns the following error response if the *aid* value is missing or invalid.

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

RELATED TL1 MESSAGES

DLT-OSACMAP

ENT-OSACMAP

NAME

RTRV-OW: Retrieve Orderwire mode.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)

INPUT FORMAT

RTRV-OW:*tid*::*ctag*[:[:[:]]];

DESCRIPTION

The **RTRV-OW** command can be initiated by users to retrieve the orderwire mode of the Network Element.

INPUT PARAMETERS

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

NOTE:
No *aid* value is permitted in the input command. The *aid* field is normally between the *tid* and *ctag* fields in the input 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 NE fully complies with the **RTRV-OW** request, the following completion response is returned.

```
IP ctag
<

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

OUTPUT PARAMETERS

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

spec_block Specific Parameter Block. The orderwire mode currently in effect is specified inside the *spec_block*. For the **RTRV-OW** command, the *spec_block* will contain only the following parameter:

owmd This will have one of the following values:

thru	Pass the orderwire and/or user bytes through. Allowed for DDM-2000 OC-3 and SLC-2000 linear and ring systems. It is also allowed in DDM-2000 OC-12 ring systems. This mode is valid irrespective of the setting of the JP jumper on the overhead controller.
e1dropmain	Drop the signal received on the E1 bytes on the main interface of the DDM-2000 OC-3 or SLC-2000 linear system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.
e1dropmain1	Drop the signal received on the E1 bytes on the main1 interface of the DDM-2000 OC-3 or SLC-2000 ring system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.

`e1dropfnc`	Drop the signal received on the E1 bytes on the fn-c interface of the DDM-2000 OC-3 or SLC-2000 linear system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.
`e1dropmain2`	Drop the signal received on the E1 bytes on the main2 interface of the DDM-2000 OC-3 or SLC-2000 ring system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.
`muxdrop`	Multiplex and drop the signal received on the E1, E2 and F1 bytes on the optical interfaces of the DDM-2000 OC-3 and SLC-2000 ring and linear systems. This mode is allowed only when the JP jumper on the overhead controller has been set in the MUX position.

EXAMPLE INPUT/OUTPUT

The following example shows a command to retrieve the orderwire mode from a linear DDM-2000 system:

```
rtrv-ow:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "owmd=e1dropfnc"
;
```

ERROR RESPONSE

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

If an **ENT-SYS** command is received with an *aid* value, the following error response is returned:

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

RELATED TL1 COMMANDS/MESSAGES

SET-OW

NAME

RETRIEVE-PERFORMANCE MONITORING: RETRIEVE-PERFORMANCE MONITORING

This command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 3.0, OC-12 Release 1.0 (for linear systems)
- OC-3 Release 5.0, OC-12 Release 2.0 (for rings)
- FiberReach Release 1.0.

DESCRIPTION

RTRV-PM commands are initiated by an OS user to request a network element to send to the OS its current set of Performance Monitoring (PM) data associated with one or more equipment units or facilities/signals within the network element.

When DDM-2000/**SLC**-2000 receives a RTRV-PM command from the OS, DDM-2000/**SLC**-2000 shall respond to the OS with a response containing performance monitoring information.

Initially, DDM-2000's/**SLC**-2000's RTRV-PM command is designed to be user-friendly. In later releases, i.e., DDM-2000 OC-3 R5 and OC-12 R2, stricter adherence to Bellcore TR-833, Issue 4, is required to assure compatibility with NMA R3.4's PM Analysis Package support of SONET.

If main slot 1 and slot 2 are equipped with different pack types (i.e. during upgrade), the report will include data for what is considered at the time as the valid system pack type.

NOTE:
This command is available to maintenance users starting with DDM-2000 OC3 R9.1, OC-12R5.1, and FiberReach R2.1.

INPUT FORMAT

RTRV-PM-z:[a]:[b]:c::[d],[e],[f],[g],[h],[i][,j];
(DDM-2000 OC-3 R3, OC-12 R1, and earlier)

RTRV-PM-z:[a]:b:c::[d],[e],[f],[g],h,[i][,j];
(DDM-2000 OC-3 R5, R6.0, OC-12 R2.0, OC-12 Regen. R2, only)

RTRV-PM-z:a:b:c::[d],[e],[f],[g],h,[i][,j];
(DDM-2000 OC-3 R6.1, OC-12 R2.1, FiberReach 1.0 and later)

TID (a) required per DDM-2000 MR 6463.

LIST OF INPUT PARAMETERS

z = command code modifier

a = TID

b = AID

c = CTAG

d = MONTYPE

e = MONLEV

f = LOCN

g = DIRN

h = TMPER

i = MONDAT

j = MONTM

DESCRIPTION OF INPUT PARAMETERS

z = command code modifier:

The command code modifier is expected to have one of the following modifier values: "rr" or ALL.

Initially, DDM-2000 shall accept and limit the response to the RTRV-PM command to the specified facility type (if z = "rr", where "rr" is a facility type that DDM-2000 supports in PM reports, e.g., T2 is not allowed) or include PM data for all valid facility types ("rr") (overriding any subsequent input parameter values, except TMPER, MONDAT and MONTM) if z = ALL.

As in previous releases, DDM-2000 shall accept and limit the response to the RTRV-PM command to the specified facility type (if z = "rr", where "rr" is a facility type that DDM-2000 supports in PM reports, e.g., T2 is not allowed) or include PM data for all valid facility types ("rr") if z = ALL. The difference in this requirement is that DDM-2000 shall *not* ignore the subsequent input parameter values when z = ALL.
This change in requirements is based on new understanding of the interpretation of TR-833, Issue 3 and 4, (and less emphasis on DDM-2000

user-friendliness) thus better TR-833 compliance will be achieved. DDM-2000/**SLC**-2000 OC-3 supports PM for the following:

DDM-2000	Path/Line Type	Release
DDM-2000 OC-3	OC3 line OC1 line OC12 line STS1 path EC1 line VT1 path T3 T1	all R9 and later R11 and later all R5 and later R6 and later all R5 and later
DDM-2000 OC-12	OC12 line OC3 line STS1 path EC1 line T3	all all all R3 and later all
DDM-2000 OC-12 Regenerator	OC12 line	R2 and later
DDM-2000 FiberReach	OC3 line OC1 path STS1 path VT1 path T1 T3	R2.2, 3.1 and later all all all all R3.1 and later

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with the following input parameter values, DDM-2000 shall *not* provide a normal command response.

Input Parameter Name	Input Parameter Value
Command code modifier	any valid value
AID	ALL
CTAG	any valid value
MONTYPE	null
MONLEV	0-UP
LOCN	NEND or null
DIRN	RCV, NA, or AZ or null
TMPER	15-MIN
MONDAT	previous day when the present time is 8 A.M. or earlier, or current day, or null, or ALL
MONTM	ALL

Denying the above command is *not* TR-833, Issue 4, compliant, but it is OS (NMA) compatible, and it reduces the maximum RTRV-PM response message length. Effectively, DDM-2000/**SLC**-2000 will not respond to a RTRV-PM command that requests all (near-end, or near-end and far-end) 15-minute PM data for all facilities/signals. The above requirement was

extended to apply to *any* valid command code modifier (in addition to ALL) based on DDM-2000 OC-3 R6.0 TL1 output buffer limitations, especially at 1200 baud (MR 5725).

a = TID

b = AID

DDM-2000/**SLC**-2000 shall accept and limit the information included in the RTRV-PM response based on the AID, if any (initially), included in the command.

The AID parameter will specify the AID for which PM data is requested. To be consistent with the DDM-2000/**SLC**-2000 user interface, in addition to AID = ALL, the following AID types are valid:

TL1 Command	Type of AID
RTRV-PM-OCn	OCn line AIDs (OC-12 Regen R2 and later also)
RTRV-PM-STS1	STS1 channel AIDs (Only VT-rings (DDM-2000 OC-3 R5 and later, will use the ring form of these AIDs, e.g., "m1-1", until *dual* STS path PM is supported some time in the future.) STS-ring *active* path PM will use the *linear* form of these AIDs, e.g., "m-1".)
RTRV-PM-EC1	EC1 port AIDs
RTRV-PM-T3	DS3 port AIDs
RTRV-PM-T1	DS1 or T1 port AIDs
RTRV-PM-VT1 (when supported)	VT1.5 channel AIDs (VT-ring *active* path PM (DDM-2000 OC-3 R7 and later) will use the *linear* form of these AIDs, e.g., "m-1-1-1", until *dual* VT path PM is supported some time in the future.)
RTRV-PM-ALL RTRV-PM-ALL	null or any AID (initially only) only ALL (OC-3 R5+, OC12 R2+, OC-12 Regen. R2)

Initially, if the AID parameter value is invalid or conflicts with the command code modifier, DDM-2000/**SLC**-2000 shall ignore the AID value and respond to the OS without limiting the output response based on the input AID value.

Unlike previous releases, if DDM-2000/**SLC**-2000 receives a RTRV-PM command with an AID parameter value that is invalid or conflicts with the command code modifier, DDM-2000/**SLC**-2000 shall *not* provide a normal command response.

If command code modifier is ALL, AID is expected to be null (initially), but TR-833, Issue 4, specifies the AID should also be ALL in such cases. If that TR-833, Issue 4, specification is violated, the AID will be considered conflicting with the command code modifier. (TR-833, Issue 5, Rev. 1, changes the specification back to allowing a null AID when the command code modifier is ALL.) In all DDM-2000 releases, RTRV-PM-COM is invalid.

As in previous releases, an AID value of ALL shall be considered valid and applicable to all AIDs of the type specified by the command code modifier.

If the AID = ALL and *some* of the effectively addressed AIDs have applicable PM data, DDM-2000/**SLC**-2000 will respond normally with the applicable PM data (otherwise, i.e., if *none* of the effectively addressed AIDs have applicable PM data, DDM-2000/**SLC**-2000 will return an error response).

Initially, if the command code modifier is ALL, DDM-2000/**SLC**-2000 shall respond to the OS without limiting the output response based on the input AID value, if any.

Unlike previous releases, if the AID value is null, DDM-2000 shall *not* provide a normal command response.

c = CTAG

d = MONTYPE

DDM-2000/**SLC**-2000 shall accept and limit the PM data included in the RTRV-PM response based on the MONTYPE, if any, included in the command. The supported values of MONTYPE are specified in Table C.3.0.

DDM-2000/**SLC**-2000 should accept and limit the PM data included in the RTRV-PM response based on the MONTYPE, if any, included in the command. The supported values of MONTYPE are specified in Table C.3.1.

The MONTYPE parameter will specify the MONTYPE for which PM data is requested.

If MONTYPE is null, DDM-2000/**SLC**-2000 shall respond with all MONTYPEs applicable to the facility type and AID, if any (initially only), specified by the previous input parameter values.

Initially, if the MONTYPE parameter value conflicts with the command code modifier, DDM-2000/**SLC**-2000 shall ignore the MONTYPE value and respond to the OS without limiting the output response based on the input MONTYPE value.

Unlike previous releases, if the MONTYPE parameter value conflicts with the command code modifier, DDM-2000/**SLC**-2000 shall *not* provide a normal command response.
Invalid MONTYPEs are not included in the RTRV-PM response (which is consistent with the blanks left in the columns for invalid MONTYPEs in the DDM-2000/**SLC**-2000 UIR). For example, all PM MONTYPEs are invalid for a clear channel DS3.

Initially, if the command code modifier is ALL, DDM-2000/**SLC**-2000 shall respond to the OS without limiting the output response based on the input MONTYPE value, if any.

Unlike previous releases, if the command code modifier is ALL, DDM-2000/**SLC**-2000 shall accept and limit the PM data included in the RTRV-PM response based on the MONTYPE, if any, included in the command.

e = MONLEV; f = LOCN; g = DIRN:

Initially, if a RTRV-PM command is received with non-null parameter values for the MONLEV, LOCN or DIRN parameters, i.e., input parameters that DDM-2000 doesn't support, DDM-2000 shall respond to the OS without limiting the output response based on those input parameter values.

Initially, DDM-2000 is not required to support MONLEV, LOCN and DIRN parameters for RTRV-PM commands.

e = MONLEV

Unlike previous releases, DDM-2000 shall accept and limit the PM data included in the RTRV-PM response based on the MONLEV, if any, included in the command.

MONLEV has the format LEV-DIRN* where valid values for LEV are decimal numerals and valid values for DIRN are UP and DN. To be

---

* LEV-DIRN is Bellcore TR-833, Issue 4, terminology so it is used here, but note that this use of "LEV-**DIRN**" is different than the separate TL1 parameter named "DIRN".

consistent with the maximum PM data counts in DDM-2000, the decimal numeral LEV will be supported up to a maximum of 7 positive integer characters. The input MONLEV threshold applies to all MONVALs to be included in the RTRV-PM response, e.g., if MONLEV = 1-UP, only MONVALs equal to or greater than 1 will be reported. Another example is, if MONLEV = 1-DN, only MONVALs equal to or less than 1 would be reported. The TL1 filtering of output by MONLEV is *in*dependent of the output VLDTY parameter (*un*like the DDM-2000 user interface zero suppression algorithm).

Unlike previous releases, a null value for MONLEV shall be interpreted as if MONLEV = 1-UP.

To comply with the intent of the use of the MONLEV parameter, the descriptions of the MONTYPE LBCL and LPT in Table C.3.0 have been changed, specifically with respect to the applicable values of MONVAL.

f = LOCN

Unlike previous releases, DDM-2000 shall accept and limit the PM data included in the RTRV-PM response based on the LOCN, if any, included in the command.

Valid values for LOCN are NEND, and FEND and null.

Unlike previous releases, a null value for LOCN shall be interpreted as if LOCN = NEND *and* FEND.

g = DIRN

Unlike previous releases, if the DIRN parameter value is other than AZ, NA, RCV or null, DDM-2000 shall *not* provide a normal command response.

Valid values for DIRN are AZ (for backward compatibility with TR-833, Issue 3, user-friendliness, and potentially with NMA R3.2.1 and R3.3 PM Analysis), NA (for TR-833, Issue 4, compliance and consistency with the default implied by DIRN being null in DDM-2000 REPT EVT TCA autonomous messages), and RCV (for TR-833, Issue 4, compliance).

Unlike previous releases (although similar in effect), a null value for DIRN shall be interpreted as if DIRN = RCV (= AZ = NA).

In general, all of DDM-2000's/**SLC**-2000's PM data is based on *received* facilities/signals. Only DDM-2000's/**SLC**-2000's MONTYPE = LPT relates to a *transmitted* signal, but the MONTYPE LPT is compliant with TR-833, Issue 3 and 4, and thus suffices without supporting DIRN = TRMT. TR-833, Issue 4, may be changed again in the near-future to specify real directions of monitoring from the network element's

perspective so the OS (NMA) can relate to the directions from the network perspective.

In the future, DDM-2000 should use DIRN parameter values such as RCV and TRMT to distinguish the true direction of PM monitoring, i.e., from the OCn or from the DSX.

h = TMPER

Initially, DDM-2000 shall respond with 15-minute PM data if TMPER = 15-MIN or null.

As in previous releases, DDM-2000 shall respond with 15-minute PM data if TMPER = 15-MIN. The difference in this requirement is that DDM-2000 shall *not* interpret TMPER = null as if TMPER = 15-MIN.

Unlike previous releases, if TMPER = anything other than 15-MIN or 1-DAY, DDM-2000 shall *not* provide a normal command response. The difference in this requirement is that DDM-2000 shall *not* consider TMPER = null to be valid.
TR-833, Issue 4, specifies that the TMPER default = "1-HR" which DDM-2000 (and SONET) do not support.

Unlike previous releases, if the TMPER parameter value conflicts with the command code modifier, DDM-2000 shall *not* provide a normal command response.

DDM-2000/**SLC**-2000 shall respond with daily PM data if TMPER = 1-DAY.

i = MONDAT; j = MONTM:

MONDAT and MONTM shall be used to determine the beginning of the interval for which the PM data is to be reported.

Initially, if TMPER = 15-MIN and MONTM is not evenly divisible by 15, DDM-2000 shall respond as if MONTM is rounded up to the nearest time that is evenly divisible by 15, e.g., round MONTM = 12-31 to 12-45.

Unlike previous releases, if TMPER = 15-MIN and MONTM is a number that is not evenly divisible by 15, DDM-2000 shall *not* provide a normal command response. The following exceptions/qualifications to this requirement apply, DDM-2000 shall provide normal command responses when the input MONTM value represents an actual DDM-2000 PM bin time stamp and when MONTM = the first DDM-2000 PM bin time stamp rounded *down* to the closest time that is evenly divisible by 15.
An example of the exception/qualification cases in the preceding requirement follows. If DDM-2000's time is reset at 3:11 P.M., the *first* DDM-2000 PM bin time stamp will be 3:11 P.M. That PM data would be

included in response to a `RTRV-PM` command with MONTM = `15-11` *or* `15-00`. DDM-2000's time is not expected to be reset often. Although NMA's user interface adjusts for Daylight Savings Time (DST), the time between NMA and network elements stays constant throughout the year.

Initially, Table C.0a specifies the performance monitoring data that DDM-2000 shall output based on the input values of the TMPER, MONDAT and MONTM input parameters.

The term "other" is used in Tables C.0a and C.0b to refer to any input value that isn't covered by another entry (in another row of Table C.0a or Table C.0b) for the subject parameter. Such "other" values will typically be invalid or incorrect input.

The term "any" is used in Tables C.0a and C.0b to refer to any input value, including "other" and null, for the subject parameter, i.e., the value of the subject parameter is not significant.

Table C.0a. Output PM Data, depending on TMPER, MONDAT and MONTM Input Parameters (DDM-2000 OC-3 R2, R3 and OC-12 R1).

TMPER	MONDAT	MONTM	Output PM Data
`15-MIN` or null	current day or null	value of MONTM > current time - 8 hrs*	15-min. data from present to MONTM
`15-MIN` or null	current day or null	value of MONTM <= current time - 8 hrs	15-min. data from present to 8 hours previous
`15-MIN` or null	current day or null	null or other	15-min. data from present to 1 hour previous
`15-MIN` or null	previous day or other	any*	15-min. data from present to 8 hours previous
`1-DAY`	current day or null	any	current 1-day data
`1-DAY`	previous day or other	any	current and previous 1-day data
other	any	any	return error response (invalid TMPER)

Unlike previous releases, Table C.0b specifies the performance monitoring data that DDM-2000 shall output based on the input values of the TMPER, MONDAT and MONTM input parameters.†

---

* Initially, when MONDAT = previous day and the effective combined value of MONDAT and MONTM is within 8 hours of the current time, output 15-min. PM data from the present to the effective combined value of MONDAT and MONTM.

† If the other input parameter values are valid, and at least *some* of the requested PM data is available, when MONDAT and/or MONTM = `ALL`, DDM-2000 shall respond with data for the available time periods only. If the input parameter values are valid, but *none* of the requested PM data is available (e.g., because the system just started operating), DDM-2000 shall return an error response (data not ready **[R-RTRVPM-317.5]**).

Table C.0b. Output PM Data, depending on TMPER, MONDAT and MONTM Input Parameters (DDM-2000 OC-3 R5+, OC-12 R2+ and FiberReach).

TMPER	MONDAT	MONTM	Output PM Data
15-MIN	ALL	ALL	15-min. data from present time to 8.25 hours earlier than present time.
15-MIN	current day or null	ALL	15-min. data from present time to previous midnight or 8.25 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 (invalid MONTM
15-MIN	ALL or current day or null	null	Single 15-min. interval of current data
15-MIN	previous day	null	return error response (invalid MONTM
15-MIN	previous day, current day, or null, or ALL	effective value of MONDAT and MONTM within 8.25 hours before current time.	Single 15-min. interval of data beginning at MONDAT and MONTM
15-MIN	previous day, current day, or null, or ALL	effective value of MONDAT and MONTM more than 8.25 hours before current time, or other	return error response (invalid MONTM or
15-MIN	other	any	return error response (invalid MONDAT
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 (invalid MONDAT
null or other	any	any	return error response (invalid TMPER

NORMAL OUTPUT FORMAT

If there is no PM data to report:

```
    <SID> <date> <time>
M  c COMPLD;
```

If there is PM data to report:

```
    <SID> <date> <time>
M  c COMPLD
[   "k,l:m,n,[o],[p],[q],[r],[s][,t]"...]
    "k,l:m,n,[o],[p],[q],[r],[s][,t]";
```

The order of applicable output lines shall be as follows:

1. by AID (in order corresponding to the shelf architecture, e.g., for DDM-2000 OC-3, by main OC-N line slots, by function units (OC-N line slots, STS-1 path terminations, or DS3/EC-1 facilities, in order as applicable), by low-speed channels (VT path terminations and/or DS1 facilities, if applicable),
2. by requested time intervals (starting with the current time interval),
3. by applicable PM parameters per AID (in same order as UIR RTRV-PM report column headings).

For example, for a DDM-2000 OC-N AID, all OC-N PM parameter values (followed by and including all applicable STS-N PM parameters values) shall be output sequentially for a requested time interval before the values for the previous time interval are output. This is comparable to output in order by rows in the DDM-2000 UIR PM reports.

LIST OF OUTPUT PARAMETERS

k = AID

l = AIDTYPE

m = MONTYPE

n = MONVAL

o = VLDTY

p = LOCN

q = DIRN

r = TMPER

s = MONDAT

t = MONTM

DESCRIPTION OF OUTPUT PARAMETERS

If DDM-2000/**SLC**-2000 receives a RTRV-PM command for which *none* of the requested PM data is available due to equipage or provisioning, DDM-2000/**SLC**-2000 shall *not* provide a normal command response.

If DDM-2000/**SLC**-2000 receives a RTRV-PM command for which only *some* of the requested PM data is available due to the equipage and provisioning, DDM-2000/**SLC**-2000 shall provide a normal command response with the supported PM data only.

c = CTAG:

The following parameter values shall be included/repeated as applicable to the PM data reported in each separate line in the body of the response:

k = AID:

The AID field shall contain the AID of the facility/signal for which PM data is being reported.

l = AIDTYPE:

AIDTYPE is the type of access identifier and shall have the value "rr" (see Table C.1) (the same as the valid values of the command code modifier included in the input command, except when the command code modifier is ALL).

m = MONTYPE:

MONTYPE field shall be the applicable entry from Table C.3.0.

MONTYPE field should be the applicable entry from Table C.3.1.

n = MONVAL:

MONVAL shall contain the measured value of the parameter specified in MONTYPE. (See Table C.3.0 for the values of MONVAL for those PM parameters for which there is no measured value, but just a binary indication of whether the threshold level has been crossed or not, e.g., Laser Bias Current Level (LBCL) and Optical Power Transmitted (LPT).) Note, the initial requirements in Table C.3.0 for the MONVAL of LBCL and LPT change for DDM-2000 OC-3 R5+ and OC-12 R2+ to accommodate the support of the MONLEV parameter.

Initially, if MONVAL = 0, the MONVAL (and associated response line) shall still be included in the response.

Although the DDM-2000/**SLC**-2000 UIR RETRIEVE-PERFORMANCE MONITORING report suppresses lines with all zeros, TR-833, Issue 3 (MONLEV default = 0-UP), and NMA R3.3's PM analysis process do not allow for suppression of zeros.

Unlike previous releases, each MONVAL (and associated response line) shall be included in the response only if the MONVAL meets the criteria of the MONLEV input parameter value.

Unlike previous releases, if DDM-2000 receives an otherwise valid RTRV-PM command but no MONVAL value meets the criteria of the MONLEV input parameter value, DDM-2000 shall still output a normal completed response.
TR-833, Issue 4, changes the default MONLEV input parameter value to 1-UP (to facilitate zero suppression), and NMA R3.4 may use MONLEV to reduce PM data volumes.

o = VLDTY:

VLDTY is the validity indicator and shall have one of the following values:

null	- Data is complete (default = COMPL), data accumulated over the subject time period.
NA	- Data is not available, including counts not available because of trouble conditions that cause performance monitoring to be suspended (the DDM-2000/**SLC**-2000 UIR RETRIEVE-PERFORMANCE MONITORING report marks such counts with a hyphen (-)).
PRTL	Data is partial, accumulated over some portion of the subject time period, including counts that overflow their registers and counts that are corrupt (the DDM-2000/**SLC**-2000 UIR RETRIEVE-PERFORMANCE MONITORING report marks such counts with a greater-than symbol (>) and/or a question mark (?), respectively).

As of DDM-2000 OC-3 R3, the UIR may not distinguish PM data as "not available" (nor use the identifying hyphen (-), instead the data may be marked with a question mark (?)), thus VLDTY = "NA" would no longer appear, instead VLDTY = "PRTL" would appear in TL1 RTRV-PM responses.

If when a new circuit pack is inserted, the subject PM data is automatically initialized to zero but the software implementation is unaware of the initialization, it is acceptable for DDM-2000/**SLC**-2000 to output MONVALs = 0 (zeros) and VLDTY = null in response to RTRV-PM commands, but it is desirable that VLDTY = NA (for all full TMPER intervals, and MONVAL = NA per TR-833, Issue 4, see the following description) and VLDTY = PRTL (for the current partial TMPER interval) in such cases.

Although not a DDM-2000 requirement, TR-833, Issue 4, specifies if VLDTY = NA, MONVAL must = NA. TR-833, Issue 4, also adds two more possible values for VLDTY, i.e., ADJ (data has been manually adjusted or initialized) and LONG (data accumulated over greater than the indicated time period), but as of NMA R3.2, NMA does not support those additional VLDTY values.

p = LOCN:

LOCN shall be null except for DS1 and DS3 far-end PM data, in which case LOCN = FEND.

q = DIRN:

DIRN shall always be null.

r = TMPER:

TMPER shall have the value 15-MIN or 1-DAY.

s = MONDAT:

MONDAT shall contain the date of the beginning of the performance monitoring period specified in TMPER. If that is the current date, then MONDAT shall be null.

t = MONTM:

MONTM shall contain the time of day of the beginning of the performance monitoring period specified in TMPER. If TMPER is 1-DAY, then MONTM shall be null.

ERROR OUTPUT

In addition to the non-message specific TL1 error responses specified in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses apply to RTRV-PM commands, also.

DDM-2000/**SLC**-2000 shall check and provide error responses for the following error conditions in the order listed.

If a RTRV-PM command contains a command code modifier which is supported but the applicable feature package option is "off," the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IICM
   /* feature option not enabled */
;
```

This case could apply to RTRV-PM-VT1 in DDM-2000 OC-3 R6.0 or to RTRV-PM-T1 in DDM-2000 OC-3 R5.1.

Unlike previous releases, if a RTRV-PM command contains a command code modifier which is supported but the applicable feature package option is "off," the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, feature option not enabled */
;
```

This case could apply to RTRV-PM-VT1 in DDM-2000 OC-3 R6.1+ or to RTRV-PM-T1 in DDM-2000 OC-3 R7.0+.

Initially, if a RTRV-PM command contains a command code modifier other than a supported "rr" value or ALL, DDM-2000/**SLC**-2000 shall return an error response denying the subject command.

Initially, this error response shall include ERRCDE = `IICM` (Input, Invalid Command).

Initially, the error response should also include the following error text: `/* Command code modifier must be VT1, STS1, EC1, OC3, OC12, T3, T1 or ALL */`.

Only the supported `RTRV-PM` command code modifiers for each DDM-2000/**SLC**-2000 release will actually be included in the above error text.

The error text should also include `VT1` when VT path PM is supported in the future.

The error text should also include `T1` when DS1 path PM is supported in the future.

Unlike previous releases, if a `RTRV-PM` command contains a command code modifier other than a supported "rr" value or `ALL`, the following error response shall be returned to the OS:

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

Unlike previous releases, if DDM-2000 receives a `RTRV-PM` command without an AID value, or an AID value that is invalid or conflicts with the command code modifier, the following error response shall be returned to the OS:

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

This case covers requests with invalid AIDs; thus, the requesting OS user can correct this situation by modifying and resending the TL1 command. The following examples have been identified:

1. RTRV-PM-OC3 but AID = a (conflict between message modifier and AID),
2. RTRV-PM-OC3 but AID = z (invalid AID),
3. RTRV-PM-STS1 with AID = c-1 with FN-C equipped with STS1E_HS circuit pack(s) (because the AID is invalid for the equipage (should be AID = c)),
4. RTRV-PM-STS1 with AID = c with FN-C equipped with an OLIU circuit pack cross connected to a MXRVO or DS3 (because the AID is invalid for the provisioned cross connection (should be AID = c-1, for example)),
5. RTRV-PM-STS1 with AID = b-1 with FN-B equipped with a MXRVO or DS3 circuit pack (because that AID is invalid without an OLIU circuit pack installed in FN-B).

Initially, if a RTRV-PM command contains a MONTYPE value not supported by DDM-2000 (see Table C.3.0), DDM-2000 shall return an error response denying the subject command.

Initially, this error response shall include ERRCDE = IIDT (Input, Invalid Data Parameter).

Initially, the error response should also include the following error text: /* Input, Invalid Data Parameter */.

Unlike previous releases, the error response should also include the following error text: /* Invalid Input, MONTYPE value not valid */.

Unlike previous releases, if a RTRV-PM command contains a MONTYPE value not supported by DDM-2000 (see Table C.3.0), the following error response shall

be returned to the OS:

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

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with a MONTYPE parameter value that conflicts with the command code modifier, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, MONTYPE value not valid for input command code modifier */
;
```

When the command code modifier = ALL, *any* valid MONTYPE (Table C.3.0) is allowable and should *not* be considered conflicting with the command code modifier.

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with a MONTYPE parameter value that conflicts with the command code modifier, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, MONTYPE value not valid for input command
      code modifier */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid MONLEV parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, MONLEV value not valid */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid MONLEV parameter value, the following error response shall be returned to the OS:

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

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid LOCN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, LOCN = NEND or null */
;
```

This error message applies to DDM-2000 OC-12 and for DDM-2000 OC-3 releases prior to when DS1 PM is supported.

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid LOCN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, LOCN = NEND or null */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid LOCN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, LOCN = NEND, FEND (T1 only) or null */
;
```

This error message applies for DDM-2000 OC-3 when DS1 PM is first supported.

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid LOCN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, LOCN = NEND, FEND (T1 and T3 only) or null */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid DIRN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, DIRN = AZ, NA, RCV or null */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid DIRN parameter value, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, DIRN = AZ, NA, RCV or null */
;
```

Initially, if a RTRV-PM command contains TMPER = any value other than 15-MIN, 1-DAY or null, DDM-2000 shall return to the OS an error response denying the subject command.

Initially, this error response shall include ERRCDE = IIDT (Input, Invalid Data Parameter).

Initially, the error response should also include the following error text: /* Invalid Input, TMPER = 15-MIN, 1-DAY or null (default TMPER = 15-MIN) */.

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with TMPER = any value other than 15-MIN or 1-DAY, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, TMPER = 15-MIN or 1-DAY only */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with TMPER = any value other than 15-MIN or 1-DAY, the following error response

shall be returned to the OS:

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

Error text was changed to "invalid TMPER" via ddmd0370.

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with a TMPER parameter value that conflicts with the command code modifier (i.e., RTRV-PM-T1 with TMPER = 15-MIN in DDM-2000 OC-3 R5), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, TMPER = 15-MIN not valid for RTRV-PM-T1 */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with a TMPER parameter value that conflicts with the command code modifier, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IDNV
   /* Input, Data Not Valid, TMPER = 15-MIN not valid for RTRV-PM-T1 */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid MONDAT per Table C.0b, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, MONDAT value not valid */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with an invalid MONDAT per Table C.0b, the following error response shall be returned to the OS:

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

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with TMPER = 15-MIN and MONTM is a number that is not evenly divisible by 15 or an invalid MONTM per Table C.0b, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IIDT
   /* Invalid Input, MONTM value not valid */
;
```

Unlike previous releases, if DDM-2000 receives a RTRV-PM command with TMPER = 15-MIN and MONTM is a number that is not evenly divisible by 15 or an invalid MONTM per Table C.0b, the following error response shall be returned to the OS:

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

Unlike previous releases, if DDM-2000 receives a `RTRV-PM-ALL` command effectively, requesting all (near-end, or near-end and far-end) 15-minute PM data for all facilities/signals, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   IICM
   /* Invalid Command, requested PM data must be limited further */
;
```

Unlike previous releases, if DDM-2000 receives a `RTRV-PM-ALL` command effectively, requesting all (near-end, or near-end and far-end) 15-minute PM data for all facilities/signals, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, requested PM data must be limited further */
;
```

Unlike previous releases, if DDM-2000 receives an otherwise valid RTRV-PM command, but the AID addresses a facility that is *not equipped* to support the requested PM data, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   ENPM
   /* Equipage, not equipped for requested PM */
;
```

This case covers requests with valid AIDs but for which the necessary system hardware is *not equipped* or cross connections not provisioned; thus, the requesting OS user can not correct this situation remotely (presuming the equipage and cross-connect provisioning are as intended). The following examples have been identified:

1. a DS1 circuit pack that doesn't support DS1 PM,
2. RTRV-PM-T3 with AID = ALL but no DS3 circuit packs equipped,
3. RTRV-PM-EC1 with an otherwise valid AID value but addressing a DS3-equipped interface,
4. RTRV-PM-OC3 with AID = fn-all but no OLIU circuit packs in any of the function unit slots,

5. RTRV-PM-STS1 with an otherwise valid AID value but addressing an *un*terminated STS1 path due to 21G OLIU equipage,
6. an OLIU that doesn't support MONTYPE = LBCL or LPT),
7. RTRV-PM-T3 with an otherwise valid AID value but addressing a DS3 in the AUTO state (thinking of this as "signal equipage" not "signal provisioning"),
8. RTRV-PM-STS1 with an otherwise valid AID, but an *un*terminated STS1 path, e.g., if no cross-connects provisioned to a MXRVO or DS3 circuit pack,
9. RTRV-PM-VT1 but no VT1.5 cross-connects provisioned (thus, a case of *un*terminated VT1.5 path),
10. RTRV-PM-STS1 with AID = m-3 with the main slot(s) equipped with an OLIU STS cross connected to another OLIU in an function unit slot (because no STS path terminates with this configuration),
11. RTRV-PM-STS1 with AID = m-3 with the main slot(s) equipped with an OLIU which is not cross connected to anything (because there is no cross connect provisioned).

Unlike previous releases, if DDM-2000 receives an otherwise valid RTRV-PM command, but the AID addresses a facility that is *not provisioned* (based on PM-related provisioning, not cross-connect provisioning) to support the requested PM data, the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, not provisioned for requested PM */
;
```

This case covers requests with valid AIDs but for which the system is *not provisioned* to support the requested PM data; thus, the requesting OS user can correct this situation via remote CIT PM-related provisioning (presuming the equipage and cross-connect provisioning are as intended). The following example has been identified:

1. a DS1/DS3 interface that isn't provisioned to support the requested PM data.

Unlike previous releases, if DDM-2000 receives a `RTRV-PM` command with valid input parameter values, but *none* of the requested PM data is available (e.g., because the system just started operating, or the none of the requested PM data is available due to suspension of PM monitoring while an auto turn-up test is in progress), the following error response shall be returned to the OS:

```
   sid date time
M  ctag DENY
   SDNR
   /* Status, Data Not Ready, none of requested PM data is available */
;
```

If DDM-2000 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 shall be returned to the OS:

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

If DDM-2000 starts to respond to a valid `RTRV-PM` command but DDM-2000's

TL1 command response output buffer overflows, DDM-2000 shall output the content of the buffer then terminate the response with the following:

```
   SABT
;
```

This case may occur when long RTRV-PM responses are attempted over a low X.25 baud rate. Note, there are three blank spaces before the SABT error code which represents "Status, Aborted".

If DDM-2000 starts to respond to a valid RTRV-PM command but DDM-2000's TL1 command response output buffer overflows, DDM-2000 shall output the content of the buffer then terminate the response with the following:

```
   sid date time
M  ctag DENY
   SABT
   /* Status, response aborted, output buffer overflow */
;
```

This error response follows the more (>) at the end of the available PM data and uses the same header information as the RTRV-PM response.

RELATED TL1 MESSAGES

SET-TH

NAME

RTRV-PM-TCA: Retrieve Performance Monitoring TCA

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 (for linear systems),
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

RTRV-PM-TCA:*tid*:*aid*:*ctag*;

DESCRIPTION

This command displays the total number of threshold crossing alerts (TCAs) associated with signals terminating in the system. A TCA occurs when a performance-monitoring counter exceeds a factory/software/user set threshold.

NOTE:
This command is available to all users.

INPUT PARAMETERS

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

aid Access identifier. This identifies the facility for which threshold levels are being retrieved. The *aid* can only have the value **ALL**.

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

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid[,aidtype]:spec_block"
;
```

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, if none of the PM features are enabled and if the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
;
```

For DDM-2000 FiberReach R1.0, if none of the PM features are enabled and if the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:section=x,line=x,sts1path=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:section=x,line=x,sts1path=x"
;
```

For DDM-2000 OC-3 R8.0, 9.0, if only the **ds1pm** feature is enabled, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
   "aid,T1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,T1:tca=x"
;
```

For DDM-2000 FiberReach R1.0, If only the **ds1pm** feature is enabled the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:section=x,line=x,sts1path=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:section=x,line=x,sts1path=x"
   "aid,T1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,T1:tca=x"
;
```

For DDM-2000 OC-3 R8.0, 9.0, if 0nly the **vtpm** feature is enabled the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
   "aid,VT1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,VT1:tca=x"
;
```

For DDM-2000 Fiber Reach R1.0, if only the **vtpm** feature is enabled the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:section=x,line=x,sts1path=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:section=x,line=x,sts1path=x"
   "aid,VT1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,VT1:tca=x"
;
```

For DDM-2000 OC-3 R8.0, 9.0, if both the **vtpm** and **ds1pm** feature are enabled the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:optics=x,section=x,line=x,sts1path=x,ds3path=x,ds3line=x"
   "aid,VT1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,VT1:tca=x"
   "aid,T1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,T1:tca=x"
;
```

For DDM-2000 FiberReach R1.0, if both the **vtpm** and **ds1pm** feature are enabled the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid:section=x,line=x,sts1path=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid:section=x,line=x,sts1path=x"
   "aid,VT1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,VT1:tca=x"
   "aid,T1:tca=x"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,T1:tca=x"
;
```

OUTPUT PARAMETERS

The output report shows the address and type of parameters that are generating TCAs.

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

Additional parameters that specifically apply to this command are defined below.

aid Access Identifier of the monitored signal. For DDM-2000 OC-3 R8.0, 9.0, 11.0 and later, this can be the address of an OC-1, OC-3 or OC-12 line, STS-1 or VT1.5 path, an EC-1 line, or DS1 or DS3 port.
Access Identifier of the monitored signal. For DDM-2000 OC-12 R5.0, this can be the address of an OC-3 or OC-12 line, STS-1 path, EC-1 line or DS3 port.

Access Identifier of the monitored signal. For DDM-2000 FiberReach R1.0, this can be the address of an OC-1 line, an STS-1 or VT1.5 path, or DS1 port.

Access Identifier of the monitored signal. For FiberReach R2.2, 3.1, this can be the address of an OC-3 or OC-1 line, an STS-1 or VT1.5 path, or a DS1 port.

Access Identifier of the monitored signal. For DDM-2000 FiberReach R3.1, this can be the address of an DS3 line, or DS3 path, when the Fiber Reach shelf's function units slots are equipped with DS3 circuit packs.

aidtype Access Identifier Type. For DDM-2000 OC-3 R8.0, 9.0, FiberReach R1.0, this gives the facility type of the signal for which TCA is being reported. The following are possible values for this parameterr:

VT1

T1

spec_block *spec_block* is a name defined block to report various attributes. The format will be *name1=value1,name2=value2....* All applicable attributes to be reported are as follows:

optics For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, this shows the total number of TCAs associated with optical performance-monitoring parameters (Transmit Pwr -1dB, Transmit Pwr -2dB, Laser Bias).

section This shows the total number of TCAs associated with section performance monitoring parameters (severely errored frame seconds).

line This shows the total number of TCAs associated with line performance monitoring parameters (B2 CV, B2 ES, B2 ES Type A, B2 ES Type B, B2 SES, B2 UAS)

sts1path This shows the total number of TCAs associated with STS-1 path performance monitoring parameters (B3 CV, B3 ES, B3 ES Type A, B3 ES Type B, B3 SES, B3 UAS).

Starting with FiberReach Rel 3.1 and later, independent TCA counts are reported for each of the two STS-1 channels, one from each ring, cross-connected to the BBG19 DS3 circuit packs in the Function Unit with addresses m1-x and m2-x.

ds3 For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, FiberReach R3.1, this shows the total number of TCAs associated with DS3 path performance monitoring parameters (severely errored frame seconds, P-bit, adjusted F&M bit, or C-bit parity CV-P, ES-P, SES-P, UAS-P) incoming from the fiber and the DSX-3.
The report will also show the total number of TCAs for DS3 line performance monitoring parameters (CV-L, ES-L, SES-L). For ports on the BBG4B (for DDM-2000 OC-3, or BBG11 (for DDM-2000 OC-12) circuit packs, path and line TCAs for the DS3 signal incoming from the DSX-3 will be displayed with a port address (a,b-3,...).

For Fiber Reach Releases 3.1 and later, when the shelf is equipped with DS3-BBG4B circuit packs in Fn, for ports on the BBG4B, BBG4 and BBG11B circuit packs, path and line TCAs for the DS3 signal incoming from the DSX-3 will be displayed with a port address (f).

Path TCAs for the DS3 signal incoming from the fiber, will be displayed with a channel address (m-1, mb-10,...).

Starting with release DDM-2000 OC-3 Release 11.0, independent TCA counts are reported for each of the two DS3 ports (a-1, a-2, ...) in a function unit equipped with BBG19 DS3 circuit packs, and for each channel connected to the ports (m1-1, m2-1, ...).

Starting with release DDM-2000 FiberReach Release 3.1, independent TCA counts are reported for each of the two DS3 ports (f-1, f-2) in the function unit equipped with BBG19 DS3 circuit packs, and for each channel connected to the ports (m1-1, m2-1, ...).

tca For DDM-2000 OC-3 R8.0, 9.0, FiberReach R1.0, this column indicates the total number of TCAs associated with the addressed signal.

A greater-than symbol (>) following a count indicates that the register has overflowed and that the indicated count is the register maximum.

A hyphen (-) indicates that the count for that parameter is not available due to a trouble condition.

A blank indicates that the report field does not apply.

A question mark (?) following a count indicates that the count includes data for less than the full counting interval. This may occur if a reset or set-date command is entered into the system or if the circuit pack is inserted or removed. If the count is both overflowed and incomplete, only the greater-than symbol (>) appears.

EXAMPLE INPUT/OUTPUT

For DDM-2000 OC-3 and OC-12, if none of the PM feature options are enabled and if the the NE fully complies with the request, the following normal completion response is returned:

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:optics=1,section=2,line=3,sts1path= ,ds3path= ,ds3line= "
;
```

For DDM-2000 FiberReach, if none of the PM feature options are enabled and if the NE fully complies with the request, the following completion response is returned:

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:section=2,line=3,sts1path= "
;
```

For DDM-2000 OC-3, if only the **ds1pm** feature is enabled:

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:optics=1,section=2,line=3,sts1path= ,ds3path= ,ds3line= "
   "c-1-1,T1:tca=35"
   "c-1-2,T1:tca=0"
   "c-2-3,T1:tca=1"
   "c-2-4,T1:tca=0"
;
```

For DDM-2000 FiberReach, if only the **ds1pm** feature is enabled:

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:section=2,line=3,sts1path= "
   "c-1-1,T1:tca=35"
   "c-1-2,T1:tca=0"
   "c-2-3,T1:tca=1"
   "c-2-4,T1:tca=0"
;
```

For DDM-2000 OC-3, if only the **vtpm** feature is enabled:

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:optics=1,section=2,line=3,sts1path= ,ds3path= ,ds3line= "
   "m-3-1-1,VT1:tca=35"
   "m-3-3-4,VT1:tca=0"
   "m-3-4-4,VT1:tca=0"
   "m-3-5-4,VT1:tca=0"
;
```

For DDM-2000 FiberReach, if only the **vtpm** feature is enabled: command):

```
rtrv-pm-tca:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "main-1:section=2,line=3,sts1path= "
   "m-3-1-1,VT1:tca=35"
   "m-3-3-4,VT1:tca=0"
   "m-3-4-4,VT1:tca=0"
   "m-3-5-4,VT1:tca=0"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, or invalid.

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

RELATED TL1 COMMANDS

REPT PM

RTRV-PM

RTRV-PMSCHED

SET-TH

NAME

RTRV-PMSCHED: Retrieve Performance Monitoring Schedule

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

RTRV-PMSCHED-*modifier*:*tid*:[*aid*]:*ctag*;

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-PMSCHED commands 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.

In general, the **RTRV-PMSCHED** *output* parameter values correspond to the **SCHED-PMREPT** *input* parameter values.

INPUT PARAMETERS

modifier For DDM-2000 OC-3 R6.1, 7.1, 11.0, OC-12 R2.1, 3.1, FiberReach R1.0, this is the command code modifier and must have one of the following values:

ALL This requests all PM report schedules.

EC1 In DDM-2000 OC-3 and OC-12 systems, this is for the electrical STS1 level external interfaces.

OC1 In DDM-2000 OC-3 and FiberReach systems, this is for the optical OC-1 level external interfaces.

OC3 In DDM-2000 OC-3 and OC-12 systems, this is for the optical OC-3 level external interfaces.

OC12 In DDM-2000 OC-3 and OC-12 systems, this is for the optical OC-12 level external interfaces.

STS1 In DDM-2000 OC-12, OC-3 and FiberReach systems, This is for the dropped STS-1 channels.

T1 In DDM-2000 OC-3 and FiberReach systems, this is for the DS1 level external interfaces.

T3 In DDM-2000 OC-3 and OC-12 systems, this is for the DS3 level external interfaces.

VT1 In DDM-2000 OC-12, OC-3 and FiberReach systems, This is for the dropped VT-1 channels

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

aid Access identifier. For DDM-2000 OC-3 R6.1, 7.1, 11.0, OC-12 R2.1, 3.1, FiberReach R1.0, this is the address of the EC1, OC-1, OC-3 or OC-12 line, VT1.5, STS1 or STS3c channel, DS1 or DS3 port, or channel for which a PM report schedule is requested.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

If *modifier* = **ALL**, the *aid* value must be **all** or null (default = **all**).

ctag Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user 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 remainder of the output parameters are described below.

aid Access identifier. For DDM-2000 OC-3 6.1, 7.1, 11.0, OC-12 R2.1, 3.1, FiberReach R1.0, this is the address of the EC1, OC-3 or OC-12 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which the PM report schedule is reported. Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

aidtype Access identifier type. For DDM-2000 OC-3 6.1, 7.1, 11.0, OC-12 R2.1, 3.1, FiberReach R1.0, this has one of the following values:

- `EC1` For DDM-2000 OC-3 and OC-12 systems: This is for the electrical STS1 level external interfaces.
- `OC1` For DDM-2000 OC-3 and FiberReach systems: This is for the optical OC-1 level external interfaces.
- `OC3` For DDM-2000 OC-3 and OC-12 systems: This is for the optical OC-3 level external interfaces.
- `OC12` For DDM-2000 OC-3 and OC-12 systems: This is for the optical OC-12 level external interfaces.
- `STS1` For DDM-2000 OC-12, OC-3 and FiberReach systems: This is for the dropped STS-1 channels.
- `STS3C` For DDM-2000 OC-12 R5.0 and later: This is for the dropped STS-3c channels.
- `T1` DDM-2000 OC-3 and FiberReach systems: This is for the DS1 level external interfaces.

T3 DDM-2000 OC-3 and OC-12 systems: This is for the DS3 level external interfaces.

VT1 DDM-2000 OC-12, OC-3 and FiberReach systems: This is for the dropped VT-1 channels.

reptinvl Report interval. This specifies how often the scheduled PM report is generated and has one of the following values:

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.

reptdat Report date. This specifies the date for the *next* 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.

repttm Report time. This specifies the time of day for the *next* 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.

numinvl Number of reports intervals. This specifies the number of PM reports (REPT PM) *remaining* to be generated. If PM reporting is scheduled to continue indefinitely, *numinvl* is null.

montype Monitored parameter type. This is the PM parameter type for which reporting is scheduled. The default is for all applicable (based on the *aidtype) montype* values to be reported.
Refer to Table 3-9 at the end of this section for a list of valid values.

monlev Monitored level. This has the format LEV-DIRN. The LEV value is a decimal numeral. DIRN has one of the following values:

DN This indicates PM data is reported for *monval* values equal to or less than the value of LEV.

UP This indicates PM data is reported for *monval* values equal to or greater than the value of LEV.

locn Location. This indicates PM data is reported for a specified location and has one of the following values:

FEND This reports far-end PM data (DS1 and DS3 PM only).

NEND This reports near-end PM data.

If PM reporting is scheduled for *both* FEND (if applicable) *and* NEND, *locn* is null.

dirn Direction. This parameter always has the value NA (not applicable).

tmper Time period. This reports PM data for the specified time interval. This parameter has one of the following values:

15-MIN This reports PM data in 15-minute intervals.

1-DAY This reports daily PM data.

tmofst Time offset. This parameter specifies the start time of the time period (*tmper*) for which PM data is 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.

If the *tmofst* is 0-0-0, the Network Element reports the PM data accumulated during the *current* time period (*tmper*).

The Network Element supports parameter grouping, with single ampersands (&), of non-null *tmofst* values to indicate PM reports scheduled at intervals (*reptinvl*) greater than 15 minutes that still include all 15-minute PM data accumulated during the report interval (*reptinvl*).

inhmode 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, *inhmode* = INH.

EXAMPLE INPUT/OUTPUT

The *aid* value in the following example is a DDM-2000 OC-3 example *aid*.

```
RTRV-PMSCHED-T3:LT-PF-2000:b:123456;

IP 123456
<

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

For DDM-2000 OC-3 6.1, 7.1, OC-12 R 2.1, 3.1, if the NE receives a **RTRV-PMSCHED** command with a command code modifier which is supported but the applicable feature package option is "off," the following error response is returned:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, feature option not enabled */
;
```

If the NE receives a **RTRV-PMSCHED** command with a command code modifier other than those listed as allowable for the input parameter *modifier*, the following error response is returned:

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

If the NE receives a **RTRV-PMSCHED** 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 */
;
```

RELATED TL1 MESSAGES

REPT PM

RTRV-PM

SCHED-PMREPT

NAME

RTRV-PTHTRC-*sts1*: Retrieve Path Trace.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** for linear systems
- OC-12 Release **5.0** for rings

INPUT FORMAT

RTRV-PTHTRC-*sts1*:*tid*:[*aid*]:*ctag*[:*msgtype*];

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-PTHTRC-*sts1* commands can be initiated to retrieve the provisioned transmit and receive path traces, the status of the path trace, and the actual receive path trace, if available.
This command retrieves path trace information pertaining to the addressed path terminating entity in a line-by-line format.

INPUT PARAMETERS

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

aid This is the SONET channel address of the terminating SONET path (STS1 or VT1) for which the path trace is requested.

If null, the *aid* defaults to all.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

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.

msgtype Message type. This is the type of message to be retrieved.

msgtype must be **ALL** or null.

OUTPUT FORMAT

If there is path trace information to report, the following output message is returned:

```
IP ctag
<

sid date time
M ctag COMPLD
   "aid=STS-1 channel address,status=x,<cr><lf>
   INCTRC=
   EXPTRC=
   TRC=
        .       .       .       .       .       .       .       .       .
        .       .       .       .       .       .       .       .       .
        .       .       .       .       .       .       .       .       .
   aid=STS-1 channel address,status=x,<cr><lf>
   INCTRC=
   EXPTRC=
   TRC=
;
```

The output message line length is limited to 80 characters irrespective of the length of the trace to be reported.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for normal completion response. The output parameters listed there apply to the **RTRV-PTHTRC-*sts1*** command, also.

Additional parameters that specifically apply to this command response are defined below.

`aid` Access Identifier. This is the address of the signal for which the path trace is to be retrieved.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

`status` Path Trace Status. This is a status report of the incoming trace. For **RTRV-PTHTRC-*rr*** messages `status` can take one of the following values.

`GOOD`	Good. This indicates that the `INCTRC` and the `EXPTRC` match.
`MISMATCH`	Mismatch. This indicates that the `INCTRC` and the `EXPTRC` do not match.
`UNAVAILABLE`	Unavailable. This indicates that there is no `INCTRC` because there has been a path interruption.

NOT_APPLICABLE Not Applicable. This indicates that the aid chosen does not have a trace capability.

The NOT_APPLICABLE, status does not apply to DDM-2000 family of products and SLC-2000.

INCTRC Incoming Path trace message. For DDM-2000 FberReach R2.2, 3.1, this indicates the incoming Path Trace (J1) content. The INCTRC is a string of the first 62 ASCII characters received in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are not displayed.

Incoming Path trace message. This indicates the incoming Path Trace (J1) content. The INCTRC is a string of the first 62 ASCII characters received in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are displayed as "??".

The 63rd and the 64th character positions of every trace message are fixed as <cr> and <lf>, respectively.

If the INCTRC is UNAVAILABLE, a question mark ("?") is reported for the INCTRC.

If there are invalid characters or there is no CR/LF in a non-null INCTRC, the status will be set to MISMATCH.

EXPTRC Expected incoming Path trace message. For DDM-2000 FberReach R2.2, 3.1, this indicates the expected Path Trace (J1) content. The EXPTRC is a string of the first 62 ASCII characters received in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are not displayed.

If no EXPTRC has been provisioned, the EXPTRC is all nulls and will be displayed as
EXPTRC=\".....\".

Expected incoming Path trace message. This indicates the expected Path Trace (J1) content. The EXPTRC is a string of the first 62 ASCII characters received in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are displayed as "??".

If no EXPTRC has been provisioned, the EXPTRC is all nulls and will be displayed as EXPTRC=\"
\".

If there are invalid characters or there is no CR/LF in a provisioned EXPTRC, the `status` will be set to `MISMATCH`.

`TRC` Outgoing Path trace message. This identifies the path trace message to be transmitted. The trace byte (J1) continuously transmits a 64 byte fixed length, ASCII string, one byte at a time. The TRC is a string of the first 62 ASCII characters to be transmitted in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are not displayed.

If no `TRC` has been provisioned, the `TRC` is all nulls and will be displayed as
`TRC=\".....\".`

Outgoing Path trace message. This identifies the path trace message to be transmitted. The trace byte (J1) continuously transmits a 64 byte fixed length, ASCII string, one byte at a time. The TRC is a string of the first 62 ASCII characters to be transmitted in the path trace bytes (J1) of the SONET signal. The terminating carriage return (<cr>) and line feed (<lf>) are displayed as "??".

If no `TRC` has been provisioned, the `TRC` is all nulls and will be displayed as `TRC=\"`
`\"`.

If there are invalid characters or there is no CR/LF in a provisioned TRC, the `status` will be set to `MISMATCH`.

The ASCII characters allowed for the path trace are letters "A" through "Z" and "a" through "z", numbers "0" through "9", and special characters: "#" (pound), "$" (dollar), "%" (percent), "&" (ampersand), "*" (asterisk), "(" (open parenthesis), ")" (close parenthesis), "+" (plus), "|" (pipe), "-" (hyphen), "[" (open square bracket), "]" (close square bracket), "{" (open bracket), "}" (close bracket), "´" (apostrophe), "`" (grave accent), "." (period), "/" (slash), "<" (less than), and ">" (greater than).

All non-printable characters in the trace messages will be mapped to question mark ("?") in the output. Nulls and spaces will be displayed as space (" ").

EXAMPLE INPUT/OUTPUT

The DDM-2000 OC-3 example below shows the response to by the user concerning a STS1 channel m-1. The STS1 channel has a `status` of `GOOD`.

```
RTRV-PTHTRC-STS1:LT-PF-2000:m-1:123456;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "m-1,status=GOOD,<cr><lf>
   INCTRC=
   EXPTRC=
   TRC=
;
```

ERROR RESPONSES

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

If a **RTRV-PTHTRC-*rr*** command is received with a *modifier* value other than **STS1**, the following error response is returned:

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

For DDM-2000 FiberReach R2.2, 3.1,If a **RTRV-PTHTRC-*STS1*** 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 */
;
```

For DDM-2000 FiberReach R2.2, 3.1, if a **RTRV-PTHTRC-***STS1* command is received with a *msgtype* value other that **ALL** or null, the following error response is returned:

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

If the NE receives an otherwise valid **RTRV-PTHTRC-***STS1* command but there is no STS-1 or channel at the specified address, the following error response is returned to the user:

```
 sid date time
M ctag DENY
 SNVS
 /* Status, Not in Valid State, address points to a non-existent channel */
;
```

RELATED TL1 COMMANDS/MESSAGES

ENT-*rr*

ENT-STS1

ENT-CRS-*rr*

NAME

RTRV-*rr*: Retrieve the provisioned values of a given type of transmission object entity in a Network Element (NE).

Support for this command is available for DDM-2000 Multiplexers starting with:

- OC-3 Release 6.1, 7.0, 7.1
- OC-12 Release 2.1, 3.1
- FiberReach Release 1.0

INPUT FORMAT

RTRV-*modifier*:*tid*:*aid*:*ctag*;

DESCRIPTION

NOTE:
This command is available to maintenance users starting with DDM-2000 OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1.

RTRV-*rr* command can be initiated by a user to retrieve the currently provisioned parameter values for specific types of transmission object entities in the NE. This command retrieves all parameter settings that are provisionable via the ENT-*rr* command pertaining to the addressed NE, reported one line per entity.

In DDM-2000 OC-3 R11.0 and later, if main slot 1 and slot 2 are equipped with different pack types (i.e. during upgrade), the report will include data for what is considered at the time as the valid system pack type.

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R 2.1, 3.1, and FiberReach R1.0, this is the message modifier for the **RTRV-***rr* message and will have one of the following values:

T1	This is for the DS1 level external interfaces including T1 extensions; Applicable to DDM-2000 OC-3 and FiberReach systems
T3	This is for the DS3 level external interfaces; Applicable to DDM-2000 OC-3, OC-12 and Fiber Reach (in release 3.1 and later releases, only if the shelf is equipped with 28-type OLIUs in Main and DS3 circuit packs in the Function unit slots) systems
EC1	This is for the electrical STS1 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems

OC1	This is for the optical OC-1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems
OC3	This is for the optical OC-3 level external interfaces; Applicable to DDM-2000 OC-3, OC-12 and FiberReach systems release 2.2, 3.1 and later releases using the 28-type OLIU circuit packs.
OC12	This is for the optical OC-12 level external interfaces; Applicable to DDM-2000 OC-12 system and to DDM-2000 OC-3 system starting with R11.0.
STS1	This is for the dropped STS-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems
STS3C	This is for the dropped STS-3c channels in OC-12 (starting with R5.0).
VT1	This is for the dropped VT-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems

For all of the remaining parameters, it is implied that the *modifier* must match the entity addressed by *aid*.

tid Target identifier. This is the name of the NE to which the command is addressed. This is a required field.

aid Access identifier. This is the address of the entity for which the currently provisioned values are requested. The *aid* is a required field and must reference the valid entity of the NE in order to be accepted. For the valid *aid*s for FiberReach, OC-3 and OC-12 systems, see Table 11-1 in the appropriate versions of the DDM-2000 User Service Manual.

ctag Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command with the response.

OUTPUT FORMAT

In response to a valid **RTRV-***rr* command, the following output report will be returned to the user, sorted by alphanumeric order of the *aid* value (similar to the CIT output).

Following is a sample output from the NE in response to the incoming **RTRV-***rr* command from the user.

