

NT4K00LA

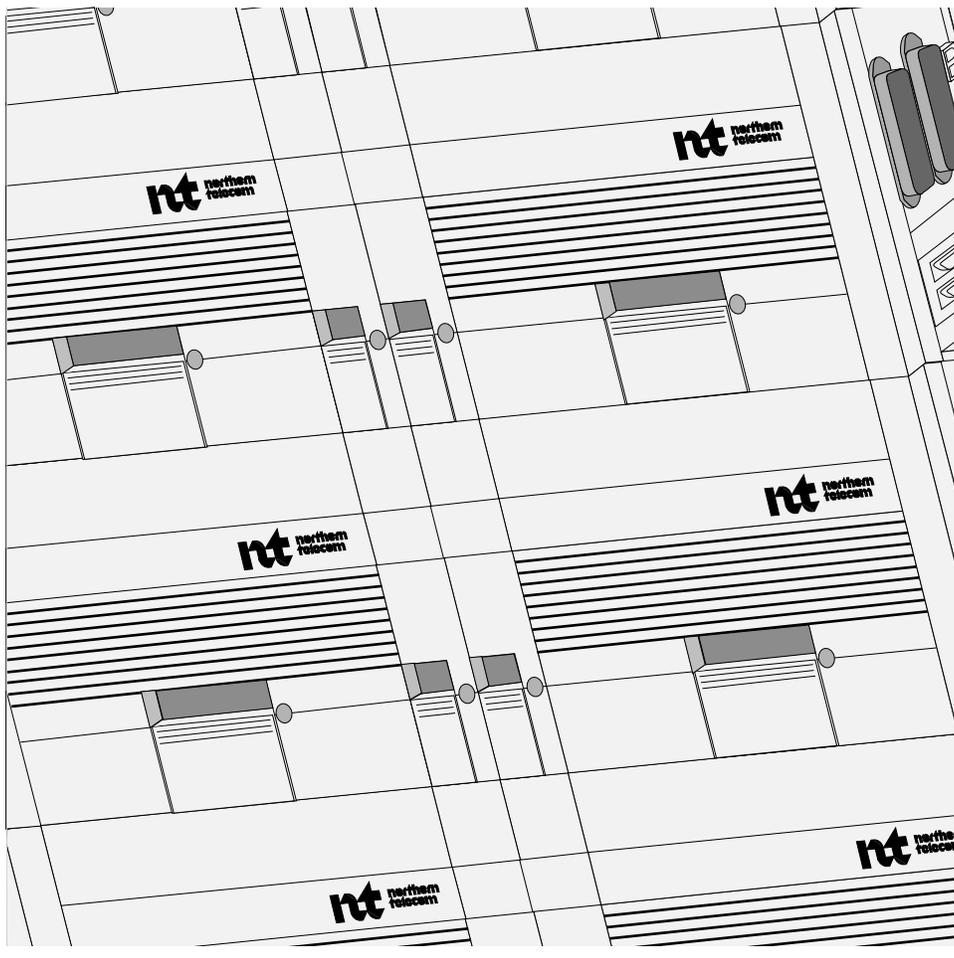
323-3001-104

SONET Products

# AccessNode

## Alarms and Surveillance Description

Issue 2.0 June 1999





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SONET Products

# **AccessNode**

## Alarms and Surveillance Description

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# Publication history

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**June 1999**

AN17 Standard release of the document, Issue 2.0. Changes reflect the addition of event reporting functionality at the GR303 MVI switch.

**February 1999**

AN16 Standard release of the document, Issue 1.0. Changes include the following:

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- FST removal
- Cooling unit CR
- OPC alarms
- BIP CR

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# About this document

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This document describes the alarms and surveillance features of AccessNode. It is written for the latest release of AccessNode products.

## Audience

The intended audience for this document includes the following groups:

- strategic and current planners
- provisioners
- transmission engineers
- network administrators

## How to use this document

Chapter 1 provides an overview of AccessNode alarms and surveillance features and defines the terms used throughout this document. Subsequent chapters discuss managing alarms, describe the visual and audible alarm indicators, and explain sending alarm information to external systems.

Displays and printouts of alarms and logs are provided along with descriptions of AccessNode telemetry byte-oriented serial (TBOS) protocol displays used for the access bandwidth manager (ABM) and transport bandwidth manager (TBM) shelves.

When you use this document, you must understand what AccessNode is, its various configurations, and its role in the fiber optic network. For information on these topics, see *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A.

For information on AccessNode Express alarms, see *AccessNode Express Alarm and Trouble Clearing Procedures*, 323-3051-543.

## Contents of this document

The subsequent chapters in this document discuss alarms and surveillance in detail. The following table lists the topics covered by those chapters.

Chapter	Topic
1	Introduction to alarms and surveillance This chapter defines AccessNode system alarm reports.
2	Management of alarms This chapter covers how an AccessNode system gathers and distributes alarm reports.
3	Visual and audible alarm indicators This chapter covers the alarm-cutoff (ACO) function that applies to audible alarm indicators.
4	Displays and printouts of alarms and logs This chapter covers the alarm report display and how to print alarm reports.
5	Sending alarm information to external systems This chapter tells you how an AccessNode system sends alarm information to the following external systems: <ul style="list-style-type: none"><li>• operations systems</li><li>• parallel telemetry systems</li><li>• serial telemetry systems.</li></ul>
6	Appendix A: TBOS displays, ABM shelf. This chapter lists the telemetry byte-oriented serial (TBOS) protocol displays for and AccessNode access bandwidth manager shelf.
7	Appendix B: TBOS displays, TBM shelf This chapter lists the telemetry byte-oriented serial (TBOS) protocol displays for and AccessNode transport bandwidth manager shelf.
8	Appendix C: Remote display This chapter explains and provides the alarm points for the remote display used in the S/DmS AccessNode system.

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## References in this document

This document refers to the following documents:

### **Description, Volume 2A**

- *Configuration and Equipment Description*, 323-3001-100

### **Commissioning and Testing, Volume 3A**

- *Setting-up Your System: VTBM*, 323-3001-230
- *Setting-up Your System: DFA*, 323-3001-235
- *Setting-up Your System: Point-to-Point*, 323-3001-240
- *Setting-up Your System: Single-Ended*, 323-3001-245

### **Commissioning and Testing, Volume 3B**

- *Optional Commissioning Procedures*, 323-3001-220
- *Site Testing Procedures*, 323-3001-221
- *System Testing Procedures*, 323-3001-222
- *Line Test Interface Commissioning Procedures*, 323-3001-223
- *DS1 Feeder Testing Procedures*, 323-3001-225

### **Operations, Administration, and Provisioning, Volume 4A**

- *OPC User Interface Description*, 323-3001-301
- *System Administration Procedures*, 323-3001-302

### **Operations, Administration, and Provisioning, Volume 4B**

- *Provisioning and Operations Procedures*, 323-3001-310
- *Line Card Provisioning Procedures*, 323-3001-315

### **Maintenance, Volume 5C**

- *Network Surveillance Procedures*, 323-3001-510

### **Separately bound documents**

- *TL1 Interface Information*, 323-3001-190



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# Introduction to alarms and surveillance

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This document describes the AccessNode's self-surveillance and event-reporting capability, and describes how AccessNode outputs alarms.

For information on AccessNode Express alarms, see *AccessNode Express Alarm and Trouble Clearing Procedures*, 323-3051-543.

## Chapter contents

This chapter explains how the AccessNode treats alarms, logs, and alerts. Use the table below to go directly to the information you require.

Topic	See
Event-reporting by AccessNode	page 1-2
Alarms	page 1-3
Alarm severity levels	page 1-6
Alerts	page 1-6
Logs	page 1-6

## Event-reporting by AccessNode

The AccessNode's event-reporting system reports logs and alerts in addition to alarms. The events that occur in an AccessNode fall into two broad categories, nonreportable events and reportable events.

A nonreportable event is one that the user does not need to know about. For example, in its normal functioning, the AccessNode initiates and terminates processes. The user need not be concerned about these events.