```
   sid date time
M  ctag COMPLD
   "aid:::spec_block:pst"
       .       .       .       .       .       .       .
       .       .       .       .       .       .       .
   "aid:::spec_block:pst"
;
```

OUTPUT PARAMETERS

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

aid Access identifier. This is the address of the entity whose currently provisioned values are being reported. In the output report, there will be one line (record) per *aid*. *aid*s corresponding to unequipped ports, slots, channels and lines will not be included in the output report.

spec_block Specific block. This parameter field is used for returning the currently provisioned parameter values for the entities, as specified in Bellcore TR-199, Issue 1. Parameters within the *spec_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.

AIS Alarm Indication Signal. This parameter is returned only when the *modifier* is T1 or T3. The **AIS** parameter is reported to indicate if DS1 or DS3 AIS is provisioned to be inserted toward the optical fiber when LOS from the DSX is encountered at the T1, DS1 or DS3 port(s) addressed by the *aid*. When the *modifier* is T3, this value is reported by the NE in this parameter only if the **LINECDE** is CCHAN†. In the case of DS3, setting **AIS**=Y, also will make the NE insert DS3 AIS toward the DSX-3 when it enters the OC-N signal fail or STS path AIS state incoming from the fiber. This

---

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

parameter will have one of the following values:

Y Insert AIS.

N Do not insert AIS.

AISALM AIS Alarm Level. In DDM-2000 OC-3 R11.1, 13,0, this parameter is returned only when the *modifier* is T3, and only for the TMUX (BBG20) circuit pack. This parameter indicates the alarm level for an incoming DS3 (from DSX) AIS. This parameter will have one of the following values:

CR Critical alarm.

MJ Major alarm

MN Minor alarm

NA No alarm

- This parameter is not applicable.

AISNC Alarm Indication Signal Notification Code for Non-Service Affecting conditions. This parameter is not reported when the *modifier* is not OC1, OC3, OC12, STS3C, STS1 or VT1. This parameter is used to indicate the alarm level that is currently being used to indicate an incoming line or path AIS that is not service affecting. This parameter will have one of the following values.

CR Reported only when the *modifier* is OC1, OC3 (applicable to FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases) , or OC12

MJ Reported only when the *modifier* is OC1, OC3 (applicable to FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases) , or OC12

MN Reported only when the *modifier* is OC1, OC3 (applicable to FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases) , OC12, STS3C, STS1, or VT1

NA Reported only when the *modifier* is OC1, OC3 (applicable to FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases) , or OC12

NR Reported only when the *modifier* is STS1, STS3C or VT1

AISNCSA Alarm Indication Signal Notification Code for Service Affecting conditions. This parameter is not reported when the *modifier* is not STS3C, STS1 or VT1. This parameter is used to indicate the Alarm Level that is currently being used to indicate an incoming path AIS that is service affecting. This parameter will have one of the following values.

CR Reported only when the *modifier* is STS3C or STS1 and the report pertains to a ring channel

MJ Reported only when the *modifier* is VT1 and the report pertains to a ring channel

MN Reported only when the *modifier* is STS3C (not applicable to DDM_2000 OC-3 and FiberReach), STS1, or VT1 and the report pertains to a non-ring channel

NA Reported only when the *modifier* is STS3C (not applicable to DDM_2000 OC-3 and FiberReach), STS1, or VT1 and the report pertains to a ring channel

NR Reported only when the *modifier* is STS3C (not applicable to DDM_2000 OC-3 and FiberReach), STS1, or VT1 and the report pertains to a non-ring channel

BPV DLCBPV to LOS indicator. In DDM-2000 OC-3 6.1, 7.0, 7.1 and FiberReach R1.0, this parameter is reported to indicate 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 T1 or DS1 port(s) addressed by the *aid*. This parameter is reported only when the *modifier* is T1 and consequently only by DDM-2000 OC-3 and FiberReach systems. This parameter will have one of the following values:

N Do not send all zeroes.

Y Setting the **BPV** 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 In DDM-2000 OC-3 R6.1 and OC-12 R2.1, this parameter is returned only when the *modifier* is OC3. This parameter is used to indicate the concatenation mode of the OC-3 line from MAIN to FN-C in an OC-3 system to be independent channels or an STS-3c channel. This parameter is valid only for linear OC-3 releases where the STS-3c feature has been enabled and will have only one of the following values:

disabled If the concatenation mode is disabled, the channels in the OC-3 line are independent.

enabled If the concatenation mode is enabled

— in the case of an OC-3 system, the three STS-1 channels recovered from the OC-3 signal in the MAIN slots are passed as STS-3c signal to the FN-C where they are reconstructed back into an OC-3 signal. Both MAIN and FN-C must be equipped before concatenation mode will

be `enabled`.

— in the case of an OC-12 system, the three STS-1 channels of the MAIN-B slots normally default connected to the addressed function unit are recovered from the OC-12 signal are passed as an STS-3c signal to the addressed function unit slots where they are converted to an OC-3 signal.

APPLICATION In DDM-2000 OC-12 R3.1, this parameter is reported only when the *`modifier`* is `OC3` and only when the the NE addressed by the *`tid`* in the input command is an OC-12 ring system. This parameter specifies that the protection mode of the OC-3 LS interface in an OC-12 system as 1+1 protected (linear extensions) or 0x1 protected (ring extensions) or set for video applications.

`0X1` In DDM-2000 OC-12 R3.1, this means that the line protection mode is 0x1. In this case, the signals in the two OC-3 lines of the protected OC-3 CP pair are independent of one another and they are both unprotected. In this configuration, the OC-3 lines will be connected to DDM-2000 OC-3 ring shelf which will perform protection switching at the path level.

`1+1` In DDM-2000 OC-12 R5.0, this means that the line protection mode is 1+1. In this case, the same signal is transmitted on both transmit lines of the protected OC-3 CP pair and the OC-3 signal from the better one of the two receive lines is selected. In this configuration, the OC-3 lines will be connected to DDM-2000 OC-3

linear shelf which will perform line protection switching.

`VIDEO` This means that the line has been set for video application. In this case, the signals in the two OC-3 lines of the protected OC-3 CP pair are independent of one another and they are both unprotected. In this configuration, the OC-3 lines will be connected to a video server.

CPMODE In DDM-2000 OC-3 R6.1, 7.0, 7.1, this parameter is reported only with the *`modifier`* `EC1`. 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 the LS mode.

FMT In DDM-2000 OC-3 R6.1, 7.0, 7.1 and FiberReach R1.0, and later, this parameter is reported to indicate the DS1 digital signal format expected to be received from the DSX-1 at the specified T1 or DS1 port(s). This parameter is reported only when the *`modifier`* is T1 and consequently by DDM-2000 OC-3, and FiberReach systems and only if the corresponding T1 or DS1 port is equipped with a T1 extension or DS1 PM Circuit Pack respectively. This parameter will 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.

In DDM-2000 OC-3 R7.1, 7.2, 8.0, 9.0, OC-12 R3.1, 4.0, 5.0, and FiberReach R3.1, and later, this parameter is reported to indicate the DS3 performance monitoring scheme that is

being used on the signal incoming from the HS fiber or the DSX to the specified DS3 port(s). This parameter is reported for the *modifier* T3 only if the **LINECDE** is not set to CCHAN. This parameter will have one of the following values:

PBIT PBIT scheme is used for DS3 PM.

FMBIT FMBIT scheme is used for DS3 PM.

CPBIT C-bit parity scheme is used for end-to-end DS3 path PM.

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

FRAME This parameter is reported only when the *modifier* is T3. **FRAME** specifies the framing format of the DS3 signal at the specified port. This parameter will have a value of

M13 to indicate that the DS3 signal is M13 formatted with the C-bits serving the traditional stuffing function, or

CBIT to indicate that the DS3 signal is C-bit formatted with the C-bits serving the end-to-end path functions.

KBYTE In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R2.1, 2.1, 3.1, this parameter is used only when the *modifier* is OC3 or OC12. **KBYTE** specifies the usage of the K byte overhead for Synchronization Messages. Both the sending and receiving messages are affected. Note that this parameter is no longer used in Ring Releases starting with OC-3 Release 9.1 and OC-12 Release 5.1, or in linear releases starting with OC-3 Release 8.1. This parameter is valid on both linear and ring OC-3 and OC-12 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.

SYNCMSG Synchronization Messaging. This parameter is available for Ring Releases starting with OC-3 Release 9.1 and OC-12 Release 5.1 and later releases, FiberReach Wide-Band Shelf release 2.2 and later, (supported for OC3 and not for OC1 line of wbs) and in linear releases starting with OC-3 Release 8.1. Synchronization messaging allows timing to be reconfigured in a network upon a node or fiber failure. The parameter value is one of the following:

kbyte This is the default value. When this option is selected, both K2 and S1 byte sync messaging are transmitted, but only K2 byte is received and interpretted for sync messaging.

sbyte When S1 byte is selected, only the S1 byte is sent and received for sync messaging. K2 byte will always send a "Don"t Use" message.

disabled When this option is selected, interpretation of both K2 and S1 bytes will be disabled and hence a "Don’t Use" message will be transmitted on both at all times.

na This option is applicable to FiberReach R3.1 with 22-Type OLIUs in FN for STS-3c application.

In DDM-2000 FiberReach R3.1, Synchronization Messaging. The requirement **[R-RTRVRR-168]** is appicable to OLIUs in the Main slots only. The Synchronization Messaging for OLIUs in Function slots is always disabled and therefore this parameter is not applicable and the reported value will be "na".

LINECDE DS1 and DS3 Line Coding. When the *modifier* is T3, the *LINECDE* parameter is used in combination with the *AIS* and *PBIT* parameters to determine the DDM-2000 VMR mode.*

AMI The **LINECDE** will have the value of AMI only when the *modifier* value is T1. Hence it is reported by only DDM-2000 OC-3 and FiberReach systems. In order to operate the T1 or DS1 port(s) addressed by the *aid* monitoring coding violations other than bipolar violations, the *LINECDE* parameter would be reported as AMI.

B8ZS The **LINECDE** will have the value of B8ZS only when the *modifier* value is T1. Hence it is reported only by DDM-2000 OC-3 and FiberReach systems. In order to operate the T1 or DS1 port(s) addressed by the *aid* monitoring bipolar violations, the *LINECDE* parameter would be reported as B8ZS.

B3ZS The **LINECDE** will have the value of B3ZS only when the *modifier* value is T3. When the port addressed by the *aid* specified in the input command is currently operating in VM or VMR mode, the **LINECDE** will be returned as B3ZS.

CCHAN The **LINECDE** will have the value of CCHAN only when the *modifier* value is T3. When the port addressed by the *aid* is currently operating in the clear channel mode, (either CC w/ AIS or CC w/o AIS mode), the *LINECDE* parameter is returned with

---

* The allowed DDM-2000 VMR modes are *Violation Monitor and Removal* (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).

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). (e-g. **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). (e-g. **LINECDE**=B8ZS(OVERRIDE))

NTFCNCDE Notification code. The NTFCNCDE parameter is reported to indicate the alarm level of DS1 or DS3 facility failures serviced by the addressed (*aid*) T1, DS1 or DS3 port(s). The *NTFCNCDE* parameter will have one of the following values:

CR	Critical Alarm.
MJ	Major Alarm.
MN	Minor Alarm.
NA	Not alarmed.

OPTPWR In DDM-2000 OC-3 R6.1, 7.0, 7.1, and OC-12 R2.1, 3.1, 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 will have only 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 In DDM-2000 OC-3 R6.1, 7.0, 7.1, OC-12 R2.1, 3.1, and FiberReach R3.1, DS3 P-bit correction. 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 DDM-2000 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 will be reported as ON.

OFF When the mode of the DS3 port(s) addressed by the *aid* in monitoring P-bit violations and not correct them (VM), the *PBIT* parameter will be reported as OFF.

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

DDM-2000 DS3 Port VMR Mode Specification (for **RTRV**-*rr***)**

VMR Mode0	**LINECDE**0	**AIS**0	**PBIT**0
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 In DDM-2000 OC-3 R6.1, 7.0, 7.1, 7.2, 8.0, 9.0, OC-12 R3.1, 4.0, 5.0, and FiberReach R3.1, Performance Monitoring Mode. This parameter is reported only when the *modifier* is T1 or T3. The *PMMD* parameter is reported to indicate if PM mode has been enabled or not for the port(s) addressed by the *aid*. This parameter will have a one of the following values:

OFF PM turned off.

ON PM turned on.

RADIO This parameter is reported by DDM-2000 OC-3 MegaStar systems and will have the values of yes or no to indicate whether

there is a Radio Frequency Unit (RFU) is connected to the SONET subsystem through an IS-3 interface.

SFTHR In DDM-2000 OC-3 R6.1, 7.0, 7.1, 11.0, OC-12 R2.1, 3.1, and FiberReach R1.0, Signal Failure threshold. This parameter is reported to indicate the signal failure threshold in terms of Bit Error Rate (BER) for the `T1`, `DS1`, `DS3`, or `EC1` port(s), or the `OC1`, `OC3`, or `OC12` line(s), or the `VT1`, `STS1`, or `STS3C` path(s) addressed by the *`aid`*. This parameter will have values of `0`, and `-5` through `-9` depending upon the *`modifier`* in the input command and its setting at the shelf.

SFAIL STS-1 Signal Failure threshold at which VT-1.5 AIS is being inserted on non-path terminating paths including pass-through paths in VT path switched rings and at which the STS path switching is occuring for STS path switched rings. Consequently, this parameter will be reported only when the *`modifier`* is `STS1` and the report is from a ring system. This parameter will be null or have one of the following values:

-3 This means that the threshold is at a BER of $10 sup -3$.

-6 This means that the threshold is at a BER of $10 sup -6$.

XBIT In DDM-2000 OC-3 R11.0, 13.0, this parameter is returned only when the *`modifier`* is T3, and is only applicable for the TMUX (BBG20) circuit pack. This parameters displays the values for both X-bits in the outgoing (towards DSX) DS3 signal. This parameter is valid only if the Frame has been set to "m13". This parameter will have one of the following values:

1 (default)

0

- For when the TMUX circuit pack has been provisioned for "cbit" framing or any other non-TMUX DS3 ports.

pst Primary State. This parameter is reported to indicate the primary state of the T1, DS1 and DS3 port(s), STS1 and VT1 dropped channels, the OC-1 lines of the DDM-2000 OC-3 systems, and the OC-3 lines of the DDM-2000 OC-12 systems addressed by the *aid* field.

The NE allows for user provisioning of 2 primary states for ports and channels: AUTO and NMON. When a port/channel is provisioned in the AUTO state, it will automatically transition to the in-service (IS) state upon detection on the low speed port/channel of a valid signal. When the port/channel is provisioned in the NMON state, the monitoring of incoming signals is disabled. The port/channel exits this state to the AUTO state through either another ENT-*rr* command or via the corresponding CIT command (eg., SET-STATE-*rr*).

The NE allows for user provisioning of 2 primary states for optical lines: IS and NMON. When the line is provisioned in the NMON state, the monitoring of incoming signals is disabled. When the line is provisioned in the IS state, the monitoring of incoming signals is enabled. Transitions between these two states occur only via execution of another another ENT-*rr* command or via the corresponding CIT command (eg., SET-STATE-*rr*). Lines do not support the AUTO state.

IS In Service. This specifies that the port/channel/line addressed by the *aid* is in the in-service state.

OOS-MA-AS Out of service, memory administration, assigned. In the terminology of DDM-2000 and FiberReach, this state is known as AUTO.

OOS Out of service (*"for Memory Administration"* implied). This specifies that the port/channel/line addressed by the *aid* is in the non monitored state.

The line state provisioning is allowed only for the OC-3 lines in the function units of OC-12 systems and the OC-1 line state provisioning is allowed only for the OC-1 lines in DDM-2000 OC-3 and SLC-2000 systems.

EXAMPLE INPUT/OUTPUT

The example below shows the response to a query concerning the DS3 port "a" of a DDM-2000 OC-3 system. This DS3 port is in-service, has a critical notification code level in case of failure, is operating in VMR mode with a signal failure threshold of $10 sup -6$.

```
rtrv-t3:ATT-PF-2000:a:123456;


IP 123456
<


   ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "a:::LINECDE=B3ZS,PBIT=ON,NTFCNCDE=CR,SFTHR=-6:IS"
;
```

The example below shows the response to a query of the user concerning the DS3 port "a" of a DDM-2000 OC-3 system. The corresponding DS3 slot is unequipped. So a null response is returned by the NE.

```
rtrv-t3:ATT-PF-2000:a:123456;


IP 123456
<


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

The example below shows the response to a query of the user concerning the VT1 channel "m-1-1-1" of a DDM-2000 OC-3 system.

```
rtrv-vt1:ATT-PF-2000:m-1-1-1:123456;


IP 123456
<


   ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "m-1-1-1:::AISNC=NR,AISNCSA=MJ,SFTHR=-6:IS"
;
```

The example below shows the response to a query of the user concerning the OC3 lines in the function unit of a DDM-2000 FiberReach system (Release 3.1 and later):

```
rtrv-oc3:ATT-PF-2000:fn-all:123456;


IP 123456
<


   ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "fn-1:::AISNC=MJ,SYNCMSG=na,SFTHR=-6:IS"
   "fn-2:::AISNC=NA,SYNCMSG=NA,SFTHR=-9:IS"
;
```

The example below shows the response to a query of the user concerning the OC1 lines in the function unit "a" of a DDM-2000 OC-3 system:

```
rtrv-oc1:ATT-PF-2000:fn-a-all:123456;


IP 123456
<


   ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "fn-a-1:::SFTHR=-6:IS"
   "fn-a-2:::SFTHR=-9:OOS"
;
```

Note that the primary states of the two OC-1 lines to fn-a are also reported.

The example below shows the response to a query of the user concerning all STS1 channels of a DDM-2000 OC-12 system when there are only three STS1 channels currently cross-connected:

```
rtrv-sts1:ATT-PF-2000:all:123456;


IP 123456
<


   ATT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "mb-1:::AISNC=NR,AISNCSA=CR,SFTHR=-6:IS"
   "mb-4:::AISNC=MN,AISNCSA=CR,SFTHR=-6:IS"
   "mb-10:::AISNC=NR,AISNCSA=NA,SFTHR=-6:IS"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to this command also. In addition to the non-message-specific error found in SRD Section 2.4.4 and Appendix Section C.3.1, the following error responses are those that the NE checks for each condition.

In DDM-2000 OC-3 R11.0, and later, if the system receives a **RTRV-*rr*** command with a command code modifier other than `T1, T3, EC1, OC1, OC3, OC12, STS1,` or `VT1`, the following error response is returned to the user:

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

In DDM-2000 FiberReach R1.0, if the system receives a **RTRV-*rr*** command with a command code modifier other than `T1, OC1, STS1, or VT1`, the following error response is returned to the user:

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

In DDM-2000 FiberReach, if the system receives a **RTRV-***rr* command with a command code modifier other than `T1, OC1, OC3, STS1 or VT1`, the following error response is returned to the user:

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

In DDM-2000 FiberReach R3.1, if the system receives a **RTRV-***rr* command with a command code modifier other than `T1, T3, OC1, OC3, STS1, or VT1`, the following error response is returned to the user:

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

In DDM-2000 OC-12 R5.0, and later, if the system receives a **RTRV-***rr* command with a command code modifier other than T3, EC1, OC3, STS1, or STS3C, the following error response is returned to the user:

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

If the NE receives a **RTRV-***rr* command without an *aid* value or with an *aid* value that is invalid for the *modifier* provided (i.e., because the *aid* refers to a different type of entity than is specified by the *modifier*), 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 modifier */
;
```

In DDM-2000 OC-3 R6.1, 7.1, and OC-12 R2.1, 3.1, if the NE 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
   ENEQ
   /* Equipage, Not EQuipped */
;
```

If the NE receives a **RTRV-***rr* command with a modifier of either STS3C, STS1 or VT1 and with a valid *aid* but there is no STS-3c, STS-1 or VT-1.5 channel at the specified address, the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, address points to a non-existent channel */
;
```

In DDM-2000 OC-3 R11.0 and OC-12 R5.0, and later, if the addressed channel is a component of a higher level channel (e.g. VT-1.5 being addressed is actually a part of an existing STS-1 channel or the STS-1 channel being addressed is actually a part of an existing STS-3c channel) the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, the specified address is
      not properly cross-connected */
;
```

In DDM-2000 OC-12 R5.0, and later, if the NE receives an ENT-*rr* command which is otherwise valid but the appropriate feature (e.g. STS-3c) has not been enabled at the system, then the following error response is returned to the user:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed, feature option not enabled */
;
```

RELATED TL1 COMMANDS

ENT-*rr*

NAME

RTRV-STATE-EQPT: Retrieve State Equipment

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0**, OC-12 Release **4.0** for linear systems
- OC-3 Release **9.0** and OC-12 Release **5.0** for rings
- FiberReach Release **1.0**

INPUT FORMAT

RTRV-STATE-EQPT:*tid*:[*aid*]:*ctag*[:[:[:]]];

DESCRIPTION

The **RTRV-STATE-EQPT** command can be initiated by general users and reports only users to retrieve the port, slot, and protection switch information for the Network Element identified by the TID. This TL1 command is intended to behave as much as is possible like its CIT equivalent.

NOTE:
This command is available to all users.

INPUT PARAMETERS

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

aid AID. The aid identifies one or more slots. A null value defaults to **all** for all slots in the system.

Valid OC-3 Addresses: **all, main-{1,2,all}, fn-all, fn-{a,b,c}-{1,2,all}, ls-all, ls-{a,b,c}-{1-8,all}, tg-{1,2,all}**
Valid SLC Addresses: **all, main-{1,2,all}, fn-all, fn-{a,c}-{1,2,all}, ls-all, ls-{a,b,c}-{1-8,all}, tg-{1,2,all}**
Valid OC-12 Addresses: **all, main-b-{1,2,all}, fn-all, fn-{a,b,c,d}-{1,2,all}, tsi-{1,2,all}, tg-{1,2,all}**

Valid FiberReach Addresses: **all, main-{1,2,all}, fn-{1,2,all}, ls-all, ls-{a,b,c,d}-{1,2,all}**

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 NE fully complies with the RTRV-STATE-EQPT request, the following normal completion response is returned with an output report as follows.

```
IP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD

    "aid,pack-type:port-state,switch-state,switch-priority"
       .        .         .           .
       .        .         .           .
    "aid,pack-type:port-state,switch-state,switch-priority"

;
```

In the output report, all slots of the same type are listed together. Within each type, slots are listed in order of their addresses wtih protection slots listed last.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

address *address* is the address of a slot. See the input parameters section for more information.

Circuit-Pack *circuit pack* is the circuit pack name (type). a null entry means not applicable or not equipped. Examples are "OLIU" or "STS1E-L".

Port-State(s) *Port State(s)*. The state of the signal, from the DSX or T1 interface for DS-1 signals is reported.

Port State(s) The state of the signal, from the DSX for DS-1, DS-3, or EC-1 signals, or from the fiber for OC-1 signals, is reported.

Port State(s) The state of the signal, from the DSX for DS-3 or EC-1 signals, is reported.

Port State (p) may be one of the following:

`in-service` In Service.
In this state, the port is monitored for failures, and the appropriate alarm is generated if a failure is detected. To retire the alarm and transition the associated port to the "auto" state, the update function must be performed after the input signal is removed.

`auto` Automatic.
In this state, the port will automatically be put "in service" if a good signal is detected. This state is not allowed for OC-1 signals.

`nmon` Not Monitored. In this state, the signal is not monitored or alarmed. The port will not automatically go to the "in service" state when a signal is detected.

`null` Not monitored, not equipped. The port state is always null for timing circuits, and for protection slots for 1x1 and 1xn protected circuit packs. The port state is null on SLC-2000 systems for slots on the low speed group. The port state is always null for both OLIU circuit packs in function units provisioned for the dual 0x1 application.

auto For OC-3 and FiberReach systems, the port state is always null for low speed slots in the `auto` state.

NOTE:
Note that the BBG19 DS3 circuit pack is 0X1 protected and thus has independent port states for the "service" and "protection" slots.

`Switch-State` *`Switch State`*. The Switch States indicates whether the circuit pack is active or standby, corresponding to the state of the protection switching relays. Switch state(s) may be one of the following:

`active` For DDM OC-N lines in a 1+1 line-protected configuration, active means the signal being received on this line is selected by the near end protection switch and the signal being transmitted on this line is selected by the far end.

For DDM ring applications, each OLIU in the main slots (OC-3) or main-b slots and the TSI in the TSI slots (OC-12) is feeding its ring channels incoming from the fiber to the other side for pass-through connections and is sending drop channels to the function units.

With the addition of pass-through cross connections in function units in Release 9.1 (OC-3) and path-protected hairpin local drop cross-connections in release 11.0 (OC-3), the above discussion applies to OLIUs in function unit slots supporting such cross connections.

For FiberReach, each OLIU in the main slots is feeding its ring channels incoming from the fiber to the other side for pass-through connections and is sending drop channels to the low-speed slots.

`active-fn`, OC-3 systems (for a main OLIU slot in ring applications) this means that the ring protection switching is currently being done on this pack, and this pack is choosing each active ring channel from either ring and sending it to the function units.

`active-ls` For FiberReach For a main OLIU slot, or for For a TSI slot in ring applications (OC-12), this means that the ring path protection switching is currently being done on this pack, and this pack is choosing each active ring channel from either ring and sending it to the function units (OC-3 or OC-12) or low-speed slots (FiberReach).

For other pack types, active means the signal is being transmitted and received from this pack. Even if the pack is removed, the slot will remain active unless there is a protection circuit pack that service can be switched to.

`active-tx` For OC-3 function unit -3 lines, the signal being transmitted is selected by the far end, but the received signal is not selected by the near end protection switch.

`active-rx` For OC-3 function unit -3 lines, the signal being received on this line is selected by the near end protection switch, but the signal being transmitted is not selected by the far end.

`active-?` For OC-3 function unit lines, the protection line is failed in the receive direction. The state of the protection line in the transmit direction is unknown; the signal transmitted on the protection line *might* be selected by the far end.

`standby` The circuit pack or optical line is not currently active.

null Not applicable or not equipped

For ring applications because of pass-through connections, the switch state will always be active for both main OLIUs (Fiber Reach and OC-3) and for for both main-b OLIUs and TSIs (OC-12). For function units provisioned for the dual 0x1 application, the switch state will always be active for both OLIUs (OC-3 and OC-12). For function units provisioned for pass-through (OC-3 R9.1 and greater) or path-protected haripin local drop (DDM-OC3 Release 11.0 or later), the switch state will alsways be active for both OLIUs.

`Switch-Priority`

`Switch Priority`. Switch priority is the currently active protection switch request. Only a higher priority protection switch request can cause a protection switch to be done. For ring applications, the switch priority in this report applies only to the equipment switching of the main to function unit signals. See the **`rtrv-state-path`** command for path protection switching information. Switch priority may be one of the following:

`inhibit` No protection switches will be done until the switch is reset.

`prot-lockout` This prevents access to the protection pack for the group.

`svc-lockout` This prevents access to the protection circuit pack for the specified service slot.

`forced`	No automatic or manual switches will be done until the forced switch is reset.
`K1/K2-byte-failure`	This occurs when the system cannot determine the protection switching state of the far end due to a failure of the automatic protection switching channel (K1/K2 bytes of the SONET line overhead on the protection line).
`APS-OC3c-Data-intf-failure`	Automatic protection switching has occurred due to a failure of the OC3c data interface on the BBG21 ELAN circuit pack. There may be one or more lower priority LAN interface failure conditions also present.
`APS-Lan-Data-intf-failure`	Automatic protection switching has occurred due to a failure of one or more LAN data interfaces associated with the BBG21/BBF7 circuit packs.
`APS-prot-line-sig-fail`	Automatic protection switching has occurred due to a protection line signal failure.
`APS-svc-line-sig-fail`	Automatic protection switching has occurred due to a service line signal failure.
`APS-sig-fail`	Automatic protection switching has occurred due to a signal failure.
`APS-sig-degrade`	Automatic protection switching has occurred due to a signal degrade.
`APS-pack-fail`	Automatic protection switching has occurred due to a circuit pack failure.
`APS-fn-fail`	(This switch priority is applicable to OC-3 Release 11.0 and all later OC-3 ring releases).

	Automatic protection switching has occurred in Main-x because of a failure in Fn-x, where there was at least one local drop cross-connect between Fn-x and Fn-y (Main-x did not fail in this case).
`APS-pack-fail-HIGH`	Automatic protection switching has occurred due to a circuit pack failure for 1xn protected circuit packs only.
`APS-auto-lock`	Traffic is forced and held onto the protection pack, unable to revert to the service pack until midnight. This occurs following four automatic switches from service to protection during a 10-minute interval.
`APS-wait-to-restore`	Automatic protection switching has occurred, but the service line is now good and service will revert back to its original source after a specified period of time.
`manual`	Traffic has been manually switched to protection.
`-`	No manual or automatic switch requests are active.

For ring applications, the switch priority in this report applies only to the equipment switching of the main OLIUs (OC-3), TSIs (OC-12) to function unit signals, or, in the case of FiberReach, from Fiber Reach main OLIUs to low speed slots. See the **`rtrv-state-path`** command for path protection switching information.

For OC-3 and FiberReach, the switch priority is always null for protection slots, with one exception. For 1xn protected slots, the protected slot may have a switch priority of `prot-lockout`.

For OC-12 systems, the switch priority is always null for protection slots.

The state of the timing reference is reported in the **`RTRV-SYNCN`** command.

EXAMPLE INPUT/OUTPUT

Comprehensive descriptions of possible reports and the format differences between DDM OC-3, DDM OC-12, FiberReach, and SLC correspond to the DDM-2000 CIT (see references). Here are a few examples that parallel some of the examples in the CIT. The following example shows a **RTRV-STATE-EQPT** command for a DDM-2000 OC-3 system in a ring configuration:

```
RTRV-STATE-EQPT:LT-PF-2000::123456;


IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD

     "tg-1,TGS:,active,"
     "tg-2,TGS:,standby,"
     "fn-c-1,OLIU:,active,"
     "fn-c-2,OLIU:,standby,"

;
```

The following example shows a **RTRV-STATE-EQPT** command for a DDM-2000 OC-12 system in a ring configuration:

```
RTRV-STATE-EQPT:LT-PF-2000::123456;


IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD

   "tg-1,TGS:,active,"
   "tg-2,TGS:,standby,"
   "main-b-1,OLIU:,active,"
   "main-b-2,OLIU:,active,"
   "tsi-1,TSI:,active-fn,"
   "tsi-2,TSI:,active,"

;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-STATE-EQPT** command, also.

RELATED TL1 COMMANDS

None.

NAME

RTRV-STATE-PATH: Retrieve State Path

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **9.0** and OC-12 Release **5.0** for rings
- FiberReach Release **1.0**

INPUT FORMAT

RTRV-STATE-PATH:*tid*:[*aid*]:*ctag*[:[:[:]]];

DESCRIPTION

NOTE:
This command is available to all users.

The **RTRV-STATE-PATH** command can be initiated by general users to display signal path state information for paths dropped at the NE and (for FiberReach and OC-3) for pass-through signals on the high-speed ring channels; it is intended to function as closely as is possible to the equivalent CIT command and to change as that CIT command changes.

Detailed information on the information which can be retrieved for different NE types and different software releases is supplied in the UIR in the command description for **rtrv-state-path**.

Information is only reported for paths where protection switching takes place and where therefore the notion of an active path is meaningful.

INPUT PARAMETERS

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

aid Access Identifier. This is the address of the port for which information is being requested. A null value requests information on ports reportable for the NE. Valid addresses are given in the DDM UIR. Descriptions are taken from the UIR and are given below:

For OC-3 Release 5.1, aid is any dropped VT1.5 or STS-1 path. For OC-3 Release 7 and later, aid is any drop or drop and continue VT1.5 or STS-1 path.

For OC-3 Release 11.0 and later, aid is any connected VT1.5 or STS-1 path. The default is **all** for all paths in the system.
Valid VT1.5 Addresses:

all, {m1,m2}-{1-3,all}-{1-7,all}-{1-4,all}
Valid OC-3 STS-1 Addresses: **all, {m1,m2}-{1-3,all}**

For OC-3 Release 11.0 and later, valid VT1.5 addresses for fn's equipped with 27G2-Us are:
{a,b,c}{1,2}-{1,2}-{1-7,all}-{1-4,all}

For OC-3 Release 13.0 and later, valid VT1.5 addresses for fn's equipped with 26G2-Us are:
{a,b,c}{1,2}-1-{1-7,all}-{1-4,all}

For OC-3 Release 13.0 and later, valid STS-1 addresses for fn's equipped with 26G2-Us are: **{a,b,c}{1,2}-1**

In FiberReach R1.0 systems, `aid` is any connected VT1.5 path. The default is **all** for all paths in the system.
Valid VT1.5 Addresses: **(when equipped with 26-type OLIU)**
all, {m1,m2}-1-{1-7,all}-{1-4,all}

In FiberReach R2.2, 3.1 systems, `aid` is any connected VT1.5 path. The default is **all** for all paths in the system.
Valid VT1.5 Addresses: **(when equipped with 28-type OLIU)**
all, {m1,m2}-{1-3,all}-{1-7,all}-{1-4,all}

In FiberReach R3.1 systems, if the shelf is equipped with DS3 circuit packs in the function unit slots,
Valid STS1 Addresses for OC-3 are :
all, {m1,m2}-{1-3,all}

For OC-12 Release 3.0 and later, `aid` is any drop or drop and continue STS-1 path. The default is **all** for all paths in the system.
Valid OC-12 STS-1 Addresses: **all, {mb1,mb2}-{1-12,all}**

In addition to STS-1 addresses mentioned above, beginning in OC-12 Release 5.0 and later, the `aid` may be any drop or drop and continue STS-3c path as well. The default is **all** for all paths in the system.
Valid OC-12 STS-3c Addresses: **all, {mb1,mb2}-{1,4,7,10,all}**

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

OUTPUT FORMAT

If the NE fully complies with the RTRV-STATE-PATH request, the following normal completion response is returned.

```
AIP 123456
<

   LT-PF-2000 9-10-26 16:42:11
M  123456 COMPLD

  "Ring 1"
  "aid:[active=yes][,APS-Condition=cond]"
   .      .     .     .
   .      .     .     .
  "aid:[active=yes][,APS-condition=cond]"

  "Ring 2"
  "aid:[active=yes][,APS-condition=cond]"
   .      .     .     .
   .      .     .     .
  "aid:[active=yes][,APS-condition=cond]"
;
```

The active and APS-condition parameters will not print when they have a null value. If both have non-null values and print, they are separated by a comma.

The order of presentation in this report when the default address of "all" is used shall be to display first the path signal termination that is closest to m[1|2]-1-1-1 or m[1|2]-1 for VT1.5 or STS-1 paths, respectively, and to increment to m[1|2]-3-7-4 or m[1|2]-3.

NOTE:
When a VT is cross connected it does not PATH-terminate the STS, and therefore the report will not show any STS lines when given an STS aid.

The order of presentation in this report when the default address of "all" is used shall be to display first the path signal termination that is closest to mb[1|2]-1 for STS-1 paths and to increment to mb[1|2]-12.

Beginning with OC-12 Release 5.0 and later, the order of presentation in this report when the default address of "all" is used shall be to display first the path signal termination that is closest to mb[1|2]-1 for both STS-3c and STS-1 paths and to increment to mb[1|2]-10 or mb[1|2]-12 for STS-3c and STS-1, respectively.

For DDM-2000 FiberReach R1.0, when equipped with 26-type OLIU, the order of presentation in this report when the default address of "all" is used shall be to display first the path signal termination that is closest to m[1|2]-1-1-1 for VT1.5 paths, and to increment to m[1|2]-1-7-4.

For DDM-2000 FiberReach R2.2, 3.1, when equipped with 28-type OLIU, the order of presentation in this report when the default address of "all" is used shall be to display first the path signal termination that is closest to m[1|2]-1-1-1 for VT1.5 paths, and to increment to m[1|2]-3-7-4.

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

address The supported values for *aid* are given in the DDM UIR. The report always displays both the Ring 1 and Ring 2 addresses.

active This parameter indicates whether the associated Ring 1 path is active, and contains one of the following:

- *active=yes* The path is provisioned as drop, or drop and continue, and this side is active.
- *(null)* The path is provisioned as drop, or drop and continue, and this side is standby.

APS-Condition This parameter provides the condition that caused the automatic protection switch to occur and appears on the path where the condition was detected. (The manual protection switch request is not shown because the system is nonrevertive.) The condition may be one of the following:

APS-condition=signal-failure

APS-condition=pack-removal

APS-condition=pack-failure

APS-condition=signal-degrade

Only manual or automatic protection switch (APS) requests that are higher priority than the currently active requests will cause a protection switch to occur. Currently, only the manual protection switch request is allowed, and because it is a lower priority than the APS requests, only APS requests will appear in the report. The APS conditions will remain active

while the condition that caused the switch still exists. When that failure clears, the APS condition is changed to null if no other APS requests exist.

EXAMPLE INPUT/OUTPUT

The following request/response is a DDM-2000 OC-3 example.

```
RTRV-STATE-PATH:LT-PF-2000:all:123456;


IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD

   "Ring 1"
   "m1-3:active=yes,"
   "m1-1-1-1:"
   "m1-1-1-2:"
   "m1-1-1-3:,APS-condition=pack-failure"
   "m1-1-1-4:"
   "m1-1-2-2:active=yes"
   "m1-1-3-1:,APS-condition=signal-degrade"
   "m1-2-3-2:active=yes"
   "m1-2-3-3:active=yes
   "m1-2-3-4:"
   "m1-2-4-1:active=yes"
   "m1-2-4-2:active=yes"
   "m1-2-4-3:active=yes"

   "Ring 2"
   "m2-3:,APS-condition=signal-failure"
   "m2-1-1-1:active=yes"
   "m2-1-1-2:active=yes"
   "m2-1-1-3:active=yes"
   "m2-1-1-4:active=yes"
   "m2-1-2-2:,APS-condition=signal-failure"
   "m2-1-3-1:active=yes"
   "m2-2-3-2:"
   "m2-2-3-3:"
   "m2-2-3-4:active=yes"
   "m2-2-4-1:"
   "m2-2-4-2:"
   "m2-2-4-3:"
;
```

The following is an example of a RTRV-STATE-PATH request on DDM-2000 OC-12.

```
RTRV-STATE-PATH:LT-PF-2000:all:123456;


IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD

   "Ring 1"
   "mb1-1:active=yes"
   "mb1-10:active=yes"
   "mb1-11:active=yes"

   "Ring 2"
   "mb2-1:"
   "mb2-10:"
   "mb2-11:,APS-condition=signal-failure"
;
```

Other sample output reports given in the DDM UIR illustrate other possible combinations of parameter values.

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **RTRV-STATE-PATH** command, also.

RELATED TL1 COMMANDS

None.

NAME

RTRV-STATE-X25: Retrieve X.25 Packet Size and State Information

Support for this message is available starting in DDM-2000 OC-3 linear Release **8.0**, DDM-2000 OC-3 ring Release **9.0**, and OC-12 Release **5.0**.

INPUT FORMAT

RTRV-STATE-X25:*tid*::*ctag*[:[:[:]]];

DESCRIPTION

The report displays the x.25 link packet size information (provisioned by the **ent.sys** command or set by default), an indication whether this is an active GNE or not, and the status of the X.25 communication. An X.25 event history is also provided. This report is, in part, determined by what the Context ID map (OSACMAP) is configured for (for further information see the ENT-OSACMAP command) and the description and requirements associated with the **vctype** parameter below.

NOTE:
This command is valid when addressed to a GNE or to a non-GNE.

NOTE:
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.
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 **RTRV-STATE-X25** request, the following normal completion response is returned.

```
IP 123456
<

  LT-PF-2000 96-03-01 04:00:02
M 123456 COMPLD

"packet-size=<packet-size>","GNE=<gne-status>"

"X.25-lcn-1,vctype=<vctype>,state=<state>,code=<code>"
"X.25-lcn-2,vctype=<vctype>,state=<state>,code=<code>"
"X.25-lcn-3,vctype=<vctype>,state=<state>,code=<code>"
"X.25-lcn-16,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-lcn-17,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-lcn-18,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-lcn-19,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-lcn-20,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-lcn-21,vctype=<vctype>,state=<state>,dte-address=<dte-address>,code=<code>"
"X.25-interface,state=<state>,code=<code>"
"lapb,state=<state>,code=<code>"
"physical-line,state=<state>,code=<code>"

"01-01,00:18:48,lcn-16,xmt,CLR_CONFRM,10-10-17"
"01-01,00:18:47,lcn-16,rcv,CLR_REQ_IND,10-10-13-00-00"
"01-01,00:18:03,lcn-16,xmt,CALL_ACC_CONN,10-10-0f"
"01-01,00:00:21,lcn-2,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-3,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-1,xmt,RESET_REQ_IND,10-01-1b-00-00"
"01-01,00:00:21,lcn-2,xmt,RESET_REQ_IND,10-02-1b-00-00"

;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **RTRV-STATE-X25** command, also. The following paramters are also defined for this command output.

`packet-size`
: `packet-size` is a string with possible values of 128 or 256; 256 being the default value.

`gne-status`
: `gne-status` is a string with possible values of "active" or "not-active".

`entity`
: This parameter shows the various X.25 communication entities. The entities are:

X.25	This communication channel is considered to be **up** upon the successful acknowledgement of the RESET_REQ_IND packet with a RESET_CONFRM packet. This does *not* imply that TL1 communication is active.
X.25	This communication channel is considered to be **up** upon the successful acknowledgement of the RESET_REQ_IND packet with a RESET_CONFRM packet. This does *not* imply that TL1 communication is active.
X.25	This communication channel is considered to be **up** upon the successful acknowledgement of the RESET_REQ_IND packet with a RESET_CONFRM packet. This does *not* imply that TL1 communication is active.
X.25	This communication channel is considered to be **up** upon the successful acknowledgement of the CALL_REQ_IND packet with a CALL_ACC_CONN packet. This does *not* imply that TL1 communication is active.
X.25	This communication channel is considered to be **up** upon the successful acknowledgement of the RESTART_PACKET packet and the RESTART_CONFRM packet. This means that layer 3 is active and ready to establish the pvc or svc communication channel.
lapb	When this communication channel is **up**, layer 2 is active and ready to send or receive a RESTART_PACKET.

`physical` This X.25 physical line is up only if the lapb is up. A **down** physical line does not necessarily mean that the physical connection (for example, a cable) is broken but that the interfacing equipment does not acknowledge the communication with the DDM-2000.

`vctype` In the startup default configuration, there are 3 permanent virtual circuits, `vctype=pvc`. The remaining Virtual Circuits are considered to be switched virtual circuits, `vctype=svc` unless and until Permanent Virtual Circuits are added (up to a maximum of 9) with the TL1 command ENT-OSACMAP or the CIT command ent-osacmap. As Permanent Virtual Circuits are added, switched virtual circuits are removed, starting with the higher numbered circuits. The input/output examples illustrate this rule.

`dte-address`
SVCs are defined by their X.25 DTE Calling Address which is equivalent to the SNPA value in the OSACMAP. The allowed values for this parameter are defined as 1 to 15 Binary Coded Decimal (BCD) digits. Furthermore, this parameter would only be displayed when the X.25 communications entity is an SVC with a State that is **up**. It would not be shown for an SVC with a **down** State or if the X.25 communications entity is a PVC, X.25 Interface, lapb or a physical line. There is no default value for this parameter. Any blanks that might appear in the **dte-address** are expressed with a dash "-".

`State` This parameter is explained in each one of the above entities.

`Code` This parameter shows a hexadecimal output of the protocol states in the DDM-2000 software. This is used by RTAC personnel for diagnostic purposes.

`Date` This parameter shows the date the X.25 event occurred.

`Time` This parameter shows the time the X.25 event occurred.

`Entity` This parameter shows the X.25 communication entity where the event occurred.

`Event` This parameter lists the event and whether it was transmitted (**xmt**) or received (**rcv**) by the DDM-2000.

`Data` This parameter shows a hexadecimal representation of frame or packet information related to the event. This is used by RTAC personnel for diagnostic purposes.

EXAMPLE INPUT/OUTPUT

The following example shows a **RTRV-STATE-X25** command for an ATT-2000 product family product with 5 Permanent Virtual Circuits.

RTRV-STATE-X25:LT-PF-2000::123456;

```
IP 123456
<

  LT-PF-2000 96-03-01 04:00:02
M 123456 COMPLD

"packet-size=256,GNE=active"

"X.25-lcn-1,vctype=pvc,state=up,code=06"
"X.25-lcn-2,vctype=pvc,state=up,code=06"
"X.25-lcn-3,vctype=pvc,state=up,code=06"
"X.25-lcn-4,vctype=pvc,state=up,code=06"
"X.25-lcn-5,vctype=pvc,state=up,code=06"
"X.25-lcn-16,vctype=svc,state=up,dte-address=0955,code=06"
"X.25-lcn-17,vctype=svc,state=down,code=00"
"X.25-lcn-18,vctype=svc,state=down,code=00"
"X.25-lcn-19,vctype=svc,state=down,code=00"
"X.25-interface,state=down,code=01"
"lapb,state=down,code=00"
"physical-line,state=down,code=down"

"01-01,00:18:48,lcn-16,xmt,CLR_CONFRM,10-10-17"
"01-01,00:18:47,lcn-16,rcv,CLR_REQ_IND,10-10-13-00-00"
"01-01,00:18:03,lcn-16,xmt,CALL_ACC_CONN,10-10-0f"
"01-01,00:00:21,lcn-2,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-3,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-1,xmt,RESET_REQ_IND,10-01-1b-00-00"
"01-01,00:00:21,lcn-2,xmt,RESET_REQ_IND,10-02-1b-00-00"
;
```

The following example shows a **RTRV-STATE-X25** command for an ATT-2000 product family product with no Permanent Virtual Circuits (having an OSACMAP with no entries or with only switched virtual circuit entries) would have the following report.

RTRV-STATE-X25:LT-PF-2000::123456;

```
IP 123456
<

  LT-PF-2000 96-03-01 04:00:02
M 123456 COMPLD

"packet-size=256,"GNE=active"

"X.25-lcn-16,vctype=svc,state=up,dte-address=09556789,code=06"
"X.25-lcn-17,vctype=svc,state=up,dte-address=77650955,code=06"
"X.25-lcn-18,vctype=svc,state=up,dte-address=6789990955,code=06"
"X.25-lcn-19,vctype=svc,state=up,dte-address=880955,code=06"
"X.25-lcn-20,vctype=svc,state=up,dte-address=59590955,code=06"
"X.25-lcn-21,vctype=svc,state=up,dte-address=5089606314,code=06"
"X.25-lcn-22,vctype=svc,state=down,code=00"
"X.25-lcn-23,vctype=svc,state=down,code=00"
"X.25-lcn-24,vctype=svc,state=down,code=00"
"X.25-interface,state=down,code=01"
"lapb,state=down,code=00"
"physical-line,state=down,code=00"

"01-01,00:18:48,lcn-16,xmt,CLR_CONFRM,10-10-17"
"01-01,00:18:47,lcn-16,rcv,CLR_REQ_IND,10-10-13-00-00"
"01-01,00:18:03,lcn-16,xmt,CALL_ACC_CONN,10-10-0f"
"01-01,00:00:21,lcn-2,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-3,rcv,RESET_CONFRM,10-03-1f"
"01-01,00:00:21,lcn-1,xmt,RESET_REQ_IND,10-01-1b-00-00"
"01-01,00:00:21,lcn-2,xmt,RESET_REQ_IND,10-02-1b-00-00"
;
```

ERROR RESPONSE

Refer to the Error Response section of **RTRV-HDR**. The error responses listed there apply to the **RTRV-STATE-X25** command, also.

RELATED TL1 COMMANDS

At this writing, Bellcore has no equivalent tl1 commands specified. This command is based on its CIT equivalent. Related Tl1 commands, also based on CIT equivalents, are ENT/DLT/RTRV-OSACMAP, and ENT-SYS.

NAME

RTRV-SYNCN: Retrieve Synchronization

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

RTRV-SYNCN:*tid*:*aid*:*ctag*;

DESCRIPTION

NOTE:
This command is available to all users.

This command displays the provisioning and operational information on the synchronization attributes as set by the **ENT-SYNCN** command.

Output reports will vary according to the provisioned timing mode.

The (hw) after a parameter value on the following reports indicate that the parameter is set by hardware switches on the TGS or TG3 circuit pack.

The synchronization output report on the following page is the general format for a system equipped with TGS or TG3 circuit packs that include DS1 timing outputs in the sync mode.

Prior to release 9.1, line timing from OC-1 OLIU circuit packs, whether from Main or Function unit slots is not provided. Starting with release 9.1, line timing from OC-1 line #1 on 27-type OLIU circuit packs in main slots is supported.

INPUT PARAMETERS

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

aid Access identifier. This identifies the facility for which synchronization attributes are being retrieved.

The *aid* can only have the value **ALL**.

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

OUTPUT FORMAT

For DDm-2000 OC-3 R8.0, 8.1, 9.0, 9.1, if the NE fully complies with the request, the following normal completion response is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
  "sync_source=x,  timing_message=x,"
  "ds1_line_code/format tg-1=xxxx/xxx (hw), tg-2=xxxx/xxx (hw),"
  "provisioned_mode=x (hw),"
  "active_timing_mode=x (hw),"
  "ds1_reference_input_state ref-1=x ref-2=x,"
  "active_circuit_pack=x,"
  "active_reference/line=x,"
  "mode_switching=x,"
  "last_reference_switch=YY-MM-DD HH:MM:SS,"
  "ds1_provisioned_mode=x (hw),"
  "ds1_output_mode=x,"
  "ais_threshold=x (message),"
  "ds1_output_state refout-1=x, refout-2=x,"
  "ds1_active_reference=x,"
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
   ...
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
  "sync_autoreconfiguration=x"
;
```

For DDM-2000 OC-12 R5.0, 5.1, if the NE fully complies with the request, the following normal completion response is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
  "sync_source=x,  timing_message=x,"
  "ds1_line_code/format tg-1=xxxx/xxx (hw), tg-2=xxxx/xxx (hw),"
  "provisioned_mode=x (hw),"
  "active_timing_mode=x (hw),"
  "ds1_reference_input_state ref-1=x ref-2=x,"
  "active_circuit_pack=x,"
  "active_reference/line=x,"
  "mode_switching=x,"
  "last_reference_switch=YY-MM-DD HH:MM:SS,"
  "ds1_provisioned_mode=x (hw),"
  "ds1_output_mode=x,"
  "ais_threshold=x (message),"
  "ds1_output_state refout-1=x, refout-2=x,"
  "ds1_active_reference=x,"
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
   ...
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
  "sync_autoreconfiguration=x"
;
```

For DDM-2000 DDM-2000 FiberReach R1.0, if the NE fully complies with the request, the following normal completion response is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
  "sync_source=x,  timing_message=x,"
  "provisioned_mode=x,"
  "active_timing_mode=x,"
  "active_circuit_pack=x,"
  "active_reference/line=x,"
  "mode_switching=x,"
  "oc-1=x, input_msg=x, output_msg=x,"
   ...
  "oc-1=x, input_msg=x, output_msg=x,"
;
```

For DDM-2000 FiberReach R2.2, 3.1, if the NE fully complies with the request, the following normal completion response is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
  "sync_source=x,  timing_message=x,"
  "provisioned_mode=x,"
  "active_timing_mode=x,"
  "active_circuit_pack=x,"
  "active_reference/line=x,"
  "mode_switching=x,"
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
   ...
  "oc-n=x, input_msg=x, output_msg=x, type=x,"
  "sync_autoreconfiguration=x"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also.

Additional parameters that specifically apply to this command are defined below.

sync_source

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R 5.0, the sync source is the optical line from which shelf (and optionally, DS1 sync output) timing is derived. If the shelf timing mode is set for `linetimed` and DS1 sync output timing is also selected, *sync_source* is both the source for shelf timing and DS1 sync outputs. If the shelf timing mode is set for `External` and DS1 sync output timing is also selected, *sync_source* is only the source for DS1 sync outputs.

For DDM-2000 OC-3 R8.0-, 9.0, the values of *sync_source* are:

`main`	OC-3 Linear Releases (default)
`main-1`	OC-3 Ring Releases (default) Starting with release 9.1, if main-1 contains a 27-type OLIU, this

	value indicates timing derived from OC-1 line #1.
`main-2`	OC-3 Ring Releases Starting with release 9.1, if main-2 contains a 27-type OLIU, this value indicates timing derived from OC-1 line #1.
`fn-c`	Linear Releases and Rings optical extensions **NOTE:** Shelf timing cannot be sourced from `fn-c`, if it is equipped with 27-type OLIU circuit packs.
—	Timing mode is hardware provisioned to be FreeRunning or External without DS1 sync outputs (i.e. `mult`).

For DDM-2000 OC-12 R5.0, the values of *`sync_source`* are:

`main-b`	OC-12 linear line address
`main-b-1,`	`OC-12 ring line addresses`
–	`Timing mode is hardware provisioned to be FreeRunning or External without DS1 sync outputs (i.e. mult`).

For DDM-2000 FiberReach R1.0, the sync source is

the optical line provisioned from which shelf timing is derived. The values of *sync_source* are:

`main-1,`	`OC-1 ring line addresses`
`main-1,`	`OC-3 ring line addresses`

timing_message Timing Message. For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, this is one of the following:

`for_shelf_only`	*sync_source* is set for LineTimed shelf.
`for_shelf_and_ds1_outputs`	*sync_source* is set for LineTimed shelf/Sync Out.
`for_ds1_outputs_only`	*sync_source* is set for External shelf timing/Sync Out.
—	If *sync_source* was printed as a dash.

Timing Message. For DDM-2000 FiberReach R1.0, this can only have the following value:

`for_shelf_only`	*sync_source* is set for LineTimed shelf.

tg-1 For DDM-2000 OC-3 R8.0-, 9.0, 11.1, 13.0, OC-12 R5.0, 7.0, this refers to the signal format and line coding of the DS1 `External` timing references (as set with option switches on the TGS or TG3 circuit pack). The valid values are:

`DS1 Line Code`

`ami`	Alternate Mark Inversion

`b8zs`	Bipolar with 8 Zeros Substitution
—	Unequipped
?	Unreadable

`DS1 Line Format`

`sf`	Super Frame format (D4)
`esf`	Extended Super Frame format
—	Unequipped
?	Unreadable

`tg-2`

For DDM-2000 OC-3 R8.0-, 9.0, 11.1, 13.0, OC-12 R5.0, 7.0: Same as the values of *`tg-1`* but for the TGS or TG3 circuit pack in slot 2.

`provisioned_mode`

For DDM-2000 OC-3 R8.0, 9.0, 11.1, 13.0, OC-12 R5.0, 7.0: Provisioned Mode is the provisioned synchronization mode of the timing generator circuit packs, as set with option switches on the TGS or TG3 circuit pack.

For DDM-2000 OC-3 R8.0, 9.0, the valid values are:

`external`	Timing derived from DS1 External reference.
`freerunning`	Timing derived from internal oscillator.
`linetimed`	Timing derived from OC-3 payload-carrying signal in the MAIN or FN-C slots. Starting with release 9.1, timing can be derived from OC-1 line #1 on 27-type OLIU circuit packs in MAIN slots. If the OC-3 shelf is equipped with

24G-U OLIU circuit packs in its MAIN slots, then the timing is derived from OC-12 payload-carrying signal in the MAIN slots only.

For DDM-2000 OC-12 R5.0, the valid values are:

`external` Timing derived from DS1 External reference.

`freerunning` Timing derived from internal oscillator.

`linetimed` Timing derived from OC-12 payload-carrying signal in the main-b slots.

For DDM-2000 FiberReach R1.0: Provisioned Mode is the provisioned synchronization mode. The valid value is:

`linetimed` Timing derived from OC-1 payload-carrying signal in the MAIN slots.

For DDM-2000 FiberReach R2.2, 3.1: Provisioned Mode is the provisioned synchronization mode. The valid value is:

`linetimed` Timing derived from OC-3 payload-carrying signal in the MAIN slots.

`active_timing_mode` For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, FiberReach R1.0: Active timing mode is the active timing synchronization mode of the system. The value may be any of the values listed above in `provisioned_mode` or one of the following:

`holdover` Timing generator is operating in holdover mode because the provisioned references are not available, or because the system has been manually switched to holdover mode.

`no_timing`	Timing circuit packs have been removed.
`?`	Timing mode is unreadable.

`ref-1`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Input State refers to the primary state of the DS1 `External` timing reference port 1, with values as follows:

`is`	in service
`auto`	automatic

`ref-2`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Same as *`ref-1`* but for DS1 `External` timing reference port 2.

`active_circuit_pack`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Active Circuit Pack indicates which timing generator circuit pack is currently active. The value is `tg-1`, `tg-2`, or `-` (empty slot).

For DDM-2000 FiberReach R1.0: Active Circuit Pack indicates which timing generator circuit pack is currently active. The value is `main-1`, `main-2`, or `-` (empty slot).

`active_reference/line`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Active Reference is the active external reference for the timing generator. When Active Reference is reported, Active Line is not reported. When the *`provisioned_mode`* is `External`, Active Reference has the following values:

`ref-1`	The active timing reference is set to the timing reference port one.
`ref-2`	The active timing reference is set to the timing reference port two.
`- (dash)`	Not applicable, DS1 references are in auto input state.

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0: Active

Line is the active LineTimed reference for the timing generator. When Active Line is reported, Active Reference is not reported.

For DDM-2000 OC-3 R8.0, 9.0: when *provisioned_mode* is `linetimed`, Active Line has one of the following values:

`main-1`

`main-2`

`fn-c-1`

`fn-c-2`

`na` Neither timing reference is active.

For DDM-2000 OC-12 R5.0, when *provisioned_mode* is `linetimed`, Active Line has the following values:

`main-b-1`

`main-b-2`

`na` Neither timing reference is active.

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, when the active timing mode is `holdover`, Active Reference/Line is the timing reference that will provide timing if the system switches out of holdover mode.

When the *provisioned_mode* is `freerunning` Active Reference and Active Line are not reported.

For DDM-2000 FiberReach R1.0, active Line is the active LineTimed reference for the timing generator. When *provisioned_mode* is `linetimed`, Active Line has one of the following values:

`main-1`

`main-2`

na Neither timing reference is active.

When the active timing mode is `holdover`, Active Line is the timing reference that will provide timing if the system switches out of holdover mode.

`mode_switching`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, Mode Switching indicates whether the mode switching for the timing generator is revertive or nonrevertive.

`revertive` Revertive mode switching. If the system is provisioned for revertive mode switching, it will automatically switch from holdover mode to the *`provisioned_mode`* (`linetimed` or `external` timing) when a good reference becomes available.

`nonrevertive` Nonrevertive mode switching. If the system is provisioned for nonrevertive mode, it will switch to holdover mode (as a result of a timing reference failure) and remain in this

mode until it is manually switched back to the provisioned timing mode by the **SET-SYNCN** command.

— Not applicable. *provisioned_mode* is freerunning.

For DDM-2000 FiberReach 1.0, Mode Switching indicates whether the mode switching for the timing generator is revertive or nonrevertive.

revertive Revertive mode switching. If the system is provisioned for revertive mode switching, it will automatically switch from holdover mode to the *provisioned_mode* (linetimed) when a good reference becomes available.

nonrevertive Nonrevertive mode switching. If the system is provisioned for nonrevertive mode, it will switch to holdover mode (as a result of a timing reference failure) and remain in this

mode until it is manually switched back to the provisioned timing mode by the **SET-SYNCN** command.

last_reference_switch

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0,Last Reference Switch Time is the date and time of the last switch of the external timing reference. It has an initial power-up value of "NA" which is retained until a reference switch occurs. The value of Switch Time (the instant a switch occurs) is obtained from the system clock. This parameter is reported only when the *provisioned_mode* is external.

****NOTE****

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, the following parameters are called the ‘‘DS1 Outputs’’ section of the report: *ds1_provisioned_mode*, *ds1_output_mode*, *ds1_output_state*, *ds1_active_reference*. DS1 Outputs is the DS1 timing outputs and can be provisioned by hardware switches on the circuit pack. If the DS1 outputs are mult, then only *ds1_provisioned_mode* is reported for this section.

ds1_provisioned_mode

mult — For DDM-2000 OC-3 R8.0, 9.0, 11.1, 13.0, in the External timing mode, a mult cable is used to distribute the incoming DS1 reference to other shelves in the bay.

sync_out — This mode indicates that timing is derived from a terminating OC-1 (release 9.1 and later), OC-3, or OC-12 (if MAIN slots equipped with 24G-U OLIU circuit packs) line and is used for network synchronization. (This mode is only available with the BBF2B or BBF4 [Release 13.0 and later] circuit pack.)

mult — For DDM-2000 OC-12 R5.0, 7.0, in the External timing mode, a mult cable is used to distribute the incoming DS1

reference to other shelves in the bay.

`sync_out` This mode indicates that timing is derived from a terminating OC-12 line and is used for network synchronization. (This mode is only available with the BBF2B or BBF4 [Release 7.0 and later] circuit pack.)

ds1_output_mode For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0,Output Mode identifies whether the DS1 timing output derivation will track transmission or lock on a particular line (1 or 2) with values:

`track`

`lock1`

`lock2`

For DDM-2000 OC-3 R8.0, 9.0, DS1 Output Mode is not reported for ring releases unless the `src` parameter is set to `fn-c` and the DS1 synchronization output is provisioned for `sync_out` mode. In addition to the condition mentioned above, in OC-3 Release 9.1 and future ring releases, DS1 Output Mode will not be reported when `sync_autoreconfiguration` parameter is enabled. This will prevent any confusion in reading the report when the autoreconfiguration forces the `active_reference/line` parameter to switch to a better source.

DS1 Output Mode is not reported for ring releases.

aisthres In OC-3 release 9.1, OC-12 release 5.1 and later ring releases, this parameter indicates the provisioned sync message quality level and its equivalent sync message phrase for the active reference at which, or greater incoming quality level numbers, DS1 AIS will be transmitted on the sync output of the BBF2B TGS or BBF4 TG3 [OC-3 Release 13.0 and OC-12 Release 7.0 and later] circuit pack. If the **SYNCMSG** parameter within the `ENT-OC3` or `ENT-OC12` command is set to

`disabled`, then the word **`disabled`** will be reported with the provisioned value of this parameter. It may be set to one of the following options:

`level5`	default value. (K2: Internal Clock, S1: Traceable SONET Clk, or disabled)
`level4`	(K2: Stratum 3, S1: Traceable Stratum 3, or disabled)
`level3`	(K2: Stratum 2, S1: Traceable Stratum 2, or disabled)
`level2`	(K2: Sync Quality Unknown, S1: Sync Trace Unknown, or disabled)

`refout-1`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, the output state is the status of the DS1 output when in the `sync_out` mode, and may be one of the following:

`good`	This status indicates that the DS1 output is traceable to the incoming OC-1 (release 9.1 and later), OC-3 or OC-12 (if main unit slots are equipped with 24G-U OLIU packs).
`ais`	DS1 AIS is inserted if a failure exists that prohibits tracing of the DS1 output to the incoming optical line.
`-`	Indicates the slot is in the auto state.
?	The circuit pack is unreadable, or slot is equipped and empty.

`refout-2`

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, the possible values for *`refout-2`* are the same as for *`refout-1`*.

`ds1_active_reference`

For DDM-2000 OC-3 R8.0, 9.0, this shows the actual line that the DS1 timing output is being derived from, with the following values:

`main-1`

`main-2`

`fn-c-1`

`fn-c-2`

For DDM-2000 OC-12 R5.0, this shows the actual line that the DS1 timing output is being derived from, with the following values:

`main-b-1`

`main-b-2`

`***NOTE***`

The lines of the report that start with *`oc-n`* identify the section of the report where input and output messages used to determine the timing source quality are listed. This section of the report is available only if the `kbyte` message parameter is set to **`enabled`** using the **`ENT-rr`** command.

In OC-3 R8.1, 9.1, OC-12 R5.1 and later, FiberReach R2.2, 3.1, this section of the report is available only if any of the optical interfaces has been provisioned for `kbyte` or `Sbyte` sync messaging using the **`ENT-rr`** command.

`oc-n`

The *`oc-1`*, *`oc-3`*, and *`oc-12`* parameters identify the addresses of optical interfaces that can carry sync messages.

`line_aid`

`slot_aid`

`input_msg`

`disabled`	For DDM-2000 OC-3 R8.0, 8.1, 9.0, 9.1, 11.1, 13.0, OC-12 R5.0, 5.1, 7.0, indicates that the field is not applicable (for example, if synchronization messaging is disabled).
?	Indicates that the message is not readable (for example, due to a line failure).

This identifies the `Kbyte` input message received on each optical interface line, and may be one of the following values:

`don't_use` The interface is not suitable for synchronization timing. (Quality Level 7)

`timing_looped_back` The network element connected to this interface is loop-timed from it. (Quality Level 7)

`stratum_4` The interface is receiving timing from a Stratum 4 clock source. (Quality Level 6)

`internal_clock` This interface is generating timing from a system in holdover or free running. (Quality Level 5) This is applicable to the DDM-2000 systems equipped with TGS (BBF2 or BBF2B) circuit packs.

`stratum_3` The interface is receiving timing from a Stratum 3 clock source (Quality Level 4) or from a DDM-2000 system equipped with TG3 (BBF4) circuit packs that is either in holdover or free running.

`stratum_2` The interface is receiving timing from a Stratum 2 clock source. (Quality Level 3)

`sync_quality_unknown` This interface is generating timing from a good quality clock source. (Quality Level 2)

`stratum_1` The interface is receiving timing from a Stratum 1 clock source. (Quality Level 1)

In OC-3 release 8.1, 9.1 and later, OC-12 release 5.1 and later, the type of sync messaging can be provisioned to `Kbyte` or `Sbyte`. In these releases, both versions of sync messages could appear in the report if the optical interfaces have been provisioned for the two types of messages. If `Sbyte` is selected, the following input messages will be applicable for the optical interface:

`don't_use` The interface is not suitable for synchronization timing (Quality Level 7). This message is equivalent to **`don't_use`** in Kbyte messaging. There is no message equivalent to **`timing_looped_back`** in Sbyte messaging.

`reserved` The interface is receiving the reserved message on S1 byte (Quality Level 7). Upon receiving this message, the system treats it the same as **`don't_use`** message.

`undefined` The interface is receiving a message on S1 byte that is not defined by the standards (Quality Level 7). Upon receiving this message, the system treats it the same as **`don't_use`** message.

`traceable_sonet_clk`
The interface is receiving timing from a system in holdover or free running (Quality Level 5). This message is equivalent to **`internal_clock`** in Kbyte messaging. This is applicable to the DDM-2000 systems equipped with TGS (BBF2 or BBF2B) circuit packs.

`traceable_stratum_3`
The interface is receiving timing from a Stratum 3 clock source (Quality Level 4) or from a DDM-2000 system equipped with TG3 (BBF4) circuit packs that is either in holdover or free running. This message is equivalent to **`stratum_3`** in Kbyte messaging.

`traceable_stratum_2`
The interface is receiving timing from a Stratum 2 clock source (Quality Level 3). This message is equivalent to **`stratum_2`** in Kbyte messaging.

`sync_trace_unknown`
This interface is receiving timing from a good quality clock source (Quality Level 2). This message is equivalent to **`sync_quality_unknown`** in Kbyte messaging.

`prs_traceable`
The interface is receiving timing from a Stratum 1 clock source (Quality Level 1). This message is equivalent to **`stratum_1`** in Kbyte messaging.

`output_msg`

This identifies the output message sent out on each OC-N interface line. The valid values for this parameter are the same as those listed for *`input_msg`*.

In addition to the above Input Messages, beginning with OC-3 R8.1, 9.1, OC-12 R5.1 and later, if the sync source is provisioned for Sbyte type of sync messaging and is receiving "traceable_stratum_3", "traceable_stratum_2", or "prs_traceable" messages, then the output messages on any of the optical interfaces provisioned for Kbyte will be "stratum_3", "stratum_2", or "stratum_1", respectively.

`type`

In OC-3 R8.1, 9.1, OC-12 R5.1 and later, FiberReach R1.0, this column identifies the type of sync messaging the optical interface was provisioned for. The valid values are:

`kbyte`

`sbyte`

`disabled`

For OC-1 interfaces, this column will only display `kbyte`.

In FiberReach R2.1, 3.1 and later, this column identifies the type of sync messaging the optical interface was provisioned for. The only valid value is:

`disabled`

For OC-1 interfaces, this column will only display `kbyte`.

sync_autoreconfiguration
For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, FiberReach R2.2, 3.1, this capability allows the system to choose the best timing source to use when it is provisioned for line timing. The valid values are **`enabled`** and **`disabled`**.

syncnmod

src

oper_E

oper_W

tg1_clk_sts

tg2_clk_sts

pds1_iof

sds1_iof

pds1_ilc

sds1_ilc

ds11_equ

ds12_equ

ds11_stat

ds12_stat

EXAMPLE INPUT/OUTPUT

For OC-3:

```
rtrv-syncn:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
  "sync_source=main,"
  "timing_message=for_shelf_only,"
  "ds1_line_code/format tg-1=ami/sf (hw),"
  "tg-2=b8zs/esf (hw),"
  "provisioned_mode=linetimed (hw),"
  "active_timing_mode=linetimed (hw),"
  "ds1_reference_input_state ref-1=is,"
  "ref-2=auto,"
  "active_circuit_pack=tg-1,"
  "active_reference/line=main-1,"
  "mode_switching=revertive,"
  "last_reference_switch=94-03-22 16:12:10,"
  "ds1_provisioned_mode=mult (hw),"
  "ds1_output_mode=track,"
  "ais_threshold=level4 (traceable stratum 3),"
  "ds1_output_state refout-1=good, refout-2=good,"
  "ds1_active_reference=main-1,"
  "oc-3=main, input_msg=timing_looped_back, output_msg=sync_quality_unknown,"
  "sync_autoreconfiguration=enabled"
;
```

For OC-12:

```
rtrv-syncn:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
  "sync_source=main-b,  timing_message=for_shelf_and_ds1_outputs,"
  "ds1_line_code/format tg-1=ami/sf (hw), tg-2=b8zs/esf (hw),"
  "provisioned_mode=linetimed (hw),"
  "active_timing_mode=linetimed (hw),"
  "ds1_reference_input_state ref-1=is ref-2=auto,"
  "active_circuit_pack=tg-1,"
  "active_reference/line=main-b-1,"
  "mode_switching=revertive,"
  "last_reference_switch=94-03-22 16:12:11,"
  "ds1_provisioned_mode=mult (hw),"
  "ds1_output_mode=track,"
  "ais_threshold=level4 (traceable stratum 3),"
  "ds1_output_state refout-1=good, refout-2=good,"
  "ds1_active_reference=main-b-1,"
  "oc-12=main-b, input_msg=timing_looped_back, output_msg=timing_looped_back,"
  "sync_autoreconfiguration=enabled"
;
```

For FiberReach:

```
rtrv-syncn:LT-PF-2000:all:123456;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
  "sync_source=main-1,"
  "provisioned_mode=linetimed,"
  "active_timing_mode=linetimed,"
  "active_circuit_pack=main-1,"
  "active_reference/line=main-1,"
  "mode_switching=revertive,"
  "oc-1=main, input_msg=timing_looped_back, output_msg=timing_looped_back,"
;
```

For FiberReach R2.2:

```
rtrv-syncn:wbs1:all:123456;

IP 123456
<

   WBS1 70-01-01 16:12:12
M  123456 COMPLD

   "sync_source=main-1, timing_message=for_shelf_only,"
   "provisioned_mode=LineTimed,"
   "active_timing_mode=LineTimed,"
   "active_circuit_pack=main-1,"
   "active_reference/line=main-1,"
   "mode_switching=revertive,"
   "oc-1=main-1, input_msg=sync_quality_unknown,
output_msg=timing_looped_back, type=kbyte,"
   "oc-1=main-2, input_msg=sync_quality_unknown,
output_msg=sync_quality_unknown, type=kbyte,"
>

   WBS1 70-01-01 01:04:41
M  123456 COMPLD
   "sync_autoreconfiguration=enabled"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, invalid, or conflicts with the command code modifier.