A reportable event is one that the user should know about. When a reportable event occurs, AccessNode generates an alarm, an alert, or a log. It chooses the type of notification that is suited to the event, as follows:

- An alarm is a notification of an actionable event.
- An alert is a notification that a customer-defined performance threshold has been reached.
- A log is a notification of a non-actionable event.

The following sections provide additional information about alarms, alerts, and logs.

## Alarms

An alarm report is a notification that an actionable event has occurred. The required action may already have been taken by the system. Alternatively, the user may have to take action in response to the event.

Every alarm has a severity level that indicates its seriousness. The following severity levels are used for alarms: critical, major, minor, and warning. For definitions of the severity levels, see “Alarm severity levels,” on page 1-6.

### Criteria for raising an alarm

When an actionable event occurs, AccessNode raises an alarm. The criteria for raising an alarm are the following:

- The event indicates that a fault condition exists in the system.
- The event or the fault condition is actionable, that is, an action is required of the craftsperson, or an action has been taken by the system, in response to the event.

When the fault condition is no longer present, the AccessNode clears the alarm.

### Typical alarm events

The following types of events cause alarms:

- loss of signal
- loss of frame
- loss of pointer
- equipment failures
  - fuse or power failure
  - synchronous equipment failure
  - loss of synchronization
  - protection-switching occurrence
  - failure to complete protection switching
  - failure of protection-switching equipment
  - failure of a central processor unit
  - failure of local nonvolatile backup memory
  - failure of OC-12 or OC-3 termination equipment
  - failure of DS1 or DS3 termination equipment

### **Line-card alarms**

By default,

- A minor alarm is raised in case of a reportable event involving a line card supporting Digital Data Service (DDS) or ISDN-U service.
- A log is raised in case of a reportable event involving a line card supporting any other service.

If you wish, you can specify line-card event reporting that differs from the default settings. To change the line-card event reporting, you use the Alarm Provisioning Manager, a software tool in the operations controller user interface (OPCUI). Using the Alarm Provisioning Manager, you can specify both service-level event reporting and line card-level event reporting.

### **Service-level event reporting**

Service-level event reporting specifications apply to a service type. The default settings for line-card event reporting, as listed above, are service-level settings. When you specify service-level event reporting, you choose a service type, you choose the type of event reporting (logs or alarms) that will apply to that service type, and you choose the network elements (one or more) where the specification will be in effect. You can apply the specification to any of the network elements served by the operations controller. Each service-level event-reporting specification applies to any line card supporting the specified service in any of the specified network elements, except in any cases in which a line-card-level specification exists.

### **Line-card-level event reporting**

Line-card-level event-reporting specifications are so-called because each one applies to an individual line card. When you specify line card-level event reporting, you specify a network element, a copper-distribution shelf, and a slot number. You then choose the type of event reporting (log or alarm). If you have chosen alarm, then you choose the severity level.

For information on how to specify line-card event reporting, see *Line Card Provisioning Procedures*, 323-3001-315, in *Operations, Administration, and Provisioning*, Volume 4B.

The event-reporting type (logs or alarms) that applies to an individual line card depends on the service-level and line-card-level event-reporting specifications that are in effect. If a line card is the subject of overlapping service-level and line-card-level specifications, the line card-level specification overrides the service-level specification.

If the event-reporting type for a line card is an alarm rather than a log, that alarm is raised in the following cases:

- if the line card is removed while in the in-service state
- if the line card fails while in the in-service state
- if a failed line card is changed from the out-of-service state to the in-service state
- if a failed line card is placed in a slot that has been provisioned for the service
- if a line card is removed from its slot (“line card missing” alarm)

A line-card alarm is cleared in the following cases:

- if service is restored on the line card
- if line-card diagnostics run and do not detect a failed condition
- if the failed line card is changed from the in-service state to the out-of-service state
- if the alarm point is inhibited from the alarm-provisioning screen in the network-element user interface
- if a line card is inserted into a slot against which a “line card missing” alarm has been raised

### **Consistency of event-reporting specifications at RFT and FCOT**

In a basic fiber-fed AccessNode system in which there are line cards in the fiber central office terminal (FCOT) as well as in the remote fiber terminal (RFT), you should ensure that all the service-level event-reporting specifications that apply to the RFT also apply to the FCOT. The FCOT in a basic fiber-fed system contains line cards if the system serves a universal application or a combined application.

### **Interaction of line-card alarms and ISDN alarms**

When an alarm is raised because of the failure or removal of a line card supporting ISDN-U service, any existing ISDN alarms applicable to that line card are cleared. After the line-card alarm clears, the ISDN alarms are re-raised if the ISDN alarm conditions still exist.

## Alarm severity levels

Every alarm has a severity level. The severity level depends on whether the event is service-affecting, and on the extent to which service is affected. Table 1-1 lists the severity levels used for alarms, and defines each level.

**Table 1-1**  
**Alarm severity levels**

Severity	Definition
Critical	A critical alarm is raised for an event that affects (or has the potential to affect) 129 or more subscriber lines.
Major	A major alarm is raised for an event that affects (or has the potential to affect) 24 or more subscriber lines.
Minor	A minor alarm is raised for an event that meets one of the following definitions:  (a) a service-affecting fault that affects 2 to 23 subscriber lines (b) a loss of redundancy on any major circuit pack, such as the processor circuit pack or an optical interface circuit pack (c) the failure of any circuit pack that is not service-affecting, such as the maintenance interface card
Warning	A warning is raised for any problem that does not currently affect service, and is not likely to become a serious service-affecting problem.

## Alerts

An alert is a notification that a user-selectable performance threshold has been reached. An alert includes all the same information items as an alarm. However, alerts differ from alarms in that alerts have only one severity level, which is indeterminate. The indeterminate severity level is reserved exclusively for alerts. The user must decide what if any action to take in response to an alert.

*Note:* For any given performance parameter, you have the option of specifying that an alarm should be raised instead of an alert if a performance threshold is surpassed. The severity level of such alarms is a warning.

## Logs

A log is an information-only notification. A log provides information that is meaningful to the user. In contrast to alarms, logs are not actionable. The user does not have to take action in response to a log.

Every log is a member of a group. The log groups are known as log types. Each group includes all the logs for an application group or for a subsystem. For example, a log group could contain all the logs for a group of related circuit packs. Each log group has a brief name, referred to as the log-type name. When a log is displayed or printed, it includes the log-type name.

Each individual log has a number that is unique within the log type. Logs with differing log types may have the same number. Log numbers are in the range 101 to 999. The log number indicates the category of event that the log reports, as shown in Table 1-2.

**Table 1-2**  
**Meanings of log numbers**

Log numbers	Categories of events reported
101 to 299	Reserved for future use
300 to 399	Trouble
400 to 499	Usage
500 to 599	State changes
600 to 699	Event completions
700 to 799	Events in progress
800 to 999	Reserved for future use

The event categories are defined as follows:

- A trouble log reports an abnormal occurrence that is not severe enough to cause an alarm.
- A usage log reports an operational summary or the usage of a resource or service.
- A state-change log reports a change in the operational state of a resource or service in the system.
- An event-completion log reports the completion or the abnormal termination of a task or of an audit.
- An event-in-progress log is a status report issued during an ongoing operation. For example, an audit may issue periodic updates while in progress.

The event-reporting system generates logs to record the results of system-initiated audits and diagnostics. The resulting logs should make it easier to detect intermittent problems.



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# Management of alarms

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This chapter explains how AccessNode gathers alarms and how network elements exchange alarm data among themselves.

## Chapter contents

Use the table below to go directly to the information you require.

Topic	See
Gathering alarms from within the AccessNode	page 2-2
Rejected alarms	page 2-2
Alarm archive	page 2-3
Remote alarms	page 2-3
System-level alarm reporting	page 2-3
Reporting alarms to digital switches	page 2-4

## Gathering alarms from within the AccessNode

Each AccessNode monitors itself and keeps track of alarms that are generated. The maintenance interface card gathers and distributes this data.

Individual pieces of equipment, including bay frames, shelves, and circuit packs, have hardware registers. The maintenance interface card polls these registers to verify their status. It scans the on/off condition of the internal hardware. It can also recognize hardware access failures, including the following: circuit pack missing, circuit pack access failure, and component ASIC access failure.

If the maintenance interface card detects an actionable event, it raises an alarm and it notifies the processor card. Users can view the alarm report on the user-interface screens. In addition, the maintenance interface card activates the appropriate alarm indicators (for example, a “fail” LED on a circuit pack).

## Rejected alarms

Every actionable event does not necessarily result in an alarm. AccessNode filters alarms and may reject an alarm as spurious. In addition, an alarm may not be enabled.

### Filtering

An AccessNode does not generate a separate notification for every reportable event that occurs. Instead, the AccessNode filters logs, alarms, and alerts. This means that if a single reportable event causes multiple other reportable events, the AccessNode analyzes the events, and generates only one log, alarm, or alert, informing the user of the original event.

Here is an example of filtering. Suppose that a failed DS3/STS mapper is inserted by mistake into a slot that has been provisioned for a DS1/VT synchronous circuit pack. AccessNode detects two actionable events: a circuit-pack mismatch and a failed circuit pack. However, after filtering the events, it raises only one alarm, a circuit pack mismatch alarm.

### Enabled and disabled alarms

Once AccessNode has detected an actionable event for which an alarm should be raised, it checks whether that alarm is enabled, and it raises the alarm only if it is enabled.

Enabling alarms is one of the steps in the provisioning process. For instructions on how to enable alarms, see *Provisioning and Operations Procedures*, 323-3001-310, in *Operations, Administration, and Provisioning*, Volume 4B.

If there is a certain alarm that you do not want to receive, you need only ensure that it is not enabled.

## Alarm archive

The alarm-archive software feature provides for the collection and management of event records for long-term storage. The operations controller (OPC) collects the event records from all the network elements within its span of control, and stores the data on its hard disk. The OPC maintains two databases, an historical-events database, and an active-alarms database.

## Remote alarms

You can access alarm information remotely, by way of multiple interfaces. Alarm information is available in both the user interfaces to AccessNode, namely the network-element user interface and the OPC user interface. In addition, AccessNode can send alarm information to external systems, such as serial telemetry systems, parallel telemetry systems, and external operations systems (OSs).

See Chapter 4, “Displays and printouts of alarms and logs,” for more information on how AccessNode displays alarm information by way of the user interfaces.

See Chapter 5, “Sending alarm information to external systems,” for more information on how AccessNode sends alarm information to telemetry systems and operations systems.

## System-level alarm reporting

System-level alarm reporting means that when an alarm occurs on one network element in a system, each network element in the system reports the alarm by way of its user interfaces, its visual alarm indicators, and its external alarm indicators (if any have been equipped). If the alarm being reported is not actually in the network element, the remote-failure indicator lamp on the local craft access panel is illuminated. System-level functionality is also extended to the operation of the alarm cutoff (ACO).

System-level alarm reporting is available as a provisionable option. One of the steps in the process of commissioning a system is to choose whether to activate system-level alarm reporting. For details, see *Commissioning and Testing*, Volume 3.

System-level alarm reporting is available only in systems in which each network element contains an access bandwidth manager shelf.

### System-level reporting not available in single-ended systems

System-level alarm reporting is not available for the network elements in a single-ended AccessNode system. The reason for this is that you cannot run the Configuration Manager tool when commissioning the network elements in a single-ended system, so you never have the option of activating system-level reporting.

## Reporting alarms to digital switches

If a basic fiber-fed AccessNode system serves an integrated application or a combined application, the system is connected to one or more digital switches. Alarm information from the AccessNode system is sent to each digital switch, traveling by way of the embedded operations channel (EOC). At the switch, the alarm information is available in the Maintenance Administration Position (MAP) interface.

### Alarm reporting in the case of a single digital host

If the AccessNode system is connected to a single digital host switch, that switch receives information about all alarms from the AccessNode system.

### Alarm reporting in the case of multihosting (DMS switches only)

In a multihosting arrangement, the AccessNode system is connected to two or more digital host switches. One of those switches is the primary digital host, and the others are secondary digital hosts.

*Note:* Multihosting by multiple digital host switches is possible only if the optional multihosting software has been purchased. For a description on multihosting, see *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A. For information on software packaging, see *Feature Overview and Application Guide* (to be released in July 1999).

### Alarm information reported to the primary digital host

In a multihosting arrangement, the primary digital host receives information about all alarms from the AccessNode system.

*Note:* If you are using the multi-IG feature at the primary digital host, you must query the correct interface group at the primary digital host to view alarm information. For information on multi-IG, see *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A.

### Alarm information reported to a secondary digital host

In a multihosting arrangement, each secondary digital host receives summary information about alarms that affect the call processing handled by that switch. Here are some examples of alarm information that is sent to a secondary host:

- an alarm for a line card whose line is switched by the switch
- an alarm for the failures of both narrowband line-interface cards in a copper-distribution drawer containing one or more line cards whose lines are switched by the switch

- an alarm for the failures of both D-links to copper-distribution drawer containing one or more line cards whose lines are switched by the switch
- an alarm for a combination of failures such as the failure of a single D-link or narrowband line-interface card in one switching plane, and the failure of the access interface card or the transport interface card in the other switching plane

In addition to classifying alarms by severity, AccessNode categorizes alarms by class and type. Table 2-1 lists and describes the alarm classes. All alarms fall within one of these classes, which appear under the Class heading on the Active Alarms screen.

**Table 2-1**  
**Alarm classes**

Class screen symbols	What they mean
Fac	Facility alarm
Eqp	Equipment alarm

Alarms within a class are further organized by alarm type, which appears under the Type heading on the Active Alarms screen. Table 2-2 lists and describes some of the alarm types for the two alarm classes.

**Table 2-2**  
**Alarm types**

Alarm class	Alarm type	Description
Eqp	ANX	ANX Loss of Comms
	ANX	DS1 Rx Fail - Major
	ANX	HDSL Loss of Sync
	ANX	Line Card Power Fail
	ANX	Shelf Mismatch
	CDSP	Circuit Pack Fail
	CDSP	Circuit Pack Mismatch
	CDSP	Circuit Pack Missing
	ESI	Degraded Timing Reference
	ESI	Intercard Failure
—continued—		

**Table 2-2**  
**Alarm types (continued)**

Alarm class	Alarm type	Description
Eqp	ESI	Oscillating Sync Status Message
	ESI	Timing Reference Interface Fail
	ESI	Undefined Sync Status Message
	LIC	Circuit Pack Fail
	LIC	Circuit Pack Mismatch
	LIC	Circuit Pack Missing
	LC	Line Card Fail (minor)
	LC	Line Card Missing (minor)
	LC	Loss of Power at NT1 (minor)
	LC	NT1 Power Status Changed (minor)
	LC	NT1 Test Mode Changed (minor)
	LC	Sync Lost with NT1 (minor)
	PSU	Circuit Pack Fail
	PSU	Circuit Pack Mismatch
	PSU	Circuit Pack Missing
	SPX	Circuit Pack Fail
SPX	SID Mismatch	
Fac	COMM	Faulty Path
	COMM	No Active Path
	TIC	VT Rx Loss of Pointer
	TIC	VT Rx Unequipped
—end—		

**Designating the primary and secondary digital hosts**

In a multihosting arrangement, only one digital switch can be the primary host. To make multihosting possible, you enter information about all the digital host switches into the database of the operations controller that serves the system. To enter this information, you use an OPC tool called the multihosting provisioning manager. (The multihosting provisioning manager is part of the optional multihosting software.)

By default, the first switch about which you enter information is designated as the primary host. Subsequently you can use the multihosting provisioning manager to designate one of the other hosts as the primary host.

**Note:** This concept applies to DMS switches only. No primary or secondary hosts exist with the GR-303 multi-vendor interface (MVI) host.