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

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, the NE returns the following error response when both TG slots are in the auto state.

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not EQuipped, Both timing slots are unequipped */
;
```

The NE returns the following error response when both MAIN slots are in the auto state.

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not EQuipped, Both main slots are unequipped */
;
```

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R5.0, the NE returns the following error response if the TG slots are transitioned from the auto state to the equipped state with timing circuit pack(s) that have invalid switch settings.

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, system Not in Valid State */
;
```

RELATED TL1 COMMANDS

ENT-SYNCN

SET-SYNCN

NAME

RTRV-SYS: Retrieve Network Element name and other system level parameters.

Support for this command is available starting in DDM-2000 OC-3 linear Release **6.2**, OC-12 linear Release **2.2**, DDM-2000 OC-3 ring Release **7.1** and OC-12 Release **3.1**.

Support for this command is available starting in DDM FiberReach OC-1 Release **1.0**.

INPUT FORMAT

RTRV-SYS:*tid*::*ctag*;

DESCRIPTION

Execution of this command on a Network Element retrieves the attributes associated with that Network Element's system, but not associated with any particular facility or equipment unit.

The system level attributes are the information that is provisioned by the **set-ne** UI command or set by switches on the SYSCTL and OHCTL circuit packs or in the case of the releases with the new controller circuit packs that do not have dip switches, set by CIT or TL1 commands.

NOTE:
This command is available to all users.

RTRV-SYS command can be initiated by a user to retrieve Network Element 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.

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 commands.

OUTPUT FORMAT

If there is system information to report, the following output message is

returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw),"
   "tid=system_name,  gne=x, agne=x, dsne=x,  x25ps=256"
   "crs=x, almgrp=n, idle=x, site=n"
   "ne=n, agne_address=x, agne_address=xx,"
   "dsne_address=xxx,"
   "shelf=n, cort=x, tbaddr=n,"
   "tblink=x, tbrem=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw),"
   "tid=system_name, gne=x, agne=x, dsne=x, x25ps=256"
   "almgrp=n, idle=x, site=n, ne=n,"
   "agne_address=x, agne_address=xx,"
   "dsne_address=xxx,"
   "shelf=n, cort=x, tbaddr=n,"
   "tblink=x, tbrem=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw),"
   "tid=system_name, agne=x, dsne=x,"
   "almgrp=n, idle=x, site=n, ne=n,"
   "agne_address=x, agne_address=xx,"
   "agne_address=xxx,"
   "cort=x, tbaddr=n,"
   "tblink=x, tbrem=x,"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw), dormant_release=x"
   "tid=system_name,  gne=x, agne=x, dsne=x,  x25ps=256"
   "crs=x, almgrp=n, idle=x, site=n"
   "ne=n, agne_address=x, agne_address=xx,"
   "agne_address=xxx,"
   "shelf=n, cort=x, tbaddr=n,"
   "tblink=x, tbrem=x,"
   "dcc=distinct"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw), dormant_release=x"
   "tid=system_name, gne=x, agne=x, dsne=x, x25ps=256"
   "almgrp=n, idle=x, site=n, ne=n,"
   "agne_address=x, agne_address=xx,"
   "agne_address=xxx,"
   "shelf=n, cort=x, tbaddr=n,"
   "tblink=x, tbrem=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw), dormant_release=x"
   "tid=system_name,  gne=x, x25ps=x"
   "crs=x, idle=x"
   "shelf=n, cort=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw), dormant_release=x"
   "tid=system_name,  gne=x, x25ps=x"
   "crs=x, almbmp=x, idle=x, macaddress=x"
   "shelf=n, cort=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw), dormant_release=x"
   "tid=system_name, gne=x, x25ps=x"
   "idle=x, macaddress=x"
   "shelf=n, cort=x"
;
```

If there is system information to report, the following output message is returned:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=x (hw),"
   "tid=system_name,"
   "idle=x"
   "cort=x,"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are defined below.

product Product identifier. This identifies the type of DDM product. Possible values are:

DDM-2000 OC-3

DDM-2000 OC-12

DDM-2000 FiberReach

SLC-2000 ARM

MegaStar 2000

dormant_release Dormant Release. If a dormant release is currently stored by the NE, this prints the release number in the form XX.XX.XX. If no dormant release exists on the NE, the parameter value is *none*.

tid Target Identifier. This is the system name.

nid

dsne For Releases 4.1 through 7.2:
The *dsne* indicates whether or not the network element identified by the *tid* is serving as the Directory Service-Network Element in a Self Healing Ring or subnetwork. It takes the values *yes* and *no*.
In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach 3.0, and beyond, the **dsne** parameter becomes obsolete.

x25ps For Releases 6.0 and later:
X.25 Packet Size. *x25ps* may have a value of 256 or 128. This parameter determines the TL1 packet size for the X.25 interface.

gne Gateway Network Element. This indicates whether this system is a gateway network element (GNE), providing a direct TL1 interface. It has a value of yes or no.
#if srd This requirement is superseded by R-RTRVSYS-130.08

Gateway Network Element. This indicates whether this system is a gateway network element (GNE), providing a direct TL1 interface. It has a value of active or

not_active.

agne Alarm Gateway Network Element, *agne* has a value of yes or no. yes indicating that the system specified by the *tid* is an Alarm Gateway Network Element. One *agne* is needed for each Alarm Group to support message communications for NE status features (FE activity, Office Alarms, Parallel Telemetry, Miscellaneous discretes, remote ACO and FE user panel status). Any member of the Alarm Group can be an *agne* but some may be preferred because of their position in the subnetwork or location near a maintenance center. Another NE of the same Alarm Group may be provisioned as a backup (dual) *agne* if required.
For proper operation of the NE status features, *one*, or *two* NEs in each Alarm Group will be designated as an *agne*.
In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **agne** parameter becomes obsolete.

agne_address For Releases 6.0 through 7.2:
The *agne_address* is the TID of the *agne* for the *almgrp* of the addressed NE. It can be the TID of the addressed NE or any other NE in the *almgrp*. More than one NE can be an *agne* for redundancy reasons. If more than one *agne* exists for the *almgrp* for the addressed NE, they are reported by repeating the *agne_address=TID* construct. If there are no *agne*s defined for the *almgrp* of the addressed NE, then this parameter is not included in the NE output.
In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **agne_address** parameter becomes obsolete.

dsne_address The *dsne_address* is the TID of the *dsne* for the dcc domain that the addressed NE is a member of. It can be the TID of the addressed NE or any other NE in the dcc domain. No more than one NE can be an *dsne* at any given time. If there are no *dsne*s defined for the *almgrp* of the addressed NE, then this parameter is not included in the NE output.
In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **dsne_address** parameter becomes obsolete.

almgrp Alarm Group, [also known as Sonet Maintenance Sub-Branch or SMSB]. This parameter determines the set of remote NEs with which the local NE can exchange remote alarm information.

All NEs in the given DCC domain (subnetwork), whether nearby or not, that have the AG number are members of the same group. All members of the AG will share NE Status information with each other but not with NEs of different AGs though they may also be in the same DCC domain.

This parameter will have a value between 1 and 255. The special value of zero means that the NE does not belong to any AG. The value is not allowed for DDM-2000, and FiberReach systems but may appear for other PF 2000 systems such as FT-2000 and DACS IV-2000.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **`almgrp`** parameter becomes obsolete.

`crs` CRoSs connect mode. This indicates whether the system is provisioned with default cross connections or manual cross-connections. It has a value of `default` or `manual`. In ring applications, it always has a value of `manual`.

`almbmp` Alarm Bumping. This parameter has a value of `enabled` or `disabled`. If enabled, the shelf will escalate a non-service affecting alarm on a standby unit to service affecting if its associated working unit enters a service affecting alarm state. The standby unit may be a path, line or circuit pack. Enabling this parameter will generate additional TL1 message traffic when the non-service affecting alarms escalate to service affecting.

`tsagran`

`idle` IdleChannelSignal determines whether or not an AIS or Unequipped signal should be inserted toward the SONET line in VT1.5 and STS-1 channels that are not cross-connected. The value may be `ais` (default) or `unequipped`.

`ais` When idle is set to `ais`, STS-1 or VT1.5 AIS is inserted towards the SONET line from SONET interfaces (OLIUs and STS1Es) if the channel is not cross-connected or, if a low speed slot is not equipped but the function unit is STS-1 cross-connected.

`unequipped` When idle is set to `unequipped`, the STS-1 or VT1.5 Unequipped signal is inserted towards the SONET line from SONET interfaces (OLIUs and STS1Es) if

the channel is not cross-connected or, if a low speed slot is not equipped but the function unit is STS-1 cross-connected.

macaddress MAC address of the IAO LAN. The 6 bytes of the MAC address are displayed using 12 hexadecimal digits.

sadd

site Site is the site address.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **site** parameter becomes obsolete.

ne NE is the network element address.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **ne** parameter becomes obsolete.

shelf Shelf is the shelf address. It identifies the physical position of the shelf in a bay.

cort This *cort* parameter for "CO" (Central Office} or "RT" (Remote Terminal) identifies the system as having characteristics of a CO or RT. The possible values are `co` or `rt`. The value of this parameter controls the TBOS Display Type, the operations of the Miscellaneous Discretes, and the external fan control.

tbos_display The TBOS 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 DDM-2000 will respond.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, and beyond, the **tbos_display** parameter becomes obsolete.

tbaddr The TBOS Address parameter reports the TBOS display address (1-8) of the NE. This address is used if the TBOS link is enabled.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **tbaddr** parameter becomes obsolete.

tblink TBOSLink reports the TBOS link function. The possible values are:

`normal` The NE has a TBOS link, but does not provide any backup functions. Of all the shelves connected to the TBOS link, only one may be set to `primary` and only one may be set to `secondary`. The remaining NEs (up to 6) should be set to `normal`.

`primary` The NE is serving as the primary TBOS backup and will respond for any other NE on the same TBOS link if the polled NE fails to respond to the telemetry remote poll within 50 msec. The primary backup NE will respond for the nonresponsive NE by reporting TBOS point 59 (communication failure) and reporting all other TBOS points polled in the display as clear.

`secondary` The NE serving as the secondary TBOS backup and responds the same as the primary TBOS backup, except the secondary backup does not respond to polls for other NEs until about 100 msec. after the poll is received. If after about 100 msec. neither the polled NE nor the primary backup NE has responded to the telemetry remote poll, the secondary TBOS backup NE will respond for the nonresponsive NE.

`noTBOS` No TBOS interface is directly connected to the shelf.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **`tblink`** parameter becomes obsolete.

tbrem TBOSRemote sets the TBOS Remote reporting status. TBOS Remote may be set to the following values:

`enabled` The shelf will report all its status and alarm conditions to other shelves via the SONET DCC.

`disabled` The shelf will not report its status and alarm conditions to other shelves. This option is used when there are more than 8 NEs in the SONET subnetwork. This is the factory default value.

In DDM-2000 OC-3 R9.8, and in OC-3 R13.0, OC-12 R7.0, FiberReach R3.0, and beyond, the **`tbrem`** parameter becomes obsolete.

`dce, dte`

`protocol`

`baud_tl1-dce, baud_tl1-dte`

EXAMPLE OUTPUT

The following example illustrates the **RTRV-SYS** command/response interaction with a DDM-2000 OC-3 system with the new controller circuit packs:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-3 (hw)"
   "tid=LT-PF-2000, agne=no, dsne=no, crs=manual,"
   "almgrp=147, idle=ais, site=4, ne=5,"
   "agne_address=ABC45678901234567890, agne_address=BCD45678901234567890,"
   "agne_address=cba45678901234567890,"
   "shelf=1, cort=co, tbaddr=4,"
   "tblink=primary, tbrem=enabled,"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction with a DDM-2000 OC-12 system with the new controller circuit packs:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-12 (hw)"
   "tid=LT-PF-2000, agne=no, dsne=no"
   "almgrp=147, idle=ais, site=4, ne=5,"
   "agne_address=ABC45678901234567890, agne_address=BCD45678901234567890,"
   "agne_address=cba45678901234567890"
   "shelf=1, cort=co, tbaddr=4,"
   "tblink=primary, tbrem=enabled,"
;
```

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 FiberReach (hw)"
   "tid=LT-PF-2000, agne=no, dsne=no"
   "almgrp=147, idle=ais, site=4, ne=5,"
   "agne_address=ABC45678901234567890,agne_address=BCD45678901234567890,"
   "agne_address=cba45678901234567890,"
   "cort=co, tbaddr=4,"
   "tblink=primary, tbrem=enabled,"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction when a dormant release is stored by the NE:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-3 (hw), dormant_release=11.00.01"
   "tid=LT-PF-2000, gne=active, agne=no, dsne=no, crs=manual,"
   "almgrp=147, idle=ais, site=4, ne=5,"
   "agne_address=ABC45678901234567890, agne_address=BCD45678901234567890,"
   "agne_address=cba45678901234567890,"
   "shelf=1, cort=co, tbaddr=4,"
   "tblink=primary, tbrem=enabled,"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction with a DDM-2000 OC-12 system with no dormant release stored:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-12 (hw), dormant_release=none"
   "tid=LT-PF-2000, gne=active, agne=no, dsne=no"
   "almgrp=147, idle=ais, site=4, ne=5,"
   "agne_address=ABC45678901234567890, agne_address=BCD45678901234567890,"
   "agne_address=cba45678901234567890"
   "shelf=1, cort=co, tbaddr=4,"
   "tblink=primary, tbrem=enabled,"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction.

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-3 (hw), dormant_release=none"
   "tid=LT-PF-2000, gne=active, x25ps=256, crs=manual"
   "idle=ais"
   "shelf=1, cort=co"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction.

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-3 (hw), dormant_release=none"
   "tid=LT-PF-2000, gne=active, x25ps=256"
   "crs=manual, almbmp=disabled, idle=ais, macaddress=08006a1ad06e"
   "shelf=1, cort=co"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction with a DDM-2000 OC-12 system with no dormant release stored:

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 OC-12 (hw), dormant_release=7.00.01"
   "tid=LT-PF-2000, gne=active, x25ps=256"
   "idle=ais, macaddress=08006a1ad06e"
   "shelf=1, cort=co"
;
```

The following example illustrates the **RTRV-SYS** command/response interaction with a DDM-2000 FiberReach system.

```
IP ctag
<

   sid date time
M  ctag COMPLD
   "product=DDM-2000 FiberReach (hw)"
   "tid=LT-PF-2000"
   "idle=ais"
   "cort=co"
;
```

ERROR RESPONSES

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

RELATED TL1 COMMANDS/MESSAGES

ENT-SYS

NAME

RTRV-TH: Retrieve Threshold

Support for this command is available for DDM-2000 multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems),
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

RTRV-TH-modifier:*tid*:*aid*:*ctag*::[*montype*],[*locn*],*tmper*[,*fmt*];

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-TH instructs a Network Element (NE) to send the current threshold level of one or more monitored parameters for which violation will trigger an automatic message.

INPUT PARAMETERS

modifier Command code modifier. For DDM-2000 OC-3 R8.0, 9.0, 11.0, OC-12 R4.0, 5.0, FiberReach R1.0, the valid modifiers are:

ALL This retrieves the threshold level for all of the following facility types:

EC1 This retrieves the threshold level for the electrical carrier signal level 1. Applicable to DDM-2000 OC-3, OC-12

OC1 This retrieves the threshold level for optical carrier level 1. Applicable to DDM-2000 OC-3 and FiberReach.

OC3 This retrieves the threshold level for optical carrier level 3. Applicable to DDM-2000 OC-3, OC-12, FiberReach R2.2, 3.1 and later.

OC12 This retrieves the threshold level for optical carrier signal level 12. Applicable to DDM-2000 OC-3 and OC-12 systems.

STS1 This retrieves the threshold level for synchronous transport signal level 1. Applicable to DDM-2000 OC-3, OC-12, FiberReach systems.

T1 This retrieves the threshold level for the DS1 level. Applicable to DDM-2000 OC-3 if the DS1 PM feature is enabled, and FiberReach systems.

T3 This retrieves the threshold level for the DS3 level. Applicable to DDM-2000 OC-3, OC-12, FiberReach Wide-Band Shelf release 3.1 and later releases, and **SLC**-2000 systems.

VT1 This retrieves the threshold level for the virtual tributary signal level 1.5. Applicable to DDM-2000 OC-3 systems, if the VT PM feature is enabled, and FiberReach systems.

This list also defines how the output lines are ordered.

tid

Target identifier. This is the name of the NE to which the command is addressed.

aid

Access identifier. This identifies the facility for which threshold levels are being retrieved.

The *aid* can only have the value **ALL**.

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.

montype Monitored parameter type. This is the performance monitoring parameter type for which a threshold is being retrieved.

The valid values are listed in Table 3-10 at the end of this section.

If null, the default value is **ALL**.

locn Location. This is the location value for the facility identified by the AID. The valid locations are:

FEND Far-end (*modifier* T1 and T3 only)

NEND Near-end

If *locn* is null, the default value is NEND, except for *modifier* T1 where if *locn* is null, the default value is FEND.

tmper Time period. This is the accumulation time period for the PM information. The only valid time periods are:

15-MIN

1-DAY

NONE

If the *tmper* value is supported but conflicts with the command code modifier, an error response is returned to the OS.

fmt Format. For DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, this parameter is only valid when the *modifier* is T1, *montype* is CVP, and *locn* is **NEND**. It specifies the type of formatting on the DS1 path. The valid formats are:

SF The DS1 path is formatted using *super frame* encoding.

ESF The DS1 path is formatted using *extended super frame* encoding. If the format is null, the default value is ESF.

For DDM-2000 OC-3 R7.2, 8.0, 9.0, OC-12 R5.0, FiberReach R3.1, this parameter is also only valid when the *modifier* is T3, *montype* is CVP, and *locn* is **NEND**. It specifies the DS3 performance monitoring scheme to be used. This parameter will have one of the following values:

PBIT PBIT scheme is used for DS3 PM. This is the default value.

FMBIT FMBIT scheme is used for DS3 PM.

CPBIT CPBIT scheme is used for DS3 PM.

OUTPUT FORMAT

For DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, if the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "aid,aidtype:montype,locn,dirn,thlev,tmper,fmt"
        .       .       .       .
        .       .       .       .
        .       .       .       .
   "aid,aidtype:montype,locn,dirn,thlev,tmper,fmt"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to the **RTRV-TH** command, also.

Additional parameters that specifically apply to this command are defined below.

aid Access identifier. This identifies the facility for which threshold levels are being retrieved.

The only allowed value of *aid* is ALL

aidtype The type of access identifier. Valid values for *aidtype* are as follows:

- EC1 The threshold level for the electrical carrier signal level 1. Applicable to DDM-2000 OC-3, OC-12 and **SLC**-2000 systems.
- OC1 The threshold level for optical carrier level 1. Applicable to DDM-2000 OC-3 and FiberReach.
- OC3 The threshold level for optical carrier level 3. Applicable to DDM-2000 OC-3, OC-12, FiberReach Wide-Band Shelf release 2.2, 3.1 and later releases. and **SLC**-2000 systems.
- OC12 The threshold level for optical carrier signal level 12. Applicable to DDM-2000 OC-3 and OC-12 systems.
- STS1 The threshold level for synchronous transport signal level 1. Applicable to DDM-2000 OC-3, OC-12 and FiberReach
- STS3c The threshold level for synchronous transport signal level 3 concatenated. Applicable to DDM-2000 OC-12 systems.
- T1 The threshold level for the DS1 level. Applicable to DDM-2000 OC-3 if the DS1 feature is enabled, and FiberReach systems.
- T3 The threshold level for the DS3 level. Applicable to DDM-2000 OC-3, OC-12, FiberReach R3.1 and later.
- VT1 The threshold level for the virtual tributary signal level 1.5. Applicable to DDM-2000 OC-3 if the VT feature is enabled, and FiberReach systems.

montype Monitored parameter for which threshold level is being retrieved.

locn Location. This is the location value for the facility identified by the AID. The valid locations are:

FEND	Far-end (*modifier* T1 and T3 only).
NEND	Near-end

dirn Direction. This specifies the direction in which the threshold is to be set and is relative to the facility identified by the AID. The value of direction must be NA (*not applicable*).

thlev Current threshold level for the monitored parameter. A threshold value of zero (0) indicates that thresholding for that *montype* is disabled.

tmper Accumulation time period for the PM information.

fmt Format. For DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, if the parameter does not apply, the report will display NA (*not applicable*) for that parameter.

EXAMPLE INPUT/OUTPUT

For OC-3 and OC-12:

```
rtrv-th-oc3:LT-PF-2000:all:123456::cvl,nend,1-day;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "ALL,OC3:CVL,NEND,NA,691,1-DAY,NA"
;
```

For FiberReach:

```
rtrv-th-oc1:LT-PF-2000:all:123456::cvl,nend,1-day;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "ALL,OC1:CVL,NEND,NA,691,1-DAY,NA"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing, invalid, or conflicts with the command code modifier.

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

The NE returns the following error response if the *montype* value is not supported, or conflicts with the command code modifier.

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

The NE returns the following error response if the *locn* value is invalid, or conflicts with the command code modifier.

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

The NE returns the following error response if the *tmper* value is invalid or conflicts with the command code modifier.

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

If the command code modifier is supported but the applicable feature package option is "off," the following error response is returned:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, feature option not enabled */
;
```

For DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, the NE returns the following error response if the *fmt* value is invalid, or conflicts with the command code modifier, *montype*, or *locn*. (for example, **RTRV-TH-T3** with a *fmt* value of **ESF**).

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

RELATED TL1 COMMANDS

REPT PM

RTRV-PM

RTRV-PMSCHED

SET-TH

SCHED-PMREPT

ENT-rr

NAME

RTRV-TL1MSGMAP: Retrieve TL1 Message Mapping

support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

RTRV-TL1MSGMAP:*tid*::*ctag*::[*acid*];

DESCRIPTION

This command displays a table that associates the given OS Application Context Identifier (*acid*) to TL1 autonomous message types.

NOTE:
This command is available to maintenance users.

INPUT PARAMETERS

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

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

acid Application Context ID. This defines the OS type. You can define what types of autonomous messages each OS type can receive. The only supported values of *acid* are:

ALL	This retrieves the message mapping for all of the following OS types.
TL1MAINTENANCE	This identifies the *maintenance* OS type.

TL1MEMORYADMINISTRATION	This identifies the *memory administration* OS type.
TL1TEST	This identifies the *testing* OS type.
TL1PEERCOMM	This identifies the OS type for peer TL1 communications.
TL1OTHER1	This identifies the RIDES OS type.
TL1OTHER2	This identifies an OS type for future use.

If null, the default value is **ALL**. This list also defines how the output lines are ordered.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "acid:msgtype,state"
    .   .   .   .
    .   .   .   .
    .   .   .   .
   "acid:msgtype,state"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to the **ENT-TL1MSGMAP** command, also.

Additional parameters that specifically apply to this command are defined below.

Output lines are ordered first by *acid*, then by *msgtype*, in the order that their values are listed in this command page. The ordering of *msgtype* is given below.

acid The application context ID.

msgtype Message Type. This is one of the supported classes of TL1 messages that the system generates. The supported message types are:

ALM REPT ALM — To report the occurrence of an event that requires immediate attention by the craft at the OS.

ENV REPT ALM ENV — To report the occurrence of an environmental alarm to the OS.

CON REPT COND — To report the active status conditions at the network element.

DB REPT DBCHG —

To report database changes that have occurred as a result of DS1 and above line termination and cross-connection provisioning commands as detected by the DDM-2000 SONET subsystem.

This list also defines how the output lines are ordered.

state This is either **ENABLED** or **DISABLED** and indicates an association of the *msgtype* to the OS.

EXAMPLE INPUT/OUTPUT

```
rtrv-tl1msgmap:LT-PF-2000::123456::tl1maintenance;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:12
M  123456 COMPLD
   "TL1MAINTENANCE:ALM,ENABLED"
   "TL1MAINTENANCE:ENV,ENABLED"
   "TL1MAINTENANCE:CON,ENABLED"
   "TL1MAINTENANCE:DB,DISABLED"
   "TL1MAINTENANCE:EVT,ENABLED"
   "TL1MAINTENANCE:PM,ENABLED"
   "TL1MAINTENANCE:SW,ENABLED"
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there also apply to **RTRV-TL1MSGMAP**.

The Network Element returns the following error response if the *acid* value is missing or invalid.

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

RELATED TL1 MESSAGES

DLT-OSACMAP

ENT-OSACMAP

RTRV-OSACMAP

ENT-TL1MSGMAP

NAME

RTRV-ULSDCC: Retrieve Upper Layer Section DCC

Support for this command is available for DDM-2000 Multiplexers starting in:

- OC-3 Release 8.0 - 11.x
- OC-12 Release 5.x only
- FiberReach Release 2.x only

NOTE:
Starting with DDM-2000 OC-3 Release 13.0, OC-12 Release 7.0, FiberReach Release 3.0, and all subsequent TARP based releases, this command is replaced by two separate commands, **RTRV-ULSDCC-L3** and **RTRV-ULSDCC-L4**.

INPUT FORMAT

RTRV-ULSDCC:*tid*:*aid*:*ctag*;

DESCRIPTION

NOTE:
This command is available to all users.

This command is available to retrieve the target NEs Network Service Access Point (NSAP) address.

The NSAP is a 20-byte (40-digit hexadecimal) address that provides unique identification for each NE in a SONET subnetwork.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. The *aid* can only have the value **ALL**.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "ALL:L3IDP=x"
   "ALL:L3DFI=x"
   "ALL:L3ORG=x"
   "ALL:L3RES=x"
   "ALL:L3ROU=x"
   "ALL:L3SYS=x"
   "ALL:L3SEL=x"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Additional parameters that specifically apply to this command response are described below:

The following seven parameters: *L3IDP*, *L3DFI*, *L3ORG*, *L3RES*, *L3ROU* (*L3RD*, *L3AREA*), *L3SYS*, *L3SEL*, identify specific fields of the NSAP address for the target NE specified by the *tid* parameter.

The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in the **ENT-ULSDCC** command description.

L3IDP The "Initial Domain Part" (IDP) of the NSAP address consists of the first 3 bytes (6-digit hexadecimal) of the address. The three subfields of the IDP are allocated and assigned according to ISO 8348 Addendum 2.

For SONET systems, the value of the AFI,IDI,IDI PAD subfields are set to "39", "840", "F" (hex), to indicate that U.S. ANSI is the registration authority responsible for the allocation and assignment of NSAP addresses. Data in this field is encoded as a binary coded decimal and displayed in hexidecimal.

L3DFI The "DSP (Domain Specific Part) Format Identifier" (DFI) consists of the next byte (2-digit hexadecimal) of the NSAP address. The purpose of this byte is to specify the format for the rest of the address. For SONET systems, the value of DFI is set to "80" hex to specify that a format in alignment with

GOSIP Version 2 is to be used.

L3ORG The "Organization ID" consists of the next three bytes (6-digit hexadecimal) of the NSAP address. Each Network Service Provider may provision this field according to the identifier assigned to them by the ANSI-administered USA Registration Authority for OSI Organization Names.

L3RES The next two bytes (4-digit hexadecimal) of the NSAP address are currently "reserved" and should have a default value of "0000" hex. A use for these bytes may be defined by ANSI.

L3ROU The "routing" parameter consists of the next four bytes of the NSAP address and encompasses two 2-byte (4-digit hexadecimal) fields of the NSAP address: the "Routing Domain" and the "Area".

L3SYS The "System Identifier" consists of the next six bytes (12-digit hexadecimal) of the NSAP address. The purpose of this field is to guarantee that the NSAP address is globally unique. In order to insure this for U.S.-manufactured systems (non-U.S.-manufactured systems would have a different IDP value), IEEE administers the allocation of addresses within this field to equipment providers.

L3SEL The "NSAP Selector" consists of the last byte (2-digit hexadecimal) of the NSAP address. Its purpose is to differentiate multiple NSAP addresses associated with the same End System. Its value is not fixed but is set in a PDU according to its usage. It is set to "AF" hex when TARP is run over CLNP. It has a value of "1D" hex when TP4 is run over CLNP. It may be set to "00" hex for other uses. When retreived and displayed, it is always shown as "00" hex.

EXAMPLE INPUT/OUTPUT

```
rtrv-ulsdcc:LT-PF-2000:all:123456:::;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:12
M  123456 COMPLD
   "ALL:L3IDP=39840F"
   "ALL:L3DFI=80"
   "ALL:L3ORG=000000"
   "ALL:L3RES=0000"
   "ALL:L3ROU=00000000"
   "ALL:L3SYS=08006A112345"
   "ALL:L3SEL=00"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is missing or invalid.

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

RELATED TL1 MESSAGES

ENT-ULSDCC

NAME

RTRV-ULSDCC-L3: Retrieve Upper Layer Section DCC - Layer 3

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

RTRV-ULSDCC-L3:*tid*:[*aid*]:*ctag*;

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-ULSDCC commands retrieve provisionable parameters of Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between Network Elements (NEs) as specified by the International Standards Organization (ISO).

RTRV-ULSDCC-L3 is used to retrieve the parameters in Layer 3 of the OSI stack, many of which are provisioned by the **ENT-ULSDCC-L3** command. Layer 3 parameters include the fields of the Network Services Access Point (NSAP) address and the enable/disable Level 2 Intermediate System (IS) capability.

The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in the **ENT-ULSDCC-L3** command description.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. The *aid* value may be **ALL** or null. Specifying the *aid* is optional.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If DDM-2000 OC-3 or OC-12 fully complies with the request, the following normal completion response is returned:

```
   tid date time
M  ctag COMPLD
   ":L3IDP=x"
   ":L3DFI=x"
   ":L3ORG=x"
   ":L3RES=x"
   ":L3RD=x"
   ":L3AREA=x"
   ":L3SYS=x"
   ":L3SEL=x"
   ":L3LV2IS=x"
;
```

If FiberReach fully complies with the request, the following normal completion response is returned:

```
   tid date time
M  ctag COMPLD
   ":L3IDP=x"
   ":L3DFI=x"
   ":L3ORG=x"
   ":L3RES=x"
   ":L3RD=x"
   ":L3AREA=x"
   ":L3SYS=x"
   ":L3SEL=x"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also. Additional parameters that specifically apply to this command response are defined below.

The following eight parameters *L3IDP*, *L3DFI*, *L3ORG*, *L3RES*, *L3RD*, *L3AREA*, *L3SYS* and *L3SEL* identify specific fields of the NSAP address for the target NE specified by the *tid* parameter.

L3IDP The "Initial Domain Part" (IDP) of the NSAP address consists of the first 3 bytes (6-digit hexadecimal) of the address. The three subfields of the IDP are allocated and assigned according to ISO 8348 Addendum 2.

For SONET systems, the value of the AFI, IDI, IDI PAD subfields are set to "39","840","F" hex, respectively, to indicate that U.S. ANSI is the registration authority responsible for the allocation and assignment of NSAP addresses. Data in this field is encoded as a binary coded decimal and displayed in hexidecimal.

L3DFI In DDM-2000 OC-3 R13.0, OC-12 R7.0 and FiberReach R3.0, and later, the "DSP (Domain Specific Part) Format Identifier" (DFI) consists of the next byte (2-digit hexadecimal) of the NSAP address. The purpose of this byte is to specify the format for the rest of the address.

For SONET systems, the value of DFI is set to "80" hex to specify that a format in alignment with GOSIP Version 2 is to be used.

L3ORG The "Organization ID" consists of the next three bytes (6-digit hexadecimal) of the NSAP address. This field is user settable, as each Network Service Provider may provision this field according to the Company Code assigned to them by the ANSI-administered USA Registration Authority for OSI Organization Names.

L3RES The next two bytes (4-digit hexadecimal) of the NSAP address are currently "reserved" and have a default value of "0000" hex. Since, in the future, a use for this field may be defined by ANSI, it is user settable.

L3RD The "Routing Domain" parameter consists of the next two bytes (4-digit hexadecimal) of the NSAP address. This field is user settable. However, until the standard use of this field has been defined, this parameter should not be provisioned to a value other than its default value.

L3AREA	The "Area" parameter consists of the next two bytes (4-digit hexadecimal) of the NSAP address and is used to identify the Area to which the NSAP address belongs. This field is user settable.
L3SYS	The "System Identifier" consists of the next six bytes (12-digit hexadecimal) of the NSAP address. The purpose of this field is to guarantee that the NSAP address is globally unique. In order to insure this for U.S.-manufactured systems (non-U.S.-manufactured systems would have a different IDP value), IEEE administers the allocation of addresses within this field to equipment providers.
L3SEL	The "NSAP Selector" consists of the last byte (2-digit hexadecimal) of the NSAP address. Its purpose is to differentiate multiple NSAP addresses associated with the same End System. It's value is not fixed but is set in a PDU according to its usage. It is set to "AF" hex when TARP is run over CLNP. It has a value of "1D" hex when TP4 is run over CLNP. It may be set to "00" hex for other uses. When retreived and displayed, it is always shown as "00" hex.
L3LV2IS	This parameter indicates if the target NE is enabled as a Level 2 IS. *L3LV2IS* may have the value **enable** or **disable**.

EXAMPLE INPUT/OUTPUT

This example shows the **RTRV-ULSDCC-L3** results for DDM-2000 OC-3 and OC-12:

```
RTRV-ULSDCC-L3:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:12
M  123456 COMPLD
   ":L3IDP=39840F"
   ":L3DFI=80"
   ":L3ORG=000000"
   ":L3RES=0000"
   ":L3RD=0000"
   ":L3AREA=0000"
   ":L3SYS=08006A112345"
   ":L3SEL=00"
   ":L3LV2IS=enable"
;
```

This example shows the **RTRV-ULSDCC-L3** results for FiberReach:

```
RTRV-ULSDCC-L3:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:12
M  123456 COMPLD
   ":L3IDP=39840F"
   ":L3DFI=80"
   ":L3ORG=000000"
   ":L3RES=0000"
   ":L3RD=0000"
   ":L3AREA=0000"
   ":L3SYS=08006A112345"
   ":L3SEL=00"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is invalid.

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

RELATED TL1 MESSAGES

ENT-ULSDCC-L3

NAME

RTRV-ULSDCC-L4: Retrieve Upper Layer Section DCC - Layer 4

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 13.0
- OC-12 Release 7.0
- FiberReach Release 3.0

INPUT FORMAT

RTRV-ULSDCC-L4:*tid*:[*aid*]:*ctag*::[*::tdc*];

DESCRIPTION

NOTE:
This command is available to all users.

RTRV-ULSDCC commands retrieve provisionable parameters of Layers 3 through 7 of the Open Systems Interconnection (OSI) 7-layer protocol stack. This stack refers to the OSI reference model which is a logical structure for network operations. This model defines a standard communication protocol between NEs as specified by the International Standards Organization (ISO).

RTRV-ULSDCC-L4 is used to retrieve the parameters in Layer 4 of the OSI stack, many of which are provisioned by the **ENT-ULSDCC-L4** command. Layer 4 parameters include:

- TARP PDU lifetime parameter
- TARP timers
- TARP Loop Detection Buffer timers
- TARP Data Cache (TDC) enable/disable
- TARP Manual Adjacencies
- TARP Data Cache (TDC) entries

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
aid	Access identifier. The *aid* value may be **ALL** or null. Specifying the *aid* is optional.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

tdc TARP Data Cache (TDC). Specifying this optional parameter retrieves the TID (*L4TDCTID*), NSAP address, (*L4TDCNSAP*) and protocol address type (*L4TDCPRO*) every entry in the target NEs TDC.

tdc can only have the value **TDC** or null. If *tdc* is not specified, the TDC entries are not retrieved.

If *tdc* is specified and the TARP Data Cache had been disabled (in the preceding **ENT-ULSDCC-L4** command), a normal completion response without any TARP Data Cache entries is returned with the indication that the TARP Data Cache is disabled. (The TARP Data Cache is flushed when the TARP Data Cache is enabled again.)

OUTPUT FORMAT

If the retrieval of the TARP Data Cache is not requested, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   ":L4TLIF=x"
   ":L4T1TM=x"
   ":L4T2TM=x"
   ":L4T3TM=x"
   ":L4T4TM=x"
   ":L4LFTM=x"
   ":L4LETM=x"
   ":L4ETDC=x"
   ":L4AJNSAP=y1
   ":L4AJNSAP=y2
;
```

If the TARP Data Cache entries are requested, there are *n* entries in the TARP Data Cache, the TARP Data Cache is enabled, and the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   ":L4TLIF=x"
   ":L4T1TM=x"
   ":L4T2TM=x"
   ":L4T3TM=x"
   ":L4T4TM=x"
   ":L4LFTM=x"
   ":L4LETM=x"
   ":L4ETDC=x"
   ":L4AJNSAP=y1
   ":L4AJNSAP=y2
   ":L4TDCTID=x1:L4TDCNSAP=y1:L4TDCPRO=z1"
   ":L4TDCTID=x2:L4TDCNSAP=y2:L4TDCPRO=z2"
   ":L4TDCTID=x3:L4TDCNSAP=y3:L4TDCPRO=z3"
                  .                 .
                  .                 .
   ":L4TDCTID=xn:L4TDCNSAP=yn:L4TDCPRO=zn"
;
```

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to this command, also. Additional parameters that specifically apply to this command response are defined below.

Requesting the retrieval of the TARP Data Cache entries displays the TIDs and NSAP addresses of NEs in the target NEs TARP Data Cache. Because the TARP Data Cache may have many entries, each entry, including all of the fields of the NSAP address, are displayed on a single line.

L4TLIF TARP Lifetime. This parameter indicates the TARP lifetime parameter that is set in TARP PDUs originated by the target NE (i.e., the NE identified by the *tid* parameter). The TARP lifetime specifies the maximum number of hops allowed for a TARP PDU. When this number of hops is exceeded, the TARP PDU will not be forwarded.

L4TLIF may have a value in the range from **1** to **65535**. *L4TLIF* has an original value of **100**.

L4T1TM TARP Timer T1. T1 is the maximum time waiting for a response to a TARP Type 1 request PDU (search within area).

L4T1TM may have a value in the range from **1** to **3600** seconds. *L4T1TM* has an original value of **15** seconds.

L4T2TM TARP Timer T2. T2 is the maximum time waiting for a response to a TARP Type 2 request PDU (search outside of the area).

L4T2TM may have a value in the range from **1** to **3600** seconds. *L4T2TM* has an original value of **25** seconds.

L4T3TM TARP Timer T3. T3 is the maximum time waiting for a response to an Address Resolution request (Type 5, i.e., requesting the TID when the NSAP address is known).

L4T3TM may have a value in the range from **1** to **3600** seconds. *L4T3TM* has an original value of **40** seconds.

L4T4TM TARP Timer T4. Timer T4 starts when T2 expires. It is used for error recovery.

L4T4TM may have a value in the range from **1** to **3600** seconds. *L4T4TM* has an original value of **20** seconds.

L4LFTM TARP Loop Detection Buffer - Flush Timer. This parameter sets the time period for flushing the TARP Loop Detection Buffer.

L4LFTM may have a value in the range from **1** to **1440** minutes. *L4LFTM* has an original value of **5** minutes.

L4LETM TARP Loop Detection Buffer - LDB Entry Timer. This is the LDB time period for discarding TARP PDUs with a sequence number equal to zero.

L4LETM has an original value of **5** minutes.

L4ETDC This parameter specifies if the TARP Data Cache is enabled or disabled.

L4ETDC may take the value **enable** or **disable**. *L4ETDC* has a default value of **enable**.

L4AJNSAP This parameter specifies the NSAP address of a TARP Manual Adjacency.

The NSAP address is a 20-byte (40-digit hexadecimal) address required by OSI to provide unique identification within the OSI subnetwork and consists of a number of fields, some of which are pre-defined and some of which are user-settable. The structure of the NSAP is shown in the **ENT-ULSDCC-L4** command description.

The display format for *L4AJNSAP* is:
iiiiii ff oooooo rrrr dddd aaaa sssssssssss ll.

- *iiiiii* is the 6-digit hexadecimal *IDP* field,
- *ff* is the 2-digit hexadecimal *DFI* field,
- *oooooo* is the 6-digit hexadecimal **L4AJORG** field,
- *rrrr* is the 4-digit hexadecimal **4AJRES** field,
- *dddd* is the 4-digit hexadecimal **L4AJRD** field,
- *aaaa* is the 4-digit hexadecimal **L4AJAREA** field,
- *ssssss* is the 12-digit hexadecimal **L4AJSYS** field,
- *ll* is the 2-digit hexadecimal *SEL* field.

The following three parameters, *L4TDCTID*, *L4TIDNSAP* and *L4TDCPRO*, comprise a complete single entry in the TARP Data Cache. These three parameters are output as a set for each entry in the TARP Data Cache if the retrieval of these entries is requested with the *tdc* input parameter.

L4TDCTID This parameter specifies the Target Identifier (TID) of each TARP Data Cache entry.

L4TDCNSAP This parameter specifies the NSAP address of each TARP Data Cache entry.

The display format for *L4TDCNSAP* is:
iiiiii ff oooooo rrrr dddd aaaa sssssssssss ll.

- *iiiiii* is the 6-digit hexadecimal *IDP* field,
- *ff* is the 2-digit hexadecimal *DFI* field,
- *oooooo* is the 6-digit hexadecimal **L4TDCORG** field,
- *rrrr* is the 4-digit hexadecimal **L4TDCRES** field,
- *dddd* is the 4-digit hexadecimal **L4TDCRD** field,
- *aaaa* is the 4-digit hexadecimal **L4TDCAREA** field,
- *ssssss* is the 12-digit hexadecimal **L4TDCSYS** field,
- *ll* is the 2-digit hexadecimal *SEL* field.

L4TDCPRO This parameter specifies the protocol address type (referred to as "tar-pro" in Bellcore GR-253) of each TARP Data Cache entry.

L4TDCPRO has a set value of "FE" hex.

EXAMPLE INPUT/OUTPUT

This example shows the **RTRV-ULSDCC-L4** results with no optional retrieval parameters specified:

```
RTRV-ULSDCC-L4:LT-PF-2000::123456;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:12
M  123456 COMPLD
   ":L4TLIF=100"
   ":L4T1TM=15"
   ":L4T2TM=25"
   ":L4T3TM=40"
   ":L4T4TM=20"
   ":L4LFTM=5"
   ":L4LETM=5"
   ":L4ETDC=enable"
   ":L4AJNSAP=39840F 80 000000 0000 0000 0000 08006A112123 00"
   ":L4AJNSAP=39840F 80 000000 0000 0000 0000 08006A112739 00"

;
```

This example shows the **RTRV-ULSDCC-L4** with the retrieval of the TARP Data Cache entries specified:

```
RTRV-ULSDCC-L4:LT-PF-2000::123456::tdc;

IP 123456
<

   LT-PF-2000 98-03-22 16:12:12
M  123456 COMPLD
   ":L4TLIF=100"
   ":L4T1TM=15"
   ":L4T2TM=25"
   ":L4T3TM=40"
   ":L4T4TM=20"
   ":L4LFTM=5"
   ":L4LETM=5"
   ":L4ETDC=enable"
   ":L4AJNSAP=39840F8000000000000000000008006A11212300"
   ":L4AJNSAP=39840F8000000000000000000008006A11273900"
   ":L4TDCTID=LT-PF2001:L4TDCNSAP=39840F80000000000000000000
     08006A11212300:L4TDCPRO=FE"
   ":L4TDCTID=LT-PF2003:L4TDCNSAP=39840F80000000000000000000
     08006A112739 00:L4TDCPRO=FE"
   ":L4TDCTID=LT-PF2002:L4TDCNSAP=39840F80000000000000000000
     08006A117453 00:L4TDCPRO=FE"
   ":L4TDCTID=LT-PF2007:L4TDCNSAP=39840F80000000000000000000
     08006A112398 00:L4TDCPRO=FE"
;
```

ERROR RESPONSES

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

The NE returns the following error response if the *aid* value is invalid.

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

The NE returns the following error response if the *tdc* value is invalid.

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

RELATED TL1 MESSAGES

DLT-ULSDCC-L4

ENT-ULSDCC-L4

NAME

RTRV-USER-SECU: Retrieve User Security

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0.

INPUT FORMAT

RTRV-USER-SECU:*tid*:*[uid]*:*ctag*;

DESCRIPTION

NOTE:
This command is available to privileged users only.

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.

INPUT PARAMETERS

tid	Target identifier. This is the name of the Network Element (NE) to which the command is addressed.
uid	This is the User Identifier of a user. For DDM-2000, its valid values are a case-sensitive alphanumeric string of 5 to 10 characters. For FT-2000 its valid values is a case-sensitive alphanumeric string of 1 to 10 characters. Only a single *uid* or a null value meaning ALL is supported in the command.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

OUTPUT FORMAT

If the NE has logins to report, the following normal completion response is returned:

```
   sid date time
M  ctag COMPLD
   "uid:,uap"
;
```

If the NE 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 maintenance 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**.

User Access Privilege. It takes one of the following values: **privileged**, **general** or **reports**. See the **ACT-USER** command for more information regarding the *uap* values.

User Access Privilege. It takes one of the following values: **privileged**, **general**, **maintenance** or **reports**. See the **ACT-USER** command for more information regarding the *uap* values.

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 NE 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 */
;
```

If the NE 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
   PIUI
   /* Privilege, Illegal User Identity, invalid UID */
;
```

RELATED TL1 COMMANDS

DLT-USER-SECU

ED-USER-SECU

ENT-USER-SECU

NAME

SCHED-PMREPT: Schedule Performance Monitoring Report

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems),
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

SCHED-PMREPT-
modifier:*tid*:*aid*:*ctag*::[*reptinvl*],[*reptstatm*],[*numrept*],[*montype*],[*monlev*],[*locn*],[*dirn*],*tmper*[,*tmofst*];

DESCRIPTION

SCHED-PMREPT commands can be initiated to request the Network Element (NE) to schedule or delete the schedule for autonomous performance-monitoring (PM) reports.

Based on the scheduled PM reports, the NE outputs autonomous REPT PM messages.

NOTE:
Users should *avoid* scheduling daily reports to start just *before* or *at* midnight. The time a **SCHED-PMREPT** command is sent may vary slightly from the time the command is received, processed and output by the NE, and the NE stores only the current and previous day's *daily* PM data.

The NE 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 **all** are counted multiple times).

The Network Element accepts each **SCHED-PMREPT** as a request for a different scheduled PM report unless two requests are *exact* duplicates.

For example (for DDM-2000 OC-3), a **SCHED-PMREPT-T1** with *aid* = **c . 1**, and another **SCHED-PMREPT-T1** with *aid* = **c . all**, 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 NE limits the potential volume of PM data that can be scheduled to be reported within any hour to 3600 lines/hour.
The NE checks ahead 30 days to determine if the 3600 lines/hour maximum would be exceeded.

INPUT PARAMETERS

modifier In DDM-2000 OC-3 R6.1, 7.1, 11.0, OC-12 R2.1, 3.1, FiberReach R1.0, this is the command code modifier and must have one of the following values:

- **EC1** This is for the electrical STS1 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- **OC1** This is for the optical OC-1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems
- **OC3** This is for the optical OC-3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- **OC12** This is for the optical OC-12 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- **STS1** This is for the dropped STS-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems
- **T1** This is for the DS1 level external interfaces; Applicable to DDM-2000 OC-3 and FiberReach systems
- **T3** This is for the DS3 level external interfaces; Applicable to DDM-2000 OC-3 and OC-12 systems
- **VT1** This is for the dropped VT-1 channels; Applicable to DDM-2000 OC-12, OC-3 and FiberReach systems

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

aid Access identifier. For DDM-2000 OC-3 R6.1, 7.1, 11.0, OC-12 R R2.1, 3.1, FiberReach R1.0, this is the address of the EC1, OC-3 or OC-12 line, STS1 channel, DS1 or DS3 port, or VT1.5 channel for which a scheduled PM report is requested. The value of *aid* can be any access identifier for which a PM threshold can be set. See UIR.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

The NE confirms the validity of the input *aid* value, but the Network Element allows PM reports to be scheduled independent of the system equipage or provisioning.

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

The next three input parameters (*reptinvl*, *reptstatm* and *numrept*) affect the *scheduling* of the PM reports primarily. However, the supported *scheduling*-related input parameter values are based on the PM data stored and thus available to be reported by the Network Element.

reptinvl 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 *tmper* = **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 *tmper* = **1-DAY** only).

The default is **15-MIN** if *tmper* = **15-MIN** and **1-DAY** if *tmper* = **1-DAY**.

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 Network Element 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*).

If **SCHED-PMREPT** command is issued with *numrept* set to **0**, *reptstatm* set to **null**, and all other input parameters (except *ctag*) are the same, the Network Element deletes all previous PM

report schedule(s) that match the input parameters in the new command.

If a **SCHED-PMREPT** command is issued with *numrept* set to **0**, and *reptstatm*, set to a time at which a report has already been scheduled to be sent and all the other input parameters except *ctag*, match a previously issued **SCHED-PMREPT** command, the Network Element will delete all the other scheduled PM reports, that are elements of the set of reports, pertaining to the matching previous command referred to above. (It is to be noted that, per this new requirement, the value for *reptstatm*, does not have to match the value set up in the preceding SCHED-PMREPT command)

(Let us explain the above by an example:

A **SCHED-PMREPT** command with *reptstatm=00-00*, *numrept=10*, and *reptinvl=15-MIN*, has already been issued.

PM reports have been sent by the NE at 00-00 and 00-15.

The user now sends, before 00-30 of the same day, a **SCHED-PMREPT** command with *reptstatm=00-30*, *numrept=0*, and all other parameters the same (except for the *ctag*).

The NE will now delete the report scheduled for 00-30 along with all the other seven reports that are a part of the set of 10 reports, scheduled to be sent every 15 Minutes. starting at 00-00.

Any other pre-scheduled PM reports that does not have matching input parameter values to the newly issud **SCHED-PMREPT** command, will not be affected by this newly issued **SCHED-PMREPT** command.

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 3-9 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**.

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 (DS1 and DS3 PM only).

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 (TR-833, Issue 3).

NA This requests PM data for which the direction is not applicable (TR-833, Issue 4 and 5).

RCV This requests PM data for the receive direction (TR-833, Issue 4 and 5).

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 and 1 . 0 only. If *tmper* = **15-MIN**, allowable values of *tmofst* are 0-{0-7}-{0,15,30,45} and 0 . 0.

In the specific case of *tmofst* = **0 . 0**, the NE 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 **0.15**. If *tmper* = **1-DAY**, the *tmofst* default is **1 . 0**.

For example, if *tmofst* is null and a PM report is scheduled to be generated at 12:05 P.M. for *tmper* = **15-MIN**, the PM data accumulated from 11:45 A.M. to 12:00 Noon is reported.

The NE 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*).

The NE accepts multiple (up to 4) non-null *tmofst* values separated by single ampersands (**&**), and reports PM data based on each such *tmofst* value specified. The order of entry of multiple *tmofst* values is *not* significant (and doesn't affect the order of output in the REPT PM messages).

If any of the *tmofst* values in the same command is duplicated, for example, *tmofst* = **0 . 0&0 . 0**, the NE denies the whole command.

If *any* of the *tmofst* values is not valid, the NE denies the whole command.

OUTPUT FORMAT

If the NE fully complies with the schedule PM report request, the following normal completion response is returned:

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

If the NE 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 NE 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 *aid* value in the following example is a DDM-2000 OC-3 example *aid*.

```
SCHED-PMREPT-T3:LT-PF-2000:b:123456:1-HR,12-05,1,PYERR-L,1-UP,NEND,NA,15-MIN,
0 . 0&0 . 45&0 . 30&0 . 15;

IP 123456
<

   LT-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 **SCHED-PMREPT** command, also.

If the NE receives a **SCHED-PMREPT** command with a command code modifier which is supported but the applicable feature package option is "off," the following error response is returned:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, feature option not enabled */
;
```

If the NE receives a **SCHED-PMREPT** command with a command code modifier other than those listed as allowable for the input parameter *modifier*, the following error response is returned:

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

If the NE receives a **SCHED-PMREPT** command without an *aid* value, or 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 the NE 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 */
;
```

If the NE 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 NE 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 NE receives a **SCHED-PMREPT** command with a *montype* value that is

not supported by the NE 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 NE 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 NE 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 NE 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 NE 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, the following error response is returned:

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

If the NE 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 NE 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 NE 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 */
;
```

RELATED TL1 MESSAGES

REPT PM

RTRV-PM

RTRV-PMSCHED

NAME

SET-ATTR-ALM: Set Attribute Alarm

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0**, OC-12 Release **4.0** (for linear systems)
- OC-3 Release **9.0**, OC-12 Release **5.0**, **7.0** (for rings)
- FiberReach Release **1.0**.

INPUT FORMAT

SET-ATTR-ALM:*tid*::*ctag*:::{specific block};

where the specific block parameters are all optional (although at least one is required), position independent, and separated by commas. Supported spec block parameters include: almdel, clrdel, pmn with the following formats used to set values for these parameters:
almdel=*AlarmDelay*,
clrdel=*ClearDelay*,
pmn=*PMN*,

The spec block cannot be null. Spec block parameters not included are unchanged by execution of the command.

DESCRIPTION

The **SET-ATTR-ALM** command can be initiated by general users to provision the incoming signal alarm delay, the alarm clear delay intervals, the office alarm levels to be raised during a power minor alarm condition.

INPUT PARAMETERS

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

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

almdel The *almdel* is the incoming signal alarm delay parameter. The incoming alarm signal sets the time (0 to 120 seconds for FT-2000 and 0 to 30 seconds for DDM-2000 with a default value of 2 seconds) that the NE element will wait, after it finds a incoming signal condition before reporting the condition. The format used is that specified by Bellcore for "spec_block" parameters which are identified not by position, but by using a name defined construct of PARAMETER=*value*, in this case, **almdel=***AlarmDelay*. The value being set for *AlarmDelay* is an integer representing

seconds. A null value leaves the parameter unchanged.

clrdel The *clrdel* is the alarm clear delay parameter. The alarm clear delay parameter sets the time (0 to 120 for FT-2000 and 0 to 30 for DDM-2000 with a default of 15 for DDM-2000) in seconds the network element will wait after a condition clears before reporting the condition. The format used is that specified by Bellcore for specific block parameters which are identified not by position, but by using a name defined construct of PARAMETER=*value*, in this case, **clrdel=***ClearDelay*. The value being set for *ClearDelay* is an integer representing seconds. A null value leaves the parameter unchanged.

pmn The *pmn* is the office alarm level to be raised during a power minor alarm condition. The value (MN or MJ) can be set either with this command via the BBG8 SYSCTL or via a switch setting on the BBG5 SYSCTL circuit pack. This parameter does not apply to the OC-12 regenerator or to any system not equipped with a BBG8 SYSCTL circuit pack. The format used is that specified by Bellcore for specific block parameters which are identified not by position, but by using a name defined construct of PARAMETER=*value*, in this case, **pmn=***PMN* where the value of *PMN* is either **MN** or **MJ**. A null value leaves the parameter unchanged.