For information on how to use the multihosting provisioning manager, see *System Administration Procedures, 323-3001-302*, in *Operations, Administration, and Provisioning, Volume 4A*.

### **GR-303 alarm reporting**

Alarm and log reports for lines terminating on all multihosted digital switches, including a GR-303 MVI local digital switch, are sent to the primary host, a GR-303 DMS switch, if one is designated. Alarm reports specific to each secondary host switch are sent to the secondary host, if it is a GR-303 DMS local digital switch. Alarm reports for equipment and facility alarms are sent to each GR-303 MVI local digital switch, since MVI switches have no primary or secondary hosts. Alarm reports also can be viewed using the OPC Alarm Manager and Event Manager tools.

Line card alarms for ISDN services are disabled by default. Existing alarm messages that report line card service type now report GR-303 MVI line card services. GR-303 MVI alarms can be enabled or disabled using the Event Reporting CI tool from within the MVIPROV CI tool commands (for instructions, see *Line Card Provisioning Procedures, 323-3001-315*, in *Operations, Administration, and Provisioning, Volume 4B*).

### **DMS-10NA alarm reporting**

Alarm conditions at the AccessNode raise an alarm at the operations controller (OPC). For critical, major, and minor alarms the AccessNode communicates the severity of the alarm along with a message to check the OPC to the DMS-10NA digital switch. When you clear the last alarm of a particular severity, the AccessNode notifies the DMS-10NA.

### **Link or circuit pack failure**

Failure of any of the redundant circuit packs in the access bandwidth manager (ABM) or the host digital terminal (HDT) will cause the DMS links to fail. When the DMS-10NA detects this failure, it busies the VLCM at the switch and raises an alarm at the switch. The failure also raises an alarm at the OPC. When one of the redundant circuit packs recovers, the alarm at the OPC is lowered and the DMS-10NA brings the VLCM back into service.

**Line subset failure**

If a failure causes only a subset of lines to be unavailable (for example, dual LIC failure or DS1 to voice module failure), the affected lines are reported as out of service. The switch provides appropriate treatment for incoming calls to the out-of-service lines.c as back in service.

---

# Visual and audible alarm indicators

---

This chapter describes how the AccessNode, using the maintenance interface card, gathers alarm data and controls visual and audible alarm indicators.

## Chapter contents

Use the table below to go directly to the information you require.

Topic	See
Visual indicators on the breaker interface panels	page 3-2
Visual indicators on the cooling unit	page 3-5
Visual indicators on the local craft access panels	page 3-6
Visual indicators on the modules in the common-equipment shelves	page 3-9
Visual indicators on the modules in the copper-distribution shelves	page 3-16
External alarm indicators	page 3-16
Alarm-cutoff feature for audible alarms	page 3-21

### Visual indicators on the breaker interface panels

The visual alarm indicators are alarm lamps and LEDs. Alarm lamps and LEDs on the AccessNode hardware are part of the standard equipment. In addition, each AccessNode has relay contacts for external alarm lamps, that is, alarm lamps outside the AccessNode.

There are visual indicators on the breaker interface panels (BIPs) used in AccessNodes. The model of BIP used in an AccessNode depends on the type of common-equipment shelf that is used, as summarized in the following table.

<b>Common-equipment shelf type</b>	<b>Breaker interface panel</b>
Access bandwidth manager shelf	Model NT4K14
Transport bandwidth manager shelf	Model NT7E56

**NT4K14 BIP**

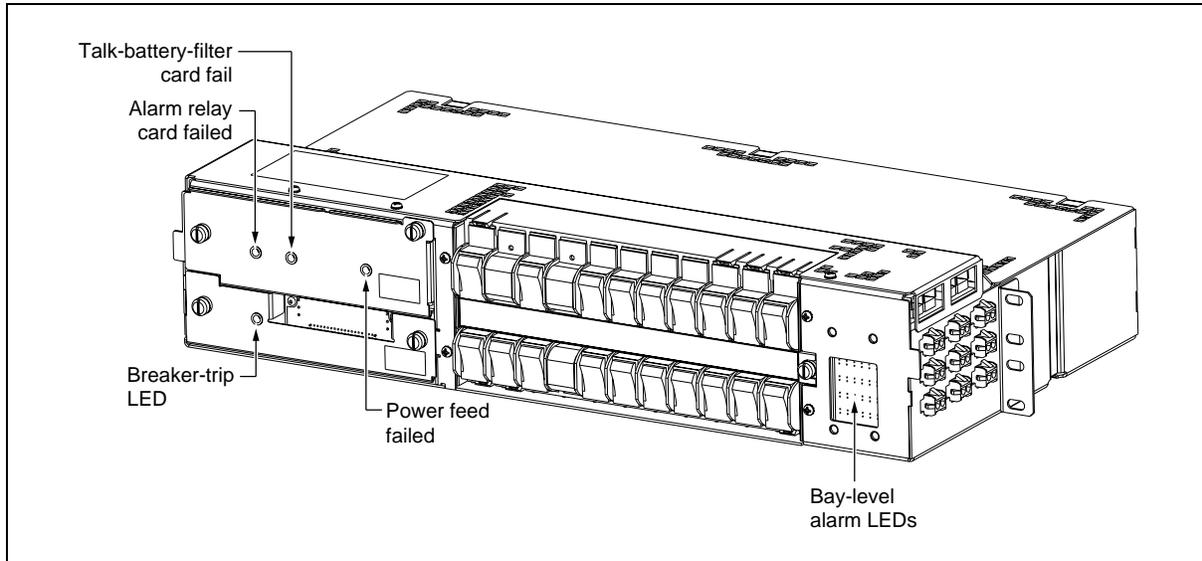
The NT4K14 BIP is used with the access bandwidth manager shelf.

Figure 3-1 shows the visual indicators on the NT4K14BA breaker interface panel.

**Figure 3-1**

**Visual indicators on the NT4K14BA BIP, used with the access bandwidth manager shelf**

PC-16503



The visual indicators listed in Table 3-1 are located on the front panel of the NT4K14BA BIP or on the front panels of the modules that install in the BIP.

**Table 3-1**  
**NT4K14 BABIP indicators**

Indicator	Definition
Power	This bay level alarm LED is green and is always lit with power applied to the system.
Critical alarm	This bay level alarm LED is red, and is lit whenever a critical alarm exists.
Major alarm	This bay level alarm LED is red, and is lit whenever a major alarm exists.
Minor alarm	This bay level alarm LED is yellow, and is lit whenever a minor alarm exists.
Breaker trip	It is red and is lit whenever any breaker is tripped or switched to the open position.
Alarm Relay	It is a red fail LED on the face of the TBF card and it is lit when the Alarm Relay card has failed or power is lost.
TBF fail	It is a red fail LED and is lit whenever the TBF card fails (for example when one of the fuses protecting the electrolytic capacitors is open).