OUTPUT FORMAT

If the NE fully complies with the **SET-ATTR-ALM** request, the following normal completion response is returned.

```
IP ctag
<


   sid date time
M  ctag COMPLD
;
```

If the **SET-ATTR-ALM** command does not alter the existing attributes, the NE will not deny the command. Instead the system will respond with the completion message (shown above).

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **SET-ATTR-ALM** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a **SET-ATTR-ALM** command that provisions the incoming signal delay to 10 seconds and provision the alarm clear delay to 30 seconds.

```
SET-ATTR-ALM:LT-PF-2000::123456:::almdel=10,clrdel=30;

IP 123456
<

   LT-PF-2000 96-10-26 16:42:11
M  123456 COMPLD
;
```

The following example shows a **SET-ATTR-ALM** command that provisions the incoming signal delay to 5 seconds and sets the level of the alarm to be raised during a power minor alarm condition to MN.

```
SET-ATTR-ALM::LT-PF-2000:123456:::almdel=5,pmn=MN;

IP 123456
<

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

The following example shows a **SET-ATTR-ALM** command that provisions the alarm clear delay to 14 seconds.

```
SET-ATTR-ALM:LT-PF-2000::123456:::clrdel=14;

IP 123456
<

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

ERROR RESPONSE

Refer to the Error Response section of **RTRV-HDR**. The error responses listed there apply to the **SET-ATTR-ALM** command, also.

If an **SET-ATTR-ALM** command is received with an invalid almdel parameter, the following error response is returned:

```
   LT-PF-2000 94-04-12 23:11:54
M  123456 DENY
   IDNV
   /* Input, Data Not Valid, invalid almdel parameter */
;
```

If an **SET-ATTR-ALM** command is received with an invalid clrdel parameter, the following error response is returned:

```
   LT-PF-2000 94-04-12 23:11:54
M  123456 DENY
   IDNV
   /* Input, Data Not Valid, invalid clrdel parameter */
;
```

If an **SET-ATTR-ALM** command is received with an invalid pmn parameter, the following error response is returned:

```
  LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
  IDNV
  /* Input, Data Not Valid, invalid pmn parameter */
;
```

RELATED TL1 COMMANDS

RTRV-ATTR-ALM

NAME

SET-ATTR-CONT: Set Attribute Control

This message is generically defined for Lucent Technologies PF2000 products. Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0**, OC-12 Release **4.0** (for linear systems)
- OC-3 Release **9.0**, OC-12 ring Release **5.0**, **7.0** (for rings)
- Fiber Reach **1.0**

INPUT FORMAT

SET-ATTR-CONT:*tid*:*aid*:*ctag*::*[conttype]*;

DESCRIPTION

The **SET-ATTR-CONT** command can be initiated by general users to provision (define) the description associated with an external control. The **RTRV-ATTR-CONT** command is used by general users to retrieve these descriptions so that, for example, a remote user can verify that a control is associated with a fan (and not a sprinkler) before operating the control.

INPUT PARAMETERS

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

aid Access identifier. The *aid* identifies the external miscellaneous discrete control for which attributes are being set. The *aid* value cannot be null and cannot be CONT-ALL.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *{set-attr-cont}* addresses.

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

conttype For the **SET-ATTR-CONT** command, the *conttype* is the text string associated with the selected miscellaneous discrete control. It is an alphanumeric string, upper and lower case, with no spaces, up to 26 characters long. *conttype* is case sensitive and is enclosed with quotes.

A null value causes *conttype* to be set to the default value. This is intended to be consistent with the behavior of the UIR command set-attr-cont.

Bellcore has defined a set of standard conttypes which may be used (but are not required), and should be listed in user documentation so that the user knows of this option. These types are: AIRCOND (Air conditioning), ENGINE (Engine), FAN (Fan), GEN (Generator), HEAT (Heat), LIGHT (light), and MISC (Miscellaneous).

OUTPUT FORMAT

If the NE fully complies with the **SET-ATTR-CONT** request, the following normal completion response is returned.

```
IP 123456
<

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

If the **SET-ATTR-CONT** command does not alter the already provisioned description, the NE will not deny the command. Instead the system will respond with the completion message (shown above).

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section for a normal completion response. The output parameters listed there apply to the **SET-ATTR-CONT** command, also.

EXAMPLE INPUT/OUTPUT

The following example shows a **SET-ATTR-CONT** command that provisions the text string for miscellaneous discrete control 3 to *fan3* for a PF-2000 system:

```
SET-ATTR-CONT:LT-PF-2000:CONT-3:123456::"fan3";

IP 123456
<

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

The following example shows a **SET-ATTR-CONT** command that provisions the text string for miscellaneous discrete control 3 to *StartGenerator* for a PF-2000 system:

```
SET-ATTR-CONT:LT-PF-2000:CONT-3:123456::"StartGenerator";

IP 123456
<

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

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **SET-ATTR-CONT** command, also.

If an **SET-ATTR-CONT** command is received with an invalid access identifier, the following error response is returned:

```
   LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
   IIAC
   /* Input, Invalid Access Identifier */
;
```

If an **SET-ATTR-CONT** command is entered with an unimplemented parameter, the following (representative) error response is returned:

```
   LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
   INUP
   /* Input, Non-null Unimplemented Parameter */
;
```

If an **SET-ATTR-CONT** command is entered for a system whose SYSCTL CO/RT switch is set to CO, the following error response is returned:

```
   LT-PF-2000 94-04-12 23:11:54
M 123456 DENY
   ENSI
   /* Equipage, Not equipped for Setting specified Information -
      RT Provisionable Only */

;
```

RELATED TL1 COMMANDS

OPR-EXT-CONT

RLS-EXT-CONT

RTRV-ALM

RTRV-ATTR-CONT

NAME

SET-ATTR-ENV: Set Attribute Environment

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.2 and OC-12 Release 2.2 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0.

INPUT FORMAT

SET-ATTR-ENV:*tid*:*aid*:*ctag*::[*ntfcncde*],[*almtype*][,*almmsg*];

DESCRIPTION

SET-ATTR-ENV commands can be initiated to request the Network Element to set the notification code (alarm level), alarm type (condition type), and/or alarm message (condition description) associated with environmental alarm/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 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

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

aid Access identifier. This is the address of the environmental points to be provisioned.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid *environmental alarm input* addresses.

A null value is not permitted with this parameter.

ctag Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user 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.

If *almtype*, *almmsg*, and *ntfcncde* are all null, they all take default values (the default *ntfcncde* is **MN**). Otherwise, a null value for *ntfcncde* leaves it unchanged.

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 alarm type values specified in Bellcore TR-833, Issue 5, Appendix F, are recommended, but 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.

If *almtype*, *almmsg*, and *ntfcncde* are all null, they all take default values (the default *almtype* is **MISC**). Otherwise, a null value for *almtype* leaves it unchanged.

almmsg Alarm message. This is the condition description to be associated with the addressed environmental point. The description may be an alphanumeric string, upper-case and lower-case characters with no spaces, up to 26 characters. The description must be enclosed within a pair of quotes (**" "**).

For consistency with the Network Element's user interface and for readability, this parameter is an exception to the general rule of TL1 input parameters' being case-insensitive. The 26-character maximum assures that the whole description fits on the related user interface screens.

If *almtype*, *almmsg*, and *ntfcncde* are all null, they all take default values. (For environmental point 15, the default *almmsg* is **externalMinor**. For the other environmental points, the default *almmsg* is **environment***n*.) Otherwise, a null value for *almmsg* leaves it unchanged.

Refer to Table 3-8 at the end of this section.

OUTPUT FORMAT

If the NE fully complies with the **SET-ATTR-ENV** request, the following normal

completion response is returned:

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

If the NE receives a valid **SET-ATTR-ENV** command, but the command does not alter the existing alarm attributes, the NE 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-ENV:LT-PF-2000:env-10:123456::MJ,HITEMP,"HighTemperature";

IP 123456
<

   LT-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 **SET-ATTR-ENV** command, also.

If the Network Element receives a **SET-ATTR-ENV** command with an invalid command modifier, the following error response is returned:

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

If the NE receives a **SET-ATTR-ENV** command but that NE does not have it's CO/RT select switch set to "RT", the following error response is returned:

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

If the NE receives a **SET-ATTR-ENV** command with an invalid *aid* value, the following error response is returned:

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

If the NE receives a **SET-ATTR-ENV** command with an invalid *ntfcncde* value, the following error response is returned:

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

If the NE receives a **SET-ATTR-ENV** command with an invalid *almtype* value,

the following error response is returned:

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

If the NE receives a **SET-ATTR-ENV** command with an invalid *almmsg* value, the following error response is returned:

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

RELATED TL1 COMMANDS

REPT ALM ENV

REPT COND

REPT EVT

RTRV-ALM-ENV

RTRV-ATTR-ENV

RTRV-COND

NAME

SET-ATTR-rr: Set Attribute

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

SET-ATTR-modifier:*tid*:*aid*:*ctag*::[*ntfcncde][,,,,];*

DESCRIPTION

SET-ATTR-rr command instructs an NE to set the notification code associated with an incoming signal failure event.

For incoming DS1 signals (DDM-2000 OC-3 only), failure events are:

- `inc. (from DSX) DS1 LOS`
- `inc (from DSX) DS1 sig fail`.

For incoming DS3 signals, failure events are:

- `inc. (from DSX) DS3 LOS`
- `inc (from DSX) DS3 sig fail`.

For incoming EC1 signals, failure events are:

- `inc. EC1 line AIS`
- `inc. EC1 LOF`
- `inc. EC1 LOS`
- `inc. EC1 sig degrade (BER)`
- `inc. EC1 sig failed (BER)`
- `inc. STS1 LOP EC1`.

Refer to Table 3-8 at the end of this section.

This attribute governs whether the event notification is alarmed (reported via `REPORT ALARM`) or not alarmed (reported via `REPORT EVENT`).

INPUT PARAMETERS

modifier This is the command code modifier and must have one of the following values:

EC1 This sets the attribute for the electrical carrier signal level 1.

T1 This sets the attribute for the DS1 level (DDM-2000 OC-3, FiberReach, and SLC-2000 only).

T3 This sets the attribute for the DS3 level.

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

aid Access identifier. This is the address of the DS1 or DS3 port or EC1 line for which the attribute is to be set.

Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid addresses.

all is not allowed in the *aid* for this command.

Refer to Table 7-7 at the end of this section for a list of valid addresses.

The *aid* value must match the signal rate specified in the second modifier.

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.

ntfcncde Notification code. This is the alarm level for an incoming signal failure event and may have one of the following values:

CR Critical alarm (not allowed for DS1s in DDM-2000 OC-3)

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** (DDM-2000 OC-3 and FiberReach only).

OUTPUT FORMAT

If the NE fully complies with the set attribute request, the following normal completion response is returned:

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

If the NE receives a valid **SET-ATTR** command, but the command does not alter the existing alarm attributes, the NE 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 *aid* value included in the following example is a DDM-2000 OC-3 example *aid*:

```
SET-ATTR-T3:LT-PF-2000:a:123456::CR;

IP 123456
<

   LT-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 **SET-ATTR** command, also.

If the NE receives a **SET-ATTR** command with an invalid command modifier, the following error response is returned:

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

If the NE receives a **SET-ATTR-rr** command with an invalid *aid* value, the following error response is returned:

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

If the NE receives a **SET-ATTR-rr** command with an invalid *ntfcncde* value, the following error response is returned:

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

If the NE 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:

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

If the NE receives a **SET-ATTR-rr** command with a valid *aid* value but the NE is equipped with the wrong type of circuit pack (for example, a MXRVO pack instead of a DS3 pack), the following error response is returned:

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

RELATED TL1 COMMANDS

ENT-rr

RTRV-ATTR-rr

RTRV-rr

NAME

SET-OW: Set Orderwire mode.

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)

INPUT FORMAT

SET-OW:*tid*::*ctag*[:::*spec_block*];

DESCRIPTION

The **SET-OW** command can be initiated by users to set/modify the orderwire mode of the Network Element (NE).

NOTE:
For DDM-2000 OC-3 and DDM-2000 OC-12, if security is enabled on any TL1 port on the NE, this command is available only to the general and privileged users for all TL1 ports on the NE.

When a NE receives an **SET-OW** command from an user, the Network Element will set/modify its orderwire mode if the received mode is different from the currently effective mode at the system.

NOTE:
The orderwire mode will remain in effect until modified (for example, by another execution of the TL1 command **SET-OW** or by the appropriate CIT command) or until overridden by system initialization.

INPUT PARAMETERS

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

NOTE:
No *aid* value is permitted in the input command. The *aid* field is normally between the *tid* and *ctag* fields in the input command.

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

spec_block Specific Parameter Block. The orderwire mode to be set/modified is specified inside the *spec_block*. Parameters within *spec_block* are specified using a *name=value,name=value,...* type construct with no constraints on the order of the arrangement of parameters.

Constructs such as *name1=value1, name2=, name3=, name4=, name5=value5,...* are acceptable and in this example only the parameters *name1* and *name5* will be attempted to be changed at the Network Element. If the current value of the parameter *name1* is already *value1* in the above example, *name1* will not be changed.

For the **SET-OW** command, the *spec_block* will contain only the following parameter:

owmd This will have one of the following values:

`thru` Pass the orderwire and/or user bytes through. Allowed for DDM-2000 OC-3 linear and ring systems. It is also allowed in DDM-2000 OC-12 ring systems. This mode is valid irrespective of the setting of the JP jumper on the overhead controller.

`e1dropmain` Drop the signal received on the E1 bytes on the main interface of the DDM-2000 OC-3 linear system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.

`e1dropmain1` Drop the signal received on the E1 bytes on the main1 interface of the DDM-2000 OC-3 ring system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.

`e1dropfnc` Drop the signal received on the E1 bytes on the fn-c interface of the DDM-2000 OC-3 linear system. This mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.

`e1dropmain2` Drop the signal received on the E1 bytes on the main2 interface of the DDM-2000 OC-3 ring system. This

mode is allowed only when the JP jumper on the overhead controller has been set in the E1 position.

`muxdrop` Multiplex and drop the signal received on the E1, E2 and F1 bytes on the optical interfaces of the DDM-2000 OC-3 ring and linear systems. This mode is allowed only when the JP jumper on the overhead controller has been set in the MUX position.

OUTPUT FORMAT

If the NE fully complies with the **`SET-OW`** request, the following completion response is returned.

```
IP ctag
<

   sid date time
M  ctag COMPLD
;
```

If the **`SET-OW`** command does not alter the existing orderwire mode, the NE will not deny the command. Instead the system will respond with the completion message (shown above). An example of this is when the system addressed by the *`tid`* is already a provisioned to have an orderwire mode of `e1dropmain2`, and **`SET-OW`** command is received to set the orderwire mode to **`e1dropmain2`**.

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 command to change the orderwire mode to e1dropfnc in a linear DDM-2000 system:

```
set-ow:LT-PF-2000::123456:::owmd=e1dropfnc;

IP 123456
<

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

The following example shows a command to modify the orderwire mode to thru:

```
set-ow:LT-PF-2000::123456:::owmd=thru;

IP 123456
<

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

ERROR RESPONSE

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

If an **SET-OW** command is received with an *aid* value, the following error response is returned:

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

If a NE receives an **SET-OW** command with **spec_block** containing anything other than the parameter **owmd**, the following error response is returned:

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

If a NE receives a **SET-OW** command with a **owmd** other than the allowable combinations described earlier, the following error response is returned:

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

RELATED TL1 COMMANDS

RTRV-OW

NAME

SET-SID: Set Target/Source IDentification (TID/SID) of the Network Element.

Support for this TL1 command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 for linear systems
- OC-3 Release 7.1 and OC-12 Release 3.1 (ring systems)
- FiberReach Release 1.0

INPUT FORMAT

SET-SID*:tid::ctag::sid;*

DESCRIPTION

CAUTION:
Network Element access is affected by this command.

This command can be initiated by an user to change the Target/Source identification of the Network Element (NE).

NOTE:
This TL1 command is available to privileged users only.

When the NE receives a **SET-SID** command, the NE will update its Target/Source identifier as requested.

The Target/Source identifier remains active until changed (for example, by the TL1 command **SET-SID** command or by the appropriate CIT command or until overridden by a Network Element initialization.

INPUT PARAMETERS

tid	Target identifier. This is the currently active name of the NE to which the command is addressed.
ctag	Correlation tag. This is included in the command by the TL1 user and is repeated by the NE in the response to allow the TL1 user to associate the command and response messages.
sid	Target identifier. This is the new name of the NE to which the command is addressed.

NOTE:
For proper operation of the TL1 interfaces, the *sid* must be unique for each Network Element within a subnetwork.

OUTPUT FORMAT

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

If the requested **SET-SID** command does not alter the existing condition, the NE shall not DENY the command. Instead the Network Element shall respond with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **SET-SID** command also.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 example requests a change of the identifier to LT-DDM-2000 from LT-PF-2000.

```
set-sid:LT-PF-2000::123456::LT-DDM-2000;


IP 123456
<


   LT-DDM-2000 93-10-26 16:42:11
M  123456 COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **SET-SID** command also.

If the NE receives a **SET-SID** with an otherwise valid set of input parameter values but the *sid* specified in the command is exactly the same as that for some other NE in the subnetwork, the following error response is returned:

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

If the NE receives a **SET-SID** with an otherwise valid set of input parameter values but the *sid* specified in the command is syntactically incorrect, the following error response is returned:

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

If the NE receives a **SET-SID** without the *sid* parameter, the following error response is returned:

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

If the NE receives a **SET-SID** with an otherwise valid set of input parameter values but the command could not be completed by the NE, the following error response is returned:

```
   sid date time
M  ctag DENY
   SROF
   /* Status, Requested Operation Failed */
;
```

RELATED TL1 MESSAGES

ENT-SYS

RTRV-SYS

NAME

SET-SYNCN: Set Synchronization

support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

SET-SYNCN:*tid*:*aid*:*ctag*::*syncnmode*[,*syncfunction*];

DESCRIPTION

SET-SYNCN instructs an NE to set the synchronization mode of an NE.

This command controls operation of the synchronization protection switching. This command lets the user control which synchronization reference is used and enables the user to switch a synchronization reference when needed.

INPUT PARAMETERS

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

aid Access identifier. This identifies the facility to which the threshold applies. The only allowed value is **ALL**.

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

syncnmode Synchronization Mode. This is the requested synchronization mode.

In DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, for *syncfunction* values of **REFERENCE** or **CIRCUITPACK**, the valid values of *syncnmode* are as follows:

INHIBIT Freeze the protection switching mechanism. Automatic protection switching is disabled until this command is executed again with the same *syncfunction* and with *syncnmode* set to **RESET**.

MANUAL Switch from active timing reference to standby timing reference.

RESET Clear active protection switch requests.

For a *syncfunction* value of **MODE**, the valid values of *syncnmode* are as follows:

HLDOVR Holdover synchronization mode. This switches from the provisioned timing mode (External or LineTimed) to holdover mode. The system remains in holdover mode. Automatic protection switching is disabled until this command is executed again with the same *syncfunction* and with *syncnmode* set to **NORM**.

NORM Normal synchronization mode. Clears any active holdover mode. This will allow the system to switch back to External or LineTimed if the system is provisioned for non-revertive mode switching or if it has been manually switched to holdover mode.

For a *syncfunction* value of **SRC**, the valid values of *syncnmode* are as follows:

MANUAL Switch from the active SynchronizationSource to the standby source.

Prior to DDM-2000 OC-3 R9.1, any slot equipped with an OC-1 OLIU is not a valid synchronization source. Thus, a manual synchronization source switch will never select a slot with an OC-1 OLIU.

Starting with DDM-2000 OC-3 R9.1, a 27-type OLIU is a valid synchronization source when in a MAIN slot, but not FN-C. OC-1 line #1 is used as the synchronization source in such a case.

Synchronization Mode. This is the requested synchronization mode.

In DDM-2000 FiberReach R3.0 and later, for a *syncfunction* value of **CIRCUITPACK**, the valid value of *syncnmode* is as follows:

MANUAL Switch from the main OLIU circuit pack that currently is used as the line-timing source to the other main OLIU circuit pack.

For a *syncfunction* value of **MODE**, the valid values of

syncnmode are as follows:

HLDOVR Holdover synchronization mode. This switches from the provisioned timing mode (LineTimed) to holdover mode. The system remains in holdover mode. Automatic protection switching is disabled until this command is executed again with the same *syncfunction* and with *syncnmode* set to **NORM**.

NORM Normal synchronization mode. Clears any active holdover mode. This will allow the system to switch back to LineTimed if the system is provisioned for non-revertive mode switching or if it has been manually switched to holdover mode.

For a *syncfunction* value of **SRC**, the valid values of *syncnmode* are as follows:

MANUAL Switch from the active SynchronizationSource to the standby source.

syncfunction Synchronization function. For DDM-2000 OC-3 8.0, 9.0, OC-12 R4.0, 5.0, This may take one of the following values:

CIRCUITPACK Selects protection switching of timing circuit packs.

MODE Selects protection switching of timing mode. Specify only if the system is provisioned for `External` DS1 or `LineTimed`.

REFERENCE Selects protection switching of DS1 timing references. Specify only if the system is provisioned for `External` DS1 timing.

SRC Selects the optical line from which shelf loop-timing and/or the DS1 synchronization output will be derived. This parameter is only applicable if SyncAutoreconfiguration is enabled using the **ENT-SYNCN** command. The SynchronizationSources that can be switched are: **main-1**, **main-2**, and **fn-c** (for DDM-2000 OC-3 ring releases) and **main-b-1** and **main-b-2** (for DDM-2000 OC-12 ring releases).

If null, the default value is **MODE**.

Synchronization function. For DDM-2000 FiberReach R1.0, 3.0, this may take one of the following values:

CIRCUITPACK	In FiberReach Release 3.0 and later, selects protection switching of timing circuit packs. Specifically, it selects protection switching of the main OLIU circuit pack that is currently used as the line-timing source for the system to the other main OLIU pack. This will also result in an "active-fn" main OLIU equipment switch.
MODE	Selects protection switching of timing mode. Specify only if the system is provisioned for `LineTimed`.
SRC	Selects the optical line from which shelf loop-timing will be derived. This parameter is only applicable if SyncAutoreconfiguration is enabled using the **ENT-SYNCN** command. The SynchronizationSources that can be switched are: **main-1** and **main-2**.

If null, the default value is **MODE**.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the requested **SET-SYNCN** command does not alter the existing condition, the Network Element shall respond with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to the **SET-SYNCN** command, also.

EXAMPLE INPUT/OUTPUT

```
set-syncn:LT-PF-2000:all:123456::norm;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR** error responses section. The error responses listed there also apply to **SET-SYNCN**.

The NE returns the following error response if the *aid* value is missing or invalid.

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

If no synchronization source switch can be completed due to the equipage of the alternate sources, the command will be denied with the following message. For example, in DDM-2000 OC-3, any slot equipped with a 27-type OLIU is not a valid standby source. Thus, a manual synchronization source switch will never select a slot with a 27-type OLIU.

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

If an equal or higher priority switch already exists on the addressed path, the command will be denied with the following message:

```
   sid date time
M  ctag DENY
   SSRD
   /* Status, Switch Request Denied, equal or higher-priority
      switch request exists or standby unavailable */
;
```

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, FiberReach R1.0, 3.0, the NE returns the following error response if the *syncnmode* value is missing or invalid.

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

For DDM-2000 OC-3 R8.0, 9.0, OC-12 R4.0, 5.0, FiberReach R1.0, 3.0, the NE returns the following error response if the *syncfunction* value is invalid.

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

If the switch request is issued for the *syncfunction* value of **SRC** and SyncAutoreconfiguration is not enabled, the command will be denied with the following message:

```
   sid date time
M  ctag DENY
   SSRD
   /* Status, Switch Request Denied, SyncAutoreconfiguration is not enabled */
;
```

The NE returns the following error response if both timing slots are empty.

```
   sid date time
M  ctag DENY
   ENEQ
   /* Equipage, Not Equipped, both timing slots are unequipped */
;
```

RELATED TL1 COMMANDS

None.

NAME

SET-TH: Set Threshold

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0

INPUT FORMAT

SET-TH-
modifier:*tid*:*aid*:*ctag*::*montype*,*thlev*,[*locn*],[*dirn*],*tmper*[,*fmt*];

DESCRIPTION

SET-TH instructs an NE to set the threshold level for a monitored parameter.

INPUT PARAMETERS

modifier Command code modifier. For DDM-2000 OC-3 R8.0, 9.0, 11.0, OC-12 R4.0, 5.0, FiberReach R1.0, the valid modifiers are:

EC1 This sets the threshold level for the electrical carrier signal level 1. Applicable to DDM-2000 OC-3, OC-12 systems.

OC1 This sets the threshold level for optical carrier level 1. Applicable to DDM-2000 OC-3 and FiberReach.

OC3 This sets the threshold level for optical carrier level 3. Applicable to DDM-2000 OC-3, OC-12, FiberReach R2.2, 3.1 and later.

OC12 This sets the threshold level for optical carrier signal level 12. Applicable to DDM-2000 OC-3 and OC-12 systems.

STS1 This sets the threshold level for synchronous transport signal level 1. Applicable to DDM-2000 OC-3, OC-12, FiberReach systems.

T1 This sets the threshold level for the DS1 level. Applicable to DDM-2000 OC-3 if the DS1 pm feature is enabled, and FiberReach systems.

T3 This sets the threshold level for the DS3 level. Applicable to DDM-2000 OC-3, OC-12, FiberReach R3.1 and later. and **SLC**-2000 systems.

VT1 This sets the threshold level for the virtual tributary signal level 1.5. Applicable to DDM-2000 OC-3, if the VT pm feature is enabled, and FiberReach systems.

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

aid Access identifier. This identifies the facility to which the threshold applies.

The *aid* can only have the value **ALL**.

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.

montype Monitored parameter type. This is the performance monitoring parameter type for which a threshold is being set.

The valid values are listed in Table 3-10 at the end of this section.

thlev Threshold level. This is the threshold level to be set for the particular *montype*. A threshold value of zero (0) will disable thresholding for that *montype*.

The valid and default values are listed in Table 3-11 at the end of this section.

locn Location. This is the location value for the facility identified by the AID. The valid locations are:

FEND Far-end (for *modifier* T1 and **T3** only).

NEND Near-end

If *locn* is null, the default value is **NEND**, except for *modifier* T1 where if *locn* is null, the default value is **FEND**.

dirn Direction. This specifies the direction in which the threshold is to be set and is relative to the facility identified by the AID. The value of direction must be null or **NA** (*not applicable*). If null, the default value is **NA**.

tmper Time period. This is the accumulation time period for the PM information. The only valid time periods are:

15-MIN

1-DAY

NONE

If the *tmper* value is supported but conflicts with the command code modifier, an error response is returned to the OS.

fmt Format. In DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, this parameter is only valid when the *modifier* is T1, *montype* is **CVP**, and *locn* is **NEND**. It specifies the type of formatting on the DS1 path. The valid formats are:

SF The DS1 path is formatted using *super frame* encoding.

ESF The DS1 path is formatted using *extended super frame* encoding. If the format is null, the default value is ESF.

In DDM-2000 OC-3 R7.2, 8.0, 9.0, OC-12 R5.0, FiberReach R3.1, This parameter is also only valid when the *modifier* is **T3**, *montype* is **CVP**, and *locn* is **NEND**. It specifies the DS3 performance monitoring scheme. This parameter will have one of the following values:

PBIT PBIT scheme is used for DS3 PM. This is the default value.

FMBIT FMBIT scheme is used for DS3 PM.

CPBIT CPBIT scheme is used for DS3 PM.

OUTPUT FORMAT

If the NE fully complies with the request, the following normal completion response is returned:

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

If the requested **SET-TH** command does not alter the existing condition, the NE responds with a COMPLD message.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The output parameters listed there for the normal completion response apply to the **SET-TH** command, also.

EXAMPLE INPUT/OUTPUT

```
set-th-oc3:LT-PF-2000:fn-c:123456::cvl,691,,,1-day;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

```
set-th-oc1:LT-PF-2000:fn-c:123456::cvl,691,,,1-day;

IP 123456
<

   LT-PF-2000 94-03-22 16:12:11
M  123456 COMPLD
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The error responses listed there also apply to the **SET-TH** command, also.

The NE returns the following error response if the *aid* value is missing, invalid, or conflicts with the command code modifier.

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

The Network Element returns the following error response if the *montype* value is missing, not supported, or conflicts with the command code modifier.

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

The Network Element returns the following error response if the *thlev* value is missing or out of range.

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

If the command code modifier is supported but the applicable feature package option is "off," the following error response is returned:

```
   sid date time
M  ctag DENY
   ICNV
   /* Input, Command Not Valid, feature option not enabled */
;
```

The Network Element returns the following error response if the *locn* value is invalid, or conflicts with the command code modifier, and if the feature is enabled.

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

The Network Element returns the following error response if the *dirn* value is invalid.

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

The Network Element returns the following error response if the *tmper* value is invalid or conflicts with the command code modifier.

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

For DDM-2000 OC-3 R7.2, 8.0, 9.0, FiberReach R1.0, the NE returns the following error response if the *fmt* value is invalid, or conflicts with the command code modifier, *montype*, or *locn*. (for example, **SET-TH-T3** with a *fmt* value of **ESF**).

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

RELATED TL1 COMMANDS

REPT PM

RTRV-PM

RTRV-PMSCHED

RTRV-TH

SCHED-PMREPT

ENT-rr

NAME

SW-TOPROTN: Switch To Protection

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0.

INPUT FORMAT

SW-TOPROTN-*modifier*:*tid*:*aid*:*ctag*::*mode*[,,*dirn*];

DESCRIPTION

CAUTION:
Execution of this command may affect service.

For DDM-2000 OLC-3 R6.1, 7.1, OC-12 R2.1, 3.1, **SW-TOPROTN** commands can be initiated to instruct the Network Element (NE) to perform an equipment (circuit pack) protection switch on low speed (DS1 or T1) transmission (DDM-2000 OC-3 only), TSI (DDM-2000 OC-12 linear releases only), function unit or synchronization circuit packs. Both revertive and nonrevertive protection switches are included.
For DDM-2000 FiberReach R1.0, **SW-TOPROTN** commands can be initiated to instruct the NE to perform an equipment (circuit pack) protection switch on low speed (DS1 or T1) transmission circuit packs.

For DDM-2000 FiberReach R3.1, **SW-TOPROTN** commands can be initiated to instruct the NE to perform an equipment (circuit pack) protection switch, on low speed DS3 (or T3) circuit pack, if the shelf is equipped with 28-type OLIUs in the Main and DS3 circuit packs in the Function Unit slots.

This **SW-TOPROTN** command is not used to switch DDM-2000 OLIUs to protection.

For DDM-2000 FiberReach R3.1, the **SW-TOPROTN** command does not apply when the FiberReach shelf is equipped with BBG19 circuit packs in the Function Unit slots.

For DDM-2000 OC-3 R6.1, 7.1, Fiber Reach R1.0, when the NE 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 *mode*s (in priority order): lockout, forced switch, or normal (manual) switch.

For DDM-2000 OC-3 R6.1, 7.1, FiberReach R1.0, when the NE 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.

For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, FiberReach R3.1, when the NE receives a **SW-TOPROTN** command with an address indicating a function unit circuit pack slot pair or a TSI (DDM-2000 OC-12 linear releases only) circuit pack slot pair, a hardware switch is operated with the following *mode*s (in priority order): inhibit, forced switch, or normal (manual) switch.

For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, when the NE receives a **SW-TOPROTN** command with an address indicating a synchronization circuit pack slot pair, a hardware switch is operated with the following *mode*s (in priority order): inhibit or normal (manual) switch.

INPUT PARAMETERS

modifier Modifier. This is a message modifier to the **SW-TOPROTN** message and may only have the following value:

EQPT Equipment. This is currently the only available modifier for use with this command.

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

aid Access identifier. This is the slot address within the NE for which the **SW-TOPROTN** command is intended.

For low speed circuit pack (DS1 or T1) protection switching (DDM-2000 OC-3 and FiberReach only), the *aid* value must identify either a single low speed slot (for example, **ls-a-1**) or all low speed slots in a single group (for example, **ls-a-all**).

For DDM-2000 FiberReach R3.1 only and later, for low speed circuit pack (DS3 or T3) protection switching, the *aid* value must identify a single function unit slot (for example, **fn**).

Valid low speed slot addresses for *mode*s **FRCD** and **NORM**: **ls-{a,b,c}-{1-7}** (Note that only *service* slots are allowed, and **all** is not allowed).

Valid low speed *service* slot addresses for *mode* **LOCKOUT**: **ls-{a,b,c}-{1-7,all}** (Note that **all** means 1,2,3,4,5,6,7).

Valid low speed *protection* slot addresses for *mode* **LOCKOUT**):
ls-{a,b,c}-8 (Note that's the protection slot only).
Valid low speed slot addresses for *mode*s **FRCD** and **NORM**:

ls-{a,b,c,d}-1 (Note that only *service* slots are allowed, and **all** is not allowed).

Valid low speed *service* slot addresses for *mode* **LOCKOUT**:
ls-{a,b,c,d}-{1,all} (Note that **all** means 1).

Valid low speed *protection* slot addresses for *mode* **LOCKOUT**):
ls-{a,b,c,d}-2 (Note that's the protection slot only).

For DDM-2000 OC-3 R6.1, 7.1, OC-12 linear only R2.1, 3.1, for function unit, TSI -2000 OC-12 linear releases only), and synchronization circuit pack protection switching, the *aid* value must identify a circuit pack slot *pair*.

Other than the use of the **all** construct within the *aid* field, grouping and/or ranging of *aid* values for this command is not allowed. Further, use of the **all** construct is only applicable when addressing low speed transmission circuit pack slots with a *mode* value of **LOCKOUT**.

Deleted.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid function unit, TSI (DDM-2000 OC-12 linear releases only), and synchronization circuit pack slot *pair* addresses.

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.

mode Protection switch mode (priority). This is the protection switch request priority of the command. The *mode* parameter must have one of the following values, listed in order of priority:

LOCKOUT Lockout. For DDM-2000 OC-3 R6.1, 7.1, FiberReach R1.0, this requests a ***lockout*** of protection switching and is applicable only when the *aid* 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 *protection* slot, any traffic that is currently on the protection circuit pack is unconditionally switched back to the service circuit pack, and no further traffic from any service circuit pack can be switched to the protection circuit pack. If the lockout addresses a *service* 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 *mode* = **RESET**).

INHIBIT Inhibit. For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, FiberReach R3.1, this requests an ***inhibit*** of protection switching and is applicable only when the *aid* value indicates a function unit, TSI (DDM-2000 OC-12 linear releases only), 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 *mode* = **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 *mode* value is applicable only when the *aid* value indicates a low speed *service* slot (DDM-2000 OC-3 or FiberReach only), or a function unit (DDM-2000 OC-3 or OC-12 only), TSI (DDM-2000 OC-12 linear releases only), or synchronization circuit pack slot pair (DDM-2000 OC-3 or OC-12 only). 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 (DDM-2000 OC-3 or FiberReach only), or a function unit (DDM-2000 OC-3 or OC-12 only), TSI (DDM-2000 OC-12 linear releases only), or synchronization circuit pack slot pair (DDM-2000 OC-3 or OC-12 only). The manual protection switch remains in effect until a protection switching ***lockout*** (when applicable), ***forced*** (when applicable), or ***reset*** is entered.

Addressing the lockout switch request to a low speed electrical circuit pack *protection* slot (in a protection group of service and protection circuit pack slots) has the same effect as addressing the lockout switch request to *all* of the *service* circuit pack slots

in the protection group. However, in this case, the state of the service circuit pack slots does not change.

dirn Direction. This parameter is intended to specify the direction of transmission affected by the protection switch. This parameter field may be null or have the [default] value **BTH** (both) for all **SW-TOPROTN-EQPT** commands to the NE.

OUTPUT FORMAT

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

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

If the NE receives a valid **SW-TOPROTN** command, but protection switching request does not alter the existing protection switching state and/or priority, the NE provides a normal completion response. A generalized example of this is when the low speed protection circuit pack slot is already locked out and a request is made for lockout of protection.

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 DDM-2000 OC-3 or FiberReach example shows a successful low speed *service* circuit pack slot lockout of protection switching command request. In this example, low speed service slot `ls-a-1` is locked out from protection switching; if any failure of the electrical low speed circuit pack in that slot is detected, no protection switch will be made to the protection circuit pack slot.

```
SW-TOPROTN-EQPT:LT-PF-2000:ls-a-1:123456::LOCKOUT,,BTH;

IP 123456
<

   LT-PF-2000 94-05-26 16:42:11
M  123456 COMPLD
;
```

The following example shows a successful synchronization circuit pack slot manual protection switching command request.

```
SW-TOPROTN-EQPT:LT-PF-2000:tg:123456::NORM;

IP 123456
<

   LT-PF-2000 94-05-28 19:13:56
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 NE receives a **SW-TOPROTN** command with a command code modifier other than **EQPT**, the following error response is returned:

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

If the NE receives a **SW-TOPROTN** command without an *aid* value, or with an invalid *aid* value (either due to a conflict between an otherwise valid low speed slot *aid* and an otherwise valid low speed protection switching *mode* value (DDM-2000 OC-3 or FiberReach only), or an *aid* value that is not supported in any case by this command), the following error response is returned:

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

```
   sid date time
M  ctag DENY
   SSRD
   /* Status, Switch Request Denied, equipped OC circuit pack
      incompatible with switch request */
;
```

For DDM-2000 OC-3 R11.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must be
      equipped with compatible OLIU packs */
;
```

RELATED TL1 COMMANDS

SW-TOWKG

NAME

SW-TOWKG: Switch To Working

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.1 and OC-12 Release 2.1 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0.

INPUT FORMAT

SW-TOWKG-*modifier*:*tid*:*aid*:*ctag*::*mode*[,,*dirn*];

DESCRIPTION

CAUTION:
Execution of this command may affect service.

For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, **SW-TOWKG** commands can be initiated to instruct the NE to reset equipment (circuit pack) protection switching on low speed (DS1 or T1) transmission (DDM-2000 OC-3 only), function unit, TSI (DDM-2000 OC-12 linear releases only), or synchronization circuit packs. Resets of both revertive and nonrevertive protection switching are included.

This **SW-TOWKG** command is not used to reset protection switching for DDM-2000 OLIUs.

For DDM-2000 FiberReach R1.0, **SW-TOWKG** commands can be initiated to instruct the Network Element to reset equipment (circuit pack) protection switching on low speed (DS1 or T1) transmission circuit packs.

For DDM-2000 FiberReach R3.1, f(CBSW-TOWKG commands can be initiated to instruct the NE to perform an equipment (circuit pack) protection switch, on low speed DS3 (or T3) circuit pack, if the shelf is equipped with 28-type OLIUs in the Main and DS3 circuit packs in the Function Unit slots.

For DDM-2000 FiberReach R3.1, the **SW-TOWKG** command does no apply when the FiberReach shelf is equipped with BBG19 circuit packs in the Function Unit slots.

When the NE 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

modifier Modifier. This is a message modifier to the **SW-TOPROTN** message and may only have the following values:

EQPT Equipment. This is currently the only available modifier for use with this command.

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

aid Access identifier. This is the slot address within the Network Element for which the **SW-TOWKG** command is intended.

In DDM-2000 OC-3 R6.1, 7.1, FiberReach R1.0, for low speed circuit pack (DS1 or T1) protection switching (DDM-2000 OC-3 and FiberReach only), the *aid* value must identify either a single low speed slot (for example, **ls-a-1**) or all low speed slots in a single group (for example, **ls-a-all**).

In DDM-2000 FiberReach Release 3.1 only and later, for low speed circuit pack (DS3 or T3) protection switching, the *aid* value must identify a single function unit pair (for example, **fn**).

Valid low speed *service* slot addresses for *mode* **RESET**: **ls-{a,b,c}-{1-7,all}** (Note that **all** means 1,2,3,4,5,6,7).

Valid low speed *protection* slot addresses for *mode* **RESET**): **ls-{a,b,c}-8** (Note that's the protection slot only).

Valid low speed *service* slot addresses for *mode* **RESET**: **ls-{a,b,c,d}-{1,all}** (Note that **all** means 1).

Valid low speed *protection* slot addresses for *mode* **RESET**): **ls-{a,b,c,d}-2** (Note that's the protection slot only).

In DDM-2000 OC-3 6.1, 7.1, OC-12 R2.1, 3.1, for function unit, TSI (DDM-2000 OC-12 linear releases only), and synchronization circuit pack protection switching, the *aid* value must identify a circuit pack slot *pair*.

Other than the use of the **all** construct within the *aid* field for all slots within one low-speed group, grouping and/or ranging of *aid* values for this command is not allowed.
Refer to Tables 3-6 and 3-7 at the end of this section for a list of valid function unit, TSI (DDM-2000 OC-12 linear releases only), and synchronization circuit pack slot *pair* addresses.

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

mode Protection switch mode (priority). This provides the protection switch request priority of the command. The *mode* parameter must have the following value:

RESET Reset. This requests a ***reset*** of protection switching. The effect of this type of protection switching request is to reset any previous manual protection switching requests for the addressed entity.

dirn Direction. This parameter is intended to specify the direction of transmission affected by the protection switch reset. This parameter field may be null or have the [default] value **BTH** (both) for all **SW-TOWKG-EQPT** commands to the NE.

OUTPUT FORMAT

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

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

If the NE receives a valid **SW-TOWKG** command, but the protection switching reset request does not alter the existing protection switching state and/or priority, the NE 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 DDM-2000 OC-3 example shows a successful low speed *service* circuit pack slot reset of protection switching command request.

```
SW-TOWKG-EQPT:LT-PF-2000:ls-a-1:123456::RESET;

IP 123456
<

   LT-PF-2000 94-05-26 16:42:11
M  123456 COMPLD
;
```

The following example shows a successful synchronization circuit pack slot pair reset protection switching command request.

```
SW-TOWKG-EQPT:LT-PF-2000:tg:123456;

IP 123456
<

   LT-PF-2000 94-05-28 19:13:56
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 NE receives a **SW-TOWKG** command with a command code modifier other than **EQPT**, the following error response is returned:

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

If the NE receives a **SW-TOWKG** command without an *aid* value or with an invalid *aid* value, the following error response is returned:

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

If the NE 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 NE 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 NE 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 */
;
```

For DDM-2000 FberReach R3.1, if the NE receives a **SW-TOWKG** command when the Function Unit slots are equipped with BBG19 circuit packs the following error response is returned:

```
   sid date time
M  ctag DENY
   ENPS
   /* Equipage, Not equipped with Protection Switching */
;
```

For DDM-2000 OC-3 R6.1, 7.1, OC-12 R2.1, 3.1, if the NE 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 */
;
```

For DDM-2000 OC-3 R11.0, if this command is received by the NE while a mix of incompatible packs exists in the main group, i.e. during upgrade, the following error message will be returned:

```
   sid date time
M  ctag DENY
   SNVS
   /* Status, Not in Valid State, both main slots must be
      equipped with compatible OLIU packs */
;
```

RELATED TL1 COMMANDS

SW-TOPROTN

NAME

TEST-IAOLAN: Test DDM-2000 IAO LAN connection to an IAO LAN hub.

Support for this command is available for DDM-2000 Multiplexers, starting with OC-3 R**15.0** (for rings).

INPUT FORMAT

TEST-IAOLAN:*tid*:*ctag*[:[:[:]]];

DESCRIPTION

NOTE:
Use of this command will not affect service.

NOTE:
This command is available to privileged, general and maintenance users.

This command tests the DDM-2000 shelf's IAO LAN connection to an IAO LAN hub, and reports the results.

The test is done by establishing a loopback between the shelf's IAO LAN and an IAO LAN hub.

NOTE:
Before executing the command, the shelf's IAO LAN interface must be connected to the IAO LAN hub.

INPUT PARAMETERS

tid Target Identifier. This is the name of the Network Element (NE) to which the command is addressed.

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

OUTPUT FORMAT

If the NE fully complies with the **TEST-IAOLAN** request, the following normal completion response is returned.

```
IP ctag
<


  sid date time
M ctag COMPLD
  "<result>"
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Parameters that specifically apply to this command response are defined below.

tid Target Identifier. This is the system name.

result This is the result of the system test. Possible values are:

```
IAO LAN test PASSED

IAO LAN test FAILED
```

NOTE:
If the test fails, the user should try simply reseating the DDM-2000 overhead controller circuit pack before checking the IAO LAN connections to the DDM-2000 shelf and IAO LAN hub.

EXAMPLE INPUT/OUTPUT

The following example shows an input/output of TEST-IAOLAN command where the test(s) pass:

```
TEST-IAOLAN:DDM-2000::12345;

IP 123456
<

   DDM-2000 98-10-26 16:42:11
M  CTAG COMPLD
 "IAO LAN test PASSED"
;
```

The following example shows an input/output of TEST-IAOLAN command where the test(s) fail:

```
TEST-IAOLAN:DDM-2000::12345;

IP 123456
<

   DDM-2000 98-10-26 16:42:11
M  CTAG COMPLD
 "IAO LAN test FAILED"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **TEST-IAOLAN** command, also.

RELATED TL1 COMMANDS

None.

NAME

TEST-SYSCTL: Test System Controller

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release **8.0** (for linear systems)
- OC-3 Release **9.0** and OC-12 Release **5.0** (for rings)
- FiberReach Release 1.0

INPUT FORMAT

TEST-SYSCTL:*tid*::*ctag*[:[:[:]]];

DESCRIPTION

The **TEST-SYSCTL** command can be initiated by a general user to cause the entire control system (system controller and, for OC-12 and OC-3, the overhead controller) to perform a self test. The command is not service affecting.

The **TEST-SYSCTL** command can be initiated by a maintenance user starting with OC-3 R9.1, OC-12 R5.1, and FiberReach R2.1 to cause the entire control system (system controller and, for OC-12, and OC-3, the overhead controller) to perform a self test. The command is not service affecting.

INPUT PARAMETERS

tid	Target identifier. This is the name of the NE to which the command is addressed.
ctag	Correlation tag. This is included in the command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages.

NOTE:
This command is available to maintenance users.

OUTPUT FORMAT

If the NE fully complies with the **TEST-SYSCTL** request, the following normal completion response is returned.

```
IP ctag
<


  sid date time
M ctag COMPLD
  "<result>"
 ["<result>"]
;
```

OUTPUT PARAMETERS

The output parameters included in the normal completion response are specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. Parameters that specifically apply to this command response are defined below.

tid Target Identifier. This is the system name.

result This is the result of the system test. Possible values are:

passed The system controller (and overhead controller where applicable) have passed the self-test.

sysctl-cp-failed
Controller circuit pack has failed the self test.

ohctl-cp-failed
Overhead system controller has failed the self-test (not applicable for FiberReach).

NOTE:
A response of *passed* is given when the self-test passes on both controllers. When one controller fails self-test and the other passes, only the failure message for the failed controller is given. When both controllers fail, both failure messages are given.

NOTE:
A response of *passed* is given when the self test passes on the system controller. A response of *sysctl-cp-failed* is given when the sytem controller passes the self-test.

EXAMPLE INPUT/OUTPUT

The following example shows an input/output of the **TEST-SYSCTL** command for a PF-2000 system where the test(s) pass:

```
TEST-SYSCTL:LT-PF-2000::12345;

IP 123456
<

   LT-PF-2000 93-10-26 16:42:11
M  CTAG COMPLD
 "passed"
;
```

ERROR RESPONSE

Refer to the **RTRV-HDR ERROR RESPONSE** section. The error responses listed there apply to the **TEST-SYSCTL** command, also.

If a **test-trmsn-t1** test or a **test-trmsn-t3** test (TL1 TEST-TRMSN-rr) is currently in progress, the following error response shall be returned:

```
  sid date time
M ctag DENY
  SSRB
  /* Status, System Resources Busy */
;
```

RELATED TL1 COMMANDS

None.

NAME

TEST-TRMSN-*rr*: Test Transmission

Support for this command is available for DDM-2000 Multiplexers, starting with:

- OC-3 Release 6.2 and OC-12 Release 2.2 (for linear systems)
- OC-3 Release 7.1 and OC-12 Release 3.1 (for rings).
- FiberReach Release 1.0

INPUT FORMAT

TEST-TRMSN-*rr:tid:aid:ctag[::[spec_block]];*

DESCRIPTION

This command sets up an automated transmission test (for one minute) at the DS1 or DS3 signal level for a channel addressed by a single low speed DS1, T1 or DS3 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 have been 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.

NOTE:
When the addressed port is on a BBG19 DS3 circuit pack, the cross-connection between the port and the OC-N ring is a 0X1 DS3 connection. This means that for a test in the TERMINAL direction (towards fiber), the test signal is transmitted only on the outgoing fiber connected to one of the main OLIUs. Only the signal received via the same OLIU is monitored for errors. It is the user's responsibility to ensure that the far-end loopback causes the signal to return on the proper fiber interface.

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.

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.

When the NE receives an **TEST-TRMSN** command from the user, NE will perform and report the results of the transmission test at the DS1 or DS3 signal level for the channel specified by the low speed port address for a duration of 1 minute.

The test proceeds to completion if not interrupted by a NE reset or initialization.

NOTE:
This command is available to maintenance users.

INPUT PARAMETERS

modifier This is the message modifier for the **TEST-TRMSN-***rr* command. The *modifier* is a required field and must only have one of the following values:

T1 This is for the DS1 level transmission test

T3 This is for the DS3 level transmission test

tid Target identifier. This is the name of the network element to which the command is addressed. The *tid* is a required parameter.

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. The *ctag* is a required parameter.

aid Access identifier. *aid* determines the low-speed port at which the test is be conducted.
For the valid *aids* for DDM-2000 systems, see the appropriate versions of the DDM-2000 User Service Manual.

spec_block Specific block. This parameter block is optional. Parameters set within the *spec_block* are positionally independent and are set using a name defined construct of: PARAMETER=*value*. The *spec_block* 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.

NOTE:
For this command in the *specific_block*, only one parameter is allowed.

For each of the parameters below there is listed one or more parameter values. The use of the word "null" in the descriptions below imply that the parameter does not appear or appears with no value (e.g. DIRN=) in the command.

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.

This option is not applicable to the TMUX (BBG20) circuit pack for DDM-2000 OC-3 if the modifier is T3.

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 **TEST-TRMSN-***rr* command that can be carried out, 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 indicated in the normal completion as specified in the **OUTPUT PARAMETERS** section for **RTRV-HDR**. The reminder of the parameters are described below.

dur This is the elapsed time in seconds of the test.

es This is the total number of errored seconds during the time interval indicated by the elapsed time value.

error This parameter is set equal to **oof** if at least one Out-Of-Frame condition was detected during testing.

EXAMPLE INPUT/OUTPUT

The following DDM-2000 OC-3 and DDM-2000 FiberReach example requests a transmission test at the DS1 level toward the TERMINAL:

```
test-trmsn-t1:LT-PF-2000:a-2-1:123456::dirn=TERMINAL;


IP 123456
<


  LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
  "dur=60,es=0"
;
```

For DDM-2000 OC-12 R2.2, 3.1, the following example requests a DS3 level test in the FACILITY direction for the fixed 1 minute duration. Note the *out of frame* condition reported for the reporting interval:

```
test-trmsn-t3:LT-PF-2000:b-3:123456::dirn=FACILITY;


IP 123456
<


  LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
  "dur=60,es=30,error=oof"
;
```

For DDM-2000 OC-12 R2.2, 3.1, the following example requests a DS3 level test in the default TERMINAL direction for the fixed 1 minute duration. But the test is aborted after 35 seconds due to hardware failure:

```
test-trmsn-t3:LT-PF-2000:d-2:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "dur=35,es=0"
   /* Hardware Failure - Test Aborted */
;
```

The NE will abort the test and terminate the TL1 command within 1 second of the hardware failure.

For DDM-2000 OC-12 R2.2, 3.1, the following example requests a DS3 level test in the default TERMINAL direction for the fixed 1 minute duration. But the NE did not detect a loopback at the far-end:

```
test-trmsn-t3:LT-PF-2000:d-2:123456;


IP 123456
<


   LT-PF-2000 93-10-26 16:42:11
M  123456 COMPLD
   "dur=60,es=60,error=oof"
/* Preliminary hardware test indicates no loopback. */
;
```

ERROR RESPONSES

Refer to the **RTRV-HDR ERROR RESPONSES** section. The requirements listed there apply to the **TEST-TRMSN** command also.

For DDM-2000 OC-3 R6.2, 7.1, if the NE system receives a `TEST-TRMSN-`*`rr`* command with a command code modifier other than `T3`, or `T1`, the following error response is returned:

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

For FiberReach R1.0, if the system receives a TEST-TRMSN-*rr* command with a command code modifier other than T1, the following error response is returned:

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

For DDM-2000 OC-12 R2.2, 3.1, if a DDM-2000 OC-12 system receives a TEST-TRMSN-*rr* command with a command code modifier other than T3, the following error response is returned:

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

If the NE receives a TEST-TRMSN-*rr* command without an *aid* value, with an *aid* that is not supported for any modifier or with an *aid* value that is invalid for the *modifier* provided (i.e., because the *aid* refers to a different type of entity than is specified by the *modifier*), 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 modifier */
;
```

If the Network Element receives a TEST-TRMSN-*rr* command with *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 NE receives a TEST-TRMSN-*rr* but the addressed *aid* is not properly equipped for this command, the following error response is returned:

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

If the NE receives an otherwise valid 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 */
;
```

For DDM-2000 OC-3 R13.0, if the modifier is T3, the addressed port is a TMUX (BBG20) circuit pack, and the **TERMINAL** option has been selected for the **DIRN** parameter, the following error response is returned:

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

RELATED COMMANDS

OPR-LPBK-*rr*

NAME

UPD-SYS: Update the Network Element

Support for this command is available for DDm-2000 multiplexers, starting with:

- OC-3 Release 8.0 and OC-12 Release 4.0 (for linear systems)
- OC-3 Release 9.0 and OC-12 Release 5.0 (for rings)
- FiberReach Release 1.0.

INPUT FORMAT

UPD-SYS*:tid::ctag;*

DESCRIPTION

CAUTION:
Execution of this command may affect service on a protected line or slot if the associated circuit packs are missing.

NOTE:
UPD-SYS may be performed at any time except before or during the first 10 seconds after powering the SYSCTL, while the CR LED is flashing.

NOTE:
If VT1.5 AIS is generated locally, for example, due to a fiber cut, an in-service VT1.5 channel will not transition to **AUTO** when the **UPD-SYS** command is executed.

This command updates the system database (as recorded in the non-volatile memory) to reflect the existing configuration and incoming signals.

This command can also be executed either by pushing the Update/initialize button, located on the SYSCTL Circuit Pack, or by entering the command from the CIT. When the Update/Initialize button is pushed, a dot (.) will appear on the 7-segment display.

This command should be executed after the following:

- Removing a circuit pack - Executing this command following a circuit pack removal deletes the circuit pack from the equipment list and clears the associated alarm. This command also changes the slot state to *auto* unless restricted by the following conditions:

— Port Status - If a circuit pack is removed before the incoming signal is removed or while the associated port or ports are in the *nmon* state, the system will not recognize that service is no longer being carried on the port and will not remove the circuit pack from the equipment list. If the port is in the *nmon* state, it must be moved to the *auto* state, using the **ENT**-*rr* command before the circuit pack can be removed and the system can be updated. An incoming signal must first be removed, then the circuit pack can be removed, and the system can be updated.

Note that this restriction does not apply to OLIU circuit packs in systems that support OC-N line states.

— Manual Cross-Connect entry - A manual cross-connection is entered into the system when an arrangement other than the default is desired. The system will not recognize a circuit pack removal until the manual cross-connection is deleted.

— Synchronization Timing Source - When the synchronization timing source is from function unit C and this circuit pack is removed, the slot state will not change to *auto*.

Failure to update after removing a circuit pack will cause an "unexpected CP type" alarm when a new and different type of circuit pack is placed in the slot. Performing the update function, will clear this alarm and provide default provisioning for the new circuit pack, provided the circuit pack is located in slot 1 of a pair. Upgrades will not work for slot 2 when slot 1 is equipped.

- Removing input signal - When an incoming DS1, T1, DS3 or EC-1 signal is removed, the system database must be updated to reflect the change and clear the associated alarm.
- Changing a switch on a circuit pack - This command should be activated following switch setting changes on the 21G OLIU, BBF2/BBF2B TGS, or BBF1/BBF3 DS1 or BBF6 T1 circuit packs. This command enters the new settings into the system. Failure to update will cause an "unexpected CP switches" or "unexpected CP type" alarm, since the new switch settings do not agree with the switch settings already recorded in the system. Activating the update function will clear this alarm and make the new switch settings effective.

Upgrades (for example, changing circuit pack type or switch settings) will not work in slot 2 when slot 1 is equipped.

INPUT PARAMETERS

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

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

OUTPUT FORMAT

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

The NE will return a COMPLD whenever it is completed even if the update resulted in no change to the database of the Network Element.

OUTPUT PARAMETERS

Refer to the **RTRV-HDR OUTPUT PARAMETERS** section. The requirements listed there apply to the **UPD-SYS** command also.

EXAMPLE INPUT/OUTPUT

The following example illustrates updating a DDM-2000 system when the entire system updates without any errors:

```
upd-sys:LT-PF-2000::123456;


IP 123456
<


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

The following example illustrates updating a DDM-2000 system when due to various conditions existing in the addressed system, some of the slots could not be updated:

```
upd-sys:LT-PF-2000::123456;


IP 123456
<


  LT-PF-2000 93-10-26 16:42:11
M  123456 PRTL
  "fn-a:SROF"
  /*Status, Requested Operation Failed, Provisioning upgrades not allowed
    from slot 2 when slot 1 is equipped */
  "tg-1:SROF"
  /*Status, Requested Operation Failed, Not equipped properly */
;
```

ERROR RESPONSES

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

If the NE receives a **UPD-SYS** command after the HW switches on the CP in slot 2 in a slot pair is updated while the the other slot 1 remains equipped, then the following error response is returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /*Status, Requested Operation Failed, Provisioning upgrades not allowed
     from slot 2 when slot 1 is equipped */
;
```

If the NE receives a **UPD-SYS** command and one or more slots are not properly equipped, the following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed,  Not equipped properly */
;
```

If a low-speed circuit pack is removed before the incoming signal is removed or while the associated port or ports are in the nmon state, the system will not recognize that service is no longer being carried on the port and will not remove the circuit pack from the equipment list. If a cross connection already exists, the operation will fail. The following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed, CRS exists or Port state NMON/IS */
;
```

For DDM-2000 OC-3 R11.0, OC-12 R5.0, 7.0, if the shelf is currently provisioned to be LineTimed from function unit C and the TGS pack type or switch settings do not support the existing condition, the following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed, New Timing Not Supported on FN-C */
;
```

For DDM-2000 OC-3 R11.0, OC-12 R5.0, 7.0, if the sync timing source is currently provisioned to be LineTimed and the addressed circuit pack is not selected for line timing, the slot state will not change to auto and, the following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed, CP required for selected timing */
;
```

For DDM-2000 OC-3 R11.0, OC-12 R5.0, 7.0, if sync timing source is currently provisioned for autoreconfiguration and the addressed circuit pack is one of the sources for timing, the slot state will not change to auto and, the following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed, CP required for selected timing */
;
```

For DDM-2000 OC-3 R11.0, OC-12 R5.0, 7.0, if Sync autoreconfiguration has been enabled, and the user attempts to re-provision timing from line timed to external timed, the following error response will be returned inside a partial completion message:

```
   sid date time
M  ctag PRTL
   "<address>:SROF"
   /* Status, Requested Operation Failed, Disable Autoreconfig First */
;
```

RELATED COMMANDS

INIT-SYS

Access Identifier Parameter Values

Tables 3-1, 3-2, and 3-3 list valid access identifier (AID) parameter values and examples for OC-3 and OC-12. These tables contain the same information as the *DDM-2000 OC-3 User/Service Manual*, *DDM-2000 OC-12 User/Service Manual*, and *DDM-2000 FiberReach User/Service Manual* Commands and Reports section, 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 3-1. OC-3 Address

Object	Entity	Address	Example
Slots	Entire system	all	all
	Main slot	main-{1,2,all}	main-all
	Function unit slot	fn-all fn-{a,b,c}-{1,2,all}	fn-all fn-b-all fn-c-1
	Function unit pair	fn-{a,b,c}	fn-a
	Low speed slot	ls-all ls-{a,b,c}-{1-8,all}	ls-all ls-b-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,b,c,all}	all main
	OC-3 Line	all {main,fn-a,fn-b,fn-c}-{1,2,all} fn-all	all main-1 fn-c-2 fn-all
	OC-1 line pair (27-type OLIU)	all main-all main-(1,2,all) fn-all fn-{a,b,c}-{1,2,all}	all main-all main-2 fn-all fn-a-all
	OC-1 line (27-type OLIU)	all main-all main-{1,2}-{1,2} fn-all fn-{a,b,c}-all fn-{a,b,c}-{a,2}-{a,2}	all main-all main-2-2 fn-all fn-b-all fn-a-2-2 fn-b-1-2
	OC-12 line	all main-{1,2,all}	all main-2
	EC-1	a,b,c,all	c
	EC-1 line	a,b,c,all	c

Table 3-1. OC-3 Address (Contd)

Object	Entity	Address	Example
Ports	DS3 (BBG4 or BBG4B only), EC-1 Port	a,b,c,all	a
	Front-Access DS3 (BBG19) Port	{a,b,c,all*}-{1-2,all}	a-1
	DS1 Port	{a,b,c,all*}-{1-7,all*}-{1-4,all}	all a-all b-2-all c-7-4
	DS1 Sync. Ref. Port	ref-{1,2}	ref-1
Channels	STS-1 Channel (within OC-3)	{m,c,all*}-{1-3,all}, {a,b}-{1,2,all} m{1,2}-{1-3,all} (Rings only)	m-3 a-2 m2-3
	STS-1 Channel (within OC-12 using 24G-U OLIU) in main unit	m{1,2}-{1-12,all} (Rings)	m2-7
	STS-1 Channel (within OC-1 using 27-type OLIU)	all {m,a,b,c}{1,2,all}	all m2-2
	STS-1 Channel for MXVRO,DS3,STS1E	a,b,c,all	a
	STS-3c Channel (within OC-12 using 24G-U OLIU) in main unit	m{1,2}-{1-4-7-10,all} (Rings)	m1-1
	VT1.5 Channel (within OC-3)	{m,c,all*}-{1-3,all*}-{1-7,all*}-{1-4,all} {a,b,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 b-2-7-4 m1-3-2-3
	VT1.5 Channel (within OC-12 using 24G-U OLIU) in main unit	m{1,2}-{1-12,all*}-{1-7,all*}-{1-4,all}(Rings)	m1-4-2-3
	VT1.5 Channel for DS1 or STS1E	{a,b,c,all*}-{1-7,all*}-{1-4,all}	a-1-2 b-7-4
	VT1.5 Channel (within OC-1 using 27-type OLIU)	all {m,a,b,c}{1,2}-all {m,a,b,c}{1,2}-{1,2}-all {m,a,b,c}{1,2}-{1,2}-{1-7}-{1-4,all}	all b1-all c2-2-all c2-1-7-4

* If all is chosen as any part of an address, no subsequent address fields should be defined.

Table 3-1. OC-3 Address (Contd)

Object	Entity	Address	Example
STS-1 Cross-connections	Main port	m-{1-3,all} m-{1-2,all}(For 27-type OLIU) m-{1-12,all}(For 24G-U OLIU in Rings)	m-3 m-2 m-3
	STS-3c Channel (within 24G-U OLIU) in Main unit	m-{1-4-7-10,all}(Rings)	m-1
	Function Unit (OC-3 OLIU)	{a,b}-{1,2,all} c-{1-3,all}	a-2 c-3
	Function Unit (27-type OLIU)	{a,b,c}-{1,2}	c-2
	Function Unit (MXRVO,STS1E,DS3)	{a,b,c}	b
VT1.5 Cross-connections	Main port	m-{1-3,all*}-{1-7,all*}-{1-4,all} m-{1-2,all*}-{1-7,all*}-{1-4,all}(For 27-type OLIU) m-{1-12,all*}-{1-7,all*}-{1-4,all}(For 24G-U OLIU)	m-3-4-4 m-2-4-4 m-1-2-1
	DS1 Low Speed Port	{a,b,c}-{1-7,all*}-{1-4,all}	b-2-4
	Function Unit (OC-3 OLIU)	{a,b}-{1,2,all*}-{1-7,all*}-{1-4,all} {c}-{1-3,all*}-{1-7,all*}-{1-4,all}	b-1-1-4 c-3-7-1
	Function Unit (27-type OLIU)	{a,b,c}-{1,2}-all {a,b,c}-{1,2}-{1-7}-{1-4,all}	b-1-all b-1-6-4
Operation Interfaces	User Panel	userpanel	userpanel
	CIT	cit-{1,2,all}	cit-1
	Section Data Comm. Channel	dcc-{m,a,b,c,all}(OC-3 linear fecom) dcc-all(OC-3 linear/rings security only) dcc-{m1,m2,b,c,all} (OC-3 Rings only fecom) dcc-all(OC-1 Rings security only) dcc-{m,a,b,c,all*}{1,2}-{1,2}(OC-1 interfaces fecom using 27-type OLIU)	dcc-m dcc-all dcc-m1 dcc-all dcc-a2-1
	TBOS	tbos-1	tbos-1
	Parallel Telemetry	partlm	partlm
	X.25 Link	x25	x25
	IAO LAN Interface	lan	lan
	Environmental Alarm Input	env-{1-21,all}†	env-1
	Environmental Control Input	cont-{1-4,all}	cont-1
Other	Faceplate Connector	fca-main used on 24G-U OLIUs	fca-main

∗ If all is chosen as any part of an address, no subsequent address fields should be defined.

† For OC-3 Release 7.1 and OC-12 Release 3.1 and earlier, the address range is env-{1-15,all}.

Table 3-2. OC-12 and OC12 Regenerator Address

Object	Entity	Address	Example
Slots	Entire system	all	all
	Main slot	main-{a,b,all*}-{1,2,all}	main-all
	TSI unit slot	tsi-{1,2,all}	tsi-1
	Function unit slot	fn-{a,b,c,d,all*}-{1,2,all}	fn-all fn-b-all fn-d-1
	Timing slot	tg-{1,2,all}	tg-all
	Sys. control slot	sysctl	sysctl
	Aux. control slot	auxctl	auxctl
Lines	OC-12 line pair	all main-{b,all}	all main-b
	OC-12 line	all main-b-{1,2,all}	all main-b-1
	OC-3 line pair	all fn-{a,b,c,d}	all fn-b
	OC-3 line	all fn-{a,b,c,d,all*}-{1,2,all}	all fn-c-2
Ports	DS3 Port	{a,b,c,d}-{1-3,all*}	a-2
	DS1 Sync. Ref. Port	ref-{1,2,all}	ref-1
	EC-1 Port	{a,b,c,d,all*}-{1-3}	b-3
Channels	STS-1 Channel (within OC-12) mb{1,2}-{1,12} STS-3c channel (within OC-12)	{m-b,all*}-{1-12,all} (Release 2.0 and earlier) {mb,all*}-{1-12,all} (Release 2.1 and later) mb1-4 mb-{1,4,7,10},all mb{1,2}-{1,4,7,10,all}	m-b-4 mb-4 mb-4 mb1-1
	STS-1 Channel (within OC-3)	{a,b,c,d}-{1-3,all}	c-1 b-3
STS-1 Cross-Connections	Main port	mb-{1-12}	mb-4
	Function unit slot	{a,b,c,d}-{1-3}	b-1
	3STS1E channel	{a,b,c,d}-{1-3}	a-2
	3DS3 channel	{a,b,c,d}-{1-3}	c-3
	Function unit (OLIU)	{a,b,c,d}-{1-3}	d-2

* If all is chosen as any part of an address, no subsequent address fields should be defined.

Table 3-2. OC-12 and OC12 Regenerator Address (Contd)

Object	Entity	Address	Example
Operation Interfaces	User Panel	userpanel	userpanel
	CIT	cit-{1,2,all}	cit-1
	Section Data Comm. Channel	dcc-{m-b,a,b,c,d,all} (Release 2.0 and earlier) dcc-{mb,a,b,c,d,all} (Release 2.1 and later, linear -fecom/security) dcc-{mb,a,b,c,d,all*}{1,2} (Rings –fecom only) dcc-all (Rings security Release 5.0 and later)	dcc-b dcc-mb dcc-mb2 dcc-all
	TBOS	tbos-1	tbos-1
	Parallel Telemetry	partlm	partlm
	X.25 Link	x25	x25
	IAO LAN interface	lan	lan
	Environmental Alarm Input	env-{1-21,all}†	env-1
	Environmental Control Input	cont-{1-4,all}	cont-1
Regenerator Slots††	Entire system	all	all
	Main slot	main-{a,b,all*}-{1,2,all}	main-all
	TSI unit slot	tsi-{1,2,all}	tsi-1
	Function unit slot	fn-{a,b,c,d,all*}-{1,2,all}	fn-all fn-b-all fn-d-1
	Timing slot	tg-{1,2,all}	tg-all
	Sys. control slot	sysctl	sysctl
	Aux. control slot	auxctl	auxctl
Regenerator Lines	OC-12 line	main-{a,b,all*}-{1,2,all}	main-b-1
Regenerator Operation Interfaces	User Panel	userpanel	userpanel
	CIT	cit-{1,2,all}	cit-1
	TBOS	tbos-1	tbos-1
	Parallel Telemetry	partlm	partlm

∗ If all is chosen as any part of an address, no subsequent address fields should be defined.

† For OC-3 Release 7.1 and OC-12 Release 3.1 and earlier, the address range is env-{1-15,all}.

†† The SYSCTL, OHCTL, and Main slots are normally the only equipped slots in the OC-12 Regenerator. Addresses for other slots may be entered, but the Regenerator will respond with a message that the shelf is not equipped properly.

Table 3-3. FiberReach Multiplexer Address

Object	Entity	Address	Example
Slots	Entire system	all	all
	Main slot	main-{1,2,all}	main-all
	Low speed slot	ls-all ls-{a,b,c,d}-{1-2,all}	ls-all ls-b-2
	Sys. control slot	sysctl	sysctl
	Aux. control slot	auxctl	auxctl
	Function unit slot	fn-{1,2,all}	fn-1
	Low Speed Protection Assembly	lsprot	lsprot
Lines	OC-1 line	all main-{1,2,all}	all main-1
Ports	DS1 Port	all {a,b,c,d,all} {a,b,c,d}-{1}-{1-4,all} {a,b,c}-{2*}-{1-2,all}	all b-all c-1-all c-2-all
	T1 Port	all {a,b,c,d}-all {a,b,c,d}-{1}-{1-2,all} {a,b,c}-{2*}-{1-2,all}	all b-all c-1-all b-2-2
Channels	STS-1 Channel (within OC-1)	m{1-2}-1	m2-1
	VT1.5 Channel (within OC-1)	all m{1,2}-1-all m{1,2}-1-{1-7}-{1-4,all}	all m2-1-all m2-1-7-3 m1-1-3-all
VT1.5 Channels for Cross-Connections	VT1.5 Channels (within OC-1)	all m-1-all m-1-{1-7}-{1-4,all}	all m-1-all m-1-4-all m-1-4-3
	VT1.5 Channel for DS1	all {a,b,c,d}-{1}-{1-4,all} {a,b,c}-{2*}-{1-4,all}	all a-1-all a-2-all b-1-4
	VT1.5 Channel for T1 {a,b,c,d}-{1-2,all}	all a-1-all {a,b,c}-{2*}-{1-2,all}	all b-1-2 a-2-all
Operation Interfaces	User Panel	userpanel	userpanel
	CIT	cit-1	cit-1
	Section Data Comm. Channel	dcc-{m1,m2,all} dcc-all (security only)	dcc-m1 dcc-all
	TBOS	tbos-1	tbos-1
	Parallel Telemetry	partlm	partlm
	Environmental Alarm Input	env-{1-15,all}	env-1
	Environmental Control Input	cont-{1-4,all}	cont-1

Alarm and Status Condition Description

Table 3-4 contains a list of condition and alarm descriptions (*conddescr* or *almmsg*) and their likely causes. It contains the same information as the *FiberReach User/Service Manual*, *DDM-2000 OC-3 User/Service Manual*, and *DDM-2000 OC-12 User/Service Manual* Retrieve Alarm Table descriptions, although not all conditions listed in the table are reported via TL1.

Table 3-4. Alarm and Status Condition Descriptions

Description	Meaning
2nd CP required for BBF3	The BBF3 (DS1PM) circuit pack requires both function unit slots in the group to be equipped. A second circuit pack of the same type should be inserted in the empty function unit slot.
2nd CP reqd for ls eqpt	The BBF6 (T1EXT) circuit pack requires both function unit slots in the group to be equipped. A second circuit pack of the same type should be inserted in the empty function unit slot.
–48V power/fuse failed	A –48 volt power feeder or a fuse on the user panel has failed.
–48V power/fuse FA|FB failed	A –48 volt power feeder or a fuse on the user panel has failed. (FA or FB identifies failure if BBG8 controller used.)
3DS3 CP failed	Internal equipment failure of the specified 3DS3 CP.
3STS1E CP failed	Internal equipment failure of the specified 3STS1E CP.
23R CP failed	Internal equipment failure of the 23R regenerator circuit pack.
AC power failed	The AC power supply to a remote terminal cabinet has failed.
ACO active	The parallel telemetry outputs and audible office alarms are normally active because the alarm conditions in the system are being suppressed. See the **opr-aco** command.
AGNE communication failure	A network element cannot establish communication with the alarm gateway network element (AGNE), or the AGNE cannot establish communication with a network element in the same alarm group. Use the **rtrv-map-network** command to determine if both network elements are in the same alarm group.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
APS – automatic lock	The service associated with a DS1 or T1EXT CP has been automatically switched and locked onto the protection DS1 or T1EXT CP. The automatic protection switching (APS) lock will remain active until midnight. **Cause:** Four automatic switches of a single DS1 or T1EXT CP in 10 minutes, probably because of an intermittent failure of the DS1 or T1EXT CP.
APS channel failed	The SONET automatic protection switching (APS) channel on the protection OC-3 or OC-12 line has failed. **Likely Causes:** Failure of the OLIU CP on the protection line at the far end; failure of the OLIU CP on the protection line at the near end.
BBF5 required in LS-4	A BBF5 circuit pack is missing from a group 3 (or earlier) shelf with two 27G2-U OLIU circuit packs in a function unit. The BBF5 is required to cross-couple transmission between the 27G2-U OLIUs. The alarm will clear when a BBF5 circuit pack is installed in slot 4 of the low-speed unit.
BBF5 required in LS-8	A BBF5 circuit pack is missing from a group 3 (or earlier) shelf with two 27-type OLIU circuit packs in a function unit. The BBF5 is required to allow proper DCC operation of the associated 27-type OLIUs with the FiberReach shelves. The alarm will clear when a BBF5 circuit pack is installed in slot 8 of the low-speed unit.
communication failure	The system is not communicating with another shelf in the subnetwork. The **rtrv-nmap-network** command will report the name of the system(s) with which this system is not communicating. **Likely Causes:** Unprotected OC-3 line failure in the subnetwork; controller failure, reset, or initialization on another shelf; section DCC channel failure on this or another shelf; failure of the OHCTL CP; failure of the OLIU or SYSCTL CP.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`control`**n**	The specified environmental control point (miscellaneous discrete output) is active. **Note**: The actual message that appears in the Alarm and Status Report for this condition can be provisioned. This is the default message. See the **`rtrv-attr-cont`** and **`set-attr-cont`** commands. **Cause:** 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 not allowed-(crs)`	The circuit pack does not support the manual cross-connection(s) currently provisioned for this slot. The user should change the circuit pack type or change the cross-connection(s) to the slot.
`CP not allowed-(eqpt)`	A DS1, DS1PM, or T1EXT CP is installed in a low-speed slot associated with a function unit currently provisioned for DS3, STS1E_L, or OLIU service. The DS1, DS1PM, or T1EXT CP should be removed from the shelf, or the function unit CP should be replaced with an MXRVO or STS1E_H CP. A second reason for getting this message is that a a DS1, DS1PM, or T1EXT CP is installed in a low-speed slot and has caused a protection mismatch between a service slot and a protection slot.
`CP not allowed-(timing)`	When associated with a TG slot, the current circuit pack switch settings do not support the synchronization timing provisioned. The user should change the circuit pack switches or change the settable synchronization parameters. When associated with function unit slot C, the circuit pack type does not support the current provisioned synchronization parameters. The circuit pack type or the timing options should be changed.
`CP removed`	A CP previously installed in this system is removed. The CP should be replaced, or an "update" should be done to remove if from the system equipment list.
`DS1 CP failed`	Internal equipment failure of the specified DS1 CP.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
DS1 loopback	A loopback (toward the optical fiber) is active on the specified T1 port. See the **opr-lpbk-t1** and **rls-lpbk-t1** commands.
DS1 loopback (to fiber)	A loopback (toward the optical fiber) is active on the specified T1 port. See the **opr-lpbk-t1** and **rls-lpbk-t1** commands.
DS1 loopback (to DSX)	A loopback (toward the DSX or T1 interface) is active on the specified T1 port. See the **opr-lpbk-t1** and **rls-lpbk-t1** commands.
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 **test-trmsn-t1** command.
DS1PM CP failed	Internal equipment failure of the specified DS1PM CP.
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 **opr-lpbk-t3** and **rls-lpbk-t3** commands.
DS3 loopback (to Fiber)	A loopback (toward the optical fiber) is active on the specified T3 port. See the **opr-lpbk-t3** and **rls-lpbk-t3** commands.
DS3 loopback (to DSX)	A loopback (toward the DSX) is active on the specified T3 port. See the **opr-lpbk-t3** and **rls-lpbk-t3** commands.
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 **test-trmsn-t3** command.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
DSNE not reachable	This alarm condition can be caused by the following cases: ■ When a non-DSNE starts up and it does not identify or get registered by a DSNE within a time interval, it will raise this alarm condition. ■ Any node (NE) registered with the DSNE will raise this alarm condition if it can no longer reach the DSNE because of a change in provisioning by the **set-ne** command to "DSNE = no". See the **set-ne** and **rtrv-ne** commands for DSNE provisioning information. ■ Any network element registered with the DSNE will raise this alarm condition if it can no longer reach the DSNE because of a DCC failure between local network element and the DSNE. Other likely causes: OC-N line failure in the subnetwork; a controller failure, reset, or initialization of the DSNE.
dormant/exec code mismatch	This alarm condition is raised when the network element detects that it contains dormant software with a release number that does not match the release number of the executing software.
duplicate DSNE	A network element has been provisioned as a directory services network element (DSNE) in a subnetwork that already has a DSNE. Only one NE in the subnetwork may be provisioned as the DSNE to ensure proper DCC communication between nodes. See the **set-ne** and **rtrv-ne** commands for DSNE provisioning information.
duplicate site/ne address	Two or more shelves in the network have the same site address and the same network element address.
duplicate TBOS display	Two or more shelves in the network have the same TBOS display number.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`duplicate TID`	Two or more shelves in the network have the same system name or "TID" set by the **`set-ne`** command.
`EC1 loopback`	A loopback (toward the optical fiber) is active on the specified EC1 port. See the **`opr-lpbk-ec1`** and **`rls-lpbk-ec1`** commands for more information.
`EC1 loopback (to Fiber)`	A loopback (toward the optical fiber) is active on the specified EC1 port. See the **`opr-lpbk-ec1`** and **`rls-lpbk-ec1`** commands for more information.
`EC1 loopback (to DSX)`	A loopback (toward the DSX) is active on the specified EC1 port. See the **`opr-lpbk-ec1`** and **`rls-lpbk-ec1`** commands for more information.
`environment`**n**	The specified environmental alarm point (miscellaneous discrete input) is active. **Note**: The actual message that appears in the Alarm and Status Report for this condition can be provisioned. This is the default message. See the **`rtrv-attr-env`** and **`set-attr-env`** commands.
`excessive holdover`	The system has been in holdover mode for more than 4 hours. This may cause degraded performance (high error rates) on the transmitted and/or received signals. Whenever this condition exists, the condition "`holdover mode active`" also exists. **Likely Causes:** See "`holdover mode active`".
`externalMinor`	The external minor alarm input (environmental alarm input 15) is active. Typically, this input will be connected to the power shelf, and will indicate that the DC power or the cooling fan in a remote terminal cabinet has failed. **Note**: The actual message that appears in the Alarm and Status Report for this condition can be provisioned. This is the default message. See the **`rtrv-attr-env`** and **`set-attr-env`** commands.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`fan control relay failed`	The thermostat on the SYSCTL indicates that the cooling fan should be turned on, and the fan control relay on the SYSCTL CP failed to operate. The system will continue to operate; but it might overheat, leading to degraded or interrupted transmission and/or circuit pack failures. **Likely Causes:** Telemetry output common is not grounded; SYSCTL CP failure.
`fan shelf failed`	The system has detected a failure of the DDM-2000 Multiplexer fan shelf. The system will continue to operate but it may overheat. The fan must be replaced within 4 hours of the failure, otherwise service might be interrupted and/or circuit packs might fail. **Likely Causes:** Filter needs replacing; a fan pack failed; fan shelf has lost one or both power feeders; the fan shelf control board has failed.
`forced switch`	When associated with an OC-3 or OC-12 line, this message means that 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**: Switching is unidirectional (one-way). 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 **`switch-line`** command. When associated with a function unit, TSI slot, or a low-speed service slot, this message means that 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 **`switch-fn`** and **`switch-ls`** commands.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
holdover mode active	The system is in holdover synchronization mode. **Likely Causes:** a. The system was manually switched to holdover mode (with the **switch-sync** command, or, in a central office system, with a TBOS control point) and the switch has not been reset. b. The system automatically switched to holdover mode because of failure of the timing references as follows: 1. The reference failures have not cleared. 2. The system is provisioned for nonrevertive synchronization mode switching. 3. The system is provisioned for external timing and no external timing references are available. 4. The system is provisioned for line-timed operation and the optical line or OLIU circuit pack has failed, or a message indicating an upstream clock problem has been received on the sync message bits of the optical line. (See the **rtrv-sync** command.) 5. The system is provisioned for sync message signaling, but the upstream system from which it line-times has not been provisioned for sync message signaling. The condition can be cleared by provisioning both systems the same. (See the **set-sync** and **rtrv-sync** commands.) The condition can be cleared by repairing at least one of the timing references (if both are failed) and resetting synchronization mode protection switch with the command: **switch-sync:s=mode,pri=reset** In a central office system, the synchronization mode can also be reset with a TBOS control point.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
illegal CP type	An illegal or unknown circuit pack type has been inserted into the shelf. The circuit pack should be removed from the shelf.
inc. (from DSX) 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:** Hard failure of upstream equipment or facility (towards the DSX-1); DS1 input is disconnected at the backplane or the DSX-1; equipment is failed or removed at DSX-1.
inc. (from DSX) DS1 sig fail	The bit error ratio (BER) in the DS1 signal incoming from the DSX-1 exceeds the provisioned failure threshold, 10^{-3}, 10^{-6}, 10^{-7}, or 10^{-8}. **Likely Causes:** Mismatch of line code (AMI/B8ZS); failure of upstream equipment or facility (towards the DSX-1); cross talk 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 Cause:** Failure of upstream equipment or facility (towards the DSX-1).
inc. DS1 sync. ref. BER	The bit error ratio (BER) in the DS1 synchronization reference signal exceeds 10^{-3}. **Likely Cause:** Failure of upstream equipment or facility (towards the DSX-1).
inc. DS1 sync. ref. EOOF	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:** Failure of the incoming DS1 synchronization reference signal.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. DS1 sync. ref. LOF	The system is unable to frame on the DS1 synchronization reference signal. **Likely Causes:** 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); 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:** Failure of the office timing supply that provides the DS1 timing reference; 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 frequency of the clock providing the DS1 reference signal is out of specification. **Likely Cause:** Failure of the office timing supply that provides the DS1 timing reference.
inc. (from fiber) DS3 AIS	The system has detected DS3 alarm indication signal (AIS) in the DEMUX direction (coming from the fiber) for the specified DS3 signal. **Likely Causes:** The incoming DS3 signal at the far end is failed; DS3 AIS is received from the DSX-3 at the far end.
inc. (from fiber) DS3 AIS	The system has detected DS3 alarm indication signal (AIS) in the DEMUX direction (coming from the fiber) for the specified DS3 signal. **Likely Causes:** The incoming DS3 signal at the far end is failed; DS3 AIS is received from the DSX-3 at the far end.
inc. (from DSX) DS3 AIS	The system has detected DS3 alarm indication signal (AIS) in the MUX direction (coming from the DSX-3) for the specified DS3 signal. Likely cause: Incoming DS3 signal at the far end is failed.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`inc. DS3 LOS`	At least 128 consecutive zeros were detected in the DS3 signal received from the DSX-3. **Likely Causes:** Equipment failed or removed at DSX-3; DS3 input disconnected at the DSX-3 or at the DDM-2000 backplane.
`inc. (from fiber) DS3 OOF`	The system has detected a DS3 out-of-frame (OOF) condition in the DEMUX direction (coming from the fiber) for the specified DS3 signal. This condition is reported only if the DS3 interface is provisioned in VM or VMR mode. See the **`set-t3`** and **`rtrv-t3`** commands. **Likely Causes:** 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; DS3 signal is looped at both ends.
`inc. (from fiber) DS3 OOF`	The system has detected a DS3 out-of-frame (OOF) condition in the DEMUX direction (coming from the fiber) for the specified DS3 signal. This condition is reported only if the DS3 interface is provisioned in VM or VMR mode. See the **`set-t3`** and **`rtrv-t3`** commands. **Likely Causes:** 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; DS3 signal is looped at both ends.
`inc. (from DSX) DS3 OOF`	The system has detected a DS3 out-of-frame (OOF) condition in the MUX direction (coming from the DSX-3) for the specified DS3 signal. Likely cause: An out-of-frame DS3 signal incoming to the DSX-3 at the far end.
`inc. (from DSX) DS3 sig fail`	The bit error ratio (BER) in the incoming DS3 signal exceeds the provisioned failure threshold, 10^{-3} or 10^{-6}. **Likely Causes:** Failure of the upstream equipment or facility (towards the DSX-3); cross talk in office wiring; unprotected failure of DS3 CP.
`inc. EC1 FERF`	The system has detected the EC-1 far-end-receive failure (FERF) signal on the incoming EC-1 signal. **Likely Causes:** Failure of the STS1E CP at the near end; failure of the STS1E CP at the far end; failure of the transmit cable on the specified line.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. EC1 LOF	The system has detected a loss-of-frame (LOF) condition in an incoming EC-1 signal. LOF is defined as an out-of-frame (OOF) condition (five consecutive errored STS-1 framing patterns) that lasts for at least 3 milliseconds. **Likely Causes:** Failure of the STS1E or equivalent CP at the far end; failure of the STS1E or equivalent CP at the near end; failure of the incoming cable; cable disconnect at the STSX-1 or shelf connector.
inc. EC1 LOS	The system has detected a loss-of-signal (LOS) condition on the EC-1 line. **Likely Causes:** Failure of the incoming signal or cable from the STSX-1; failure of the STS1E or 3STS1E CP at the near end; cable disconnect at the STSX-1 or shelf connector.
inc. EC1 line AIS	The system has detected EC-1 line alarm indication signal (AIS) on an incoming EC-1 line. **Likely Cause:** Failure of an STS1E or 3STS1E CP at the far end.
inc. EC1 sig degrade (BER)	The bit error ratio (BER) in the received EC-1 signal exceeds the provisioned threshold (10^{-5} to 10^{-9}). **Likely Causes:** Failure of the STS1E or 3STS1E CP at the near end; failure of the incoming cable; cross talk in office wiring; failure of the incoming signal from the STSX-1.
inc. EC1 sig failed (BER)	The bit error ratio (BER) in the received EC-1 signal exceeds the provisioned threshold of 10^{-3}. **Likely Causes:** Failure of the STS1E CP at the near end; failure of the incoming cable; cross talk in office wiring; failure of the incoming signal from the STSX-1.
inc. OC12 FERF	The system has detected the OC-12 far-end-receive failure (FERF) signal on the incoming OC-12 signal. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the transmit fiber on the specified line.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. OC12 LOF	The system has detected a loss-of-frame (LOF) condition in an incoming OC-12 signal. LOF is defined as an out-of-frame (OOF) condition (four consecutive errored STS-1 framing patterns) that lasts for at least 3 milliseconds. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.
inc. OC12 LOS	The system has detected a loss-of-signal (LOS) condition on the OC-12 line. **Likely Causes:** Failure of the OLIU CP at near end; failure of the OLIU CP at far end; failure of the receive fiber.
inc. OC12 line AIS	The system has detected OC-12 line alarm indication signal (AIS) on an incoming OC-12 line. **Likely Cause:** Failure of an OLIU CP at the far end.
inc. OC12 sig. degrade (BER)	The bit error ratio (BER) in the specified OC-12 line exceeds the provisioned soft error threshold (10^{-9} to 10^{-5}) but is below the hard error threshold of 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber; optical attenuator is being used when it should not be, or is not being used when it should be.
inc. OC12 sig. failed (BER)	The bit error ratio (BER) in the received OC-12 signal exceeds 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.
inc. OC3 BER	The bit error ratio (BER) in the received OC-3 signal exceeds 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.
inc. OC3 FERF	The system has detected the OC-3 far-end-receive failure (FERF) signal on the incoming OC-3 signal. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the transmit fiber on the specified line.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`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 (five consecutive errored STS-1 framing patterns) that lasts for at least 3 milliseconds. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; 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:** If this condition occurs on the STS-1 on both OC-3 lines, an unprotected failure of an MXRVO or a DS3 CP at the far end. If this condition occurs on only one OC-3 line, 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:** Failure of the OLIU CP at near end; failure of the OLIU CP at far end; failure of the receive fiber.
`inc. OC3 line AIS`	The system has detected OC-3 line alarm indication signal (AIS) on an incoming OC-3 line. **Likely Cause:** Failure of an OLIU CP at the far end.
`inc. OC3 sig. degrade (BER)`	The 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:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber; incorrect setting of the optical power switch on the OLIU CP.
`inc. OC3 sig. failed (BER)`	The bit error ratio (BER) in the received OC-3 signal exceeds 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. OC1 FERF	The system has detected the OC-1 far-end receive failure (FERF) signal in the incoming OC-1 signal. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the transmit fiber on the specified line.
inc. OC1 LOF	The system has detected a loss-of-frame (LOF) condition in an incoming OC-1 signal. LOF is defined as an out-of-frame (OOF) condition (five consecutive errored STS-1 framing patterns) that lasts for at least 3 milliseconds. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.
inc. OC1 LOS	The system has detected loss-of-signal (LOS) condition on the OC-1 line. **Likely Causes:** Failure of the OLIU CP at near end; failure of the OLIU CP at far end; failure of the receive fiber.
inc. OC1 line AIS	The system has detected OC-1 line alarm indication signal (AIS) on an incoming OC-1 line. Likely cause: Failure of an OLIU CP at the far end.
inc. OC1 sig. degrade (BER)	The bit error ratio (BER) in the specified OC-1 line exceeds the provisioned soft error threshold (10^{-9} to 10^{-5}) but below the hard error threshold of 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.
inc. OC1 sig. failed (BER)	The bit error ratio (BER) in the received OC-1 signal exceeds 10^{-3}. **Likely Causes:** Failure of the OLIU CP at the near end; failure of the OLIU CP at the far end; failure of the receive fiber.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`inc. STS1 AIS`	The system has detected an incoming STS-1 alarm indication signal (AIS) in the active OC-1, OC-3, or OC-12 line. The system responds by transmitting DS1 or DS3 AIS toward the DSX or T1 interface and transmitting STS-1 yellow toward the fiber from which the AIS is being received. **Likely Causes:** Incomplete or incorrect cross-connect provisioning in an end-to-end network. For OC-3, unprotected removal or failure of a DS3, MXRVO, STS1E, or OLIU CP at the far end; unprotected optical line failure. For OC-12, unprotected removal or failure of a 3DS3 or OLIU CP at the far end. For FiberReach, unprotected removal or failure of an OLIU CP at the far end; unprotected optical line failure.
`inc. STS1 LOP EC1`	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 Cause:** Failure of the far-end or near-end STS1E or 3STS1E circuit pack.
`inc. STS1 LOP OC1` *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:** If this condition occurs on the STS-1 on both OC-1 lines, unprotected failure of an MXRVO or an OLIU CP at the far end. If this condition occurs on only one OC-1 line, failure of the OLIU CP at the near end or far end.
`inc. STS1 LOP OC12 #`*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:** If this condition occurs on the STS-1 on both OC-12 lines, unprotected failure of a 3DS3 CP at the far end. If this condition occurs on only one OC-12 line, failure of the OLIU CP at the near end or far end.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`inc. STS1 LOP OC3 #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:** If this condition occurs on the STS-1 on both OC-3 lines, unprotected failure of an MXRVO or a DS3 CP at the far end. If this condition occurs on only one OC-3 line, failure of the OLIU CP at the near end or far end.
`inc. STS1 sig. degrade (BER)`	For STS-1 path switched ring applications, the bit error ratio (BER) of the specified STS-1 signal exceeds the user-provisioned signal degrade threshold. **Likely Causes:** Failure at a fiber; failure of an OLIU circuit pack at some point in the STS-1 path.
`inc. STS1 sig. failed (BER)`	In ring applications, the bit error ratio (BER) of the specified STS-1 signal exceeds the signal fail threshold (10^{-6}). For VT1.5 path-switched rings, the system responds by inserting VT Path AIS in each pass-through VT contained in the STS-1. Locally, the system will select the VTs from the STS-1 on the other ring, as appropriate. **Likely Causes:** Failure of the near-end OLIU CP reporting the STS-1 failure; failure of the far-end OLIU; failure of the receive fiber if the OC-3 is also reporting a failure.
`inc. STS1 unequipped`	The system has detected the unequipped code (SONET path overhead signal code label byte=0) on an in-service STS-1 channel. Likely cause: An upstream STS-1 cross-connect has been deleted.
`inc. STS1 yellow`	The system has detected an incoming STS-1 yellow signal inserted by the far-end path terminating equipment. **Likely Causes:** Unprotected unidirectional failure of an OLIU CP or fiber at some point in the end-to-end path; unprotected failure of a 3DS3 CP at the far end; unprotected failure of a 3DS3 CP at the near end.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. VT AIS	The system has detected VT path alarm indication signal (AIS) incoming from the active OC-n line. The system responds by transmitting DS1 AIS toward the DSX-1 or T1 interface, or DSX-3 and VT yellow toward the fiber from which the AIS is being received. **Likely Causes:** Incomplete or incorrect cross-connect provisioning in end-to-end network; unprotected removal or failure of a DS1 or T1EXT CP at the far end. In ring applications, a non-service affecting VT AIS alarm message may result from an upstream OLIU or fiber failure affecting only one ring direction. A VT yellow alarm message is not returned for a non-service affecting VT AIS.
inc. VT LOP	The system has detected a VT loss-of-pointer (LOP) condition. **Likely Causes:** For OC-3: Unprotected failure of a DS1 CP at the near end; unprotected failure of a DS1 CP at the far end; unprotected failure of an MXRVO CP at the near of far end; unprotected failure of an OC1 CP at the far end. For FiberReach: Unprotected failure of a DS1 or T1EXT CP at the near end; unprotected failure of a DS1 or T1EXT CP at the far end; unprotected failure of an MXRVO CP at the far end; unprotected failure of an OC1 CP at the near or far end; unprotected failure of a 2OC1 CP at the far end.
inc. VT sig. degrade (BER)	In a VT path switched ring, the system has detected a VT error rate that exceeds the provisioned threshold of 10^{-5} to 10^{-8}. The system selects a good VT signal from the other ring path. **Likely Causes:** An OLIU circuit pack failure; a fiber failure at some point on the failed ring.
inc. VT unequipped	The system has detected the unequipped code (SONET path overhead VT signal code label byte=0) on an in-service VT1.5 channel. Likely cause: An upstream VT1.5 cross-connect has been deleted.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
inc. VT yellow	The far end is detecting VT AIS or VT LOP and inserting VT yellow in its transmit signal. **Likely Cause:** Unprotected unidirectional failure of a circuit pack or fiber at some point in the end-to-end path.
inconsistent DCC switches	The "User/Network" switch on the OHCTL circuit pack is set the same at both ends of the DCC.
inhibit switch	When associated with an OC-3 or OC-12 line, this message means that 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**: 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 **switch-line** command. When associated with a function unit slot, TSI slot, timing slot, or timing reference, this message means that 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 **switch-fn**, **switch-tsi**, and **switch-sync** commands.
inhibit auto. OS messages	This message occurs when TL1 autonomous alarm reporting is inhibited by the TL1 **inh-msg** command. This message is cleared by enabling autonomous message reporting with the TL1 **alw-msg** command.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`Intersubsystem link failure`	In a *MegaStar* 2000 system, the SONET subsystem session is active but is unable to communicate with the RADIO subsystem.
`invalid CP switches`	When associated with a TG slot, this message means that the timing mode switch settings on the TGS CP are invalid.
`lockout of protection`	When associated with an OC-3 or OC-12 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**: 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 "inhibit" request is entered. See the **`switch-line`** command. When associated with 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 **`switch-ls`** command.
`lockout of service`	When associated with 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 **`switch-ls`** command.
`ls prot assembly removed`	The system has been reset with no low-speed protection assembly installed. This is not a valid system configuration. The user should install a low-speed protection assembly and execute the reset function.
`ls prot mode not chgd-(crs)`	An attempt to change the low-speed protection mode has failed because all cross-connections terminating on low-speed ports were not removed. The user should remove all such cross-connections and execute the reset function.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`manual switch`	The specified DS1 or T1EXT 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 preempts the manual switch. See the **`switch-ls`** command.
`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 **`switch-sync`** command.
`MXRVO CP failed`	Internal equipment failure of the specified MXRVO CP.
`OC12 connector failed`	The faceplate connector which carries the pass through channels between the OC-12 interfaces on the 24-type OLIUs has been removed or has failed.
`OHCTL CP failed`	Internal equipment failure of the OHCTL CP.
`OHCTL standby boot fail`	Internal equipment failure of the OHCTL circuit pack during a local or remote software download. Likely cause: OHCTL circuit pack hardware failure.
`OLIU CP failed`	Internal equipment failure of the specified OLIU CP.
`program installation IP`	This system is being used to install software into another system. If this procedure is interrupted prior to completion, control circuit packs of the remote systems will likely become inoperable until another install program attempt is successful. For OC-3 Release 11.0 and later and OC-12 Release 5.1 and later, this condition will appear if the network element determines that it is time to install a new software generic (originally, the action that caused this event to take place was initiating the **`apply`** command).
`protection CP different`	This message will be seen only when a FiberReach node is configured for 1x7 low-speed protection. The circuit pack in the protection slot is different from and will not protect all of the circuit packs in the service slots. If this is acceptable, execute the update function to clear the alarm. Otherwise, one or more of the service or protection circuit packs must be changed.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
section DCC channel failed	The system cannot communicate with the far-end system through the SONET section data communications channel (DCC). **Likely Causes:** SYSCTL or OHCTL 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. When Address=LAN, the likely causes are: LAN link integrity failure; excessive LAN retransmission attempts, collisions,…; program installation in progress at the far end; SYSCTL or OLIU CP failure at the near end.
STS1E_H CP failed	Internal equipment failure of the high-speed STS1E CP.
STS1E_L CP failed	Internal equipment failure of the low-speed STS1E CP.
SYSCTL CP failed	Internal equipment failure of the SYSCTL CP. The system has determined that some part of the SYSCTL CP has failed. **Note:** Some types of failures cannot be reported since the SYSCTL CP cannot function under these conditions.
SYSCTL standby boot fail	Internal equipment failure of the SYSCTL circuit pack during a local or remote software download. Likely cause: SYSCTL circuit pack hardware failure.
T1EXT CP failed	Internal equipment failure of the specified T1EXT CP.
TID address map full	The size of the directory services network element (DSNE) data base at the GNE has been exceeded. **Likely Cause:** Network elements have been removed form the network but not from the DSNE data base located at the GNE. See the **dlt-tadrmap** command.
TGS CP failed	Internal equipment failure of the specified TGS CP, or the systems at both ends of the span are line-timed from each other.
TSI CP failed	Internal equipment failure of the TSI CP.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
unexpected CP present	For OC-3, a DS1 CP has been installed in a low-speed slot associated with a function unit currently provisioned for DS3 service. The DS1 CP should be removed from the shelf, or the DS3 CP should be replaced with an MXRVO CP. For OC-12, a circuit pack has been installed in the MAIN-A slot. The circuit pack should be removed from the shelf. For FiberReach, a circuit pack has been installed into one of the function unit slots. The circuit pack should be removed from the shelf.
unexpected CP switches	When associated with the SYSCTL or OHCTL slot, this message means that an invalid switch setting has been selected on the CP or that some of the unused switches are not in the prescribed position. For OLIU slots, it indicates that the optical power switch on the OLIU CP was different from what is was before the OLIU CP was replaced. For DS1, DS3, or T1EXT slots, this message means that a change in a circuit pack switch setting was made. When associated with a TG slot, this message means: ■ the timing mode switch settings on the TGS CP are — 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 OC-12, when associated with a function unit (FN) slot, this message means that the optical power switch on the 21G OLIU CP is different from what it was before the 21G OLIU CP was replaced.

Table 3-4. Alarm and Status Condition Descriptions (Contd)

Description	Meaning
`unexpected CP type`	When associated with a function unit (FN) slot, this message means that a different but supported circuit pack is inserted in a slot already provisioned. For OC-3, when associated with a low-speed DS1 slot, this message means that a different but supported DS1 circuit pack type (for example, BBF3) is inserted in a slot already provisioned. When associated with an OC-12 system, this message means that an OLIU, 3DS3, or 3STS1E CP is inserted in a slot provisioned for a different type of circuit pack. For the STS1E circuit pack, this message means that the CP type switch (located on the circuit pack) is different from that already provisioned for the slot. This message is issued as a status condition if a 24-type OLIU is inserted in a main slot provisioned for a 22-type OLIU. This will occur during an upgrade of an OC-3 ring interface to an OC-12 ring interface on an OC-3 shelf.
`unsupported DCC connection`	This message is issued when the DCC is enabled on an OC-1 connection between the main slots in two OC-3 shelves. The alarm is cleared by disabling the DCC on the OC-1 interface using the **`set-fecom`** command. The OC-3 system does not support a DCC link over an OC-1 line terminating on the main slots between two OC-3 shelves.
`X.25 communication failure`	Failure in the X.25 communication channel. **Likely Causes:** 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. See the **`set-ne`** command for provisioning.

Monitored Parameter Types

Table 3-5 lists the subset of the monitored parameter types (*montype*).

Table 3-5. 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. For OC-3 Release 3.0 and OC-12 Release 1.0 and earlier, in REPT EVT TCA messages for *montype*=LBCL, *monval* is null and *thlev*=1.5 (representing 50% current increase). In **RTRV-PM** responses for *montype*=LBCL, *monval*=1 if there is no TCA, and *monval*=1.5 if a TCA exists. For OC-3 Release 5.0 and OC-12 Release 2.0 and later, *monval*=0 if there is no TCA (to complement DDM-2000 Multiplexer support of the *monlev* parameter).
LPT	Light power intensity transmitted. For OC-3 Release 3.0 and OC-12 Release 1.0 and earlier, in REPT EVT TCA messages for *montype*=LPT, *monval* is null and *thlev*=-1 or -2 (representing -1 dB or -2 dB optical transmit power thresholds). In **RTRV-PM** responses for *montype*=LPT, *monval*=1 if there is no TCA, and *monval*=-1 or -2 if a TCA exists. For OC-3 Release 5.0 and OC-12 Release 2.0 and later, *monval*=0 if there is no TCA, and *monval*=*thlev* (= 1 or 2) if a TCA exists (to complement DDM-2000 Multiplexer support of the *monlev* parameter).
OOF	Out-of-frame second count, more specifically, severely errored frame seconds (SEFS) count.
PSC-L	Protection switching count – line (OC-3 Release 3.0 and OC-12 Release 1.0 and later, except rings).
SESL	Severe errored second count – line.
SESP	Severe errored second count – path.
UASL	Unavailable second count – line.
UASP	Unavailable second count – path.

Provisionable PM Parameters

Tables 3-6, 3-7, 3-8, 3-9, and 3-10 describe the performance monitoring (PM) parameters provisionable via selected switches and the CIT.

Additional information about these provisionable PM parameters may be found in 363-206-202, *DDM-2000 OC-3 Multiplexer User/Service Manual*; 363-206-207, *DDM-2000 OC-12 Multiplexer User/Service Manual*; and 363-206-301, *DDM-2000 FiberReach Multiplexer Wideband Shelf User/Service Manual*.

Table 3-6. OC-3 Performance Monitoring Parameters Provisionable Via the CIT

Parameter Definition		Threshold Range [Default]		Command
Facility	Measure	Current Quarter Hour	Current Day	set-pmthres-
OC-3 Optics	Optical Transmit Power*(21G/21G-U only)	–1 dB, –2 dB	–1 dB, –2 dB	**sect**
	Laser Bias Current*(21G/21G-U only)	enable/disable	enable/disable	**sect**
OC-3 Section	SE Frame Seconds (SEFS)	1-63[10]	1-4095[30]	**sect**
OC-1 Section	SE Frame Seconds (SEFS)	1-63[10]	1-4095[30]	**sect**
OC-3 Line	B2 Coding Violations (CV)	1-13841[1384]	1-1328736[132874]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
	Line Protection Switch Counts (PSC-L)	1-63[2]	(1-255)[4]	**line**
OC-1 Line	B2 Coding Violations (CV)	1-13841[1384]	1-1328736[132874]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
EC-1 Line	B2 Coding Violations (CV) EC-1	1-4613[461]	1-442848 [44285]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
STS-1 Path	B3 Coding Violations (CV)	1-4510[451]	1-432960 [43296]	**sts1**
	B3 Errored Seconds (ES)	1-900[40]	1-65535[900]	**sts1**
	B3 Errored SecondsType A (ESA)	1-900[30]	1-65535[90]	**sts1**
	B3 Errored SecondsType B (ESB)	1-900[30]	1-65535[90]	**sts1**
	B3 Severely Errored Seconds (SES)	1-63[20]	1-4095[60]	**sts1**
	B3 Unavailable Seconds (UAS)	1-63[30]	1-4095[90]	**sts1**

* Threshold is set once for both current quarter hour and current day.

Table 3-6. OC-3 Performance Monitoring Parameters Provisionable Via the CIT (Contd)

Parameter Definition		Threshold Range [Default]		Command
Facility	**Measure**	**Current Quarter Hour**	**Current Day**	**set-pmthres-**
DS3 Path for P-Bit, F&M-Bit, and C-Bit from Fiber and DSX	CV-P Coding Violations	1-16383[40]	1-1048575[3820]	**t3**
	ES-P Errored Seconds	1-900[25]	1-65535[250]	**t3**
	SES-P Severely Errored Seconds	1-63[4]	1-4095[40]	**t3**
	UAS-P Unavailable Seconds	1-63[10]	1-4095[10]	**t3**
	SEFS	1-63[2]	1-4095[8]	**t3**
DS3 Line	CV-L Coding Violations	1-16383[40]	1-1048575[3865]	**t3**
	Errored Seconds, Line (ES-L)	1-900[25]	1-65535[250]	**t3**
	Severely Errored Seconds, Line (SES-L)	1-63[4]	1-4095[40]	**t3**
VT1.5 Path	V5 Errored Seconds (ES)	1-900 [40]	1-65535 [900]	**vtl**
	V5 Severely Errored Seconds (SES)	1-63[20]	1-4095 [60]	**vtl**
	V5 Unavailable Seconds (UAS)	1-63[30]	1-4095 [90]	**vtl**
DS1 Path	ES-P Errored Seconds	1-900[65]*	1-65535 [648]	**tl**
	SES-P Severely Errored Seconds	1-63[10]*	1-4095 [100]	**tl**
	UAS-P Unavailable Seconds	1-63[10]*	1-4095 [10]	**tl**
	ES-PFE Errored Seconds	1-900[65]*	1-65535 [648]	**tl**
	SES-PFE Severely Errored Seconds	1-63[10]*	1-4095 [100]	**tl**
	UAS-PFE Unavailable Seconds	1-63[10]*	1-4095 [10]	**tl**
	CV-P (SF) Coding Violations	1-16383[72]*	1-1048575 [691]	**tl**
	CV-P (ESF) Coding Violations	1-16383[13296]*	1-1048575 [132960]	**tl**
	CV-PFE Coding Violations	1-16383[13296]*	1-1048575 [132960]	**tl**
DS1 Line	ES-L Line Errored Seconds	1-900[65]*	1-65535 [648]	**tl**

* In OC-3 Release 9.1 and later, 15 minute DS1 PM bins will be monitored and reported.

Table 3-7. OC-12 Performance Monitoring Parameters Provisionable Via the CIT

Parameter Definition		Threshold Range [Default]		Command
Facility	Measure	Current Quarter Hour	Current Day	set-pmthres-
OC-3 Optics	Optical transmit power* (21G/21G-U only)	–1 dB, –2 dB	–1 dB, –2 dB	**sect**
	Laser Bias Current * (21G/21G-U only)	enabled/disabled	enabled/disabled	**sect**
OC-12 Optics	Laser Bias Current*	enabled/disabled	enabled/disabled	**sect**
OC-3 Section	SEFS	1-63[10]	1-4095[30]	**sect**
OC-12 Section	SEFS	1-63[10]	1-4095[30]	**sect**
OC-12 Line	B2 Coding Violations (CV)	1-55365[5537]	1-5315040[531504]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
	Line Protection Switch Counts (PSC-L)	1-63[2]	(1-255)[4]	**line**
OC-3 Line	B2 Coding Violations (CV)	1-13841[1384]	1-1328736[132874]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
	Line Protection Switch Counts (PSC-L)	1-63[2]	(1-255)[4]	**line**
EC-1 Line	B2 Coding Violations (CV) EC-1	1-4613[461]	1-442848 [44285]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
STS-1 Path	B3 Coding Violations (CV)	1-4510[451]	1-432960[43296]	**sts1**
	B3 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**sts1**
	B3 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**sts1**
	B3 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**sts1**
	B3 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**sts1**
	B3 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**sts1**
DS3 Path for P-Bit, F&M Bit, and C-Bit from Fiber and DSX	CV-P Coding Violations	1-16383[40]	1-1048575[3820]	**t3**
	ES-P Errored Seconds	1-900[25]	1-65535[250]	**t3**
	SES-P Severely Errored Seconds	1-63[4]	1-4095[40]	**t3**
	UAS-P Unavailable Seconds	1-63[10]	1-4095[10]	**t3**
	SEFS	1-63[2]	1-4095[8]	**t3**
DS3 Line	CV-L Coding Violations	1-16383[40]	1-1048575[3865]	**t3**
	Errored Seconds, Line (ES-L)	1-900[25]	1-65535[250]	**t3**
	Severely Errored Seconds, Line (SES-L)	1-63[4]	1-4095[40]	**t3**

* Threshold is set once for both current quarter-hour and current day.

Table 3-8. OC-12 Regenerator Performance Monitoring Parameters Provisionable Via the CIT

Parameter Definition		Threshold Range [Default]		Command
Facility	Measure	Current Quarter Hour	Current Day	set-pmthres-
OC-12 Optics	Laser Bias Current *	enabled/disabled	enabled/disabled	**sect**
OC-3 Section †	SEFS	1-63[10]	1-4095[30]	**sect**
OC-12 Section †	SEFS	1-63[10]	1-4095[30]	**sect**
OC-12 Line †	B2 Coding Violations (CV)	1-55365[5537]	1-5315040[531504]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**

* Threshold is set once for both current quarter-hour and current day.

† Release 2.0 (23R-U REGENR).

Table 3-9. FiberReach Multiplexer Parameters Provisionable via the CIT

Parameter	Range	Default (Note 1)	Command (Note 2)
Date	current value	70-01-01	**set-date**
Time	current value	00:00:00	**set-date**
Target ID (system name)	20 characters	Site#NE#	**set-ne**
Site number	1-32	32	**set-ne**
Network element #	1-5	5	**set-ne**
CO/RT select	CO, RT	RT	**set-ne**
TBOS address	1-8	1	**set-ne**
TBOS link	primary, secondary, normal, no TBOS	no TBOS	**set-ne**
TBOS remote	enabled, disabled	disabled	**set-ne**
AGNE	yes, no	no	**set-ne**
Alarm group number	1-255	255	**set-ne**
VT Uneqpd./AIS insert	Uneqpd., AIS	AIS	**set-ne**
CIT page length	0 (pager off), 3-150 rows	24	**set-link**
PM thresholds	See PM Table (Table 3-10)	-	**set-pmthres**
Alarm holdoff delay	0-30 sec	2	**set-attr-alm**
Alarm clear delay	0-30 sec	15	**set-attr-alm**
Power minor almn. level	MN, MJ	MN	**set-attr-alm**
OC1 degrade threshold	10^{-5} to 10^{-9}	10^{-6}	**set-oc1**
STS-1 path signal degrade threshold	10^{-5} to 10^{-9}	0 (disabled)	**set-sts1**
NSA STS-1 path AIS alarm level	MN, NR	MN	**set-sts1**
SA STS-1 path AIS alarm level	CR, MN, NA, NR	MN	**set-sts1**
STS-1 channel state	NMON, AUTO*	AUTO	**set-state-sts1**
VT1.5 path signal degrade threshold**	10^{-5} to 10^{-8}	0 (disabled)	**set-vt1**
NSA VT path AIS	MN, NR	MN	**set-vt1**
SA VT path AIS	MJ, MN, NA, NR	MJ	**set-vt1**
VT channel state**	NMON, AUTO‡	AUTO	**set-state-vt1**
DS1 line coding†	AMI,B8ZS,noOverride§	noOverride	**set-t1**†
DS1 alarm level†	MJ, MN, NA	NA	**set-t1**†
DS1 AIS insertion†	yes, no	yes	**set-t1**†
DS1 failure threshold†	10^{-3}, 10^{-6}, 10^{-7}, 10^{-8} BER	10^{-3}	**set-t1**†
DS1 BPV to LOS†	yes,no	no	**set-t1**†
DS1 PM Mode†	off, on	off	set-t1
DS1 PM Format†	sf, esf, esfn	esf	**set-t1**
DS1 primary port state†	NMON, AUTO§	AUTO	**set-state-t1**†

See Notes and footnotes at end of table.

Table 3-9. FiberReach Multiplexer Parameters Provisionable Via the CIT (Contd)

Parameter	Range	Default (Note 1)	Command (Note 2)
Environmental alarm level	CR, MJ, MN, NA	MN	**set-attr-env**
Environmental alarm type	10 characters		**set-attr-env**
Environmental alarm description	26 characters		**set-attr-env**
Control point description	26 characters		**set-attr-cont**
Far end communication over DCC ¶	enabled,disabled	enabled	**set-fecom**§
DCC identity for OSI ntwks.	userside, networkside	see command pages	**set-fecom**¶
Set security ¶	enabled,disabled,lockout	disabled	**set-secu**§
CIT security ¶	enabled,disabled,lockout	disabled	**set-secu**§
CIT timeout (minutes) ¶	0-120	15	**set-secu**§
DCC security ¶	enabled,disabled,lockout	disabled	**set-secu**§
DCC timeout (minutes) ¶	0-120	15	**set-secu**§
Sync Timing Source	main-1, main-2	main-1	**set-sync**
SYNC mode switching	revertive, nonrevertive	revertive	**set-sync**
Feature Packaging ¶	enabled, disabled	disabled	**set-feat**
VT PM or DS1 PM			
NSAP			
OrganizationID (Operator ID)	6 hex digits	000000	**ent-ulsdcc**
Reserved (Reserved)	4 hex digits	0000	**ent-ulsdcc**
Routing Data (Domain/Area)	8 hex digits	00000000	**ent-ulsdcc**
ACID (OS type or funct.)	see command pgs.		**ent-tl1msgmap**
TL1 message type	see command pgs.		**ent-tl1msgmap**
Action to assoc. message type to OS	enabled, disabled	enabled	**ent-tl1msgmap**
Cross-connection type	twoway, locked	twoway	**ent-crs-vt1**
Ring ID for locked	m1, m2	see command pages	**ent-crs-vt1**

Note 1
Default means factory default (the CIT prompts display current provisioned values).

Note 2
To view the current values, precede these commands with **rtrv-** instead of **set-**.

* AUTO means the port or channel is ready to be automatically provisioned via signal detection.

† Parameter can be set for each port.

‡ AUTO means the port or channel is ready to be automatically provisioned via signal detection.

§ noOverride means read and use switch settings on circuit pack.

¶ This command is available to privileged users only.

** Parameters can be set for each channel.

The following identifiers (ID) are used for the shelf, site, network element (NE), network service access point (NSAP) address, and alarm group network element (AGNE).

- **Site ID:** The site ID is a parameter with values of from 1 to 32 site addresses. The site ID is displayed on the 7-segment display on the SYSCTL circuit pack to indicate to which site the USER panel alarm LEDs apply. For site IDs greater than eight, a dash is displayed on the 7-segment display. The same site ID should be assigned to all shelves in the same bay or cabinet. It is recommended that the site ID be assigned consecutively starting at the central office (CO) site unless parallel telemetry is used. If parallel telemetry is used, the CO site should be assigned as site 7 and the remote sites should be assigned numbers 1 through 6. Site IDs can be repeated for separate alarm groups. See the TOP section for procedures on setting the Site ID.
- **Network Element ID:** The network element ID is a parameter with values of from 1 to 5. Network elements at a specific site that belong to the same subnetwork must be assigned a unique network element ID. The network element ID is combined with the site ID to form a default value for the TID.
- **TID:** The target identifier (TID) is a 20-character parameter that is set through the CIT using the **`set-ne`** command. The TID is used in the **`rlgn`** command to identify an NE to which a remote login session is being established. The TID is also used by an OS such as Bellcore's network monitoring and analysis (NMA) system to identify NEs using the TL1 message-based communications protocol.

  After the **`init-sys:all`** or **`init-sys:systcl`** command is entered, the system sets the TID to a default value obtained by combining the site ID with the NE ID. The TID must be unique among all NEs. The default TID may be changed using the **`set-ne`** command to a unique user-assigned value recognized by the OS.
- **NSAP:** The network service access point (NSAP) is a multiple part address that uniquely identifies the NE. The NSAP is used for subnetwork communications using the OSI protocol. The NSAP is set to unique values assigned to control hardware at the factory and does not have to be modified by the user. The user can only modify the values defined by the **`ent-ulsdcc`** command. The Routing Domain and Area parameters must not be changed from their default values when interworking with FT-2000 OC-48 Lightwave Systems.
- **AGNE:** In an alarm group (either all DDM-2000 Multiplexers or mixed with FT-2000 OC-48 Lightwave Systems), at least one NE must be designated as a AGNE by setting its AGNE parameter to "yes" using the **`set-ne`** command. An AGNE is an NE in an alarm group, through which members of an alarm group exchange alarm and status information. By default all NEs are in the same alarm group. For subnetworks having more than 16 NEs, the AGNE and GNE should be separate NEs. The

AGNE is a "collection point" and does not have to be a NE in a CO, for example.

Table 3-10. FiberReach Multiplexer Performance Monitoring Parameters Provisionable via the CIT

Parameter Definition		Threshold Range [Default]		Command
Facility	**Measure**	**Current Quarter Hour**	**Current Day**	**set-pmthres-**
OC-1 Section	SE Frame Seconds (SEFS)	1-63[10]	1-4095[30]	**sect**
OC-1 Line	B2 Coding Violations (CV)	1-13841[1384]	1-1328736[132874]	**line**
	B2 Errored Seconds (ES)	1-900[40]	(1-65535)[900]	**line**
	B2 Errored Seconds Type A (ESA)	1-900[30]	(1-65535)[90]	**line**
	B2 Errored Seconds Type B (ESB)	1-900[30]	(1-65535)[90]	**line**
	B2 Severely Errored Seconds (SES)	1-63[20]	(1-4095)[60]	**line**
	B2 Unavailable Seconds (UAS)	1-63[30]	(1-4095)[90]	**line**
	Line Protection Switch Counts (PSC-L)	1-63[2]	(1-255)[4]	**line**
STS-1 Path	B3 Coding Violations (CV)	1-4510[451]	1-432960 [43296]	**sts1**
	B3 Errored Seconds (ES)	1-900[40]	1-65535[900]	**sts1**
	B3 Errored SecondsType A (ESA)	1-900[30]	1-65535[90]	**sts1**
	B3 Errored SecondsType B (ESB)	1-900[30]	1-65535[90]	**sts1**
	B3 Severely Errored Seconds (SES)	1-63[20]	1-4095[60]	**sts1**
	B3 Unavailable Seconds (UAS)	1-63[30]	1-4095[90]	**sts1**
VT1.5 Path	V5 Errored Seconds (ES)	1-900 [40]	1-65535 [900]	**vtl**
	V5 Severely Errored Seconds (SES)	1-63[20]	1-4095 [60]	**vtl**
	V5 Unavailable Seconds (UAS)	1-63[30]	1-4095 [90]	**vtl**
DS-1 Path	ES-P Errored Seconds	-	1-65535 [648]	**tl**
	SES-P Severely Errored Seconds	-	1-4095 [100]	**tl**
	UAS-P Unavailable Seconds	-	1-4095 [10]	**tl**
	ES-PFE Errored Seconds	-	1-65535 [648]	**tl**
	SES-PFE Severely Errored Seconds	-	1-4095 [100]	**tl**
	UAS-PFE Unavailable Seconds	-	1-4095 [10]	**tl**
	CV-P (SF) Coding Violations	-	1-1048575 [691]	**tl**
	CV-P (ESF) Coding Violations	-	1-1048575 [132960]	**tl**
	CV-PFE Coding Violations	-	1-1048575 [132960]	**tl**
DS-1 Line	ES-L Line Errored Seconds	-	1-65535 [648]	**tl**

* Threshold is set once for both current quarter hour and current day.

Condition Types

Table 3-11 lists the subset of the condition types (*condtype*) (from Bellcore's TR-TSY-000833, Issue 3) that are supported by OC-3 and OC-12.

Table 3-11. Condition Types (*condtype*)

Description	Meaning
AIS	Alarm indication signal detected.
BUFROVLD	Buffer overload (OC-3 Release 6.0 and OC-12 Release 2.0 and later). Used to report TL1 autonomous message *output* 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 (OC-3 Release 5.0 and later). 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 (OC-3 Release 6.0 and OC-12 Release 2.0 and later). Used to report illegal circuit packs in function unit slots when the DDM-2000 Multiplexer does not know what type of circuit pack to expect.
FERF	Line far-end-receive failure.
HLDOVRSYNC	Holdover synchronization mode (OC-3 Release 5.0 and OC-12 Release 2.0 and later).
INHAUDB	Alarm audibles inhibited (OC-3 Release 6.1 and OC-12 Release 2.1 and later).
INHMSG	Automatic messages to OS inhibited (OC-3 Release 6.1 and OC-12 Release 2.1 and later).
INHSWPR	Inhibited switch to protection (OC-3 Release 5.0 and OC-12 Release 2.0 and later).
INHSWWKG	Inhibited switch to working. Used to report DS1 circuit pack automatic lock (OC-3 only).
LHI	Loss of holdover integrity. Used to report excessive synchronization holdover.