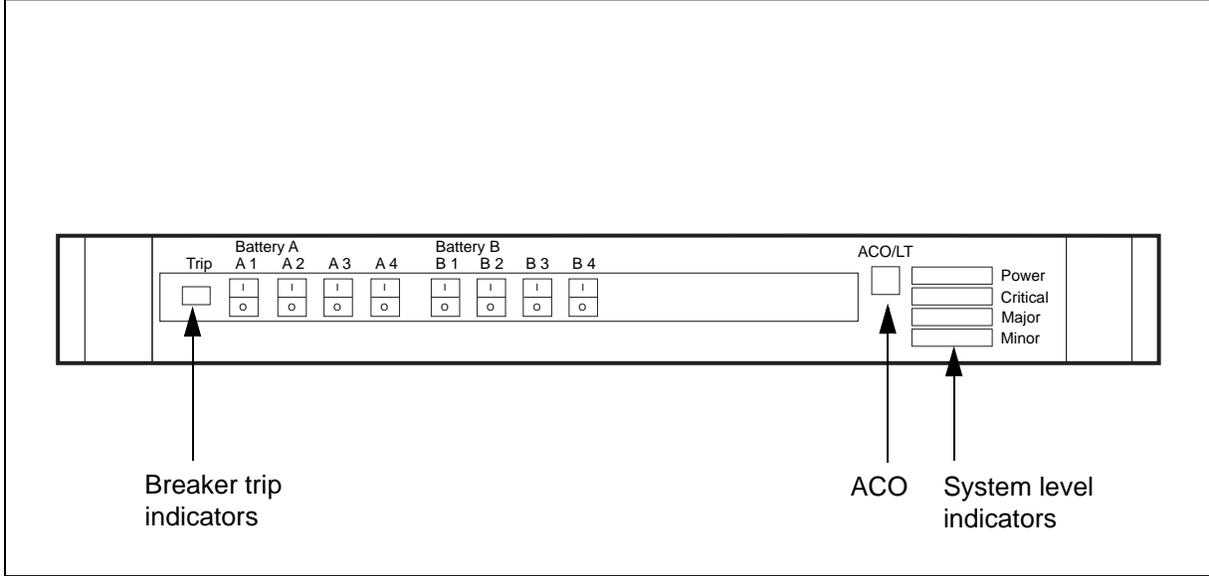
3-4 Visual and audible alarm indicators

**NT7E56 BIP**

The NT7E56 BIP is used with the transport bandwidth manager shelf.  
Figure 3-2 shows the visual indicators on the NT7E56 breaker interface panel.

**Figure 3-2**  
**NT7E56 BIP, used with the transport bandwidth manager shelf**

PC-10255



The visual indicators listed in Table 3-2 are located on the front panel of the NT7E56 BIP.

**Table 3-2**  
**NT7E56 BIP indicators**

Indicator	Definition
Power	This bay level alarm lamp is white, and is always lit when there is power to the frame.
Critical alarm	This bay level alarm lamp is red, and is lit whenever a critical alarm exists.
Major alarm	This bay level alarm lamp is red, and is lit whenever a major alarm exists.
Minor alarm	This bay level alarm lamp is yellow, and is lit whenever a minor alarm exists.
Breaker trip	It is red and is lit whenever any breaker is tripped or switched to the open position.
ACO	This bay level alarm lamp/pushbutton is green, and is lit whenever a cutoff of audible alarms is in effect.

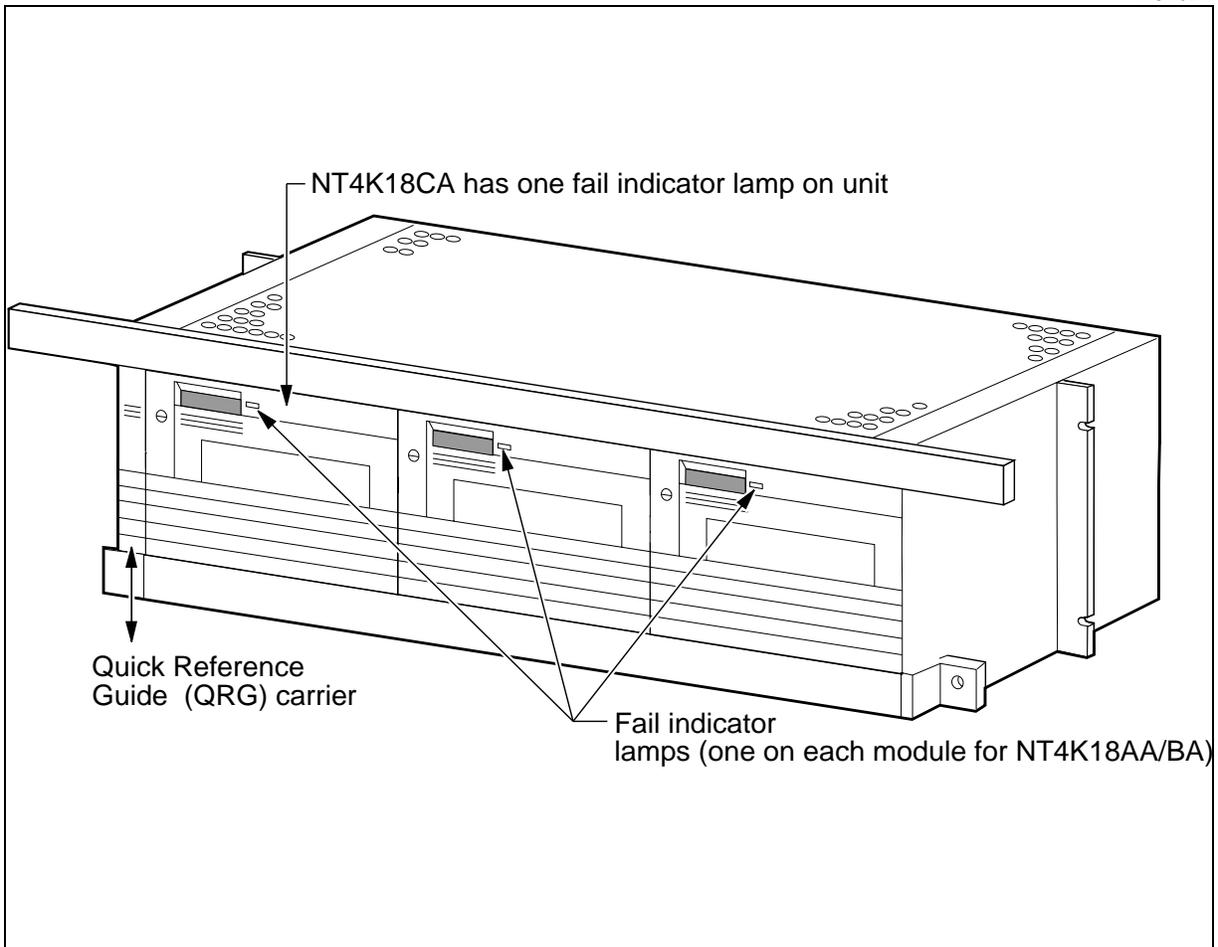
## Visual indicators on the cooling unit

On the NT4K18AA/BA cooling units, there are three visual alarm indicators. On the face of each of the three cooling modules there is a red fail indicator, as shown in Figure 3-3. The fail indicator lights up if the cooling module fails.

On the 8-fan cooling unit there is just one red fail LED indicator. This LED is located on the top left side of the front panel of the cooling unit. The fail indicator lights up if any of the internal fans or cooling unit power circuits fail.

**Figure 3-3**  
Visual indicators on the cooling unit

PC-10241



### Visual indicators on the local craft access panels

There are visual indicators on the local craft access panels (LCAPs) used in AccessNodes.

The model of LCAP used in an AccessNode depends on the type of common-equipment shelf that is used, as summarized in the following table.

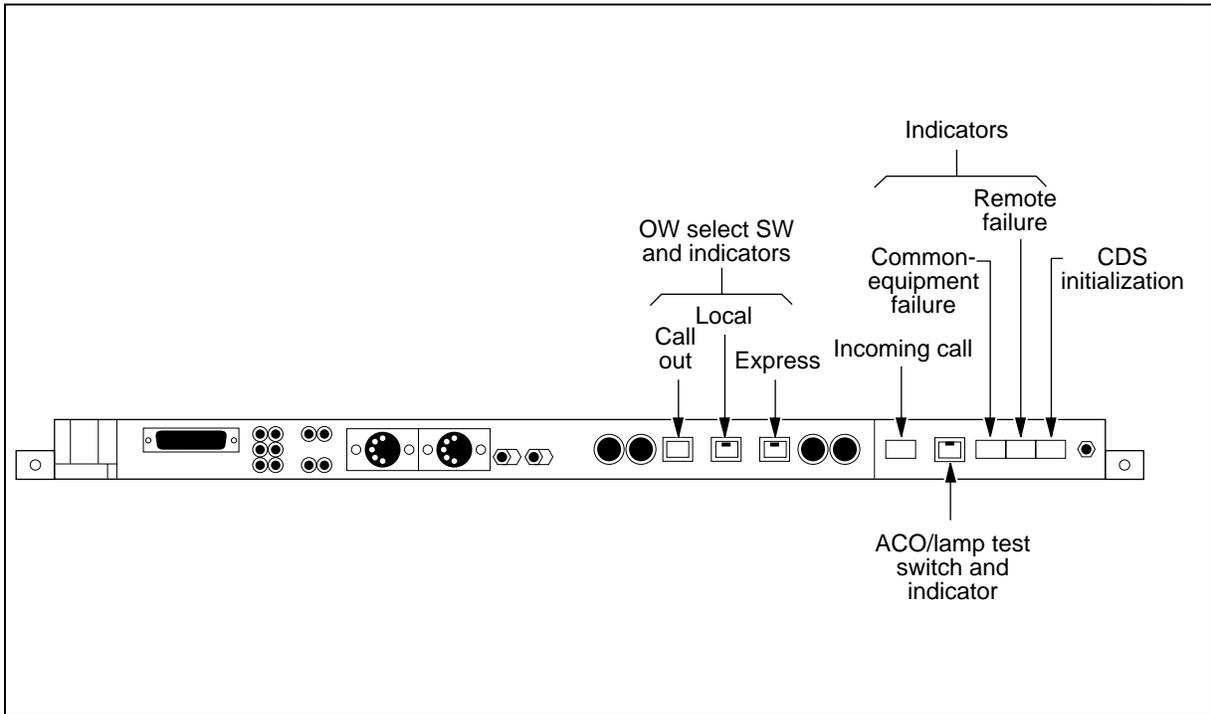
Common-equipment shelf type	Local craft access panel
Access bandwidth manager shelf	Model NT4K16
Transport bandwidth manager shelf	Model NT7E5047

#### NT4K16 LCAP

Figure 3-4 shows the visual indicators on the NT4K16 local craft access panel, which is used with the access bandwidth manager shelf.

**Figure 3-4**  
**Visual indicators on the NT4K16 LCAP, used with the access bandwidth manager shelf**

PC-10260



The visual indicators listed in Table 3-3 are located on the front panel of the NT4K16 LCAP.

**Table 3-3**  
**NT4K16 LCAP indicators**

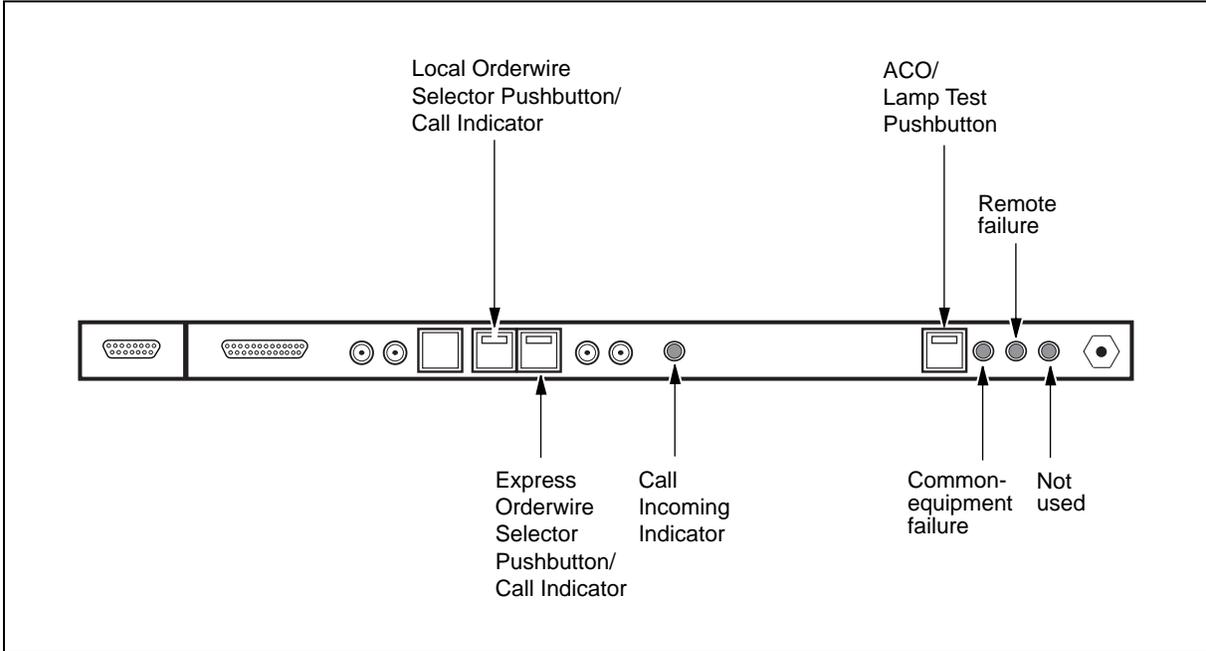
Indicator	Definition
Common equipment fail	This bay level alarm lamp is red, and is lit whenever there is a failure on any of the circuit packs in the common-equipment shelf.
Remote fail	This bay level alarm lamp is red, and is lit whenever there is an alarm at one of the other AccessNode network elements in the system.
CDS initialization	This is lit while diagnostics on line-interface units in the copper-distribution shelves (CDSs) are in progress.
ACO	This is located inside the ACO/LT pushbutton. It is green, and is lit whenever a cutoff of audible alarms is in effect.
Incoming call	This is green, and is lit when an incoming call is waiting on the orderwire.
Local orderwire	This is located in the local orderwire pushbutton. It is green, and is lit when the local orderwire channel is in use. It flashes when there is an incoming call on the channel.
Express orderwire	This is located in the express orderwire pushbutton. It is green, and is lit when the express orderwire channel is in use. It flashes when there is an incoming call on the channel.

**NT7E5047 LCAP**

Figure 3-5 shows the visual indicators on the NT7E5047 local craft access panel, which is used with the transport bandwidth manager shelf.

**Figure 3-5**  
**Visual indicators on the NT7E5047 LCAP, used with the transport bandwidth manager shelf**

PC-10254



The visual indicators listed in Table 3-4 are located on the front panel of the NT7E5047 LCAP.

**Table 3-4**  
**NT7E5047 LCAP indicators**

Indicator	Definition
Common equipment fail	This bay level alarm lamp is red, and is lit whenever there is a failure on any of the circuit packs in the common-equipment shelf.
Remote fail	This bay level alarm lamp is red, and is lit whenever there is an alarm at one of the other AccessNode network elements in the system.
ACO	This is located in the ACO/LT pushbutton. It is green, and is lit whenever a cutoff of audible alarms is in effect.
Incoming call	This is green, and is lit when an incoming call is waiting on the orderwire.
Local orderwire	This is located in the local orderwire pushbutton. It is green, and is lit when the local orderwire channel is in use. It flashes when there is an incoming call.
Express orderwire	This is located in the express orderwire pushbutton. It is green, and is lit when the express orderwire channel is in use and flashes when there is an incoming call