Table 3-11. Condition Types (*condtype*) (Contd)

Description	Meaning
LOF	Loss of frame.
LOP	Loss of pointer.
LOS	Loss of signal.
LPBKNETWORK	Loopback, Network. Used for all loopbacks and network tests (OC-3 Release 6.1 and OC-12 Release 2.1 and later).
MAN	Manual. Used to report CIT logins, login attempts, and logouts (OC-3 Release 3.0 and OC-12 Release 1.2 and later).
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 (OC-3 only). Also used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
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.
OC12TERM	OC-12 terminating equipment failure (OC-12 only). 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 (OC-3 Release 3.0 and OC-12 Release 1.0 and later), duplicate TIDs, and duplicate GNEs and TID address map full (OC-3 Release 6.0 and OC-12 Release 2.0 and later).
PWR	Power failure.
SLMF	Unequipped signal.
SYNC	Loss of timing on a protected synchronization link.
SYNCCLK	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.

Table 3-11. Condition Types (*condtype*) (Contd)

Description	Meaning
T1TERM	DS1 terminating equipment failure (OC-3 only). 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=*montype*. Used for PM TCA reporting. Refer to Table 3-3 for the valid values.
T-BERP	Incoming ring path signal BER threshold exceeded (OC-3 Release 6.1 and OC-12 Release 2.1 and later).
TSI	Time slot interchange failure. Used to report failures of internal TSI circuit packs that do not directly terminate external signals (OC-12 only). Also used to report circuit pack removals, unexpected types or switches, and unallowed or illegal circuit packs.
WKSWPR-x	Working facility switched to protection line x. Used to report manual and automatic protection switches for timing references and optical lines (OC-3 Release 5.0 and OC-12 Release 2.0 and later).
YEL	Yellow signal received, outgoing signal failure.

TL1 Character Set Definitions

Table 3-12 provides the TL1 character set definitions. The table separates these definitions by symbolic, numeric, and alphabetic characters.

Table 3-12. TL1 Character Set Definitions

Symbolic Characters				*Numeric Characters*			
Dec	**Hex**	**ASCII**	**Keystroke**	**Dec**	**Hex**	**ASCII**	**Keystroke**
33	21	!	!	48	30	0	0
34	22	"	"	49	31	1	1
37	25	%	%	50	32	2	2
39	27	’	’	51	33	3	3
40	28	(	(	52	34	4	4
41	29	)	)	53	35	5	5
42	2A	*	*	54	36	6	6
43	2B	+	+	55	37	7	7
45	2D	-	-	56	38	8	8
46	2E	.	.	57	39	9	9
47	2F	/	/				
60	3C	<	<				
62	3E	>	>				
91	5B	[	[				
93	5D	]	]				
94	5E						
96	60	‘	‘				
123	7B	{	{				
124	7C	|	|				
125	7D	}	}				
126	7E	≈	≈				

Table 3-12. TL1 Character Set Definitions (Contd)

Alphabetic Characters

Dec	Hex	ASCII	Keystroke	Dec	Hex	ASCII	Keystroke
65	41	A	A	97	61	a	a
66	42	B	B	98	62	b	b
67	43	C	C	99	63	c	c
68	44	D	D	100	64	d	d
69	45	E	E	101	65	e	e
70	46	F	F	102	66	f	f
71	47	G	G	103	67	g	g
72	48	H	H	104	68	h	h
73	49	I	I	105	69	i	i
74	4A	J	J	106	6A	j	j
75	4B	K	K	107	6B	k	k
76	4C	L	L	108	6C	l	l
77	4D	M	M	109	6D	m	m
78	4E	N	N	110	6E	n	n
79	4F	O	O	111	6F	o	o
80	50	P	P	112	70	p	p
81	51	Q	Q	113	71	q	q
82	52	R	R	114	72	r	r
83	53	S	S	115	73	s	s
84	54	T	T	116	74	t	t
85	55	U	U	117	75	u	u
86	56	V	V	118	76	v	v
87	57	W	W	119	77	w	w
88	58	X	X	120	78	x	x
89	59	Y	Y	121	79	y	y
90	5A	Z	Z	122	7A	z	z

Serial Telemetry

4

Contents

Overview 4-1

Introduction 4-1

Related Provisioning 4-2

- Central Office/Remote Terminal Select 4-3
- Termination 4-3
- Display Number 4-4
- Backup Function 4-4
- Remote Enable 4-6
- Far-End Communication 4-6
- Alarm Groups 4-7
- Section DCC User Side/Network Side 4-8
- Network Services Access Point 4-9
- Gateway Network Element 4-9
- Alarm Gateway Network Element 4-9
- Directory Services Network Element 4-10
- Provisioning Examples 4-10

Multiplexers per Link 4-14

Tests 4-14

Alarm and Status Points — DDM-2000 OC-3 4-15

Alarm and Status Points — DDM-2000 OC-12 4-32

Alarm and Status Points — DDM-2000 OC-12 Regenerator 4-44

Control Points — DDM-2000 OC-3 4-50

Control Points — DDM-2000 OC-12 4-54

Contents

Control Points — DDM-2000 OC-12 Regenerator 4-58

Alarm and Status Point — TL1 Translation 4-60

Control Point — TL1 Translation 4-66

NMA Scan Point Definition 4-66

- Condition Type 4-66
- Service Effect 4-67
- Threshold Level (Condition Description) 4-67
- Equipment Alarms 4-68
- Signal Levels 4-68
- Case Insensitivity 4-68
- Equipment Data Base Definition 4-69

Alarm and Status Points — FiberReach 4-70

Control Points — FiberReach 4-73

Serial Telemetry

4

Overview

This section presents information on serial telemetry operations system (OS) interfaces, using telemetry byte-oriented serial (TBOS) protocol. It includes information about TBOS-related provisioning, alarm and status points, control points, and Transaction Language 1 (TL1) translations.

Introduction

The DDM-2000 OC-3, OC-12, FiberReach, and OC-12 Regenerator Multiplexers support serial telemetry using the TBOS protocol. TBOS offers more detailed alarm, status, and control capabilities to and from a remote operations center than parallel telemetry. The DDM-2000 Multiplexer TBOS interface is via a 2400 baud RS-422 port. (Refer to OC-3 Application Schematic SD-7C510-01, CAD 10, OC-12 Application Schematic SD-7C513-01, CADs 7 and 26, and FiberReach Application Schematic SD-7C516-01.)

Serial Telemetry is **not** supported as of the following DDM-2000 Multiplexer releases:

- OC-3 Release 13.0 and later
- OC-12 Release 7.0 and later
- FiberReach Release 3.0 and later

Each DDM-2000 Multiplexer 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 up to eight DDM-2000 Multiplexers.

Related Provisioning

The following list summarizes the TBOS-related parameters (described below) that are provisionable via hardware switch settings on the system controller circuit pack (SYSCTL) or software provisionable in a DDM-2000 Multiplexer:

- CO/RT select
- Gateway Network Element (GNE).
- Directory Services Network Element (DSNE) (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach 1.0-2.X.)
- Far-end communication
- Section DCC user side/network side
- Subnetwork Partitioning
- TBOS termination
- TBOS display number
- TBOS backup function
- Remote TBOS enable
- Alarm Gateway Network Element (AGNE) (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach 1.0-2.X.)
- Alarm Group (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach 1.0-2.X.)

Refer to the appropriate user/service manual (see the ***Related Documentation*** section in the **About This Document** chapter) for:

- Specific switch addresses and settings
- The craft interface terminal (CIT) user interface commands (**`set-fecom`**, **`ent-ulsdcc`**, and **`set-ne`**) used to set the software provisionable parameters
- The **`rtrv-ne`**, **`rtrv-fecom`**, and **`rtrv-ulsdcc`** commands which report all the parameter values

Figures 4-1, 4-2, and 4-3 provide TBOS-related provisioning examples for:

- DDM-2000 OC-3 Only
- Combined DDM-2000 OC-3 and OC-12 Multiplexer Applications
- Combined DDM-2000 OC-3 and FiberReach Multiplexer Applications.

Central Office/Remote Terminal Select

A DDM-2000 Multiplexer supports 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 (BBG5) circuit pack for DDM-2000 OC-3 Release 7.2, OC-12 Release 3.1, and earlier, and via the CIT for DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X. The selection of CO or RT also controls the appropriate processing of the miscellaneous discrete environmental points as alarm/status and controls. The fan shelf failure is applicable at COs only. The fan control relay failure is applicable only at RT sites.

If the RT is selected, a TBOS link, if any, physically connected to this DDM-2000 Multiplexer, either directly or through intrabay multiple connections, is ignored. Thus, for example, the TBOS backup function (see below) is not applicable.

The OC-12 Regenerator supports only a CO TBOS display. The hardware switch settings on the SYSCTL circuit pack must be set to "CO" in regenerator applications.

Termination

A CO DDM-2000 Multiplexer may be connected to a TBOS link either directly or through the intrabay multiple cable. The *last* CO DDM-2000 Multiplexer in a series of CO DDM-2000 Multiplexers connected to the same TBOS link must be designated as the TBOS termination. If only one CO DDM-2000 Multiplexer is connected to a TBOS link, that CO DDM-2000 Multiplexer must be designated as the TBOS termination. The TBOS termination is provisionable via a hardware switch setting on the SYSCTL circuit pack.

Provisioning the TBOS termination is not applicable to DDM-2000 Multiplexers (for example, remote DDM-2000 Multiplexers) that are not connected to a TBOS link, either directly or through the intrabay multiple cable.

NOTE:
TBOS termination switch S4-2 on the SYSCTL (BBG5) should always be set to **OFF** in all applications.

Display Number

Each DDM-2000 Multiplexer 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 (BBG5) SYSCTL circuit pack for DDM-2000 OC-3 Release 7.2, OC-12 Release 3.1, and earlier, and via the CIT for DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X.

The TBOS display number (and telemetry remote and TBOS link) must be associated in the monitoring OS with the identity of each DDM-2000 Multiplexer.

Backup Function

When multiple CO DDM-2000 Multiplexers are connected to the same TBOS link, one of the DDM-2000 Multiplexers can be provisioned as the primary TBOS backup via hardware switch settings on the SYSCTL (BBG5) circuit pack for DDM-2000 OC-3 Release 7.2, OC-12 Release Release 3.1, and earlier and via the CIT for DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X. The same hardware switches are used to provision a DDM-2000 Multiplexer TBOS backup function as one of the following:

- Primary backup — serves as primary TBOS backup (described below)
- Secondary backup — serves as TBOS backup if primary TBOS backup fails (described below)
- Normal — the DDM-2000 Multiplexer is connected to a TBOS link and reports via TBOS but has no backup responsibility
- No TBOS link — no TBOS link is physically connected to this DDM-2000 Multiplexer, either directly or through the intrabay multiple cable. This setting is normally used in all remote DDM-2000 Multiplexers.

The TBOS backup function assures that failure of a single DDM-2000 Multiplexer will not cause the TBOS link to fail. This will allow the continued reporting of displays from other DDM-2000 Multiplexers on that link.

The TBOS backup function assures that each DDM-2000 Multiplexer on a TBOS link is polled for its TBOS display, even if one or more of the DDM-2000s fail to respond to the telemetry remote when polled. Without a DDM-2000 Multiplexer TBOS backup, a telemetry remote that did not receive a TBOS display from a polled DDM-2000 Multiplexer would start polling again for TBOS display #1. Thus, any TBOS display beyond that of a nonresponsive DDM-2000 Multiplexer would not be polled.

The DDM-2000 Multiplexer serving as the primary TBOS backup will respond for any other DDM-2000 Multiplexer on the same TBOS link if the polled DDM-2000 Multiplexer fails to respond for itself. More specifically, the primary TBOS backup DDM-2000 Multiplexer responds to the telemetry remote if any polled

DDM-2000 Multiplexer fails to respond to its poll within about 50 msec. The primary TBOS backup DDM-2000 Multiplexer will respond for the nonresponsive DDM-2000 Multiplexer by reporting TBOS point 14 controller failure and reporting all other TBOS points in the polled display as clear.

A DDM-2000 Multiplexer serving as the secondary TBOS backup operates the same as the primary TBOS backup, except the secondary TBOS backup does not respond to polls for other DDM-2000 Multiplexers until about 100 msec after the poll is received. If after 100 msec neither the polled DDM-2000 Multiplexer nor the primary TBOS backup DDM-2000 Multiplexer has responded to the telemetry remote poll, the secondary TBOS backup DDM-2000 Multiplexer will respond for the nonresponsive DDM-2000 Multiplexer.

In combined DDM-2000 OC-3 and OC-12 applications, only CO DDM-2000 Multiplexers physically connected to a TBOS link, either directly or through the intrabay multiple cable, are candidates to be a primary or secondary TBOS backup.

NOTE 1:
Apparently, some telemetry remotes (such as Northern Telecom's 7025) sometimes poll for all eight displays on a TBOS link even if less than eight displays are assigned to the link. The purpose of this feature is for the Northern Telecom 7025 telemetry remote to ''learn'' about any new NEs that may have been added to a TBOS link. If the telemetry remote gets a response from a new NE, the telemetry remote will poll that NE (identified by TBOS display number) on a regular basis thereafter. A DDM-2000 Multiplexer serving a TBOS backup function would respond to any polls for nonexistent NEs, thus causing the telemetry remote to think new NEs have been added to the TBOS link. As long as the extra displays are not included in the network monitoring and analysis (NMA) data base, the extra display responses would be logged only as errors in NMA. However, users should be aware of this incompatibility when the above-mentioned Northern Telecom 7025 telemetry remote capability and DDM-2000 Multiplexers TBOS backup function are used together and less than eight displays are assigned to a TBOS link.

NOTE 2:
TBOS resistor adaptor cable (ED-8C724-20, G352) should be added between the DDM-2000 Multiplexer shelf TBOS connector J53 and the standard TBOS interface cable assembly for use with most telemetry remote units. Otherwise, when a TBOS telemetry remote unit is used to monitor DDM-2000 Multiplexer shelves that are cascaded together and one of the shelves has been optioned as the primary or secondary TBOS backup, the DDM-2000 Multiplexer may fail to answer the TBOS poll and the telemetry remote unit may fail the TBOS port. The only telemetry remote with which the TBOS resistor adaptor cable is known not to be required is Lucent Technologies ACORN telemetry remote unit. There also

may be some other vendor's telemetry remote units which do not require the TBOS resistor adaptor cable. If you experience a TBOS interface problem, please contact your local Regional Technical Assistance Center (RTAC) for assistance.

Remote 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) can be enabled or disabled via a hardware switch on the SYSCTL (BBG5) for DDM-2000 OC-3 Release 7.2, OC-12 Release 3.1, and earlier and via the CIT for DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X. Remote TBOS reporting should be enabled in OC-3-only applications.

In combined DDM-2000 OC-3, OC-12 and/or FiberReach applications with more than eight DDM-2000 Multiplexers in the same subnetwork, disabling remote TBOS reporting for *some* of the NEs maybe appropriate. Because a single TBOS link can support at most eight DDM-2000 Multiplexers, remote TBOS reporting should be disabled for all but one of the collocated CO NEs in the same subnetwork that would exceed the TBOS link limit. The other CO NEs should be connected to a different TBOS link. Another alternative to limit the number of NEs per TBOS link is to provision separate alarm groups (described later).

The OC-12 Regenerator does not support remote TBOS reporting.

Far-End Communication

Far-end communication over the SONET section DCC may be provisioned, using the CIT user interface command **`set-fecom`**, as either enabled (default) or disabled. The TBOS display updates are exchanged using the section DCC in the optical signals. (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 DDM-2000 Multiplexer shares its TBOS display information with the other DDM-2000 Multiplexers to which it is connected via optical facilities. Thus, a remote DDM-2000 Multiplexer TBOS alarm and status display can be forwarded to the telemetry remote via a CO DDM-2000 Multiplexer, 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 separating the DDM-2000 Multiplexer subnetwork.

- If far-end communication is enabled but the section DCC (or the optical signal itself) fails, the CO DDM-2000 Multiplexer (with access to the TBOS link) responds for each of the unintentionally isolated DDM-2000 Multiplexers by reporting TBOS point 14 controller failure (OC-3 Release 1.0 only). All other TBOS points in the isolated DDM-2000 Multiplexer alarm and status displays are cleared. In the same case, in DDM-2000 OC-3 Release 2.0-11.X, OC-12 Release 1.0, and FiberReach Release 1.0-2.X, only TBOS point 59 communication failure is reported (instead of TBOS point 14). The DDM-2000 Multiplexer adjacent to the section DCC (or optical signal) failure reports that alarm condition.

In combined DDM-2000 OC-3 and OC-12 applications, any CO OC-3 shelves that report their TBOS displays via the section DCC to the collocated CO OC-12 in the same subnetwork are subject to the effects of far-end communication provisioning and section DCC failures as described above.

In DDM-2000 OC-3 ring applications, all high-speed section DCCs should be enabled for communications survivability.

The DDM-2000 OC-12 Regenerator does not support remote far-end communication over the section DCC, thus each OC-12 Regenerator must be physically connected to a TBOS link, either directly or through the intrabay multiple cable.

Alarm Groups

When subnetwork sizes were smaller, every NE broadcasted its status to all other NEs in the subnetwork. For DDM-2000 OC-3 Release 7.2-11.X, OC-12 Release 5.X, and FiberReach1.0-2.X, the exchange of NE status information is limited to NEs in the same alarm group. This status information includes:

- Alarm/status level
- User panel condition
- ACO status
- TBOS status
- Parallel telemetry status
- Miscellaneous discrete information.

An alarm group is a set of NEs that share status information between themselves. Alarm groups can be nodes in a ring, nodes of a linear extension, nodes of an OC-12 service, or any other logical grouping such as a maintenance group or geographical group. All NEs are defaulted into an alarm group (number 255). Users provision NEs into alarm groups by assigning each member an alarm group number to support operations interworking and large networks, and to avoid sending unnecessary information to every NE.

For example, 24 NEs could be provisioned into three alarm groups each with eight NEs that share a community of interest. All members of the same alarm group share NE status information but do not share information with other alarm groups.

Depending on provisioning, a member of an alarm group can:

- Know the alarm/status of all members of the same alarm group and, if the NE is at the CO, activate audible office alarms for the alarm group.
- List a report of the alarm or status condition of other NEs in the group.
- Display composites of other member's user panel information. If the site identification of a remote NE is from one to eight, display the user panel status at the site instead of a composite display. As a feature, the same site/NE identification can appear more than once in a subnetwork, as long as it is in different alarm groups. This supports creating large subnetworks by combining several small subnetworks without having to change the site/NE identification.
- Relay other members' parallel telemetry alarm/status closure states to the OS.
- Send and receive miscellaneous discrete alarm/status closure states to and from alarm group members at a CO.
- Send and receive ACO requests to and from members of the same alarm group with the same site number. This supports the ability for a user to activate ACO for a group of NEs having the same site number and subnetwork connectivity to another member NE in the group.

Each NE's alarm group number is provisionable via the CIT **`set-ne`** command. By default, all NEs belong to alarm group number 255, and if not changed, NE status is sent to all NEs in the subnetwork. Those NEs located in a CO can perform alarm activation functions.

Section DCC User Side/Network Side

For DDM-2000 OC-3 Release 6.0-7.2 and OC-12 Release 2.0-3.1, with the open systems interconnect (OSI) protocol on the section DCC, the section DCC user side/network side must be provisioned via hardware switch settings on the OHCTL (BBG7) and BOHTCTL (BCP1) circuit packs. For DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0, FiberReach Release 1.0, and later, the section DCC user side/network side is provisionable via the CIT et-fecom command. There is a separate setting for each possible optical termination on a DDM-2000 Multiplexer. Each *end* (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-fecom** 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 separating the subnetwork. There is no interdependency among multiple section DCCs terminating on the same DDM-2000 Multiplexer.

Network Services Access Point

For DDM-2000 OC-3 Release 6.0-11.X and OC-12 Release 2.0-5.X and FiberReach Release 1.0-2.X, with the OSI protocol on the section DCC, another provisionable parameter is the network services access point, but the factory default values of that software parameter suffice for these releases. The CIT user interface command **ent-ulsdcc** is available but should not be used to change the default 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 DDM-2000 Multiplexer subnetwork. For DDM-2000 OC-3 Release 13.0, OC-12 Release 7.0, FiberReach Release 3.0, and later, NSAP Area Address provisioning is supported as part of the subnetwork partioning, but TBOS is not supported for these releases. Refer to the TL1/X.25 Interface section of this document.

Gateway Network Element

In DDM-2000 OC-3 Release 6.0-7.2, OC-12 Release 2.0-3.1, one DDM-2000 Multiplexer in each subnetwork must be provisioned as the Gateway Network Element (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 when OSI is supported on the DCC, and the DDM-2000 Multiplexer GNE also serves as the directory services network element (DSNE). One DDM-2000 Multiplexer in each subnetwork must be provisioned as the GNE. All other DDM-2000 Multiplexers in the same subnetwork are *not* GNEs. The default is that each DDM-2000 Multiplexer is *not* the GNE.

The DDM-2000 Multiplexer **rtrv-ne** CIT user interface command indicates *if* the queried DDM-2000 Multiplexer is a GNE. In DDM-2000 OC-3 Release 3.0-7.2 and OC-12 Release 1.0-3.1, **rtrv-ne** also includes the *address* of the GNE from the perspective of each queried DDM-2000 Multiplexer.

For DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X, TL1 GNE provisioning has no effect on TBOS.

Alarm Gateway Network Element

For DDM-2000 OC-3 Release 7.2-11.X, OC-12 Release 5.X, and FiberReach 1.0-2.X, one NE in each alarm group must be provisioned as an

alarm gateway network element (AGNE). The AGNE broadcasts NE status information to members of its alarm group. Considerations for choosing an NE as an AGNE include being central to the group to minimize communications links and being easily accessible for maintenance purposes. A backup AGNE can be provisioned to "shadow" the primary AGNE by sending duplicate status reports to members of the group. Any DDM-2000 or FT-2000 (Release 6.0-7.X) in a subnetwork can serve as an AGNE. DDM-2000 can be provisioned as an AGNE via the CIT **`set-ne`** command.

For subnetworks having more than 16 NEs, the AGNE, DSNE, and TL1 GNE should be separate NEs. The AGNE is a "collection point" and does not have to be an NE in a CO, for example.

Directory Services Network Element

For DDM-2000 OC-3 Release 6.0-11.X, OC-12 Release 2.0-5.X, and FiberReach Release 1.0-2.X, supports OSI seven-layer protocol stack architecture over the SONET DCC and Lucent Directory Services. This architecture requires network layer 3 names called NSAPs for addressing NEs while users at remote OSs and at NE CITs use application layer 7 names called target identifiers (TIDs). The single NE in each subnetwork that translates between NSAPs and TIDs is called the directory services network element (DSNE).

Any DDM-2000 or FT-2000 (Release 6.0-7.X) in a subnetwork can serve as the DSNE (except FiberReach). NEs added to a subnetwork are registered automatically by the DSNE and have access to all features. DDM-2000 can be provisioned as the DSNE via the CIT **`set-ne`** command.

Provisioning Examples

Figures 4-1, 4-2, and 4-3 provide examples of TBOS-related provisioning for DDM-2000 Multiplexer.

- Figure 4-1 provides TBOS-related provisioning example for DDM-2000 OC-3 Multiplexer applications only.
- Figure 4-2 provides a TBOS-related provisioning example for a combined DDM-2000 OC-3, OC-12, or OC-12 Regenerator Multiplexer application.
- Figure 4-3 provides TBOS-related provisioning example for a combined DDM-2000 OC-3 and FiberReach Multiplexer application.

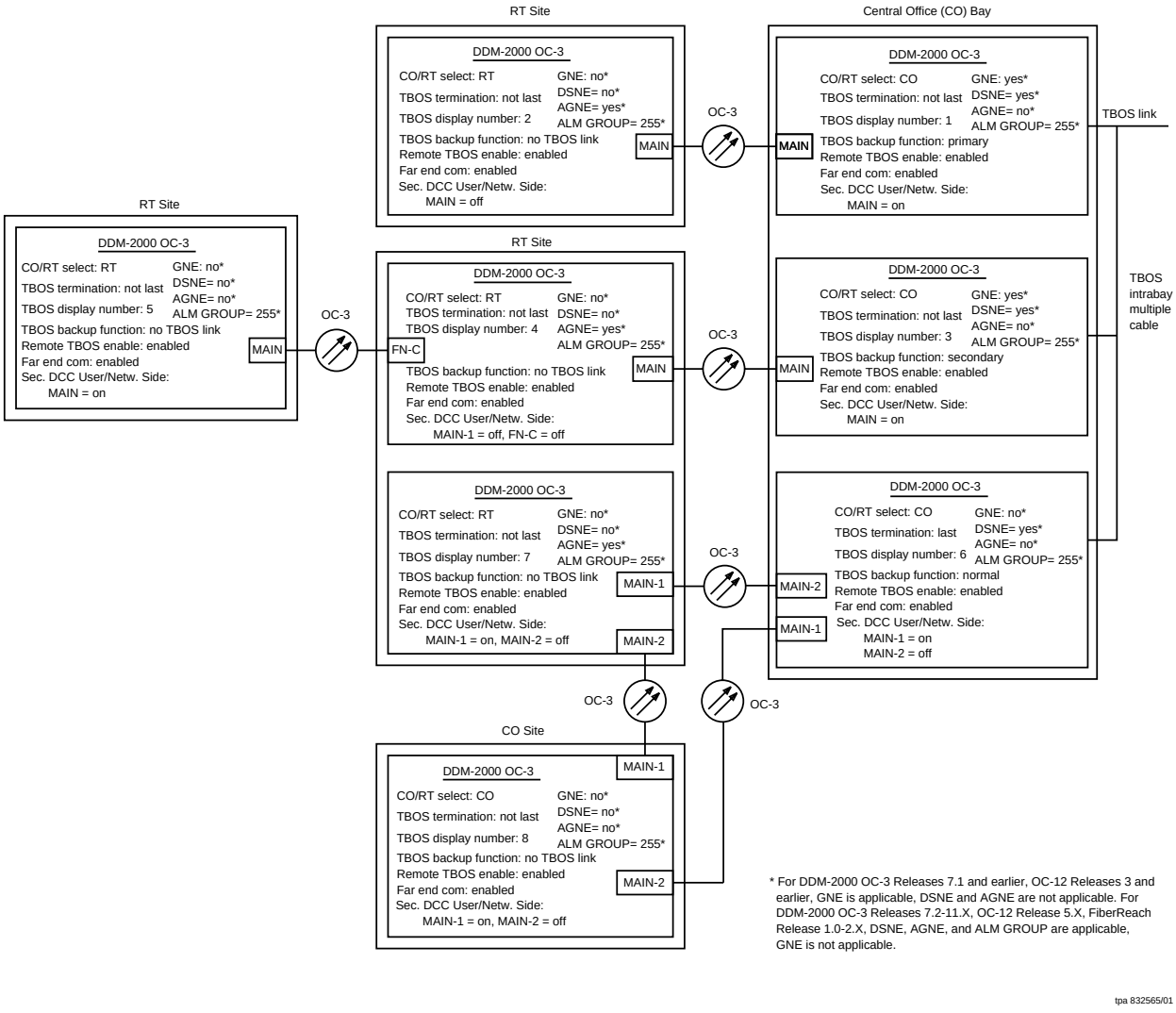


Figure 4-1. Example of TBOS-Related Provisioning for DDM-2000 OC-3 Multiplexer Applications Only

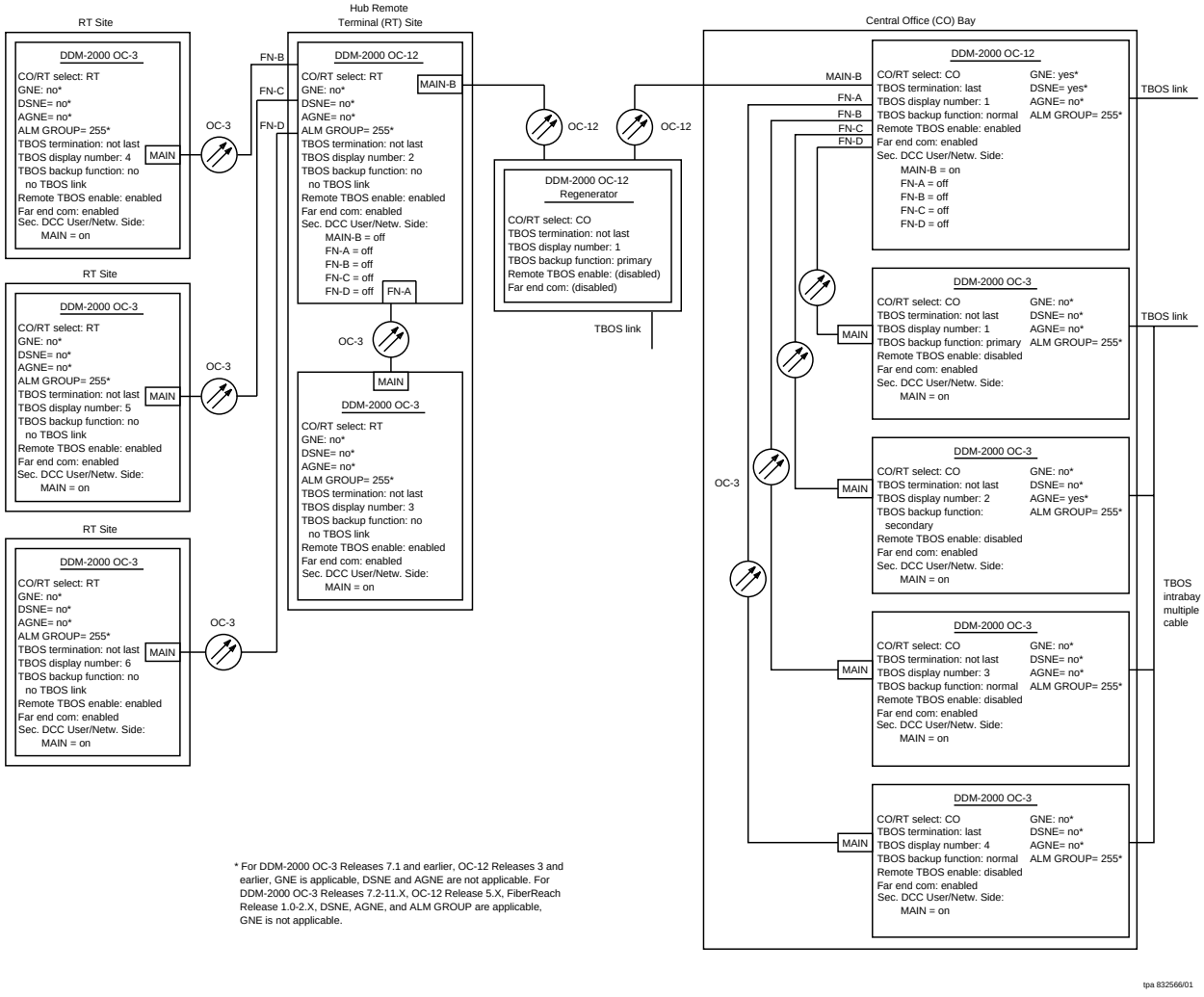


Figure 4-2. Example of TBOS-Related Provisioning for a Combined DDM-2000 OC-3, OC-12, or OC-12 Regenerator Multiplexer Application

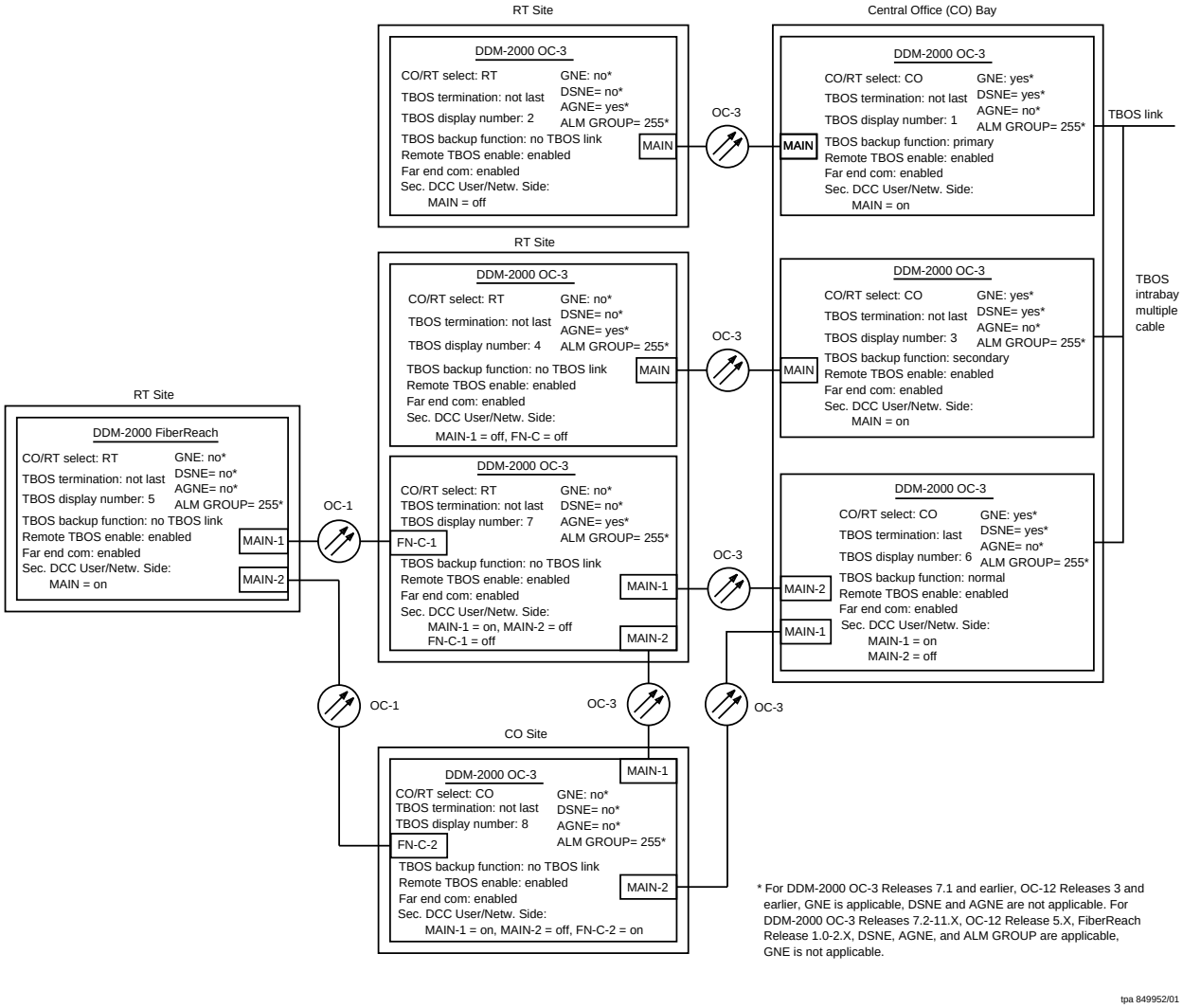


Figure 4-3. Example of TBOS-Related Provisioning for a Combined DDM-2000 OC-3 and FiberReach Multiplexer Application

Multiplexers per Link

A single TBOS link connected to a CO DDM-2000 Multiplexer can be used to support up to eight DDM-2000 Multiplexer shelves. A TBOS link supports eight TBOS alarm and status displays and each DDM-2000 Multiplexer shelf supports one TBOS alarm and status display. Thus, for example, four point-to-point linear OC-3 applications can be supported via a single TBOS link by physically connecting the TBOS link to one of the CO DDM-2000 Multiplexers and connecting the other three CO DDM-2000 Multiplexers in the same bay via the intrabay multiple cable (refer to OC-3 Application Schematic SD-7C510-01, CADs 15 and 16).

Multiple CO OC-3, OC-12, and/or OC-12 Regenerator shelves in the same bay can be connected to the same TBOS link via the intrabay multiple cable. (Refer to OC-12 Application Schematic SD-7C513-01, CADs 12 and 13.) In applications with more than eight DDM-2000 Multiplexers in the same subnetwork, the provisionable remote TBOS enable or alarm group (see above) parameter should be used.

Tests

The DDM-2000 Multiplexer supports serial telemetry (TBOS) display testing via the CIT user interface command **`test-tlm-ser`**. Refer to the appropriate user/service manual. (See the **Related Documentation** paragraph in the ***About This Document*** section.)

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).

Alarm and Status Points — DDM-2000 OC-3

Table 4-1 summarizes the DDM-2000 OC-3 TBOS alarm and status display.

Table 4-1. DDM-2000 OC-3 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/OC1* Signal Failure (LOS+LOF*+SF/SD +STS1 LOP* +EC1 AIS*)		
3	NSA	Incoming OC-3/OC-12** Signal Failure (LOS+LOF+SF +STS1/STS3C† LOP)		
4	SA	Incoming OC-3/OC-12** Signal Failure (LOS+LOF+SF+AIS)		
5	SA	Incoming STS1/STS3C† LOP (on OC-1, OC-3 or OC-12**)		
6	SA	Incoming VT Path AIS‡/LOP/Path Signal/Degrade Unequipped		
7	NSA	Incoming OC-3/OC-12** Signal Degrade		
8	SA	Incoming OC-3/OC-12** Signal Degrade/STS Path AIS‡/Signal Failures§/Degrade Unequipped		
9	NSA	Synchronization Equipment Failure		
10	SA			
11	NSA	Multiplex Equipment Failure		
12	SA			
13	NSA	Fuse/Power Circuit Failure		
14	NSA	Controller Failure/Provisioning Error		
15	NSA	OC-3/OC-12 Optical Terminating Equipment Failure or OC-12 FacePlate Connector**		
16	SA			
17	NSA	DS1 Terminating Equipment Failure or Illegal CP Type		
18	SA			
19	NSA	Jumper Card DS3/EC1*/OC1/TMUX Terminating Equipment Failure (CP removed)		
20	SA			
21	NSA	Section Data Comm. Channel (DCC/LAN) Failure/Provisioning Error		
22	NSA	Incoming OC-1 Signal Failure (LOS+LOF++STS1 LOP+ AIS)		
23	NSA	DS1 Terminating Equipment APS - Automatic Lockout		
24	NSA	OC-3 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 OC-3/OC-12** Line AIS		
30	NSA	Incoming VT Path AIS/LOP/Path Signal Degrade§		
31	NSA	Incoming STS Path AIS/Signal Failure/Signal Degrade/DS3 AIS/OOF§		
32	SA	Excessive Sync. Holdover		

See **Note** and footnotes at end of table.

Table 4-1. DDM-2000 OC-3 TBOS Alarm and Status Points (Contd)

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
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	Fan Shelf Failure	NSA	Misc. Discrete Env. Alarm/Status 14
47	Alarm	Reserved for Future Alarm Use	NSA	External Minor
48	Alarm	Reserved for Future Alarm Use	NSA	Fan Control Relay Failure
49	Status	Inhibit Sync. Equipment Protection Switching		
50	Status	Inhibit DS1 Sync. Ref. Protection Switching		
51	Status	Holdover Mode Active		
52	Status	Incoming OC-3/OC-12** Line FERF		
53	Status	Manual Forced/Inhibit/Lockout OC-3 Line Prot. Switching ¶		
54	Status	Manual Forced/Inhibit/Lockout 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/OC-1 line FERF		
61	Status	Incoming VT Path Yellow		
62	Status	Unexpected CP Type (24G-U OC-12 Interface)		
63	Status	Reserved for Future Status Use		
64	–	TBOS Telemetry Link Failure		

See **Note** and footnotes at end of table.

Table 4-1. DDM-2000 OC-3 TBOS Alarm and Status Points (Contd)

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. The telemetry remote station constants should assign attributes to the OC-3 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

* Release 5.1 and later EC1 interfaces only.

† Release 6.1 and later STS3C signals only. In Release 6.0, STS3C LOP conditions are reported as individual STS1 LOP conditions.

‡ Release 3.2 and later.

§ Release 5.0 and later ring releases.

¶ Not applicable to the main OC-3 lines in ring applications.

** Release 11.0 and later ring releases (MAIN slots equipped with 24G-U OLIUs)

The following explanations are provided for the OC-3 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 OC-3 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 Descriptions Table (Table 3-4).

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 363-206-202, *OC-3 Multiplexer User/Service 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/OC-1 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 (OC-3 Release 5.1 and later)
- inc. EC1 LOF (OC-3 Release 5.1 and later)
- inc. EC1 LOS (OC-3 Release 5.1 and later)
- inc. EC1 sig degrade (BER) (OC-3 Release 5.1 and later)
- inc. EC1 sig failed (BER) (OC-3 Release 5.1 and later)
- inc. STS1 LOP EC1 (OC-3 Release 5.1 and later)
- inc OC1 LOF
- inc OC1 LOS
- inc OC1 sig failed (BER)
- inc OC1 line AIS
- inc OC1 sig degrade (BER)

The condition is service-affecting.

Alarm Point 3 — **Incoming OC-3 Signal Failure (LOS + LOF + SF + STS1/STS3C LOP)** — indicates if at least one of the following is detected:

- inc. OC-3 LOF
- inc. OC-3 LOS
- inc. OC-3 sig failed (BER)
- inc. STS1 LOP OC-3 *slotaid*
- inc. STS3C LOP OC-3 *slotaid* (OC-3 Release 6.1 and later)

The condition is protected; thus it is non-service-affecting.

Alarm Point 4 — **Incoming OC-3 Signal Failure (LOS + LOF + SF + AIS)** — indicates if at least one of the following is detected:

- inc. OC-3 line AIS
- inc. OC-3 LOF
- inc. OC-3 LOS

- `inc. OC-3 sig failed (BER)`

The condition is not protected; thus it is service-affecting.

Alarm Point 5 — **Incoming STS1/STS3C LOP (on OC-3)** — indicates if the following is detected:

- `inc. STS1 LOP OC-3 slotaid`
- `inc. STS3C LOP OC-3 slotaid` (OC-3 Release 6.1 and later)

The condition is not protected; thus it is service-affecting.

Alarm Point 6 — **Incoming VT AIS/LOP** — indicates if at least one of the following is detected:

- `inc. VT AIS` (OC-3 Release 3.2 and later)
- `inc. VT LOP`
- `inc. VT signal degrade` (OC-3 Release 7.0 and later ring releases)
- `inc. VT unequipped` (OC-3 Release 7.1 and later ring releases)

The condition is service-affecting.

Alarm Point 7 — **Incoming OC-3 Signal Degrade** — indicates if the following is detected:

- `inc. OC-3 sig. degrade (BER)`

The condition is protected; thus it is non-service-affecting.

Alarm Point 8 — **Incoming OC-3 Signal Degrade/STS Path AIS/Signal Failure** indicates if at least one of the following is detected:

- `inc. OC-3 sig. degrade (BER)`
- `inc. STS1 AIS` (OC-3 Release 3.2 and later)
- `inc. STS1 sig. failed (BER)` (DDM-2000 Multiplexer ring releases only)
- `inc. STS1 sig degrade (BER)` (OC-3 Release 7.1 and later ring releases)
- `inc. STS1 unequipped` (OC-3 Release 7.1 and later ring releases)

The condition is not protected; thus it is service-affecting.

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 OC-3 Application Schematic SD-7C510-01, CADs 18 and 34, P62 pin 18.

The condition is protected; thus it is non-service-affecting.

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 (OC-3 Release 6.0 through 7.1)
- duplicate site/ne address
- duplicate TBOS display
- duplicate TID
- OHCTL CP failed
- SYSCTL CP failed
- TID address map full (OC-3 Release 6.0 and later)
- TLMCTL CP failed (OC-3 Release 1.0 only)
- unexpected CP switches (in SYSCTL or AUXCTL slot)
- unexpected CP type (in AUXCTL slot)

- AGNE communication failure
- intersubsysbus communication link failed

The condition is non-service-affecting but may mask service-affecting 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 (OC-3 Release 5.1 and later)
- illegal CP type
- unexpected CP present (OC-3 Release 3.1 and earlier only)
- unexpected CP switches
- unexpected CP type

The condition is protected; thus it is non-service-affecting.

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 (OC-3 Release 5.1 and later)
- illegal CP type
- unexpected CP switches
- unexpected CP type

The condition is not protected; thus it is service-affecting.

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` (OC-3 Release 6.0 and later)
- `CP not allowed - (crs)`
- `CP not allowed - (timing)`
- `CP removed`
- `DS3 CP failed`
- `illegal CP type`
- `STS1E_H CP failed` (OC-3 Release 6.0 and later)
- `STS1E_L CP failed` (OC-3 Release 5.1 and later)
- `unexpected CP type`
- `BBF5 required in LS-8` (OC-3 Release 9.0 and later ring releases)

Alarm Point 21 — **Data Communications Channel (DCC) Failure/Provisioning Error** — indicates if the following is detected:

- `inconsistent DCC switches` (OC-3 Release 6.0 and later)
- `section DCC channel failed`

The condition is non-service-affecting.

Alarm Point 22 — **Incoming DS3/EC1/OC-1 Signal Failure** — (OC-3 Release 9.0 and later ring releases) indicates at least one of the following is detected:

- `inc. OC1 LOF`
- `inc. OC1 LOS`
- `inc. OC1 signal failed (BER)`
- `inc. OC1 line AIS`
- `inc. OC1 signal degrade (BER)`

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.

Alarm Point 24 — **OC-3 APS Channel Failure** — indicates if the following is detected:

- APS `channel failed` (Not applicable to ring applications without linear OC-3 extensions)

The condition is non-service-affecting.

Alarm Points 25 and 26 — **DS1 Synchronous Reference 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 Synchronous Reference signal, the system automatically goes into synchronization holdover mode; thus the condition is non-service-affecting.

Alarm Point 27 — **PM Summary TCA** — indicates if at least one 15-minute or one-day PM TCA is detected during the current 15-minute or one-day interval, respectively. The condition is non-service-affecting. This alarm point is set **ON** only 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 3-6.

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. This alarm point will be set **ON** only for the minimum 20 seconds, then turned **OFF** automatically for each such control point received.

Alarm Point 29 — **Incoming OC-3 Line AIS** — indicates if the following is detected:

- `inc. OC-3 line AIS`

The condition is non-service-affecting. If the condition is unprotected, TBOS alarm point 4, incoming OC-3 signal failure, is also triggered to indicate the condition is service-affecting.

Alarm Point 30 — **Incoming VT Path AIS/LOP** — indicates if at least one of the following is detected:

- `inc. VT AIS` (OC-3 Release 3.1 and earlier, and OC-3 VT-path-switched rings)
- `inc. VT LOP` (OC-3 VT-path-switched rings only)
- `inc. VT signal degrade` (OC-3 Release 7.0 and later ring releases)
- `inc. VT unequipped` (OC-3 Release 7.1 and later ring releases)

The condition is non-service-affecting.

Alarm Point 31 — **Incoming STS Path AIS/Signal Failure** — indicates if at least one of the following is detected:

- `inc. STS1 AIS` (OC-3 Release 3.1 and earlier, and DDM-2000 Multiplexer ring releases)
- `inc. STS1 sig failed (BER)` (DDM-2000 Multiplexer ring releases only)
- `inc. STS1 signal degrade (BER)`
- `inc. STS1 unequipped` (OC-3 Release 7.1 and later ring releases)

The condition is non-service-affecting.

Alarm Point 32 — **Excessive Synchronous Holdover** — indicates if the following is detected:

- `excessive holdover`

The condition may be service-affecting because it may cause degraded performance (high error rates) on the transmitted and/or received signals. When 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 — **Fan Shelf Failure** — indicates if the following is detected:

- `fan shelf failed`

The condition is non-service-affecting.

CO Alarm Points 47 – 48 — reserved for future alarm use (may be assigned in a later release).

RT Alarm Points 33 – 46 — **Miscellaneous Discrete Environment Alarm/Status 1 through 14** — indicate if the following is detected at a remote terminal (RT) site:

- `environment`*`xx`*

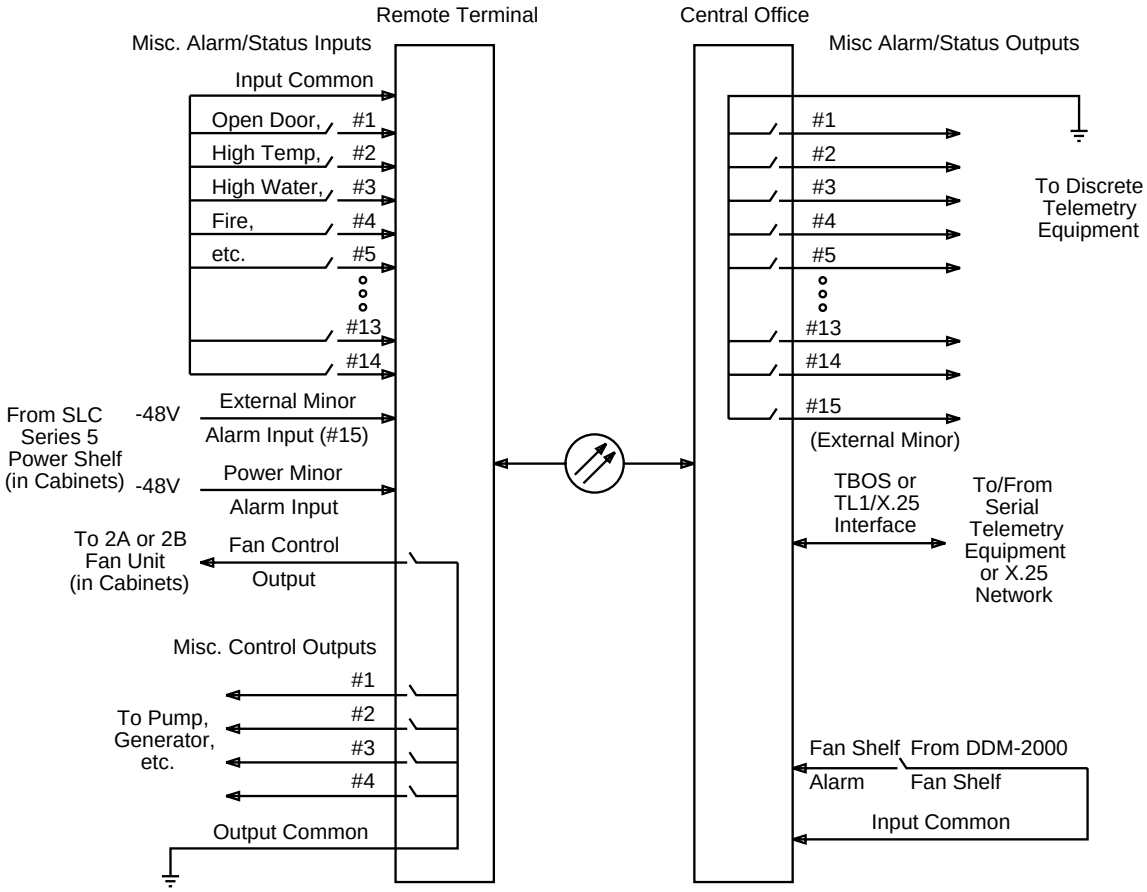
The conditions are non-service affecting. Because these miscellaneous discrete environmental alarm and status points are user settable, the text description of the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point can be provisioned by the user.

In controlled environment vault (CEV) applications using DDM-2000 Multiplexer miscellaneous discrete environmental alarm and status points (for example, with the TBOS CO/RT Select provisioned to be RT) and with a DDM-2000 Multiplexer fan shelf equipped, RT miscellaneous discrete environmental alarm point #14 should monitor the fan shelf. In such cases the RT miscellaneous discrete environmental alarm point should be provisioned with description "FanShelfFailed" and the default alarm ("MN"). This assures consistency with similar CO applications with the fan shelf equipped and monitored by TBOS CO

point 46, fan shelf failed.

Figures 4-4, 4-5, and 4-6 show the miscellaneous discrete environmental alarms and controls for TBOS or TL1/X.25 at the CO.

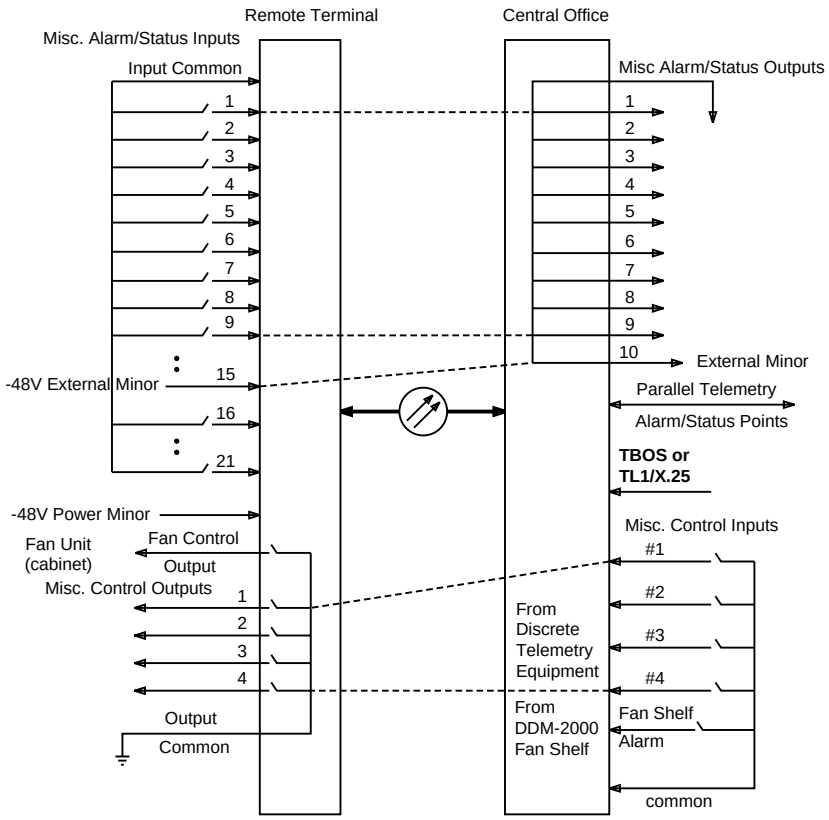
- Figure 4-4 provides the DDM-2000 OC-3/OC-12 miscellaneous discrete environmental alarms and controls (BBG5 SYSCTL) for TBOS or TL1/X.25 at the central office.
- Figure 4-5 provides the DDM-2000 OC-3/OC-12 miscellaneous discrete environmental alarms and controls (BBG8 SYSCTL) for TBOS or TL1/X.25 at the central office.
- Figure 4-6 provides the FiberReach miscellaneous discrete environmental alarms and controls for TBOS or TL1/X.25 at the central office.



Notes:

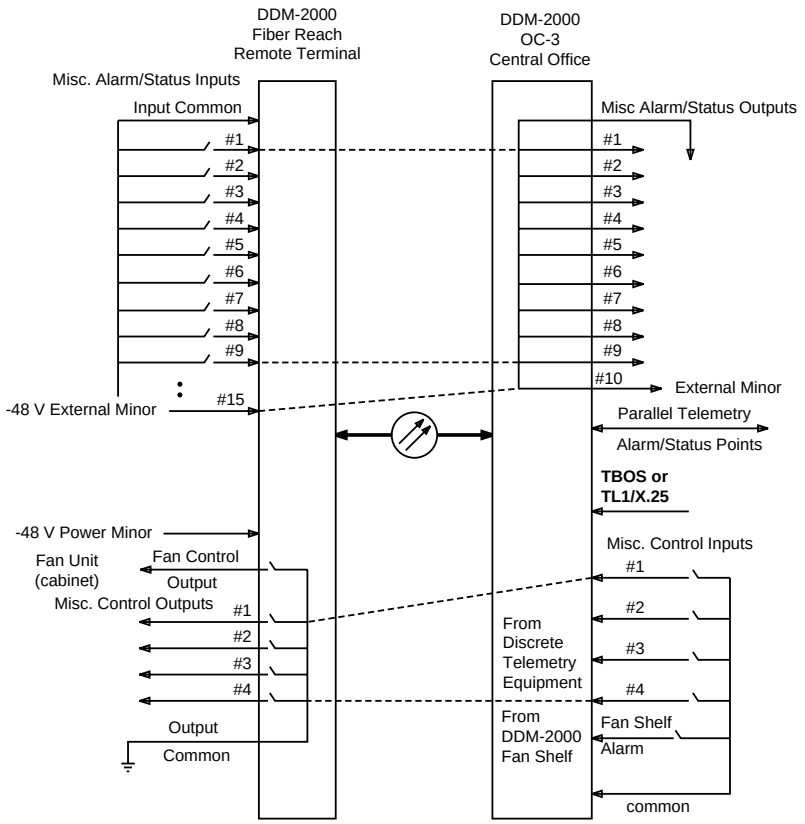
1. In a remote terminal, the output common must be wired to ground in all applications.
2. Miscellaneous alarm input #1 is typically wired to open door alarm in Lucent Technologies cabinets.
3. Miscellaneous alarm input #14 is typically wired to the DDM-2000 Multiplexer fan shelf alarm in controlled environment remote terminal applications where the DDM-2000 Multiplexer fan shelf is required.

Figure 4-4. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG5 SYSCTL (TBOS or TL1/X.25 at Central Office)



Miscellaneous alarm input #14 is typically wired to fan shelf alarm in controlled environment remote terminal applications where the fan shelf is required. If the BBG8 SYSCTL circuit pack is used at the CO, the fan alarm can be wired to misc discrete 1-9 at the remote site if a parallel telemetry output at the CO is required.

Figure 4-5. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG8 SYSCTL (TBOS or TL1/X.25 at Central Office)



Miscellaneous alarm input #14 is typically wired to fan shelf alarm in controlled environment remote terminal applications where the fan shelf is required. If the BBG8 SYSCTL circuit pack is used at the CO, the fan alarm can be wired to misc discrete 1-9 at the remote site if a parallel telemetry output at the CO is required.

Figure 4-6. FiberReach 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. This condition is based on the wired input to OC-3 Application Schematic SD-7C510-01, CADs 18 and 34, P62 pin 4. 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.

RT Alarm Point 48 — **Fan Control Relay Failure** — indicates if the following is detected:

- `fan control relay failed`

The condition is non-service-affecting.

Status Point 49 — **Inhibit Synchronous Equipment Protection Switching** — indicates if the following is detected:

- `inhibit switch` (for TGS CP)

Status Point 50 — **Inhibit DS1 Synchronous Reference 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 — **OC-3 Line FERF** — indicates if the following is detected:

- `inc. OC-3 FERF`

Status Point 53 — **Manual Forced/Inhibit/Lockout OC-3 Line Protection Switching** — indicates if at least one of the following is detected for an OC-3 line:

- `forced switch`
- `inhibit switch`
- `lockout of protection`

Status Point 54 — **Manual Forced/Inhibit Function Unit Equipment Protection 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` (OC-3 Release 5.1 and later)
- `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 (see Table 4-4 containing a list of OC-3 TBOS control points). This status point will be set **ON** only for the minimum 20seconds, 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`
- `inc. OC1` FERF (OC-3 Release 9.0 and later ring releases)

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 DDM-2000 Multiplexer fails. The telemetry remote controls this point.

Alarm and Status Points — DDM-2000 OC-12

Table 4-2 summarizes the DDM-2000 OC-12 TBOS alarm and status display.

Table 4-2. DDM-2000 OC-12 TBOS Alarm and Status Points

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
1	SA	Incoming DS3/EC1 Signal Failure (LOS+LOF+SF/SD+STS1 LOP+EC1 AIS)		
2	NSA	Incoming OC3 Signal Failure (LOS+LOF+SF +STS1/STS3c* LOP)		
3	SA	Incoming OC3 Signal Failure (LOS+LOF+SF+AIS)		
4	NSA	Incoming OC12 Signal Failure (LOS+LOF+SF +STS1/STS3c* LOP)		
5	SA	Incoming OC12 Signal Failure (LOS+LOF+SF+AIS)		
6	SA	Incoming STS1/STS3C* LOP (on OC3/OC12)		
7	NSA	Incoming OC3/OC12 Signal Degrade		
8	SA	Incoming OC3/OC12 Signal Degrade/STS Path AIS†/Signal Failure Degrade/STS Unequipped		
9	NSA	Synchronization Equipment Failure/Frequency Error		
10	SA			
11	NSA	TSI Equipment Failure		
12	SA			
13	NSA	Fuse/Power Circuit Failure		
14	NSA	Controller Failure/Provisioning Error		
15	NSA	Optical Terminating Equipment Failure or illegal CP type.		
16	SA			
17	NSA	DS3/EC1 Terminating Equipment Failure		
18	SA			
19	NSA	OC-3/OC-12 APS Channel Failure		
20	Alarm	Reserved for Future Alarm Use		
21	NSA	Section Data Comm. Channel (DCC) Failure/Provisioning Error		
22	NSA	Protected DS1 Sync. Ref. Failure		
23	NSA	Unprotected DS1 Sync. Ref. Failure		
24	NSA	PM Summary TCA		
25	NSA	Incoming OC3 Line AIS		
26	NSA	Incoming OC12 Line AIS		
27	NSA	Incoming STS Path AIS/Signal Failure/Degrade/STS Unequipped		
28	Alarm	Reserved for Future Alarm Use		
29	Alarm	Reserved for Future Alarm Use		
30	NSA	Invalid TBOS Command Received		
31	SA	Excessive Sync. Holdover		
32	Alarm	Reserved for Future Alarm Use		

See **Note** and footnotes at end of table.

Table 4-2. DDM-2000 OC-12 TBOS Alarm and Status Points (Contd)

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
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	Fan Shelf Failure	NSA	Misc. Discrete Env. Alarm/Status 14
47	Alarm	Reserved for Future Alarm Use	NSA	External Minor
48	Alarm	Reserved for Future Alarm Use	NSA	Fan Control Relay Failure
49	Status	Inhibit Sync. Equipment Protection Switching		
50	Status	Inhibit DS1 Sync. Ref. Protection Switching		
51	Status	Holdover Mode Active		
52	Status	Incoming OC-3/OC-12 Line FERF		
53	Status	Manual Forced/Inhibit/Lockout OC-3 Line Prot. Switching‡		
54	Status	Manual Forced/Inhibit/Lockout OC12 Line Prot. Switching		
55	Status	Manual Forced/Inhibit TSI Equipment Prot. Switching		
56	Status	Manual Forced/Inhibit DS3/EC1 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	Reserved for Future Status Use		
62	Status	Reserved for Future Status Use		
63	Status	Reserved for Future Status Use		
64	–	TBOS Telemetry Link Failure		

See **Note** and footnotes at end of table.

Table 4-2. DDM-2000 OC-12 TBOS Alarm and Status Points (Contd)

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. The telemetry remote station constants should assign attributes to the DDM-2000 OC-12 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.

* Release 2.1 and later STS3C signals only. In Release 2.0, STS3C LOP conditions are reported as individual STS1 LOP conditions.

† Release 1.2 and later.

‡ Not applicable to the Main OC-12 lines in ring applications.

The following explanations are provided for the DDM-2000 OC-12 TBOS alarm and status points listed in Table 4-2. The specific conditions that may trigger each point are listed, using exactly the same condition descriptions used in the OC-12 user interface alarm and status report (for example, `inc. DS3 LOS`). For detailed explanations and likely causes of these conditions, refer to Table 3-4.

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 363-206-207, *OC-12 Multiplexer User/Service 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 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 degrade`
- `inc. (from DSX) DS3 sig fail`
- `inc. EC1 line AIS`
- `inc. STS1 LOP`
- `inc. EC1 LOF`
- `inc. EC1 LOS`
- `inc. EC1 signal degrade (BER)`
- `inc. EC1 signal failed (BER)`

Alarm Point 2 — **Incoming OC-3 Signal Failure (LOS + LOF + SF + STS1/STS3C LOP)** — indicates if at least one of the following is detected:

- `inc. OC-3 LOF`
- `inc. OC-3 LOS`
- `inc. OC-3 sig failed (BER)`
- `inc. STS1 LOP OC-3 slotaid`
- `inc. STS3C LOP OC-3 slotaid` (OC-12 Release 2.1 and later)
- `inc. STS3C LOP OC-12 slotaid` (OC-12 Release 2.1 and later)

The condition is protected; thus it is non-service-affecting.

Alarm Point 3 — **Incoming OC-3 Signal Failure (LOS + LOF + SF + AIS)** — indicates if at least one of the following is detected:

- `inc. OC-3 line AIS`
- `inc. OC-3 LOF`
- `inc. OC-3 LOS`
- `inc. OC-3 sig failed (BER)`

The condition is not protected; thus it is service-affecting.

Alarm Point 4 — **Incoming OC-12 Signal Failure (LOS + LOF + SF + STS1 LOP)** — indicates if at least one of the following is detected:

- `inc. OC-12 LOF`
- `inc. OC-12 LOS`
- `inc. OC-12 sig failed (BER)`
- `inc. STS1 LOP OC-12 slotaid`

The condition is protected; thus it is non-service-affecting.

Alarm Point 5 — **Incoming OC-12 Signal Failure (LOS + LOF + SF + AIS)** — indicates if at least one of the following is detected:

- `inc. OC-12 line AIS`
- `inc. OC-12 LOF`
- `inc. OC-12 LOS`
- `inc. OC-12 sig failed (BER)`

The condition is not protected; thus it is service-affecting.

Alarm Point 6 — **Incoming STS1/STS3C LOP (on OC-3/OC-12)** — indicates if at least one of the following is detected:

- `inc. STS1 LOP OC-3 slotaid`
- `inc. STS1 LOP OC-12 slotaid`
- `inc. STS3C LOP OC-3 slotaid` (OC-12 Release 2.1 and later)
- `inc. STS3C LOP OC-12 slotaid` (OC-12 Release 2.1 and later)

The condition is not protected; thus it is service-affecting.

Alarm Point 7 — **Incoming OC-3/OC-12 Signal Degrade** — indicates if at least one of the following is detected:

- `inc. OC-3 sig. degrade (BER)`
- `inc. OC-12 sig. degrade (BER)`

The condition is protected; thus it is non-service-affecting.

Alarm Point 8 — **Incoming OC-3/OC-12 Signal Degrade/STS1 Path AIS** — indicates if at least one of the following is detected:

- `inc. OC-3 sig. degrade (BER)`
- `inc. OC-12 sig. degrade (BER)`

- inc. STS1 AIS (OC-12 Release 1.2 and later)
- inc. STS1 signal degrade (BER)
- inc. STS1 signal failed
- inc. STS1 unequipped

The condition is not protected; thus it is service-affecting.

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 — **TSI Equipment Failure** — indicate if at least one of the following is detected in a TSI slot:

- CP removed
- illegal CP type
- TSI 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 OC-12 Application Schematic SD-7C513-01, CADs 15 and 31, P68 pin 9.

The condition is protected; thus it is non-service-affecting.

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 (OC-12 Release 2.0 through 3.1)
- duplicate site/ne address

- duplicate TBOS display
- duplicate TID
- OHCTL CP failed
- SYSCTL CP failed
- TID address map full (OC-12 Release 2.0 and later)
- unexpected CP switches (in SYSCTL or AUXCTL slot)
- AGNE communication failure (Release 4.0 and later)

The condition is non-service-affecting but may mask service-affecting conditions.

Alarm Point 15 — **Optical Terminating Equipment Failure** — indicates if at least one of the following is detected:

- CP removed
- illegal CP type
- OLIU CP failed
- unexpected CP present (OC-12 Release 1.0 only)
- unexpected CP switches
- unexpected CP type

The condition is protected; thus it is non-service-affecting.

Alarm Point 16 — **Optical Terminating Equipment Failure** — indicates if at least one of the following is detected:

- CP removed
- illegal CP type
- OLIU CP failed
- unexpected CP switches
- unexpected CP type

The condition is not protected; thus it is service-affecting.

Alarm Points 17 and 18 — **DS3 Terminating Equipment Failure** — indicate if at least one of the following is detected in a function unit (FN) slot:

- 3DS3 CP failed

- `CP removed`
- `illegal CP type`
- `unexpected CP type`

Alarm Point 19 — **OC-3/OC-12 APS Channel Failure** — indicates if the following is detected:

- `APS channel failed`

The condition is non-service-affecting.

Alarm Point 20 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 21 — **Section Data Communications Channel (DCC) Failure/Provisioning Error** — indicates if the following is detected:

- `inconsistent DCC switches` (OC-12 Release 2.0 and later)
- `section DCC channel failed`

The condition is non-service-affecting.

Alarm Points 22 and 23 — **DS1 Synchronous Reference 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 Synchronous Reference signal, the system automatically goes into synchronization holdover mode; thus the condition is non-service-affecting.

Alarm Point 24 — **PM Summary TCA** — indicates if at least one 15-minute or one-day PM TCA is detected during the current 15-minute or one-day interval, respectively. The condition is non-service-affecting. This alarm point is set **ON** only 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 3-7.

Alarm Point 25 — **Incoming OC-3 Line AIS** — indicates if the following is detected:

- `inc. OC-3 line AIS`

The condition is non-service-affecting. (If the condition is unprotected, TBOS alarm point 3, incoming OC-3 signal failure, is also triggered to indicate the condition is service-affecting.)

Alarm Point 26 — **Incoming OC-12 Line AIS** — indicates if the following is detected:

- `inc. OC-12 line AIS`

The condition is non-service-affecting. (If the condition is unprotected, TBOS alarm point 5, incoming OC-12 signal failure, is also triggered to indicate the condition is service-affecting.)

Alarm Point 27 — **Incoming STS Path AIS** — indicates if the following is detected:

- `inc. STS1 AIS` (OC-12 Release 1.1 and earlier, and OC-12 ring releases)
- `inc. STS1 signal degrade (BER)`
- `inc. STS1 signal failed (BER)`
- `inc. STS1 unequipped`

The condition is non-service-affecting.

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 (see Table 4-5 containing a list of OC-12 TBOS Control Points). This condition is non-service-affecting. This alarm point will be set **ON** only for the minimum 20 seconds, then turned **OFF** automatically for each such control point received.

Alarm Point 29 — **Excessive Sync. Holdover** — indicates if the following is detected:

- `excessive holdover`

The condition may be service-affecting because it may cause degraded performance (high error rates) on the transmitted and/or received signals. When this condition exists, TBOS status point 51 (holdover mode active) is also set.

Alarm Points 30 – 32 — reserved for future alarm use (may be assigned in a later release).

CO Alarm Points 33 – 45 — reserved for future alarm use (may be assigned in a later release).

CO Alarm Point 46 — **Fan Shelf Failure** — indicates if the following is detected:

- `fan shelf failed`

The condition is non-service-affecting.

CO Alarm Points 47 – 48 — reserved for future alarm use (may be assigned in a later release).

RT Alarm Points 33 – 46 — **Miscellaneous Discrete Environment Alarm/Status 1 through 14** — indicate if the following is detected at a remote terminal (RT) site:

- `environment`*`xx`*

The conditions are non-service-affecting. 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.

In controlled environment vault (CEV) applications using DDM-2000 Multiplexer miscellaneous discrete environmental alarm and status points (with the TBOS CO/RT Select provisioned to be RT) and with a DDM-2000 Multiplexer fan shelf equipped, RT miscellaneous discrete environmental alarm point #14 should monitor the fan shelf. In such cases the RT miscellaneous discrete environmental alarm point should be provisioned with description "FanShelfFailed" and the default alarm ("MN"). That assures consistency with similar CO applications with the fan shelf equipped and monitored by TBOS CO point 46 fan shelf failed.

Figures 4-4, 4-5, and 4-6 show the miscellaneous discrete environmental alarms and controls for TBOS at the central office.

RT Alarm Point 47 — **External Minor** — indicates if the following is detected:

- `ExternalMinor`

The condition is non-service-affecting. This condition is based on the wired input to OC-12 Application Schematic - SD-7C513-01, CADs 15 and 31, P68 pin 2. 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 — **Fan Control Relay Failure** — indicates if the following is detected:

- `fan control relay failed`

The condition is non-service-affecting.

Status Point 49 — **Inhibit Sync. Equipment Protection Switching** — indicates if the following is detected:

- `inhibit switch` (for TGS CP)

Status Point 50 — **Inhibit DS1 Synchronous Reference 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 — **OC-3/OC-12 Line FERF** — indicates if at least one of the following is detected:

- `inc. OC-3 FERF`
- `inc. OC-12 FERF`

Status Point 53 — **Manual Forced/Inhibit/Lockout OC-3 Line Protection Switching** — indicates if at least one of the following is detected for an OC-3 line:

- `forced switch`
- `inhibit switch`
- `lockout of protection`

Status Point 54 — **Manual Forced/Inhibit/Lockout OC-12 Line Protection Switching** — indicates if at least one of the following is detected for an OC-12 line:

- `forced switch`
- `inhibit switch`
- `lockout of protection`

Status Point 55 — **Manual Forced/Inhibit TSI Equipment Protection Switching** — indicates if at least one of the following is detected for equipment in a TSI slot:

- `forced switch`
- `inhibit switch`

Status Point 56 — **Manual Forced/Inhibit DS3 Terminating Equipment Protection Switching** — indicates if at least one of the following is detected in a function unit (FN) slot:

- `forced switch`
- `inhibit switch`

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`
- `DS3 loopback`
- `DS3 trmsn test IP`
- `EC1 loopback` (OC-3 Release 5.1 and later)
- `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 (see Table 4-5 containing a list of OC-12 TBOS control points). This status point will be set **ON** only 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 Points 61 – 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 DDM-2000 Multiplexer fails. The telemetry remote controls this point.

Alarm and Status Points — DDM-2000 OC-12 Regenerator

Table 4-3 summarizes the DDM-2000 OC-12 Regenerator TBOS alarm and status display.

Table 4-3. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Points

Point	Type (Note)	Central Office Condition
1	Alarm	Reserved for Future Alarm Use
2	Alarm	Reserved for Future Alarm Use
3	Alarm	Reserved for Future Alarm Use
4	Alarm	Reserved for Future Alarm Use
5	SA	Incoming OC-12 Signal Failure (LOS)
6	Alarm	Reserved for Future Alarm Use
7	Alarm	Reserved for Future Alarm Use
8	Alarm	Reserved for Future Alarm Use
9	NSA	Illegal CP Type (in TG slot)
10	Alarm	Reserved for Future Alarm Use
11	NSA	Illegal CP Type (in TSI slot)
12	Alarm	Reserved for Future Alarm Use
13	NSA	Fuse/Power Circuit Failure
14	NSA	Controller Failure/Provisioning Error
15	NSA	Illegal CP Type (in OLIU slot)
16	SA	Optical Terminating Equipment Failure
17	NSA	Illegal CP Type (in FN slot)
18	Alarm	Reserved for Future Alarm Use
19	Alarm	Reserved for Future Alarm Use
20	Alarm	Reserved for Future Alarm Use
21	Alarm	Reserved for Future Alarm Use
22	Alarm	Reserved for Future Alarm Use
23	Alarm	Reserved for Future Alarm Use
24	NSA	PM Summary TCA
25	Alarm	Reserved for Future Alarm Use
26	Alarm	Reserved for Future Alarm Use
27	Alarm	Reserved for Future Alarm Use
28	NSA	Invalid Command Received
29	Alarm	Reserved for Future Alarm Use

See **Note** at end of table.

Table 4-3. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Points (Contd)

Point	Type (Note)	Central Office Condition
30	Alarm	Reserved for Future Alarm Use
31	Alarm	Reserved for Future Alarm Use
32	Alarm	Reserved for Future Alarm Use
33	Alarm	Reserved for Future Alarm Use
34	Alarm	Reserved for Future Alarm Use
35	Alarm	Reserved for Future Alarm Use
36	Alarm	Reserved for Future Alarm Use
37	Alarm	Reserved for Future Alarm Use
38	Alarm	Reserved for Future Alarm Use
39	Alarm	Reserved for Future Alarm Use
40	Alarm	Reserved for Future Alarm Use
41	Alarm	Reserved for Future Alarm Use
42	Alarm	Reserved for Future Alarm Use
43	Alarm	Reserved for Future Alarm Use
44	Alarm	Reserved for Future Alarm Use
45	Alarm	Reserved for Future Alarm Use
46	Alarm	Reserved for Future Alarm Use
47	Alarm	Reserved for Future Alarm Use
48	Alarm	Reserved for Future Alarm Use
49	Status	Reserved for Future Status Use
50	Status	Reserved for Future Status Use
51	Status	Reserved for Future Status Use
52	Status	Reserved for Future Status Use
53	Status	Reserved for Future Status Use
54	Status	Reserved for Future Status Use
55	Status	Reserved for Future Status Use
56	Status	Reserved for Future Status Use
57	Status	Reserved for Future Status Use
58	Status	Valid TBOS Command Received
59	Status	Reserved for Future Status Use

See **Note** at end of table.

Table 4-3. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Points (Contd)

Point	Type (Note)	Central Office Condition
60	Status	Reserved for Future Status Use
61	Status	Reserved for Future Status Use
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. The telemetry remote station constants should assign attributes to the DDM-2000 OC-12 Regenerator TBOS points as follows:

Points 1 – 48 = alarms
Points 49 – 63 = status

LOS = Loss of Signal
TCA = Threshold Crossing Alert

The following explanations are provided for the DDM-2000 OC-12 Regenerator TBOS alarm and status points listed in Table 4-3. The specific conditions that may trigger each point are listed, using exactly the same condition descriptions used in the DDM-2000 OC-12 Regenerator user interface alarm and status report, for example, `inc. OC12 LOS`. For detailed explanations and likely causes of these conditions, refer to Table 3-4.

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 363-206-207, *OC-12 Multiplexer User/Service 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 Points 1 – 4 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 5 — **Incoming OC-12 Signal Failure (LOS)** — indicates if the following is detected:

- `inc. OC-12 LOS`

The condition is not protected at the regenerator, although it may be protected at the terminal multiplexer. Since the protection status of the terminal multiplexer is unknown at the regenerator, the condition is designated as service-affecting.

Alarm Points 6 – 8 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 9 — **Illegal CP Type (in TG slot)** — indicates if the following is detected in a TG slot:

- `illegal CP type`

The condition is non-service-affecting.

Alarm Point 10 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 11 — **Illegal CP Type (in TSI slot)** — indicates if the following is detected in a TSI slot:

- `illegal CP type`

The condition is non-service-affecting.

Alarm Point 12 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 13 — **Fuse/Power Circuit Failure** — indicates if the following is detected:

- `–48 V power/fuse failed`

The condition is protected; thus it is non-service-affecting.

Alarm Point 14 — **Controller Failure/Provisioning Error** — indicates if at least one of the following is detected:

- `CP removed` (from SYSCTL or AUXCTL slot)
- `OHCTL CP failed`
- `SYSCTL CP failed`
- `unexpected CP switches` (in SYSCTL or AUXCTL slot)

The condition is non-service-affecting but may mask service-affecting conditions.

Alarm Point 15 — **Illegal CP Type (in OLIU slot)** — indicates if the following is detected in an OLIU slot:

- `illegal CP type`

The condition is non-service-affecting.

Alarm Point 16 — **Optical Terminating Equipment Failure** — indicates if at least one of the following is detected:

- `CP removed`
- `illegal CP type`
- `REGENR CP failed`

The condition is not protected at the regenerator, although it may be protected at the terminal multiplexer. Since the protection status of the terminal multiplexer is unknown at the regenerator, the condition is designated as service-affecting.

Alarm Point 17 — **Illegal CP Type (in FN slot)** — indicates if the following is detected in a function unit (FN) slot:

- `illegal CP type`

The condition is non-service-affecting.

Alarm Points 18 – 23 — reserved for future alarm use (may be assigned in a later release).

Alarm Point 24 — **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. This alarm point is set **ON** only 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 363-206-207, *OC-12 Multiplexer User/Service Manual*. For the OC-12 Regenerator Release 1.0, only the laser bias current level (LBCL) parameter and threshold level is supported.

Alarm Points 25 – 27 — reserved for future alarm use (may be assigned in a later release).

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 (see Table 4-6 containing a list of the OC-12 Regenerator TBOS Control Points). This condition is non-service-affecting. This alarm point will be set **ON** only for the minimum 20 seconds, then turned **OFF** automatically for each such control point received.

Alarm Points 29 – 48 — reserved for future alarm use (may be assigned in a later release).

Status Points 49 – 57 — reserved for future status use (may be assigned in a later release).

Status Point 58 — **Valid TBOS Command Received** — indicates if a TBOS control point command is received for a valid control point (see Table 4-6 containing a list of the OC-12 Regenerator TBOS control points). This status point will be set **ON** only for the minimum 20 seconds, then turned **OFF** automatically for each such control point received.

Status Points 59 – 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 DDM-2000 Multiplexer fails. The telemetry remote controls this point.

Control Points — DDM-2000 OC-3

Table 4-4 lists the TBOS control display points for the DDM-2000 OC-3. The control function descriptions provide clear explanations of the control points. The equivalent CIT commands are also included in Table 4-4 as a specific cross-reference to 363-206-202, *OC-3 Multiplexer User/Service Manual*, if additional detailed explanation is required.

Table 4-4. DDM-2000 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	Manual LS Switch to Protection - MXR B, DS1 1-4 (**`switch-ls:ls-b-1:pri=manual`**)
9	55&57&58	Manual LS Switch to Protection - MXR B, DS1 5-8 (**`switch-ls:ls-b-2:pri=manual`**)
10	55&57&58	Manual LS Switch to Protection - MXR B, DS1 9-12 (**`switch-ls:ls-b-3:pri=manual`**)
11	55&57&58	Manual LS Switch to Protection - MXR B, DS1 13-16 (**`switch-ls:ls-b-4:pri=manual`**)
12	55&57&58	Manual LS Switch to Protection - MXR B, DS1 17-20 (**`switch-ls:ls-b-5:pri=manual`**)
13	55&57&58	Manual LS Switch to Protection - MXR B, DS1 21-24 (**`switch-ls:ls-b-6:pri=manual`**)
14	55&57&58	Manual LS Switch to Protection - MXR B, DS1 25-28 (**`switch-ls:ls-b-7:pri=manual`**)
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`**)

See **Note** and footnotes at end of table.

Table 4-4. DDM-2000 OC-3 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
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**)
22	56&57&58	Lockout Switching - LS-A (**switch-ls:ls-a-all:pri=lockout**)
23	56&57&58	Lockout Switching - LS-B (**switch-ls:ls-b-all:pri=lockout**)
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	Reset Switching - LS-B (**switch-ls:ls-b-all:pri=reset**)
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 OC-3 equipped)
29	57&58 & 54 & 53	Forced Switch - FN-B (**switch-fn:fn-b:pri=forced**) (if MXRVO/DS3/STS1E* equipped) (**switch-line:fn-b:pri=forced**) (if OC-3 equipped)
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 OC-3 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 OC-3 equipped)
32	58	Manual Switch - FN-B (**switch-fn:fn-b:pri=manual**) (if MXRVO/DS3/STS1E* equipped) (**switch-line:fn-b:pri=manual**) (if OC-3 equipped)
33	58	Manual Switch - FN-C (**switch-fn:fn-c:pri=manual**) (if MXRVO/DS3/STS1E* equipped) (**switch-line:fn-c:pri=manual**) (if OC-3 equipped)

See **Note** and footnotes at end of table.

Table 4-4. DDM-2000 OC-3 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
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 OC-3 equipped)
35	57&58 & 54 & 53	Inhibit Switching - FN-B (**switch-fn:fn-b:pri=inhibit**) (if MXRVO/DS3/STS1E* equipped) (**switch-line:fn-b:pri=inhibit**) (if OC-3 equipped)
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 OC-3 equipped)
37	53&57&58	Lockout Switching - FN-A (only if OC-3 equipped) (**switch-line:fn-a:pri=lockout**)
38	53&57&58	Lockout Switching - FN-B (only if OC-3 equipped) (**switch-line:fn-b:pri=lockout**)
39	53&57&58	Lockout Switching - FN-C (only if OC-3 equipped) (**switch-line:fn-c:pri=lockout**)
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 OC-3 equipped)
41	57 clears & 58 & 54 clears & 53 clears	Reset Switching - FN-B (**switch-fn:fn-b:pri=reset**) (if MXRVO/DS3/STS1E* equipped) (**switch-line:fn-b:pri=reset**) (if OC-3 equipped)
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 OC-3 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**)

See **Note** and footnotes at end of table.

Table 4-4. DDM-2000 OC-3 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)	RT Control Function (Equivalent CIT Command)
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`**)	
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.

* Release 5.1 and later EC1 interfaces only

† These TBOS control points for Main are not applicable to the main OC-3 lines for path switched ring applications. Therefore, these commands are not valid for ring applications.

‡ For each RT miscellaneous discrete environmental control point, a miscellaneous discrete environmental alarm or status point should 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 4-4.

Control Points — DDM-2000 OC-12

Table 4-5 lists the TBOS control display points for the DDM-2000 OC-12. The control function descriptions provide clear explanations of the control points. The equivalent CIT commands are also included in Table 4-5 as a specific cross-reference to 363-206-207, *OC-12 Multiplexer User/Service Manual*, if additional detailed explanation is required.

Table 4-5. DDM-2000 OC-12 TBOS Control Points

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
1	57&58 & 56 & 53	Forced Switch - FN-A (**`switch-fn:fn-a:pri=forced`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-a:pri=forced`**) (if OC-3 equipped)
2	57&58 & 56 & 53	Forced Switch - FN-B (**`switch-fn:fn-b:pri=forced`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-b:pri=forced`**) (if OC-3 equipped)
3	57&58 & 56 & 53	Forced Switch - FN-C (**`switch-fn:fn-c:pri=forced`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-c:pri=forced`**) (if OC-3 equipped)
4	57&58 & 56 & 53	Forced Switch - FN-D (**`switch-fn:fn-d:pri=forced`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-d:pri=forced`**) (if OC-3 equipped)
5	58	Manual Switch - FN-A (**`switch-fn:fn-a:pri=manual`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-a:pri=manual`**) (if OC-3 equipped)
6	58	Manual Switch - FN-B (**`switch-fn:fn-b:pri=manual`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-b:pri=manual`**) (if OC-3 equipped)
7	58	Manual Switch - FN-C (**`switch-fn:fn-c:pri=manual`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-c:pri=manual`**) (if OC-3 equipped)
8	58	Manual Switch - FN-D (**`switch-fn:fn-d:pri=manual`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-d:pri=manual`**) (if OC-3 equipped)
9	57&58 & 56 & 53	Inhibit Switching - FN-A (**`switch-fn:fn-a:pri=inhibit`**) (if 3DS3/3STS1E* equipped) (**`switch-line:fn-a:pri=inhibit`**) (if OC-3 equipped)

See **Note** and footnotes at end of table.

Table 4-5. DDM-2000 OC-12 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO and RT Control Function (Equivalent CIT Command)
10	57&58 & 56 & 53	Inhibit Switching - FN-B (**switch-fn:fn-b:pri=inhibit**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-b:pri=inhibit**) (if OC-3 equipped)
11	57&58 & 56 & 53	Inhibit Switching - FN-C (**switch-fn:fn-c:pri=inhibit**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-c:pri=inhibit**) (if OC-3 equipped)
12	57&58 & 56 & 53	Inhibit Switching - FN-D (**switch-fn:fn-d:pri=inhibit**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-d:pri=inhibit**) (if OC-3 equipped)
15	53&57&58	Lockout Switching - FN-A (only if OC-3 equipped) (**switch-line:fn-a:pri=lockout**)
16	53&57&58	Lockout Switching - FN-B (only if OC-3 equipped) (**switch-line:fn-b:pri=lockout**)
17	53&57&58	Lockout Switching - FN-C (only if OC-3 equipped) (**switch-line:fn-c:pri=lockout**)
18	53&57&58	Lockout Switching - FN-D (only if OC-3 equipped) (**switch-line:fn-d:pri=lockout**)
19	57 clears & 58 & 56 clears & 53 clears	Reset Switching - FN-A (**switch-fn:fn-a:pri=reset**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-a:pri=reset**) (if OC-3 equipped)
20	57 clears & 58 & 56 clears & 53 clears	Reset Switching - FN-B (**switch-fn:fn-b:pri=reset**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-b:pri=reset**) (if OC-3 equipped)
21	57 clears & 58 & 56 clears & 53 clears	Reset Switching - FN-C (**switch-fn:fn-c:pri=reset**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-c:pri=reset**) (if OC-3 equipped)
22	57 clears & 58 & 56 clears & 53 clears	Reset Switching - FN-D (**switch-fn:fn-d:pri=reset**) (if 3DS3/3STS1E* equipped) (**switch-line:fn-d:pri=reset**) (if OC-3 equipped)
23	55&57&58	Forced Switch - TSI (**switch-tsi:pri=forced**)
24	58	Manual Switch - TSI (**switch-tsi:pri=manual**)
25	55&57&58	Inhibit Switching - TSI (**switch-tsi:pri=inhibit**)
26	55&57 clear & 58	Reset Switching - TSI (**switch-tsi:pri=reset**)

See **Note** and footnotes at end of table.

Table 4-5. DDM-2000 OC-12 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)
27	28	Reserved for Future Control Use
28	54&57&58/28 †	Forced Switch - Main-B † (**`switch-line:main-b:pri=forced`**)
29	28	Reserved for Future Control Use
30	58/28 †	Manual Switch - Main-B † (**`switch-line:main-b:pri=manual`**)
31	28	Reserved for Future Control Use
32	54&57&58/28 †	Inhibit Switching - Main-B † (**`switch-line:main-b:pri=inhibit`**)
33	28	Reserved for Future Control Use
34	54&57&58/28 †	Lockout Switching - Main-B † (**`switch-line:main-b:pri=lockout`**)
42	28	Reserved for Future Control Use
43	54&57 clear & 58/28 †	Reset Switching - Main-B † (**`switch-line:main-b:pri=reset`**)
44	28	Reserved for Future Control Use
45	28	Reserved for Future Control Use
46	28	Reserved for Future Control Use
47	28	Reserved for Future Control Use
48	28	Reserved for Future Control Use
49	28	Reserved for Future Control Use
50	28	Reserved for Future Control Use
51	28	Reserved for Future Control Use
52	28	Reserved for Future Control Use
53	28	Reserved for Future Control Use
54	28	Reserved for Future Control Use
55	28	Reserved for Future Control Use
56	28	Reserved for Future Control Use
57	58	Manual Switch - TGS CP (**`switch-sync:s=circuitpack,pri=manual`**)
58	49&57&58	Inhibit Switching - TGS CP (**`switch-sync:s=circuitpack,pri=inhibit`**)
59	49&57 clear & 58	Reset Switching - TGS CP (**`switch-sync:s=circuitpack,pri=reset`**)
60	58	Manual Switch - Sync. Reference (**`switch-sync:s=reference,pri=manual`**)

See **Note** and footnotes at end of table.

Table 4-5. DDM-2000 OC-12 TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)	RT Control Function (Equivalent CIT Command)
61	50&57&58	Inhibit Switching - Sync. Reference (**`switch-sync:s=reference,pri=inhibit`**)	
62	50&57 clear & 58	Reset Switching - Sync. Reference (**`switch-sync:s=reference,pri=reset`**)	
63	CO51&CO57 &CO58 or RT58‡	Manual Switch - Sync. Mode (**`switch-sync:s=mode,pri=manual`**)	Operate Misc. Discrete Env. Control 1
64	CO51&CO57 clear & CO58 or RT58‡	Reset Switching - Sync. Mode (**`switch-sync:s=mode,pri=reset`**)	Operate Misc. Discrete Env. Control 2
65	CO28 or RT58‡	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 3
66	CO28 or RT58‡	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 4
67	CO28 or RT58‡	Reserved for Future Control Use	Release Misc. Discrete Env. Control 1
68	CO28 or RT58‡	Reserved for Future Control Use	Release Misc. Discrete Env. Control 2
62	CO28 or RT58‡	Reserved for Future Control Use	Release Misc. Discrete Env. Control 3
63	CO28 or RT58‡	Reserved for Future Control Use	Release Misc. Discrete Env. Control 4
64	58	Alarm Cut Off (**`opr-aco`**)	
65	58	Processor Reset (**`reset`**)	
66	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.

* EC-1 interfaces only.

† These TBOS control points for Main-B do not apply for the Main OC-12 lines for path switched rings.

‡ For each RT miscellaneous discrete environmental control point, a miscellaneous discrete environmental alarm or status point should 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 4-1.

Control Points — DDM-2000 OC-12 Regenerator

Table 4-6 lists the TBOS control display points for the DDM-2000 OC-12 Regenerator. The control function descriptions provide clear explanations of the control points. The equivalent CIT commands are also included in Table 4-6 as a specific cross-reference to 363-206-207, *OC-12 Multiplexer User/Service Manual*, if additional detailed explanation is required.

Table 4-6. DDM-2000 OC-12 Regenerator TBOS Control Points

Control	CO Verification Status Point	CO Control Function (Equivalent CIT Command)
1	28	Reserved for Future Control Use
2	28	Reserved for Future Control Use
3	28	Reserved for Future Control Use
4	28	Reserved for Future Control Use
5	28	Reserved for Future Control Use
6	28	Reserved for Future Control Use
7	28	Reserved for Future Control Use
8	28	Reserved for Future Control Use
9	28	Reserved for Future Control Use
10	28	Reserved for Future Control Use
11	28	Reserved for Future Control Use
12	28	Reserved for Future Control Use
13	28	Reserved for Future Control Use
14	28	Reserved for Future Control Use
15	28	Reserved for Future Control Use
16	28	Reserved for Future Control Use
17	28	Reserved for Future Control Use
18	28	Reserved for Future Control Use
19	28	Reserved for Future Control Use
20	28	Reserved for Future Control Use
21	28	Reserved for Future Control Use
22	28	Reserved for Future Control Use
23	28	Reserved for Future Control Use
24	28	Reserved for Future Control Use
25	28	Reserved for Future Control Use
26	28	Reserved for Future Control Use
27	28	Reserved for Future Control Use
28	28	Reserved for Future Control Use

Table 4-6. DDM-2000 OC-12 Regenerator TBOS Control Points (Contd)

Control	CO Verification Status Point	CO Control Function (Equivalent CIT Command)
29	28	Reserved for Future Control Use
30	28	Reserved for Future Control Use
31	28	Reserved for Future Control Use
32	28	Reserved for Future Control Use
33	28	Reserved for Future Control Use
34	28	Reserved for Future Control Use
35	28	Reserved for Future Control Use
36	28	Reserved for Future Control Use
37	28	Reserved for Future Control Use
38	28	Reserved for Future Control Use
39	28	Reserved for Future Control Use
40	28	Reserved for Future Control Use
41	28	Reserved for Future Control Use
42	28	Reserved for Future Control Use
43	28	Reserved for Future Control Use
44	28	Reserved for Future Control Use
45	28	Reserved for Future Control Use
46	28	Reserved for Future Control Use
47	28	Reserved for Future Control Use
48	28	Reserved for Future Control Use
49	28	Reserved for Future Control Use
50	28	Reserved for Future Control Use
51	28	Reserved for Future Control Use
52	28	Reserved for Future Control Use
53	28	Reserved for Future Control Use
54	28	Reserved for Future Control Use
55	28	Reserved for Future Control Use
56	28	Reserved for Future Control Use
57	28	Reserved for Future Control Use
58	28	Reserved for Future Control Use
59	28	Reserved for Future Control Use
60	28	Reserved for Future Control Use
61	28	Reserved for Future Control Use
62	58	Alarm Cut Off (**`opr-aco`**)
63	58	Processor Reset (**`reset`**)
64	28	Reserved for Future Control Use

Alarm and Status Point — TL1 Translation

Tables 4-7, 4-8, and 4-9 specify the recommended translation of the DDM-2000 Multiplexer TBOS alarm and status points to TL1 messages for the DDM-2000 OC-3, OC-12, and OC-12 Regenerator. The TL1 translation is provided to support the required provisioning of the OS with the meaning of each DDM-2000 Multiplexer TBOS alarm and status point. The TL1 translation is also provided for customers who rely on proprietary telemetry remote/mediation devices to translate TBOS to TL1 (to the OS) instead of interfacing from the telemetry remote (to the OS) via E2 or E2A telemetry protocol.

For each DDM-2000 Multiplexer TBOS alarm and status point, Tables 4-7 through 4-9 specify the recommended parameter values in columns corresponding to the key parameters in TL1 `REPT ALM` and `REPT EVT` messages. The terminology used and parameter values specified are based on Bellcore TR-TSY-000833, Issue 3, Revision 1, and Issue 4. The NMA information is understood to be valid for NMA Releases 2.4, 3.2, 3.2.1, and 3.3, and expected to be valid for NMA Release 3.4, based on Lucent Technologies DDM-2000 Multiplexer Operations Systems Modifications for Intelligent Network Elements (OSMINE) project with Bellcore.

For the convenience of the reader, the abbreviated column headings and most parameter values are spelled out in the **Glossary**. In the ALMCDE (alarm code) column, the following codes are used:

- A Automatic message
- * Minor alarm
- ** Major alarm
- *C Critical alarm.

In Tables 4-7 through 4-9, the choice of `REPT ALM` or `REPT EVT` message types and the values for the ALMCDE and NTFCNCDE fields are based on the DDM-2000 Multiplexer default alarm levels.

Table 4-7. DDM-2000 OC-3 TBOS Alarm and Status Point Translation to TL1 Messages

TBOS Point	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE	SRVEFF or CONDEFF	DIRN	CONDDESCR or ALMMSG
1	A	REPT EVT	T1		LOS 01	SC	NA	Inc DS1 Sig Failed
2	**	REPT ALM	T3 (or EC1)	MJ	LOS 02	SA	NA	Inc DS3 (or EC1) Sig Failed
3	*	REPT ALM	OC-3	MN	LOS 03	NSA	NA	Inc OC-3 Sig Failed
4	*C	REPT ALM	OC-3	CR	LOS 04	SA	NA	Inc OC-3 Sig Failed
5	*C	REPT ALM	STS1	CR	LOP 05	SA	NA	Inc STS1 Loss Pointer
6	**	REPT ALM	VT1	MJ	LOP 06	SA	NA	Inc VT LOP or AIS
7	*	REPT ALM	OC-3	MN	T-BERL 07	NSA	NA	Inc OC-3 Sig Degrade
8	*C	REPT ALM	OC-3	CR	T-BERL 08	SA	NA	OC-3 Degrade/STS Fail
9	*	REPT ALM	EQPT	MN	SYNCCLK 09	NSA	NA	Sync Eqpt Failed
10	*C	REPT ALM	EQPT	CR	SYNCCLK 10	SA	NA	Sync Eqpt Failed
11	*	REPT ALM	EQPT	MN	MUX 11	NSA	NA	Mux Eqpt Failed
12	*C	REPT ALM	EQPT	CR	MUX 12	SA	NA	Mux Eqpt Failed
13	*	REPT ALM	COM	MN	PWR 13	NSA	NA	Fuse/Pwr Ckt Failed
14	**	REPT ALM	EQPT	MJ	CONTR 14	NSA	NA	Controller Fail/Prov
15	*	REPT ALM	EQPT	MN	OC3TERM 15	NSA	NA	OC3 Term Eqpt Failed
16	*C	REPT ALM	EQPT	CR	OC3TERM 16	SA	NA	OC3 Term Eqpt Failed
17	*	REPT ALM	EQPT	MN	T1TERM 17	NSA	NA	DS1 Term Eqpt Failed
18	**	REPT ALM	EQPT	MJ	T1TERM 18	SA	NA	DS1 Term Eqpt Failed
19	*	REPT ALM	EQPT	MN	T3TERM (or EC1TERM) 19	NSA	NA	DS3 (or EC1) Term Eqpt Failed
20	*	REPT ALM	EQPT	CR	T3TERM (or EC1TERM) 20	SA	NA	DS3 (or EC1) Term Eqpt Failed
21	**	REPT ALM	COM	MJ	EOC 21	NSA	NA	SectionDCC Fail/Prov
22		REPT ALM	OC1	MN	LOS 22	NSA	NA	inc. OC1 signal failed
23	*	REPT ALM	EQPT	MN	INHSWWKG 23	NSA	NA	DS1 Eqpt Auto Lock
24	*	REPT ALM	COM	MN	EOC 24	NSA	NA	OC3 APS Chanl Failed
25	*	REPT ALM	T1	MN	SYNC 25	NSA	NA	Prot Sync Ref Failed
26	**	REPT ALM	T1	MJ	SYNCOOS 26	NSA	NA	Unprot Sync Ref Fail
27	A	REPT EVT	OC-3		T-CVL 27	TC	NA	PM Summary TCA
28	A	REPT EVT	COM		MAN 28	TC	NA	Invalid TBOS Command
29	A	REPT EVT	OC-3		AIS 29	SC	NA	Inc OC-3 Line AIS
30	A	REPT EVT	VT1		AIS 30	SC	NA	Inc VT Path LOP/AIS

Table 4-7. DDM-2000 OC-3 TBOS Alarm and Status Point Translation to TL1 Messages (Contd)

TBOS Point	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE	SRVEFF or CONDEFF	DIRN	CONDDESCR or ALMMSG
31	A	REPT EVT	STS1		AIS 31	SC	NA	STS Path AIS/Failed
32	**	REPT ALM	COM	MJ	LHI 32	SA	NA	Excess Sync Holdover
CO 33-45	Reserved for Future Alarm Use							
CO 46	*	REPT ALM	COM	MN	EXT 46	NSA	NA	Fan Shelf Failed
CO 47-48	Reserved for Future Alarm Use							
RT 33-46†	*	REPT ALM	ENV	MN	MISC 33(-46)	NSA	NA	Misc Discrete Env 1(-14)
RT 47	*	REPT ALM	ENV	MN	MISC 47	NSA	NA	External Minor
RT 48	*	REPT ALM	EQPT	MN	CONTR 48	NSA	NA	Fan Relay Failed
49	A	REPT EVT	EQPT		INHSWPR 49	SC	NA	Inh Sync Eqpt ProtSw
50	A	REPT EVT	T1		INHSWPR 50	SC	NA	Inh Sync Ref Prot Sw
51	A	REPT EVT	COM		HLDOVRSYNC 51	SC	NA	Holdover Mode Active
52	A	REPT EVT	OC-3		FERF 52	SC	NA	Inc OC-3 Line FERF
53	A	REPT EVT	OC-3		WK/INHSWPR 53	TC	NA	Man OC-3 Prot Sw/Inh
54	A	REPT EVT	EQPT		WK/INHSWPR 54	TC	NA	Man Func ProtSw/Inh
55	A	REPT EVT	EQPT		WKSWPR 55	SC	NA	Man DS1 Eqpt Prot Sw
56	A	REPT EVT	EQPT		WK/INHSWPR 56	SC	NA	Man DS1 Prot Sw/Inh
57	A	REPT EVT	COM		MAN 57	SC	NA	Abnormal Condition
58	A	REPT EVT	COM		EXTCONT 58	TC	NA	Valid TBOS Command
59	A	REPT EVT	COM		EOC 59	SC	NA	Communication Failed
60	A	REPT EVT	STS1		YEL 60	SC	NA	Inc STS Path Yellow
61	A	REPT EVT	VT1		YEL 61	SC	NA	Inc VT Path Yellow
62-63	Reserved for Future Status Use							
64	**	REPT ALM	COM	MJ	OSLINK 64	NSA	NA	TBOS Tlm Link Failed

† Because these miscellaneous discrete environmental alarm and status points are user settable, the *appropriate* parameter values to describe the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point ***must*** be provisioned at the OS. The parameter values included in this table are defaults only.

Table 4-8. DDM-2000 OC-12 TBOS Alarm and Status Point Translation to TL1 Messages

TBOS Point	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE	SRVEFF or CONDEFF	DIRN	CONDDESCR or ALMMSG
1	**	REPT ALM	T3	MJ	LOS 01	SA	NA	Inc DS3 Sig Failed
2	*	REPT ALM	OC3	MN	LOS 02	NSA	NA	Inc OC3 Sig Failed
3	*C	REPT ALM	OC3	CR	LOS 03	SA	NA	Inc OC3 Sig Failed
4	*	REPT ALM	OC12	MN	LOS 04	NSA	NA	Inc OC12 Sig Failed
5	*C	REPT ALM	OC12	CR	LOS 05	SA	NA	Inc OC12 Sig Failed
6	*C	REPT ALM	STS1	CR	LOP 06	SA	NA	Inc STS1 Loss Pointer
7	*	REPT ALM	OC12	MN	T-BERL 07	NSA	NA	IncOC3/12 SigDegrade
8	*C	REPT ALM	OC12	CR	T-BERL 08	SA	NA	OC3/12Degrad/STS AIS
9	*	REPT ALM	EQPT	MN	SYNCCLK 09	NSA	NA	Sync Eqpt Failed
10	*C	REPT ALM	EQPT	CR	SYNCCLK 10	SA	NA	Sync Eqpt Failed
11	*	REPT ALM	EQPT	MN	TSI 11	NSA	NA	TSI Eqpt Failed
12	*C	REPT ALM	EQPT	CR	TSI 12	SA	NA	TSI Eqpt Failed
13	*	REPT ALM	COM	MN	PWR 13	NSA	NA	Fuse/Pwr Ckt Failed
14	**	REPT ALM	EQPT	MJ	CONTR 14	NSA	NA	Controller Fail/Prov
15	*	REPT ALM	EQPT	MN	OC12TERM 15	NSA	NA	OC3/12 TermEqpt Fail
16	*C	REPT ALM	EQPT	CR	OC12TERM 16	SA	NA	OC3/12 TermEqpt Fail
17	*	REPT ALM	EQPT	MN	T3TERM 17	NSA	NA	3DS3 Term Eqpt Fail
18	*C	REPT ALM	EQPT	CR	T3TERM 18	SA	NA	3DS3 Term Eqpt Fail
19	*	REPT ALM	COM	MN	EOC 19	NSA	NA	OC3/12 APS ChanlFail
20	Reserved for Future Alarm Use							
21	**	REPT ALM	COM	MJ	EOC 21	NSA	NA	Section DCC Fail/Prov
22	*	REPT ALM	T1	MN	SYNC 22	NSA	NA	Prot Sync Ref Failed
23	**	REPT ALM	T1	MJ	SYNCOOS 23	NSA	NA	Unprot Sync Ref Fail
24	A	REPT EVT	OC12		T-CVL 24	TC	NA	PM Summary TCA
25	A	REPT EVT	OC3		AIS 25	SC	NA	Inc OC3 Line AIS
26	A	REPT EVT	OC12		AIS 26	SC	NA	Inc OC12 Line AIS
27	A	REPT EVT	STS1		AIS 27	SC	NA	Inc STS Path AIS
28	A	REPT EVT	COM		MAN 28	TC	NA	Invalid TBOS Command
29	**	REPT ALM	COM	MJ	LHI 29	SA	NA	Excess Sync Holdover
30	Reserved for Future Alarm Use							
31	Reserved for Future Alarm Use							
32	Reserved for Future Alarm Use							

Table 4-8. DDM-2000 OC-12 TBOS Alarm and Status Point Translation to TL1 Messages (Contd)

TBOS Point	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE	SRVEFF or CONDEFF	DIRN	CONDDESCR or ALMMSG
CO 33-45	Reserved for Future Alarm Use							
CO 46	*	REPT ALM	COM	MN	EXT 46	NSA	NA	Fan Shelf Failed
CO 47-48	Reserved for Future Alarm Use							
RT 33-46†	*	REPT ALM	ENV	MN	MISC 33(-46)	NSA	NA	Misc Discrete Env 1(-14)
RT 47	*	REPT ALM	ENV	MN	MISC 47	NSA	NA	External Minor
RT 48	*	REPT ALM	EQPT	MN	CONTR 48	NSA	NA	Fan Relay Failed
49	A	REPT EVT	EQPT		INHSWPR 49	SC	NA	Inh Sync Eqpt ProtSw
50	A	REPT EVT	T1		INHSWPR 50	SC	NA	Inh Sync Ref Prot Sw
51	A	REPT EVT	COM		HLDOVRSYNC 51	SC	NA	Holdover Mode Active
52	A	REPT EVT	OC12		FERF 52	SC	NA	Inc OC3/12 Line FERF
53	A	REPT EVT	OC3		WK/INHSWPR 53	TC	NA	Man OC3 Prot Sw/Inh
54	A	REPT EVT	OC12		WK/INHSWPR 54	TC	NA	Man OC12 Prot Sw/Inh
55	A	REPT EVT	EQPT		WK/INHSWPR 55	TC	NA	Man TSI Prot Sw/Inh
56	A	REPT EVT	EQPT		WK/INHSWPR 56	SC	NA	Man DS3 Prot Sw/Inh
57	A	REPT EVT	COM		MAN 57	SC	NA	Abnormal Condition
58	A	REPT EVT	COM		EXTCONT 58	TC	NA	Valid TBOS Command
59	A	REPT EVT	COM		EOC 59	SC	NA	Communication Failed
60	A	REPT EVT	STS1		YEL 60	SC	NA	Inc STS Path Yellow
61-63	Reserved for Future Status Use							
64	**	REPT ALM	COM	MJ	OSLINK 64	NSA	NA	TBOS Tlm Link Failed

† Because these miscellaneous discrete environmental alarm and status points are user settable, the *appropriate* parameter values to describe the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point ***must*** be provisioned at the OS. The parameter values included in this table are defaults only.

Table 4-9. DDM-2000 OC-12 Regenerator TBOS Alarm and Status Point Translation to TL1 Messages

TBOS Point	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE	SRVEFF or CONDEFF	DIRN	CONDDESCR or ALMMSG
1-4	Reserved for Future Alarm Use							
5	*C	REPT ALM	OC12	CR	LOS 05	NSA†	NA	Inc OC12 Sig Failed
6-8	Reserved for Future Alarm Use							
9	*	REPT ALM	EQPT	MN	SYNCCLK 9	NSA	NA	Illegal CP type
10	Reserved for Future Alarm Use							
11	*	REPT ALM	EQPT	MN	TSI 11	NSA	NA	Illegal CP type
12	Reserved for Future Alarm Use							
13	*	REPT ALM	COM	MN	PWR 13	NSA	NA	Fuse/Pwr Ckt Failed
14	**	REPT ALM	EQPT	MJ	CONTR 14	NSA	NA	Controller Fail/Prov
15	*	REPT ALM	EQPT	MN	OC3TERM 15	NSA	NA	Illegal CP type
16	*C	REPT ALM	EQPT	CR	OC12TERM 16	NSA†	NA	OC12 Term Eqpt Fail
17	*	REPT ALM	EQPT	MN	T3TERM 17	NSA	NA	Illegal CP type
18-23	Reserved for Future Alarm Use							
24	A	REPT EVT	OC12		T-LBCL 24	TC	NA	PM Summary TCA
25-27	Reserved for Future Alarm Use							
28	A	REPT EVT	COM		MAN 28	TC	NA	Invalid TBOS Command
29-57	Reserved for Future Status Use							
58	A	REPT EVT	COM		EXTCONT 58	TC	NA	Valid TBOS Command
59-63	Reserved for Future Status Use							
64	**	REPT ALM	COM	MJ	OSLINK 64	NSA	NA	TBOS Tlm Link Failed

† The service affecting (SRVEFF) values for these conditions cannot be accurately determined at the regenerator, since they are protected at the terminal multiplexer rather than at the regenerator. Therefore, although TBOS points 5 and 16 are defined as service affecting (SA), the corresponding TL1 messages should be designated as non-service affecting (NSA) to eliminate the possibility of incorrectly reporting an SA condition to NMA. The terminal multiplexer will also detect the condition and will report the correct SRVEFF value.

Control Point — TL1 Translation

No DDM-2000 Multiplexer TBOS control point to TL1 message translation is required in NMA. NMA users activate TBOS controls by addressing a specific DDM-2000 Multiplexer and specifying a TBOS control point number.

NMA Scan Point Definition

Table 4-10 provides a mapping between the field labels on NMA's scan point definition screen and the corresponding TL1 parameter names as used in the TL1 Translation Tables (Tables 4-7 through 4-9). The NMA field labels that appear on an NMA scan point definition screen depend on the message type (REPT ALM, REPT ALM ENV, or REPT EVT). The NMA field labels are shown in the order they appear on the NMA scan point definition screens.

Table 4-10. NMA Field Label to TL1 Parameter Name Mapping

NMA Field Label	TL1 Parameter Name
message type	Message Type (REPT ALM or REPT EVT) Message Type and Message Modifier (REPT ALM ENV)
condition type	CONDTYPE (for REPT ALM and REPT EVT)
alarm type	ALMTYPE (for REPT ALM ENV only)
service affecting	SRVEFF (for REPT ALM and REPT ALM ENV if, REPT EVT => NSA)
direction	DIRN (always NA = not applicable)
threshold level	CONDDESCR (for REPT ALM and REPT EVT))
alarm message	ALMMSG (for REPT ALM ENV only)
equipment alarm	Message Modifier (if EQPT => "yes")
priority	NTFCNCDE
signal level	Message Modifier (for REPT ALM and REPT EVT, except if EQPT or COM => no signal level)
condition effect	CONDEFF (for REPT EVT only)

Condition Type

In Tables 4-7 through 4-9, to ensure that the NMA correctly associates each alarm and clear pair when a TBOS point is set **ON** (alarm) and later **OFF** (clear), the CONDTYPE (and ALMTYPE) values are appended with the TBOS point number to make each CONDTYPE (and ALMTYPE) value unique.

If Northern Telecom's 7025 telemetry remote is used with its proprietary interface to NMA, 11 characters of the 20-character NMA condition type (CONDTYPE) and alarm type (ALMTYPE) field are used for the telemetry remote's physical address. Northern Telecom's physical address, which is also appended to the CONDTYPE (and ALMTYPE), includes the TBOS point number and thus the TBOS point numbers included in the TL1 Translation Table should not be repeated twice. In Northern Telecom's case, the TL1 CONDTYPE (and ALMTYPE) text entries must not exceed 9 characters in length. Table 4-11 shows the recommended abbreviations (from the TL1 Translation Table) for TL1 CONDTYPE text entries.

Table 4-11. Recommended Abbreviations for TL1 CONDTYPE Entries

TBOS Point	CONDTYPE	CONDTYPE (9-Character Abbreviation)
51	HLDOVRSYNC	HLDOVSYNC
53, 54, 55 (OC-12 only), 56	WK/INHSWPR	WK/INHSW

Service Effect

The service affecting (SRVEFF) column in Tables 4-7 through 4-9 reflect the actual effect on customer traffic [service affecting (SA) or non-service affecting (NSA)].

Threshold Level (Condition Description)

In Tables 4-7 through 4-9, the condition description (CONDDESCR) column is limited to 20 characters to match NMA scan point definition threshold level field maximum of 20 characters. For other OSs (or mediation devices translating to TL1), the longer condition descriptions of the TBOS alarm and status points in Tables 4-1 through 4-3 may be used.

Equipment Alarms

Tables 4-7 through 4-9 identify DDM-2000 Multiplexer alarm and status points as equipment alarms with message modifier EQPT. Message modifiers indicating transmission rates (T1, T3, T3X, T4X, etc.) are not equipment alarms. Message modifier COM indicates an alarm that cannot be associated with a specific equipment component or facility.

Signal Levels

Until NMA Release 3.4 (when NMA supports generic SONET signal levels), NMA is expected to continue to allow only asynchronous signals (T1, T3, T3X, T4X, etc.) to be entered in the NMA signal level field. Therefore, the SONET signals (included as message modifiers in Tables 4-7 through 4-9) should be mapped to the following ''equivalent'' asynchronous signals for purposes of provisioning the NMA signal level field (see Table 4-12).

Table 4-12. SONET Signal Mapping

SONET Signal	"Equivalent" Asynchronous Signal
OC-12	T4X (OC-12 only)
OC-3	T3X
EC1	T3
STS = STS1	T3
VT = VT1 = VT1.5	T1 (OC-3 only)

In these cases, the actual SONET signal should be included in the CONDDESCR column as shown in Tables 4-7 through 4-9.

Case Insensitivity

Although Tables 4-7 through 4-9 use uppercase and lowercase characters for readability and consistency with TL1, NMA is case-insensitive and outputs the subject parameter values in lowercase characters only.

Equipment Data Base Definition

The minimal NMA equipment data base provisioning required to monitor DDM-2000 Multiplexer via TBOS (or parallel telemetry) is documented in Bellcore Methods. The Methods, which focus on monitoring DDM-2000 Multiplexer via TL1/X.25, were prepared by Bellcore under the Operations Systems Modifications for Intelligent Network Elements (OSMINE) contract with Lucent Technologies. Customers may contact Lucent Technologies Technical Support Organization or the Regional Technical Assistance Center (RTAC) for copies of these documents.

Alarm and Status Points — FiberReach

Table 4-13 summarizes the FiberReach Multiplexer TBOS alarm and status display.

Table 4-13. FiberReach 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	Alarm	Reserved for Future Alarm Use		
3	NSA	Incoming OC3 Signal Failure (LOS, LOF, BER)		
4	SA	Incoming OC3 Signal Failure (LOS, LOF, BER, Line AIS)		
5	SA	Incoming STS1 LOP (on OC1, OC3)		
6	SA	Incoming VT Path AIS/LOP/Path Signal Degrade		
7	NSA	Incoming OC-3 Signal Degrade		
8	SA	Incoming OC-3 Signal Degrade		
9 10	NSA SA	Incoming OC1 Signal Failure (LOS+LOF+SF+STS1 LOP) Incoming OC1 Signal Failure (LOS+LOF+SF+AIS)		
11 12	NSA SA	Incoming OC1 Signal Degrade Incoming OC1 Signal Degrade, STS Path AIS/Signal Failure/Degrade		
13	NSA	Fuse/Power Circuit Failure		
14	NSA	Controller Failure/Provisioning Error		
15 16	NSA SA	OC3 Terminating Equipment Failure		
17 18	NSA SA	DS1 Terminating Equipment Failure		
19 20	NSA SA	OC1 Terminating Equipment Failure		
21	NSA	Section Data Comm. Channel (DCC) Failure/Provisioning Error		
22	Alarm	Reserved for Future Alarm Use		
23	NSA	DS1 Terminating Equipment APS – Automatic Lockout		
24	Alarm	Reserved for Future Alarm Use		
25	Alarm	Reserved for Future Alarm Use		
26	Alarm	Reserved for Future Alarm Use		
27	NSA	PM Summary TCA		
28	NSA	Invalid TBOS Command Received		
29	NSA	Incoming OC1/OC3 Line AIS		
30	NSA	Incoming VT Path AIS/LOP/Path Signal Degrade		
31	NSA	Incoming STS Path AIS/Signal Failure/Degrade		

See **Note** and footnotes at end of table.

Table 4-13. FiberReach TBOS Alarm and Status Points (Contd)

Point	Type (Note)	Central Office Condition	Type (Note)	Remote Terminal Condition
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	Fan Shelf Failure	NSA	Misc. Discrete Env. Alarm/Status 14
47	Alarm	Reserved for Future Alarm Use	NSA	External Minor
48	Alarm	Reserved for Future Alarm Use	NSA	Fan Control Relay Failure
49	Status	Reserved for Future Use		
50	Status	Reserved for Future Use		
51	Status	Holdover Mode Active		
52	Status	Incoming OC1 Line FERF		
53	Status	Incoming OC3 Line FERF		
54	Status	Manual Forced/Inhibit/Lockout 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 Use		
63	Status	Reserved for Future Use		
64	–	TBOS Telemetry Link Failure		

See **Note** and footnotes at end of table.

Table 4-13. FiberReach TBOS Alarm and Status Points (Contd)

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. The telemetry remote station constants should assign attributes to the OC-3 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

* Signal Failure/Signal Degrade (SF/SD) BER.

Control Points — FiberReach

Table 4-14 summarizes the FiberReach Multiplexer TBOS control points.

Table 4-14. FiberReach 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 - LS-A (**`switch-ls:ls-a-1:pri=manual`**) (1X1 or 1X7)
2	55&57&58	Manual LS Switch to Protection - LS-B (**`switch-ls:ls-a-2:pri=manual`**) (1X1 or 1X7)
3	55&57&58	Manual LS Switch to Protection - LS-C (**`switch-ls:ls-a-3:pri=manual`**) (1X1 or 1X7)
4	55&57&58	Manual LS Switch to Protection - LS-D (**`switch-ls:ls-a-4:pri=manual`**) (1X1 or 1X7)
5	55&57&58	Manual LS Switch to Protection - LS-D (**`switch-ls:ls-a-4:pri=manual`**) (1X7 only)
6	55&57&58	Manual LS Switch to Protection - LS-D (**`switch-ls:ls-a-4:pri=manual`**) (1X7 only)
7	55&57&58	Manual LS Switch to Protection - LS-D (**`switch-ls:ls-a-4:pri=manual`**) (1X7 only)
8	58	Reserved for Future Control Use
9	58	Reserved for Future Control Use
10	58	Reserved for Future Control Use
11	58	Reserved for Future Control Use
12	58	Reserved for Future Control Use
13	58	Reserved for Future Control Use
14	58	Reserved for Future Control Use
15	58	Reserved for Future Control Use
16	58	Reserved for Future Control Use
17	58	Reserved for Future Control Use
18	58	Reserved for Future Control Use
19	58	Reserved for Future Control Use
20	58	Reserved for Future Control Use
21	56&57&58	Lockout Switching - LS-C (**`switch-ls:ls-c-all:pri=lockout`**) (1X7 only)
25	56&57&58	Lockout Switching - LS-A (**`switch-ls:ls-a-all:pri=lockout`**) (1X1 only)

See **Note** at end of table.

Table 4-14. FiberReach TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)	RT Control Function (Equivalent CIT Command)
26	56&57&58	Lockout Switching - LS-B (**switch-ls:ls-b-all:pri=lockout**) (1X1 only)	
27	56&57&58	Lockout Switching - LS-C (**switch-ls:ls-c-all:pri=lockout**) (1X1 only)	
28	56&57&58	Lockout Switching - LS-D (**switch-ls:ls-d-all:pri=lockout**) (1X1 only)	
29	56&57 clear & 58	Reset Switching - LS-A (**switch-ls:ls-a-all:pri=reset**) (1X1 only)	
30	56&57 clear & 58	Reset Switching - LS-B (**switch-ls:ls-b-all:pri=reset**) (1X1 only)	
31	56&57 clear & 58	Reset Switching - LS-C (**switch-ls:ls-c-all:pri=reset**) (1X1 only)	
32	56&57 clear & 58	Reset Switching - LS-D (**switch-ls:ls-d-all:pri=reset**) (1X1 only)	
33	56&57 clear & 58	Reset Switching - LS-D (**switch-ls:ls-d-all:pri=reset**) (1X7 only)	
34	58	Reserved for Future Control Use	
35	58	Reserved for Future Control Use	
36	58	Reserved for Future Control Use	
37	58	Reserved for Future Control Use	
38	58	Reserved for Future Control Use	
39	58	Reserved for Future Control Use	
40	58	Reserved for Future Control Use	
41	58	Reserved for Future Control Use	
42	58	Reserved for Future Control Use	
43	58	Reserved for Future Control Use	
44	58	Reserved for Future Control Use	
45	58	Reserved for Future Control Use	
46	58	Reserved for Future Control Use	
47	58	Reserved for Future Control Use	
48	58	Reserved for Future Control Use	
54	58	Reserved for Future Control Use	
55	58	Reserved for Future Control Use	
56	58	Reserved for Future Control Use	
57	58	Reserved for Future Control Use	
58	58	Reserved for Future Control Use	

See **Note** at end of table.

Table 4-14. FiberReach TBOS Control Points (Contd)

Control Point	CO and RT Verification Status Point (Note)	CO Control Function (Equivalent CIT Command)	RT Control Function (Equivalent CIT Command)
59	58	Reserved for Future Control Use	
60	58	Reserved for Future Control Use	
61	58	Reserved for Future Control Use	
62	58	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 1
63	58	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 2
64	CO28 or RT58	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 3
65	CO28 or RT58	Reserved for Future Control Use	Operate Misc. Discrete Env. Control 4
66	CO28 or RT58	Reserved for Future Control Use	Release Misc. Discrete Env. Control 1
67	CO28 or RT58	Reserved for Future Control Use	Release Misc. Discrete Env. Control 2
68	CO28 or RT58	Reserved for Future Control Use	Release Misc. Discrete Env. Control 3
69	CO28 or RT58	Reserved for Future Control Use	Release Misc. Discrete Env. Control 4
70	58	Alarm Cut Off (**opr-aco**)	
71	58	Processor Reset (**reset**)	
72	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.