## Visual indicators on the modules in the common-equipment shelves

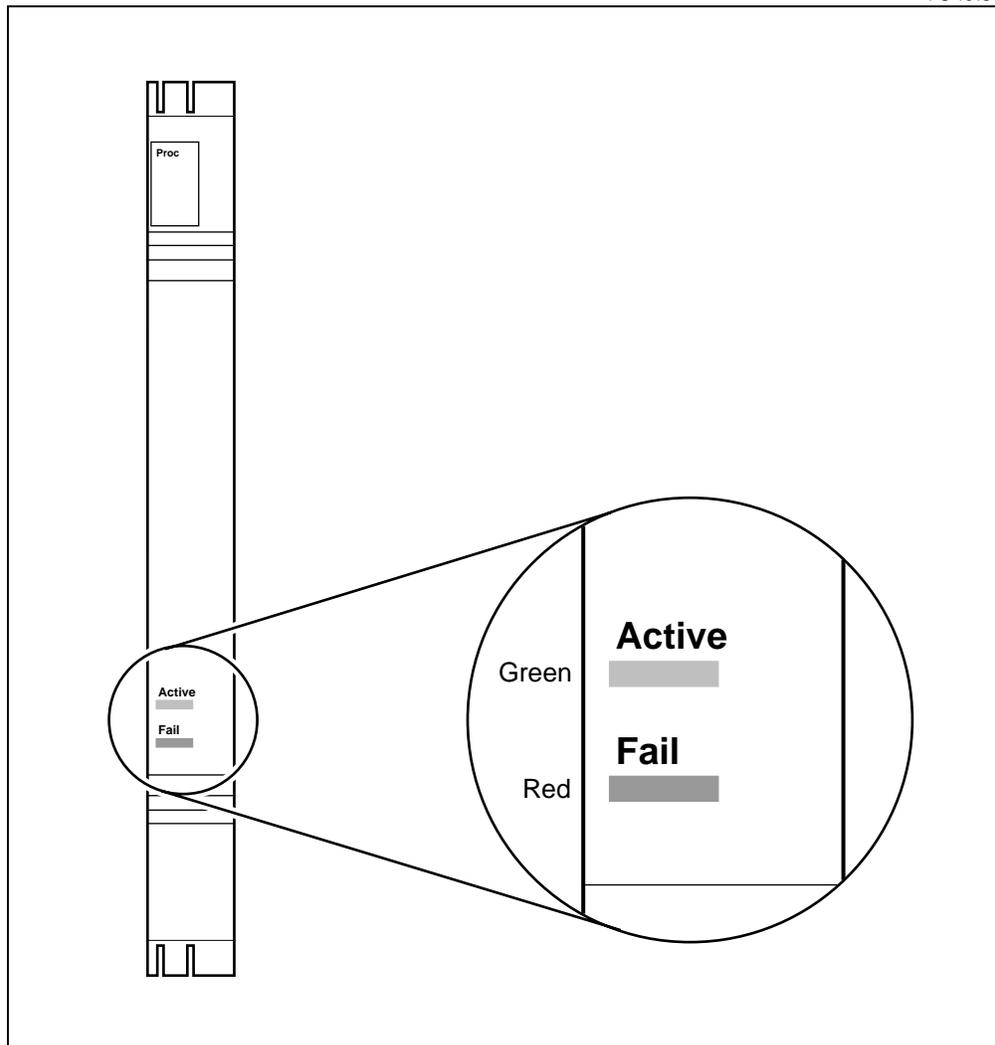
Every circuit pack and card used in the lower level of the common-equipment shelf has a red alarm lamp labeled Fail, to indicate circuit pack failure, and every one except the DS3 protection switch card has a green indicator lamp labeled Active, to indicate that the circuit pack is active.

### Processor card

Figure 3-6 shows a front view of the processor card, which is typical.

**Figure 3-6**  
**Front view of the processor card**

PC-10154

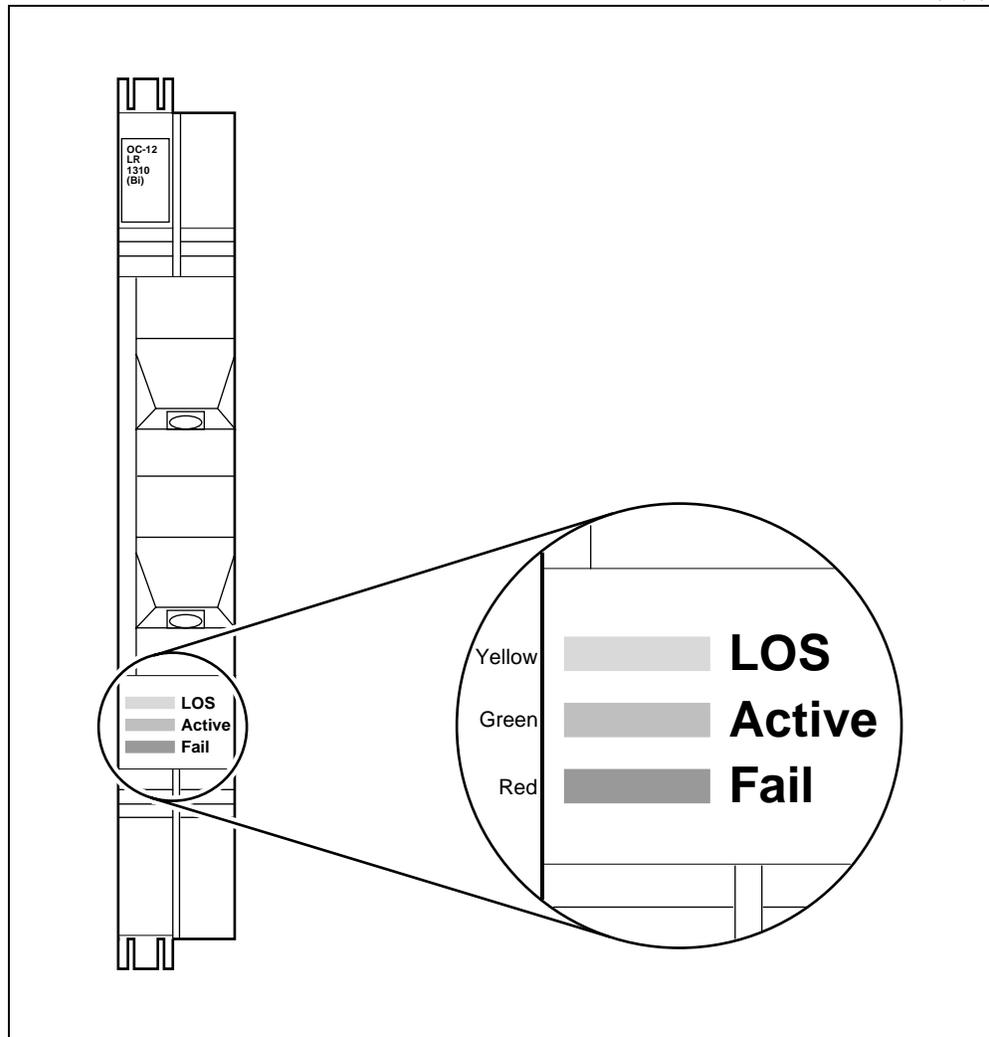


### Optical interface card

Each OC-12 or OC-3 interface circuit pack has three indicator lamps on its faceplate. In addition to the Active and Fail lamps, each optical interface circuit pack also has a yellow lamp labeled LOS, which is lit to indicate loss of the optical input signal. Figure 3-7 shows a front view of the OC-12 interface circuit pack, which is typical.