Parallel Telemetry

5

Contents

Overview 5-1

Introduction 5-1

Related Provisioning 5-2

- Site Number/Far-End Identifier 5-3
- Network Element Number 5-5
- Gateway Network Element 5-5
- Central Office/Remote Terminal Select 5-6
- Far-End Communication 5-6
- Section DCC User Side/Network Side 5-7
- Network Service Access Point 5-7
- Directory Services Network Element 5-8
- Alarm Groups 5-8
- Alarm Gateway Network Element 5-9
- Provisioning Examples 5-11

Wiring Together Multiplexers in a Bay 5-13

Tests 5-13

Alarm and Status Points 5-14

Control Point 5-18

Alarm and Status Points — TL1 Translations 5-19

NMA Scan Point Definition 5-22

Central Office — Miscellaneous Discrete Environmental Conditions 5-22

- Miscellaneous Discrete Environmental Alarm and Status Points 5-22

Contents

- Central Office — Miscellaneous Discrete Environmental Control Points 5-30
- Miscellaneous Discrete Environmental Alarm and Status Points — TL1 Translation 5-32
- NMA Scan Point Definition 5-33

Parallel Telemetry

5

Overview

This chapter presents information on parallel telemetry interfaces to the operations system (OS). It includes information about parallel telemetry-related provisioning, alarm and status points, the control point, and Transaction Language 1 (TL1) translations.

Introduction

As an alternative to TL1/X.25 and telemetry byte-oriented serial (TBOS) protocol, DDM-2000 OC-3, OC-12, OC-12 Regenerators, and FiberReach Multiplexers support parallel telemetry.

NOTE:
Parallel Telemetry is not supported as of the following DDM-2000 Multiplexer releases:

- OC-3 Release 13.0 and later
- OC-12 Release 7.0 and later
- FiberReach Release 3.0 and later

To use parallel telemetry, DDM-2000 OC-3 Release 1.0 must be equipped with the optional TLMCTL circuit pack, and DDM-2000 OC-3 Release 2.0 and later must be equipped with an OHCTL circuit pack. DDM-2000 OC-12 and OC-12 Regenerators must always be equipped with an OHCTL circuit pack.

DDM-2000 Multiplexer parallel telemetry interface is dependent on the wiring of individual (parallel) leads to the telemetry remote. Refer to:

- DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 11
- DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 8
- FiberReach Application Schematic, SD-7C516-01.

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 DDM-2000 Multiplexer:

- Site Number/Far-End Identifier
- Network Element (NE) number
- Gateway Network Element (GNE)
  (Applies to OC-3 Releases through 7.2 and OC-12 Releases through 3.1.)
- Central Office/Remote Terminal Select
- Far-End Communication
- Section DCC User Side/Network Side
- Subnetwork Partitioning
- Directory Services Network Element (DSNE)
  (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X.)
- Alarm Groups
  (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X.)
- Alarm Gateway Network Element (AGNE)
  (Applies to DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X.)

Refer to the appropriate user/service manual (see the ***Related Documentation*** section in the **About This Document** chapter), for the specific switch addresses and settings, as well as the Craft Interface Terminal (CIT) user interface commands **`set-ne`**, **`set-fecom`**, and **`ent-ulsdcc`**, which are used to set the software provisionable parameters, and **`rtrv-ne`**, **`rtrv-fecom`**, and **`rtrv-ulsdcc`**, which report all the parameter values.

Figures 5-1 and 5-2 provide parallel telemetry-related provisioning examples for OC-3 Multiplexer only and combined OC-3 and OC-12 Multiplexer applications.

Site Number/Far-End Identifier

For DDM-2000 OC-3 Release 7.2, OC-12 Release 3.0, and earlier, the site number 1-32 is provisionable via hardware switch settings on the SYSCTL (BBG5) circuit pack. The site number relates to the far-end identifier (ID). A central office (CO) DDM-2000 Multiplexer may be connected to the parallel telemetry interface either directly or through the intrabay multiple cable. In this case no far-end ID applies to that CO DDM-2000 Multiplexer. But, the site number of that CO DDM-2000 Multiplexer affects the mapping of site number to the far-end ID for all other DDM-2000 Multiplexers in the same subnetwork. When the site number of the CO DDM-2000 Multiplexer with the parallel telemetry interface is set to **7** (as recommended), the site number equals the far-end ID for each remote DDM-2000 Multiplexer.

For DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X and later, the site number 1-64 is provisioned via the CIT **`set-ne`** command.

- In DDM-2000 OC-3-only or DDM-2000 OC-12-only applications, each DDM-2000 OC-3 within the same subnetwork should be assigned a unique site number; thus the NE number may be any valid setting.
- In combined DDM-2000 OC-3, OC-12 and/or FiberReach applications:
  - — site numbers should be assigned to distinguish the DDM-2000 Multiplexer(s) in each office (or site) from the DDM-2000 Multiplexer(s) in other offices (or sites) within the same subnetwork.
  - — all DDM-2000 Multiplexers in the same office (or site) and in the same subnetwork should be assigned the same site number, but each of those DDM-2000 Multiplexers should be identified uniquely by assigning different NE numbers.
- In DDM-2000 OC-3 R13.0, OC-12 R7.9, and FiberReach R3.0 and later, the site and NE number parameters are eliminated.

Table 5-1 shows the mapping between site numbers and resultant far-end ID assignments. Each row of the table contains the DDM-2000 Multiplexer site numbers mapped to the far-end IDs (1-6), depending on the site number of the CO DDM-2000 Multiplexer with the parallel telemetry interface. For example, if the site number of the CO DDM-2000 Multiplexer with the parallel telemetry interface is **1** (first row of the table), then all the site numbers match the far-end IDs except the DDM-2000 Multiplexer with site number **7** is assigned to far-end ID **1**.

The DDM-2000 OC-12 Regenerator does not support remote far-end communication over the section data communications channel (DCC), thus each DDM-2000 OC-12 Regenerator must be physically connected to the parallel telemetry interface, either directly or through the intrabay multiple cable. Because each DDM-2000 OC-12 Regenerator is its own subnetwork, the far-end ID does not apply, and the site number of every regenerator may be set to **1**.

Table 5-1. Site Number to Parallel Telemetry Far-End ID Mapping

Site Number of DDM-2000 With Parallel Telemetry Interface	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 (*Recommended*)	1	2	3	4	5	6	–	–
$>=$8 (*not valid*)	1	2	3	4	5	6	–	–

Network Element Number

For DDM-2000 OC-3 Release 7.2 and OC-12 Release 3.0 and earlier, the network element (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 DDM-2000 Multiplexer within a subnetwork.

For DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X, the NE number is provisioned via the CIT **`set-ne`** command.

In DDM-2000 OC-3 only applications, each DDM-2000 OC-3 within the same subnetwork should be assigned a unique site number, thus the NE number may be any valid setting. Similarly, in combined DDM-2000 OC-3 and OC-12 applications, site numbers should be assigned to distinguish the DDM-2000 Multiplexer(s) in each office (or site) from the DDM-2000 Multiplexer(s) in other offices (or sites), within the same subnetwork. Thus, in combined DDM-2000 OC-3 and OC-12 applications, all DDM-2000 Multiplexers in the same office (or site) and in the same subnetwork should be assigned the same site number, but each of those DDM-2000s should be identified uniquely by assigning different NE numbers.

Because each DDM-2000 OC-12 Regenerator is its own subnetwork, the NE number of every regenerator may be set to **1**.

Gateway Network Element

In DDM-2000 OC-3 Release 6.0-7.2, OC-12 Release 2.0-3.1, one DDM-2000 Multiplexer in each subnetwork must be provisioned as the Gateway Network Element (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 when OSI is supported on the DCC, and the DDM-2000 Multiplexer GNE also serves as the directory services network element (DSNE). One DDM-2000 Multiplexer in each subnetwork must be provisioned as the GNE. All other DDM-2000 Multiplexers in the same subnetwork are *not* GNEs. The default is that each DDM-2000 Multiplexer is *not* the GNE.

The DDM-2000 Multiplexer **`rtrv-ne`** CIT user interface command indicates *if* the queried DDM-2000 Multiplexer is a GNE. In DDM-2000 OC-3 Release 3.0-7.2 and OC-12 Release 1.0-3.1, **`rtrv-ne`** also includes the *address* of the GNE from the perspective of each queried DDM-2000 Multiplexer.

For DDM-2000 OC-3 Release 8.0-11.X, OC-12 Release 5.X, and FiberReach Release 1.0-2.X, TL1 GNE provisioning has no effect on parallel telemetry.

Central Office/Remote Terminal Select

The selection of the central office (CO) or remote terminal (RT) controls the appropriate processing of the miscellaneous discrete environmental points as alarm/status and controls. The fan shelf failure is applicable only at COs. The fan control relay failure is applicable only at RT sites.

- For DDM-2000 OC-3 Release 7.2 and OC-12 Release 3.1 and earlier, the selection of CO or RT is provisionable via hardware switch settings on the SYSCTL circuit pack.
- For DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0, and FiberReach Release 1.0 and later, selection of CO or RT is provisionable via the CIT.
- The DDM-2000 OC-12 Regenerator does not support miscellaneous discrete environmental alarm and status points. The hardware switch settings on the SYSCTL circuit pack must be set to **CO** in regenerator applications.

Far-End Communication

Far-end communication over the SONET section DCC may be provisioned, using the CIT user interface command **`set-fecom`**, as either enabled (default) or disabled. The parallel telemetry display updates are exchanged using the section DCC in the optical signals. (The section DCC is *not* available on EC1 signals.)

- If far-end communication is enabled (and remote parallel telemetry reporting is enabled, see above) for all intervening section DCCs, each DDM-2000 Multiplexer shares its parallel telemetry information with the other DDM-2000 Multiplexers to which it is connected via optical facilities. Thus, a remote DDM-2000 Multiplexer parallel telemetry alarm and status points can be forwarded to the telemetry remote via a CO DDM-2000

Multiplexer, and vice versa for TBOS parallel telemetry.

- If far-end communication is disabled, the exchange of parallel telemetry (and other alarm, control and maintenance) information is restricted accordingly, effectively separating the DDM-2000 Multiplexer subnetwork.
- If far-end communication is enabled but the section DCC (or the optical signal itself) fails, the DDM-2000 Multiplexer adjacent to the section DCC (or optical signal) failure reports that alarm condition.

In combined DDM-2000 OC-3 and OC-12 applications, any CO OC-3 shelves that report their parallel telemetry information via the section DCC to the collocated CO OC-12 in the same subnetwork are subject to the effects of far-end communication provisioning and section DCC failures as described above.

In DDM-2000 OC-3 ring applications, all high-speed section DCCs should be enabled for communications survivability.

The DDM-2000 OC-12 Regenerator does not support remote far-end communication over the section DCC.

Section DCC User Side/Network Side

For DDM-2000 OC-3 Release 6.0-7.2 and OC-12 Release 2.0-3.1, with the open systems interconnect (OSI) protocol on the section DCC, the section DCC user side/network side must be provisioned via hardware switch settings on the OHCTL (BBG7) and BOHTCTL (BCP1) circuit packs. For DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0, FiberReach Release 1.0, and later, the section DCC user side/network side is provisionable via the CIT et-fecom command. There is a separate setting for each possible optical termination on a DDM-2000 Multiplexer. Each *end* (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-fecom`** 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 separating the subnetwork. There is no interdependency among multiple section DCCs terminating on the same DDM-2000 Multiplexer.

Network Service Access Point

For DDM-2000 OC-3 Release 6.0-11.X and OC-12 Release 2.0-5.X and FiberReach Release 1.0-2.X, with the OSI protocol on the section DCC, another provisionable parameter is the network services access point, but the factory default values of that software parameter suffice for these releases. The CIT

user interface command **ent-ulsdcc** is available but should not be used to change the default NSAP, and the **rtrv-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 DDM-2000 Multiplexer subnetwork. Refer to the TL1/X.25 Interface section of this document.

Directory Services Network Element

For DDM-2000 OC-3 Release 6.0-11.X, OC-12 Release 2.0-5.X, and FiberReach Release 1.0-2.X, supports OSI seven-layer protocol stack architecture over the SONET DCC and Lucent Directory Services. This architecture requires network layer 3 names called NSAPs for addressing NEs while users at remote OSs and at NE CITs use application layer 7 names called target identifiers (TIDs). The single NE in each subnetwork that translates between NSAPs and TIDs is called the directory services network element (DSNE).

Any DDM-2000 or FT-2000 (Release 6.0-7.X) in a subnetwork can serve as the DSNE (except FiberReach). NEs added to a subnetwork are registered automatically by the DSNE and have access to all features. DDM-2000 can be provisioned as the DSNE via the CIT **set-ne** command.

Alarm Groups

When subnetwork sizes were smaller, every NE broadcasted its status to all other NEs in the subnetwork. For DDM-2000 OC-3 Release 7.2-11.X, OC-12 Release 5.X, and FiberReach1.0-2.X, the exchange of NE status information is limited to NEs in the same alarm group. This status information includes:

- Alarm/status level
- User panel condition
- ACO status
- TBOS status
- Parallel telemetry status
- Miscellaneous discrete information.

An alarm group is a set of NEs that share status information between themselves. Alarm groups can be nodes in a ring, nodes of a linear extension, nodes of an OC-12 service, or any other logical grouping such as a maintenance group or geographical group. All NEs are defaulted into an alarm group (number 255). Users provision NEs into alarm groups by assigning each member an alarm group number to support operations interworking and large networks, and to avoid sending unnecessary information to every NE.

For example, 24 NEs could be provisioned into three alarm groups each with eight NEs that share a community of interest. All members of the same alarm group share NE status information but do not share information with other alarm groups.

Depending on provisioning, a member of an alarm group can:

- Know the alarm/status of all members of the same alarm group and, if the NE is at the CO, activate audible office alarms for the alarm group.
- List a report of the alarm or status condition of other NEs in the group.
- Display composites of other member's user panel information. If the site identification of a remote NE is from one to eight, display the user panel status at the site instead of a composite display. As a feature, the same site/NE identification can appear more than once in a subnetwork, as long as it is in different alarm groups. This supports creating large subnetworks by combining several small subnetworks without having to change the site/NE identification.
- Relay other members' parallel telemetry alarm/status closure states to the OS.
- Send and receive miscellaneous discrete alarm/status closure states to and from alarm group members at a CO.
- Send and receive ACO requests to and from members of the same alarm group with the same site number. This supports the ability for a user to activate ACO for a group of NEs having the same site number and subnetwork connectivity to another member NE in the group.

Each NE's alarm group number is provisionable via the CIT **`set-ne`** command. By default, all NEs belong to alarm group number 255, and if not changed, NE status is sent to all NEs in the subnetwork. Those NEs located in a CO can perform alarm activation functions.

Alarm Gateway Network Element

For DDM-2000 OC-3 Release 7.2-11.X, OC-12 Release 5.X, and FiberReach 1.0-2.X, one NE in each alarm group must be provisioned as an alarm gateway network element (AGNE). The AGNE broadcasts NE status information to members of its alarm group. Considerations for choosing an NE as an AGNE include being central to the group to minimize communications links and being easily accessible for maintenance purposes. A backup AGNE can be provisioned to "shadow" the primary AGNE by sending duplicate status reports to members of the group. Any DDM-2000 or FT-2000 (Release 6.0-7.X) in a subnetwork can serve as an AGNE. DDM-2000 can be provisioned as an AGNE via the CIT **`set-ne`** command.

For subnetworks having more than 16 NEs, the AGNE, DSNE, and TL1 GNE should be separate NEs. The AGNE is a "collection point" and does not have to be an NE in a CO, for example.

Provisioning Examples

Figures 5-1 and 5-2 provide examples of parallel telemetry-related provisioning for the DDM-2000 Multiplexer.

- Figure 5-1 provides parallel telemetry-related provisioning examples for DDM-2000 OC-3 Multiplexer applications only.
- Figure 5-2 provides a parallel telemetry-related provisioning example for a combined DDM-2000 OC-3 and OC-12 application.

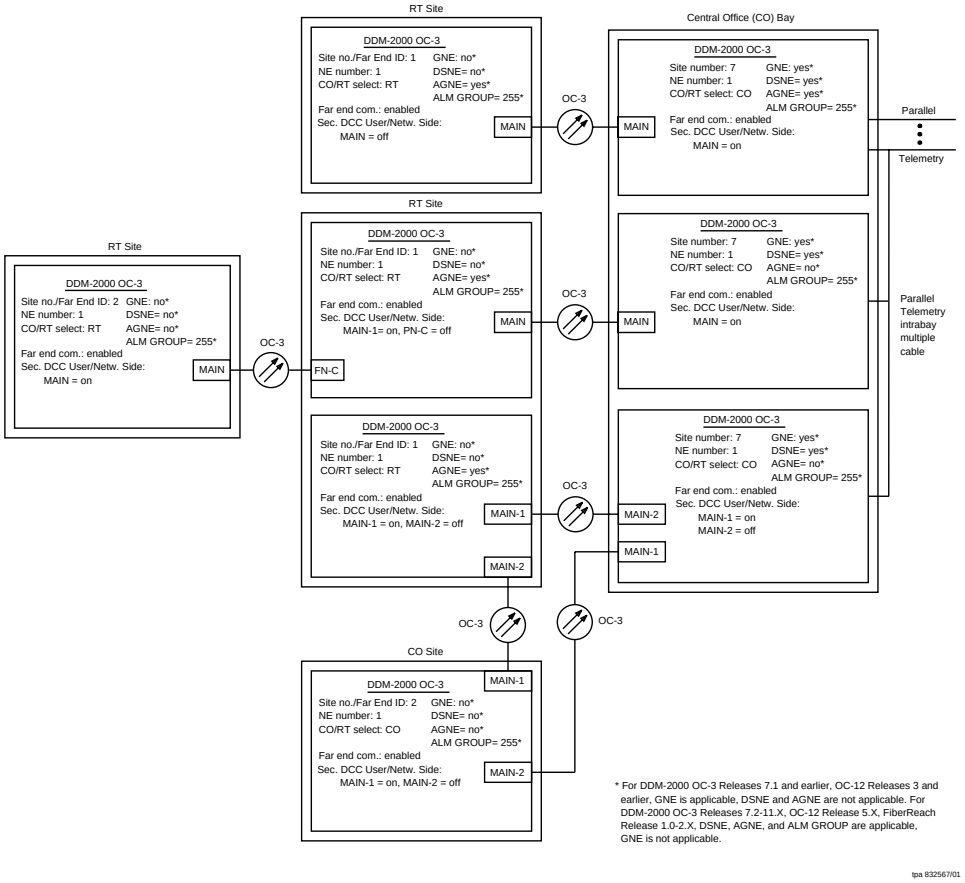


Figure 5-1. Example of Parallel Telemetry-Related Provisioning for DDM-2000 OC-3 Only Applications

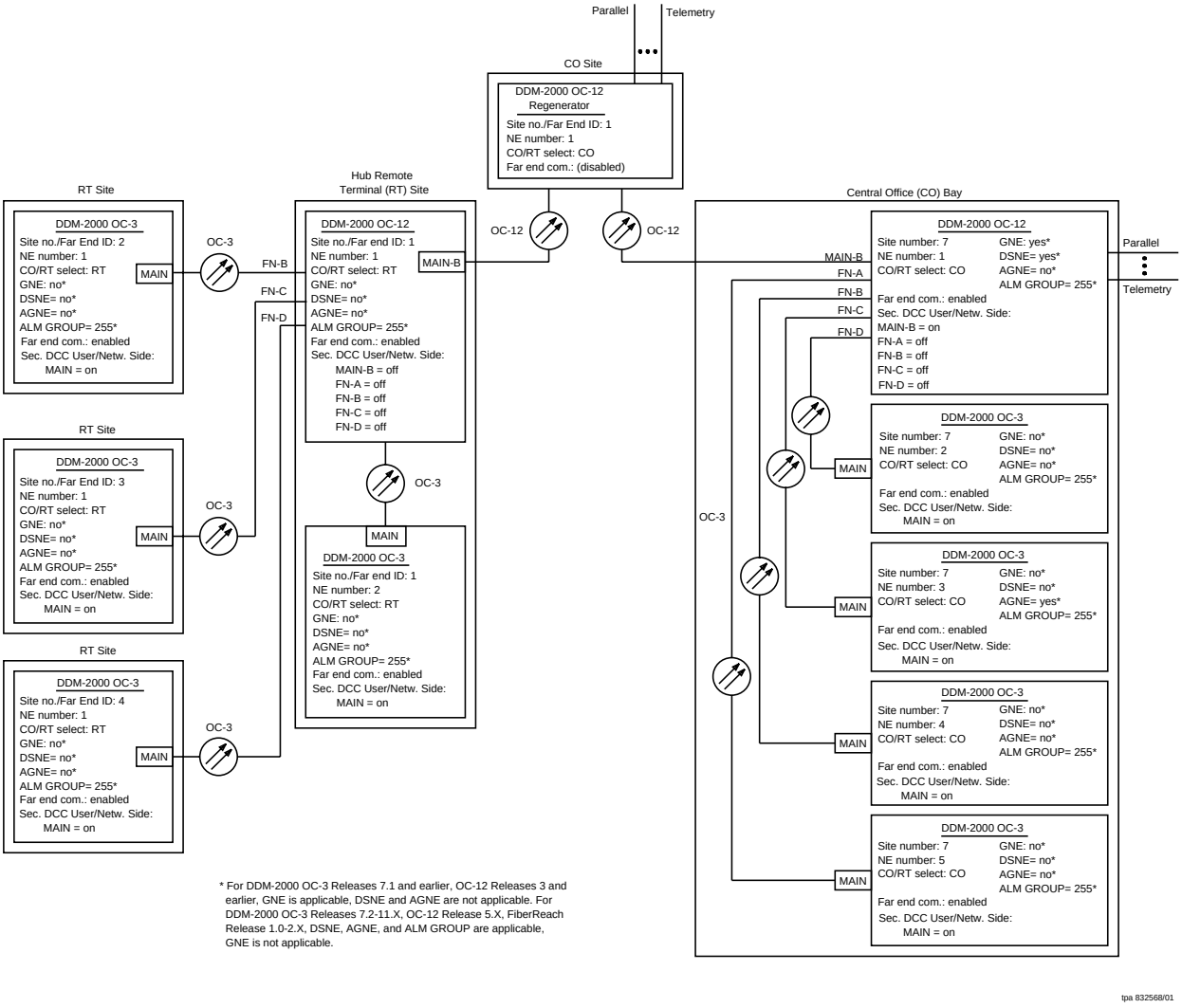


Figure 5-2. Example of Parallel Telemetry-Related Provisioning for a Combined DDM-2000 OC-3, OC-12, or OC-12 Regenerator Application

Wiring Together Multiplexers in a Bay

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 DDM-2000 Multiplexers in a bay can be wired together. As for TBOS, an intrabay multiple cable is provided for this purpose. Refer to:

- DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 12
- DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 9
- FiberReach Application Schematic, SD-7C516-01.

A parallel telemetry system ID is assigned automatically and uniquely to each DDM-2000 Multiplexer in a bay based on the order in which the DDM-2000 Multiplexers are cabled together for parallel telemetry reporting purposes. The first DDM-2000 Multiplexer in a bay, the DDM-2000 Multiplexer providing the external connection to the telemetry remote, is assigned system ID **1**, and the next DDM-2000 Multiplexer is assigned system ID **2**, etc. Note that no parallel telemetry system ID is assigned or reserved for unequipped shelf positions in a bay.

Tests

DDM-2000 Multiplexer supports parallel telemetry testing via the CIT user interface command **`test-tlm-par`**. Refer to the appropriate user/service manual. (See the ***Related Documentation*** section in the **About This Document** chapter.)

The parallel telemetry tests consist of setting the user-specified parallel telemetry 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 one point or all points (including the miscellaneous discrete environmental alarm and status points) in a test via the CIT user interface command **`test-tlm-ser`**.

Alarm and Status Points

Table 5-2 summarizes the DDM-2000 Multiplexer parallel telemetry alarm and status points.

Table 5-2. Central Office Parallel Telemetry Alarm and Status Points

Wire ID (Note)	Type	Scan Point Description
CR	SA	Critical Alarm
MJ	SA	Major Alarm
MN	NSA	Minor Alarm
PMN*	NSA	Power Minor Alarm
NE	STATUS	Near End = location of condition detected
		Reported condition detected at:
FE1*	STATUS	Far-End ID #1
FE2*	STATUS	Far-End ID #2
FE3*	STATUS	Far-End ID #3
FE4*	STATUS	Far-End ID #4
FE5*	STATUS	Far-End ID #5
FE6*	STATUS	Far-End ID #6
CLF	STATUS	Incoming SONET Signal Failure
INCM*	STATUS	Incoming Asynchronous Electrical Signal Failure
		Condition reported by:
SID1	STATUS	System ID #1
SID2	STATUS	System ID #2
SID3	STATUS	System ID #3
SID4	STATUS	System ID #4
SID5	STATUS	System ID #5
SID6	STATUS	System ID #6
ACO-O	STATUS	Alarm CutOff (-Output)

Note: Refer to:
DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 11
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 8
FiberReach Application Schematic, SD-7C516-01.

* Does not apply to the DDM-2000 OC-12 Regenerator.

The following explanations are provided for the DDM-2000 Multiplexer parallel telemetry alarm and status points. The specific conditions that may trigger:

- the incoming SONET signal failure [a carrier line failure (CLF)],
- the incoming asynchronous (and low-speed SONET) electrical signal failure (INCM), or
- the power minor alarm (PMN) points,

are listed. They use the same condition descriptions as the DDM-2000 Multiplexer user interface alarm and status report. An example is: `inc. OC3 line AIS`. For detailed explanations and likely causes of these conditions, refer to Table 3-4.

When multiple alarms are active, only the highest level parallel telemetry alarm point and all status points are reported by each DDM-2000 Multiplexer. When the highest level alarm clears, the next highest level active alarm point and all status points will be reported. If multiple CO DDM-2000 Multiplexers are wired together in a bay for parallel telemetry reporting purposes, the parallel telemetry output consists of the wiring of the highest level alarm point and associated status points from *each* CO DDM-2000 Multiplexer.

The parallel telemetry alarm points are subject to the user-provisioned alarm hold-off delay. The alarm hold-off delay is provisionable via the CIT user interface **`set-attr-alm`** command. The default is 2 seconds. Refer to the appropriate user/service manual. (See the ***Related Documentation*** section in the **About This Document** chapter.)

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 — This point indicates if a critical alarm (any single failure causing loss of service on more than four DS1s or any unprotected synchronization equipment failure) is detected.

Major — This point indicates if a major alarm [any single failure causing loss of service on four DS1s or less (DDM-2000 Multiplexer OC-3 only)], loss of both DS1 synchronization references, or any non-service-affecting failure that could mask other service-affecting failures [for example, section DCC failure] is detected.

Minor — This point indicates if a minor alarm (any non-service-affecting failure that cannot mask a service-affecting failure or any protected synchronization, equipment, or transmission failure) is detected.

Power Minor — This point indicates if an `AC power failed` (any non-service-affecting switch from AC power to battery backup at a remote site) is detected.

This condition is based on the wired input to:

- DDM-2000 OC-3 Application Schematic SD-7C510-01, CADs 18 and 34, P62 pin 4
- DDM-2000 OC-12 Application Schematic SD-7C513-01, CADs 15 and 31, P68 pin 9
- FiberReach Application Schematic, SD-7C516-01.

Near End — This point identifies the near end as the location at which the reported condition was detected.

Far-End ID — These six points identify the far-end DDM-2000 Multiplexer shelf at which a reported condition is detected. The assignment of far-end IDs depends on the site number of the CO DDM-2000 Multiplexer with the parallel telemetry interface as described in the ***Site Number/Far-End Identifier*** section.

Incoming SONET Signal Failure (CLF) — 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. LOF` (`OC-3`, `OC-12` or `OC-1`)
- `inc. LOS` (`OC-3`, `OC-12` or `OC-1`)
- `inc. line ASI` (`OC-3`, `OC-12` or `OC-1`)
- `inc. signal degrade (BER)` (`OC-3`, `OC-12` or `OC-1`)
- `inc. signal failed (BER)` (`OC-3`, `OC-12` or `OC-1`)
- `inc. STS1 LOP EC1` (if provisioned to be an alarm and high-speed EC1)
- `inc. STS1 LOP OC-3` (or `OC-12`) *`slotaid`*
- `inc. VT LOP` (DDM-2000 OC-3 and FiberReach only)

OC-12 Regenerator Release 1.0 detects `inc. OC12 LOS` only.

Incoming Asynchronous (and low-speed SONET) Electrical Signal Failure (INCM) — 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 low-speed EC1)
- `inc. EC1 sig. failed (BER)` (if provisioned to be an alarm and low-speed EC1)
- `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`
- `inc. STS1 LOP EC1` (if provisioned to be an alarm and low-speed EC1)
- `inc. (from DSX) DS1 LOS` (if provisioned to be an alarm) (DDM-2000 OC-3 and FiberReach only)
- `inc. (from DSX) DS1 sig fail` (if provisioned to be an alarm) (DDM-2000 OC-3 and FiberReach only)
- `inc. (from DSX) DS3 LOS` (if provisioned to be an alarm)
- `inc. (from DSX) DS3 sig fail` (if provisioned to be an alarm)

System ID — These six points identify the CO DDM-2000 Multiplexer shelf reporting a condition when the parallel telemetry alarm and status points are wired together among multiple CO DDM-2000 Multiplexers in a bay. The system ID points are not physically wired together as can be done for other common parallel telemetry outputs within a bay. The parallel telemetry system IDs are assigned automatically as described in the ***Wiring Together Multiplexers in a Bay*** section.

Alarm Cutoff (-Output) — 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 (when multiple CO DDM-2000 Multiplexers are wired together in a bay for parallel telemetry reporting purposes) 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 DDM-2000 Multiplexer via its parallel telemetry output points).

The ACO is only reported as active for DDM-2000 Multiplexers (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 ACO input control point
- TBOS ACO control point 62.

Control Point

Table 5-3 identifies the control point for DDM-2000 Multiplexer parallel telemetry.

Table 5-3. Central Office Parallel Telemetry Control Point

Wire ID (Note)	Verification Status Point Wire ID (Note)	Control Point Description (Equivalent CIT Command)
ACO-I	ACO-O	Alarm CutOff (-Input) (**opr-aco**)

Note: Refer to:
DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 11
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 8
FiberReach Application Schematic, SD-7C516-01.

The following explanation is provided for the DDM-2000 Multiplexer parallel telemetry control point. The equivalent CIT command is also included in Table 5-3 as a specific cross-reference. Refer to the appropriate user/service manual. (See the ***Related Documentation*** section in the **About This Document** chapter.)

Alarm Cutoff (-Input) — 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 IDs (when multiple CO DDM-2000 Multiplexers are wired together in a bay for parallel telemetry reporting purposes). The parallel telemetry ACO input control applies to all CO DDM-2000 Multiplexers that are wired together for parallel telemetry reporting purposes.

The parallel telemetry ACO input control does not affect the parallel telemetry outputs during a parallel telemetry test.

Alarm and Status Points — TL1 Translations

Tables 5-4 and 5-5 specify two alternatives for the translation of the DDM-2000 Multiplexer parallel telemetry alarm and status points to TL1 messages. The TL1 translations are provided to support the required provisioning of the OS with the meaning of the DDM-2000 Multiplexer parallel telemetry alarm and status points. The TL1 translation is also provided for customers who rely on proprietary telemetry remote/mediation devices to translate parallel telemetry to TL1 (to the OS) instead of interfacing from the telemetry remote (to the OS) via E2 or E2A telemetry protocol.

Table 5-4 is based on *one-to-one* translation of the DDM-2000 Multiplexer parallel telemetry alarm and status points to TL1 messages. Table 5-5 is based on *combinations* of the DDM-2000 Multiplexer parallel telemetry alarm and status points. The combinations of the alarm and status points can be translated to more specific TL1 messages than when each point is viewed independently. DDM-2000 Multiplexer parallel telemetry alarm and status points are designed to be viewed in combinations, but the variety of individual points and/or combinations of points that may occur, especially when multiple simultaneous alarms exist, may be too flexible to be accommodated in the OS.

In addition to the combinations of alarm and status points represented in Tables 5-4 and 5-5, the DDM-2000 Multiplexer provides far-end ID and system ID points which are also designed to be viewed in combinations with the other alarm and status points. (Refer to the ***Related Provisioning*** section for explanations of the far-end ID and system ID points.) For each individual alarm and status point and each combination of alarm and status points, additional combinations identifying the reporting DDM-2000 Multiplexer by far-end ID and/or system ID are possible. Again, the variety of individual points and/or combinations of points that may occur, especially when multiple simultaneous alarms exist, may be too flexible to be accommodated in the OS [for example, in a network monitoring and analysis (NMA) system].

In Tables 5-4 and 5-5, the choice of `REPT ALM` or `REPT EVT` message types and the values for the ALMCDE and NTFCNCDE fields are based on the DDM-2000 Multiplexer default alarm levels.

Table 5-4. TL1 Translation — Option 1. Parallel Telemetry Alarm and Status Point Translation to TL1 Messages

	TL1 Translation							
Wire ID (Note)	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE (Note)	SRVEFF or CONDEFF	DIRN	CONDDESCR
CR	*C	REPT ALM	COM	CR	EXT/INT CR	SA NSA	NA	Shelf Critical Alarm (OC-12 Regenerator only)
MJ	**	REPT ALM	COM	MJ	EXT/INT MJ	SA NSA	NA	Shelf Major Alarm (OC-12 Regenerator only)
MN	*	REPT ALM	COM	MN	EXT/INT MN	NSA	NA	Shelf Minor Alarm
PMN†	*	REPT ALM	COM	MN	PWR PMN	NSA	NA	AC Power Failed
NE	A	REPT EVT	COM		ID‡ NE	SC	NA	Near End Shelf Loc.
FE1-6†	A	REPT EVT	COM		ID‡ FE1(-6)	SC	NA	Far-End ID #1(-6)
CLF	A	REPT EVT	OC3§ (or OC12§) (or EC1§) (or OC1§)		LOS/LOP CLF	SC	NA	Inc SONET Sig Failed
INCM†	A	REPT EVT	T3		LOS INCM	SC	NA	Inc DSX/Sync Fail
SID1-6	A	REPT EVT	COM		ID‡ SID1(-6)	SC	NA	System ID #1(-6)
ACO-O	A	REPT EVT	COM		ACOMAN ACO-O	SC	NA	Alarm CutOff Active

Note: The CONDTYPE values are appended with the parallel telemetry point labels (wire ID) to make the full CONDTYPE value unique and insure that NMA correctly associates alarm and clear pairs. Refer to:

DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 11
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 8
FiberReach Application Schematic, SD-7C516-01.

† Not applicable to the DDM-2000 OC-12 Regenerator.

‡ This parameter value is not included in TR-833, Issue 3 or 4, but it is understood that NMA will accept the value. These ID points are intended to be viewed with the other parallel telemetry alarm and status points to identify the source of the reported alarm or status condition.

§ Until NMA Release 3.4, when NMA supports generic SONET signal levels, use NMA *signal level* **T3** for EC1, **T3X** for OC3, and **T4X** for OC12 (DDM-2000 OC-12 only).

Table 5-5. TL1 Translation — Option 2. Parallel Telemetry Alarm and Status Point Translation to TL1 Messages

	TL1 Translation							
Wire ID (Note)	**ALMCDE**	**Message Type**	**Message Modifier**	**NTFCNCDE**	**CONDTYPE (Note)**	**SRVEFF or CONDEFF**	**DIRN**	**CONDDESCR**
CR only	*C	REPT ALM	EQPT	CR	INT CR	SA NSA	NA	Internal Eqpt Failed (OC-12 Regenerator only)
CR+CLF	*C	REPT ALM	OC3§ (or OC12§) (or OC1§) (or EC1§)	CR	LOS/LOP CR	SA NSA	NA	Inc OC3, OC12 or OC1) Fail/Degrade (OC-12 Regenerator only)
MJ only	**	REPT ALM	COM	MJ	EXT/INT MJ	SA NSA	NA	Shelf Major Alarm (OC-12 Regenerator only)
MJ+CLF†	**	REPT ALM	VT1§	MJ	LOP MJ	SA	NA	Inc VT Loss of Pointer
MJ+INCM†	**	REPT ALM	T3	MJ	LOS MJ	SA	NA	Inc DS3/SyncRef Fail
MN only	*	REPT ALM	EQPT	MN	INT MN	NSA	NA	Prot Eqpt Failed
MN+CLF†	*	REPT ALM	OC3§ (or OC12§) (or OC1§)	MN	LOS/LOP MN	NSA	NA	Inc OC3, OC12 or OC1) Fail/Degrade
MN+INCM†	*	REPT ALM	EQPT	MN	T1 MN	NSA	NA	Prot Sync Ref Failed
PMN†	*	REPT ALM	COM	MN	PWR PMN	NSA	NA	Fuse/Pwr Ckt Failed
NE	A	REPT EVT	COM		ID‡ NE	SC	NA	Near-End Shelf Loc.
FE1-6†	A	REPT EVT	COM		ID‡ FE1(-6)	SC	NA	Far-End ID #1(-6)
SID1-6	A	REPT EVT	COM		ID‡ SID1(-6)	SC	NA	System ID #1(-6)
ACO-O	A	REPT EVT	COM		ACOMAN ACO-O	SC	NA	Alarm Cutoff Active

See **Note** and footnotes at end of table.

Table 5-5. TL1 Translation — Option 2. Parallel Telemetry Alarm and Status Point Translation to TL1 Messages (Contd.)

Note: The CONDTYPE values are appended with the parallel telemetry point labels (wire ID) to make the full CONDTYPE value unique and insure that NMA correctly associates alarm and clear pairs. Refer to:
DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 11
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 8
FiberReach Application Schematic, SD-7C516-01.

† Not applicable to the DDM-2000 OC-12 Regenerator.

‡ This parameter value is not included in TR-833, Issue 3 or 4, but it is understood that NMA will accept the value. These ID points are intended to be viewed in conjunction with the other parallel telemetry alarm and status points to identify the source of the reported alarm or status condition.

§ Until NMA Release 3.4, when NMA supports generic SONET signal levels, use NMA *signal level* **T3** for EC1, **T3X** for OC3, **T4X** for OC12 (DDM-2000 OC-12 only), and **T1** for VT1 (DDM-2000 OC-3 and FiberReach only).

NMA Scan Point Definition

The NMA provisioning required to support DDM-2000 Multiplexer parallel telemetry alarm and status points is basically the same as for TBOS. Refer to the ***NMA Scan Point Definition*** section for TBOS, located in Chapter 4.

Central Office — Miscellaneous Discrete Environmental Conditions

Miscellaneous Discrete Environmental Alarm and Status Points

To allow monitoring of conditions and equipment collocated with a DDM-2000 Multiplexer at a remote site:

- For DDM-2000 OC-3 Release 7.2 and OC-12 Release 3.0 and earlier, 15 miscellaneous discrete environmental alarm and status points are available, and 15 of those can be reported via CO miscellaneous discrete outputs (Figure 5-3).
- For DDM-2000 OC-3 Release 8.0, OC-12 Release 5.0, and FiberReach Release 2.0 and later, 21 miscellaneous discrete environmental alarm and status points are available, but only 10 of those can be reported via CO

miscellaneous discrete outputs (Figure 5-4).

- For FiberReach 1.0, 15 miscellaneous discrete environmental alarm and status points are available, and 10 of those can be reported via CO miscellaneous discrete outputs (Figure 5-5).

NOTE:
The CO reporting of miscellaneous discrete environmental alarm and status points is not supported as of the following DDM-2000 Multiplexer releasesr:

- OC-3 Releases 13.0 and later
- OC-12 Release 7.0 and later
- FiberReach Release 3.0 and later

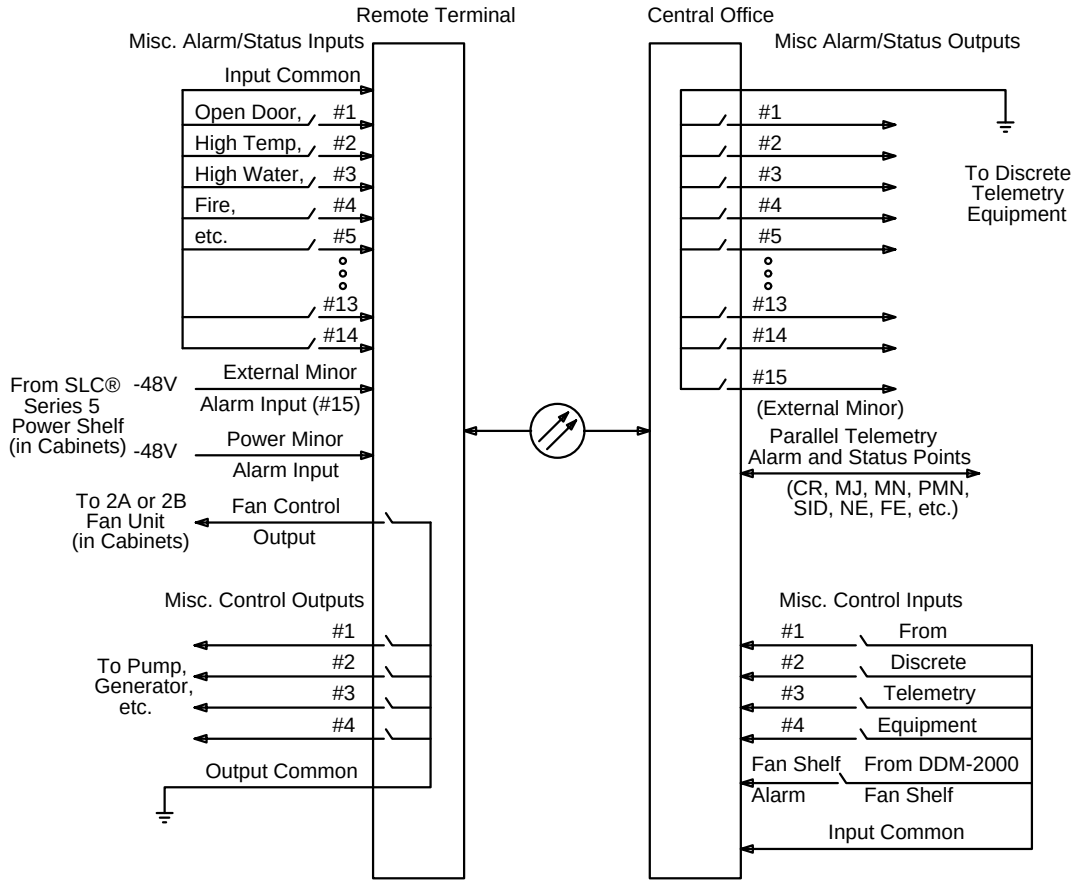
Although the remote reporting and control of miscellaneous discretes via parallel telemetry (and TBOS) is not supported in the above-mentioned releases, remote reporting and control of miscellaneous discretes is still supported via TL1.

These points are typically wired to report environmental alarm conditions (for example, open door and high temperature) at the site of the remote DDM-2000 Multiplexer, although points 1 through 14 are user-settable. Point 15 (although user-settable also) is defined to report external minor and point 16 is defined to report fan control relay failure. The user-settable miscellaneous discrete environmental alarm and status points may also be used to report alarms from collocated digital loop carrier, for example, *SLC Series 5 or DDM-Plus.*

The operation of these miscellaneous discrete environmental alarm and status points is dependent on the wiring of the same at the remote DDM-2000 Multiplexer shelf per:

- DDM-2000 OC-3 Application Schematic, SD-7C510-01, CADs 18 and 34
- DDM-2000 OC-12 Application Schematic, SD-7C513-01, CADs 15 and 31
- FiberReach Application Schematic, SD-7C516-01.

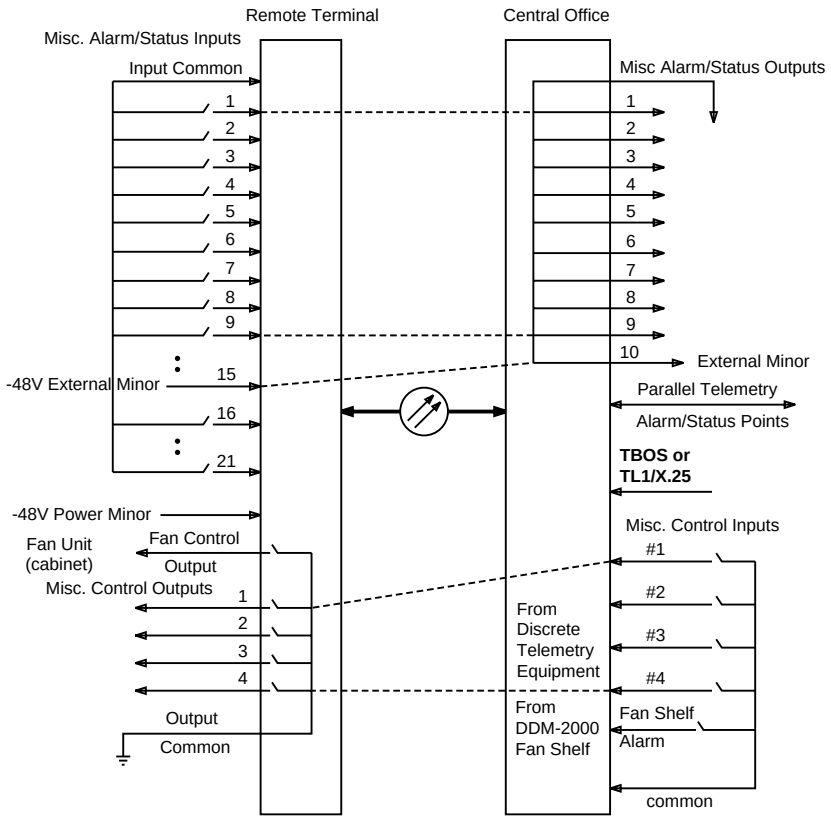
The DDM-2000 OC-12 Regenerator does not support miscellaneous discrete environmental alarm and status points.



Notes:

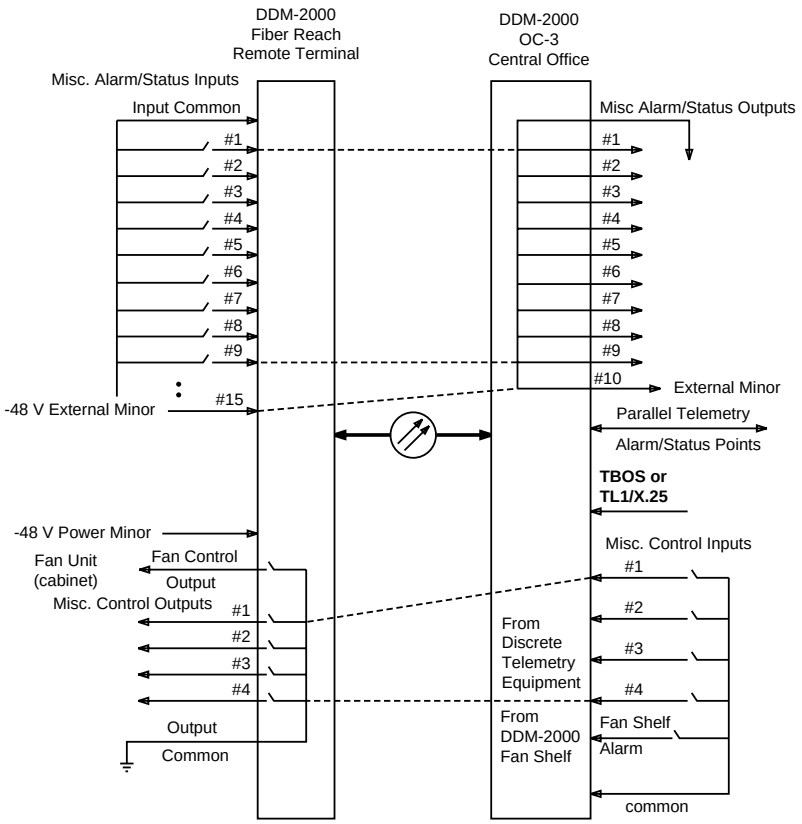
1. In a remote terminal, the output common must be wired to ground in all applications.
2. Miscellaneous alarm input #1 is typically wired to open door alarm in Lucent Technologies cabinets.
3. Miscellaneous alarm input #14 is typically wired to the DDM-2000 Multiplexer fan shelf alarm in controlled environment remote terminal applications where the DDM-2000 Multiplexer fan shelf is required.

Figure 5-3. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG5 SYSCTL (Parallel Telemetry at Central Office)



Miscellaneous alarm input #14 is typically wired to fan shelf alarm in controlled environment remote terminal applications where the fan shelf is required. If the BBG8 SYSCTL circuit pack is used at the CO, the fan alarm can be wired to misc discrete 1-9 at the remote site if a parallel telemetry output at the CO is required.

Figure 5-4. DDM-2000 OC-3/OC-12 Miscellaneous Discrete Environmental Alarms and Controls BBG8 SYSCTL (Parallel Telemetry at Central Office)



Miscellaneous alarm input #14 is typically wired to fan shelf alarm in controlled environment remote terminal applications where the fan shelf is required. If the BBG8 SYSCTL circuit pack is used at the CO, the fan alarm can be wired to misc discrete 1-9 at the remote site if a parallel telemetry output at the CO is required.

Figure 5-5. FiberReach Multiplexer Miscellaneous Discrete Environmental Alarms and Controls (Parallel Telemetry at Central Office)

For DDM-2000 OC-3 Release 1.0 only, the optional TLMCTL circuit pack is required in a CO DDM-2000 Multiplexer which reports the remote miscellaneous discrete environmental alarm and status points via parallel telemetry.

- Miscellaneous discrete environmental *alarm* points are coordinated with the parallel telemetry alarm and status points described earlier. For example, an environmental alarm condition that turns on a miscellaneous discrete environmental alarm point will turn on the appropriate parallel telemetry alarm point and system ID and far-end ID status point.
- Miscellaneous discrete environmental *status* points operate entirely independent of the parallel telemetry alarm and status points described earlier. For example, an environmental status condition that turns on a miscellaneous discrete environmental status point will *not* turn on a parallel telemetry system ID or far-end ID status point.

The DDM-2000 Multiplexer does not support the wiring together of multiple CO DDM-2000 Multiplexers in a bay for the reporting of miscellaneous discrete environmental alarm and status outputs via parallel telemetry.

Table 5-6 identifies the DDM-2000 Multiplexer parallel telemetry miscellaneous discrete environmental alarm and status points.

Table 5-6. Central Office 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
TLMO-16	NSA	Fan Control Relay Failure

Note: Refer to:

DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 17
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 14
FiberReach Application Schematic, SD-7C516-01.

With the BBG8 SYSCTL, discrete outputs 1 through 10 are provided with output point 10 (External Minor) associated with input point 15.

The following explanations are provided for the DDM-2000 Multiplexer parallel telemetry miscellaneous discrete environmental alarm and status points. The conditions that may trigger the points are listed, using exactly the same condition descriptions used in the DDM-2000 Multiplexer user interface alarm and status report, for example:

`environment`*`xx`*

For explanations of these conditions, refer to Table 3-4.

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.

  In controlled environment vault (CEV) applications using DDM-2000 Multiplexer miscellaneous discrete environmental alarm and status points (for example, with the TBOS CO/RT select provisioned to be RT) and with a DDM-2000 Multiplexer fan shelf equipped, RT miscellaneous discrete environmental alarm point #14 is recommended to monitor the fan shelf. In such cases, the RT miscellaneous discrete environmental alarm point should be provisioned with the description "FanShelfFailure" and the default alarm ("MN"). That assures consistency with similar CO applications with the fan shelf equipped and monitored by TBOS CO point #46 fan shelf failure.

- **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.

- **Fan Control Relay Failure**
  This indicates if the following is detected:

  `fan control relay failed`

Central Office — Miscellaneous Discrete Environmental Control Points

Four user settable miscellaneous discrete environmental control points are available to allow control of equipment collocated with a DDM-2000 Multiplexer 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 DDM-2000 Multiplexer shelf per:

- DDM-2000 OC-3 Application Schematic, SD-7C510-01, CADs 18 and 34;
- DDM-2000 OC-12 Application Schematic, SD-7C513-01, CADs 15 and 31;
- FiberReach Application Schematic, SD-7C516-01.

See Figures 5-3, 5-4, and 5-5.

The DDM-2000 OC-12 Regenerator does not support miscellaneous discrete environmental control points.

For DDM-2000 OC-3 Release 1.0, the optional TLMCTL circuit pack is required in a CO DDM-2000 Multiplexer which accepts the remote miscellaneous discrete environmental control points via parallel telemetry.

The miscellaneous discrete environmental control points operate entirely independent of the parallel telemetry control point described earlier. The DDM-2000 Multiplexer does not support the wiring together of multiple CO DDM-2000 Multiplexers in a bay for miscellaneous discrete environmental control inputs via parallel telemetry.

Table 5-7 identifies the miscellaneous discrete environmental control points for DDM-2000 Multiplexer parallel telemetry.

Table 5-7. Central Office 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:
DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 17
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 14
FiberReach Application Schematic, SD-7C516-01.

* 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.

The following explanation is provided for the DDM-2000 Multiplexer miscellaneous discrete environmental control points. There are no equivalent CIT user interface commands for these control points.

The four user settable miscellaneous discrete environmental control points listed in Table 5-7 identify the miscellaneous discrete environmental control point to be activated on a remote DDM-2000 Multiplexer. 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.

Miscellaneous Discrete Environmental Alarm and Status Points — TL1 Translation

Table 5-8 specifies the translation of the DDM-2000 Multiplexer parallel telemetry miscellaneous discrete environmental alarm and status points to TL1 messages. Because these miscellaneous discrete environmental alarm and status points are user settable, the *appropriate* parameter values to describe the actual condition monitored and reported by each miscellaneous discrete environmental alarm and status point must be provisioned at the OS (for example, NMA). The parameter values included in Table 5-8 are defaults only. The choice of REPT ALM ENV and REPT ALM messages and the values of the ALMCDE and NTFCNCDE fields are based on the DDM-2000 Multiplexer default alarm levels.

Table 5-8. TL1 Translation — Parallel Telemetry Miscellaneous Discrete Environmental Alarm and Status Point Translation to TL1 Messages

	TL1 Translation							
Wire ID (Note)	ALMCDE	Message Type	Message Modifier	NTFCNCDE	CONDTYPE or ALMTYPE (Note)	SRVEFF	DIRN	CONDDESCR or ALMMSG
TLMO-1(-14)†	*	REPT ALM	ENV	MN	MISC 1(-14)	NSA	NA	Misc Discrete Env 1(-14)
TLMO-15†	*	REPT ALM	ENV	MN	MISC 15	NSA	NA	ExternalMinor
TLMO-16†	*	REPT ALM	EQPT	MN	CONTR 16	NSA	NA	Fan Relay Failed

Note: The CONDTYPE and ALMTYPE values are appended with the parallel telemetry point numbers (from Wire IDs) to make the full CONDTYPE and ALMTYPE values unique and assure that NMA correctly associates alarm and clear pairs. Refer to:

DDM-2000 OC-3 Application Schematic, SD-7C510-01, CAD 17
DDM-2000 OC-12 Application Schematic, SD-7C513-01, CAD 14
FiberReach Application Schematic, SD-7C516-01.

† Not applicable to the DDM-2000 OC-12 Regenerator.

NMA Scan Point Definition

The NMA provisioning required to support DDM-2000 Multiplexer parallel telemetry miscellaneous discrete environmental alarm and status points is basically the same as for TBOS. Refer to the ***NMA Scan Point Definition*** section for TBOS, located in Chapter 4.

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 after the fault clears (nonrevertive).

1x1 Line Protection

A 1x1 protection system has **two bidirectional lines**.

One line is designed as the **service line**.

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)

ACID

Application Context IDentifier

ACO

Alarm Cutoff — A pushbutton 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 pushbutton on the user panel.

AGNE

Alarm Gateway Network Element

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.")

ADM
Add/Drop Multiplexer

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

ALMMSG
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. **Binary zeros** are represented by signal elements that have zero amplitude.

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

ATM
Asynchronous Transfer Mode

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 OC-3 shelf.

Available Time
In performance monotoring, the 1-second intervals.

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.

BCD
Binary Coded Decimal

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

BPV
Bipolar Violation

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

CID
Craft Interface Device

CIMAP
Circuit Installation and Maintenance Assistance Package operations system

CIT
Craft Interface Terminal

*CLEI**
COMMON LANGUAGE Equipment Identifier

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

---

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

CS&O
Customer Support and Operations

CTAG
Correlation tag

CTS
Clear To Send

CTS
Customer Technical Support

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
The Dual DS3 Multiplexer — A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or optical signal.

DDM-2000 Multiplexer
The 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.

DFI
Domain Specific Part Format Identifier

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 — A designed network element that is responsible for administering a database that maps network element names (TIDs) to NSAPs in an OSI subnetwork. There can be only one DSNE per subnetwork. There can also be an OSGNE.

DSP
Domain Specific Part

DSR
DCE 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 Terminal 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.

DTR
DTE Ready

Dual 0x1
See "Ring (0x1) Low-Speed Interface."

Dual Homing
A network topology in which two shelves as hosts supporting other systems. For example, OC-1 rings on OC-3 shelves or OC-3 systems on OC-12 systems. Each system is interconnected between the two separate hosts. Also referred to as ring-on-ring.

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).
- 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 Ouf 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)

EST
Environmental Stress Testing

F

FCC
Federal Communication Commission

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
The 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 OC-3 Multiplexer, or in the A, B, C, or D function unit slots of the 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.

GR
Bellcore general requirement

Group
Eight slots that may be equipped

GTP
General Telemetry Processor

GUI
Graphical User Interface

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

IC
Internal Clock — Used in synchronization messaging.

ID
Identifier. (See "Shelf ID" and "Site ID.")

IDP
Initial Domain Part

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

IMF
Infant Mortality Factor

INC
Incoming Status

INCM
A parallel telemetry point used to indicate incoming low-speed failures.

I/O
Input/Output

IP
Internetwork Protocol

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

ISO
International Standards Organization

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

LEC
Local Exchange Carrier

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. A failure to synchronize to an incoming signal.

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 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

MM
Multimode

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 Acknowledgement

NE
Near End

NE
Network Element — The basic building block of a telecommunications network that meets SONET standards. Typical internal attributes of an NE include:

- one or more high- and low-speed transmission ports
- built-in intelligence, synchronization, and timing capability
- access interfaces for use by technicians
- operations systems.

In addition, an NE 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) used to monitor network facilities.

NMON
Not Monitored — A provisioning state for equipment that is not monitored or alarmed.

Nonrevertive
A protection switching mode in which (after a protection switch occurs) the equipment remains in its current configuration after failure conditions that caused a protection switch to occur are cleared or after any external switch commands are reset. (See "Revertive.")

NRZ
Nonreturn to Zero

NSA
Not Service Affecting

NSAP
Network Service Access Point

NTF
No Trouble Found

Null
Omitted; for example, no value, zero or space.

O

O&M
Operations and Mintenance

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 that 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.

OSGNE
Centralized Survivable Operations System Access

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.

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 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.")

PRM
Performance Report Message

PROTN
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 (DCE to DTE)

RD
Received Data

RD
Routing Domain

RFU
Radio Frequency Unit

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 (the service equipment is active and the protection equipment is standby) after any failure conditions that caused a protection switch to occur, to clear, or after any external switch commands are reset. (See "Nonrevertive.")

Ring
A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over a protection line.

Ring (0x1) Low-Speed Interface
Formerly referred to as dual 0x1 or single 0x1. In ring applications, the OC-3 and OC-12 Multiplexers use a 0x1 interface. Both fibers carry service, as opposed to a linear (1x1) low speed interface, where one fiber is used for service and the other for protection.

RT
Remote Terminal — An unstaffed equipment enclosure that may have a controlled or uncontrolled environment.

RTAC
Regional Technical Assistance Center (1-800-225-7822)

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

SDH
Synchronous Digital Hierarchy

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 affect traffic dropped at the failed node only.

SEFS
Severely Errored Frame Seconds

SEO
Single-Ended Operations

Service Line
On an OC-3 system, a service (working) line is a pair of fibers (one transmit and one receive) that terminate on an OLIU circuit pack in the **`main-1`**, **`fn-a-1`**, **`fn-b-1`**, or **`fn-c-1`** slot. As defined by the SONET standard, the SONET APS channel is not defined on a service (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

Shelf ID
A settable parameter with values of from one to eight. Used to log into a selected shelf in a bay using the CIT.

SG
Signal Ground

SID
Source Identifier and/or System Identifier

Site ID
A settable parameter with values of from 1 to 50. Displayed on SYSCTL circuit pack to indicate to which site the user panel alarms and LEDs apply.

SM
Single Mode

SMSB
SONET Maintenance Sub-Branch

SLC-2000
A next generation digital loop carrier (DLC) system with a built-in OC-3 SONET Multiplexer. The system supports basic telephone service, a full compliment of special services, Integrated Services Digital Network (ISDN), and Fiber in the Loop (FITL) through standard TR-08 and TR-303 interfaces.

SNPA
SubNetwork Point of Attachment

SONET
Synchronous Optical Network

SPE
Synchronous Payload Envelope

SQU
Sync Quality Unknown. Used in synchronization messaging.

SR
Service Region

SRD
Software Release Description

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.")

Star Topology
For DDM-2000 FiberReach, this refers to a configuration of multiple point-to-point OC-1 extensions from a single DDM-2000 Multiplexer.

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 Multiplexer and all the remote DDM-2000 Multiplexers 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

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 Multiplexer, 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 the CCITT human-machine language.

TLMCTL
The TLMCTL circuit pack provides the optional parallel telemetry interface in the central office OC-3 Release 1.0.

TLB
Timing Looped Back. Used in synchronization messaging.

TMN
Telecommunications Management Network

TOP
Task Oriented Practice

TR
Bellcore Technical Requirement

TSA
Time Slot Assignment

TSI
Time Slot Interchange

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. The system 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 pushbutton on the user panel.

V

VC
Virtual Circuit

VCS
Virtual Circuit Switch

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

WAN
Wide Area Network

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).