**Figure 3-7**  
**Front view of the OC-12 interface circuit pack**

PC-10165

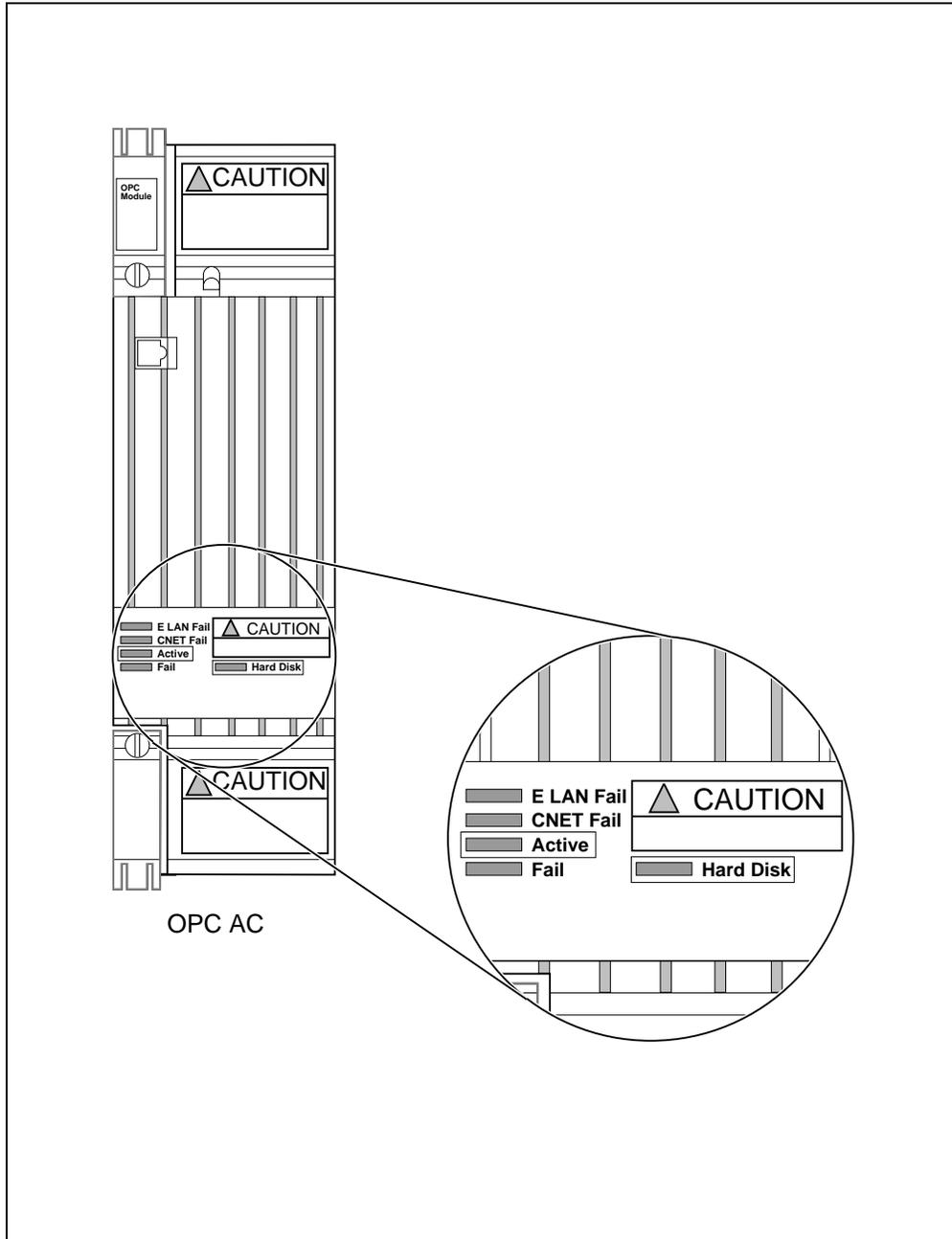


### Operations controller

The OPC module has a total of four indicator lamps on its faceplate, as shown in Figure 3-8.

**Figure 3-8**  
**Front view of the operations controller module**

PC-15749



### 3-12 Visual and audible alarm indicators

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Table 3-5 lists the meanings of the lamps on the operations controller module.

**Table 3-5**  
**OPC indicators**

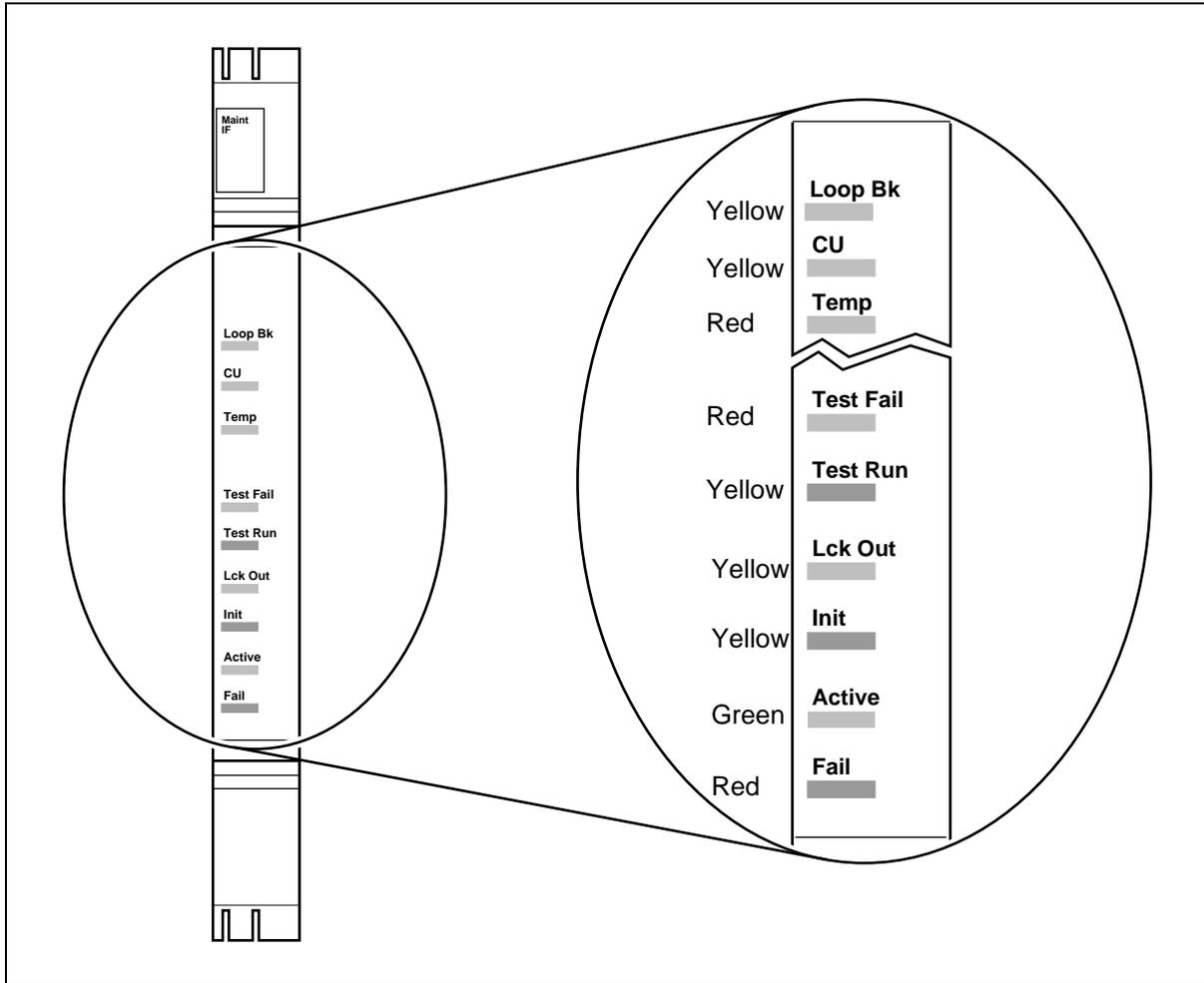
<b>Indicator</b>	<b>Definition</b>
E LAN fail	The OPC cannot communicate through the Ethernet port. The connector for this port is on the front of the OPC module.
CNET fail	The OPC cannot communicate through the control-network port. As an option, the OPC may be linked to multiple network elements by way of control network.
Active	The OPC module is working.
Fail	The OPC module is in the failed state.
Hard disk	This is located in the local orderwire pushbutton. It is green, and is lit when the local orderwire channel is in use. It flashes when there is an incoming call.
Express orderwire	Indicates OPC hard disk drive is being accessed.

### Maintenance interface card

The maintenance interface card has a total of nine indicator lamps on its faceplate, as shown in Figure 3-9.

**Figure 3-9**  
**Front view of the maintenance interface card**

PC-10163



### 3-14 Visual and audible alarm indicators

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Table 3-6 lists the meanings of the lamps on the maintenance interface card.

**Table 3-6**  
**Maintenance interface card indicators**

<b>Indicator</b>	<b>Definition</b>
Loopbk	The transport loopback is active.
CU	Reserved for future use.
Temp	The shelf is over temperature
TestFail	The exerciser test has failed.
TestRun	The exerciser test is running.
LckOut	Protection for DS1s or DS3s or OC-3s or OC-12s is locked out.
Init	The transport system is initializing.
Active	The maintenance interface card is working.
Fail	The maintenance interface card is in the failed state.

### DS3 mapper card

The DS3/STS mapper has five indicator lamps, as shown in Figure 3-10.

**Figure 3-10**  
Front view of a DS3/STS mapper

PC-10161

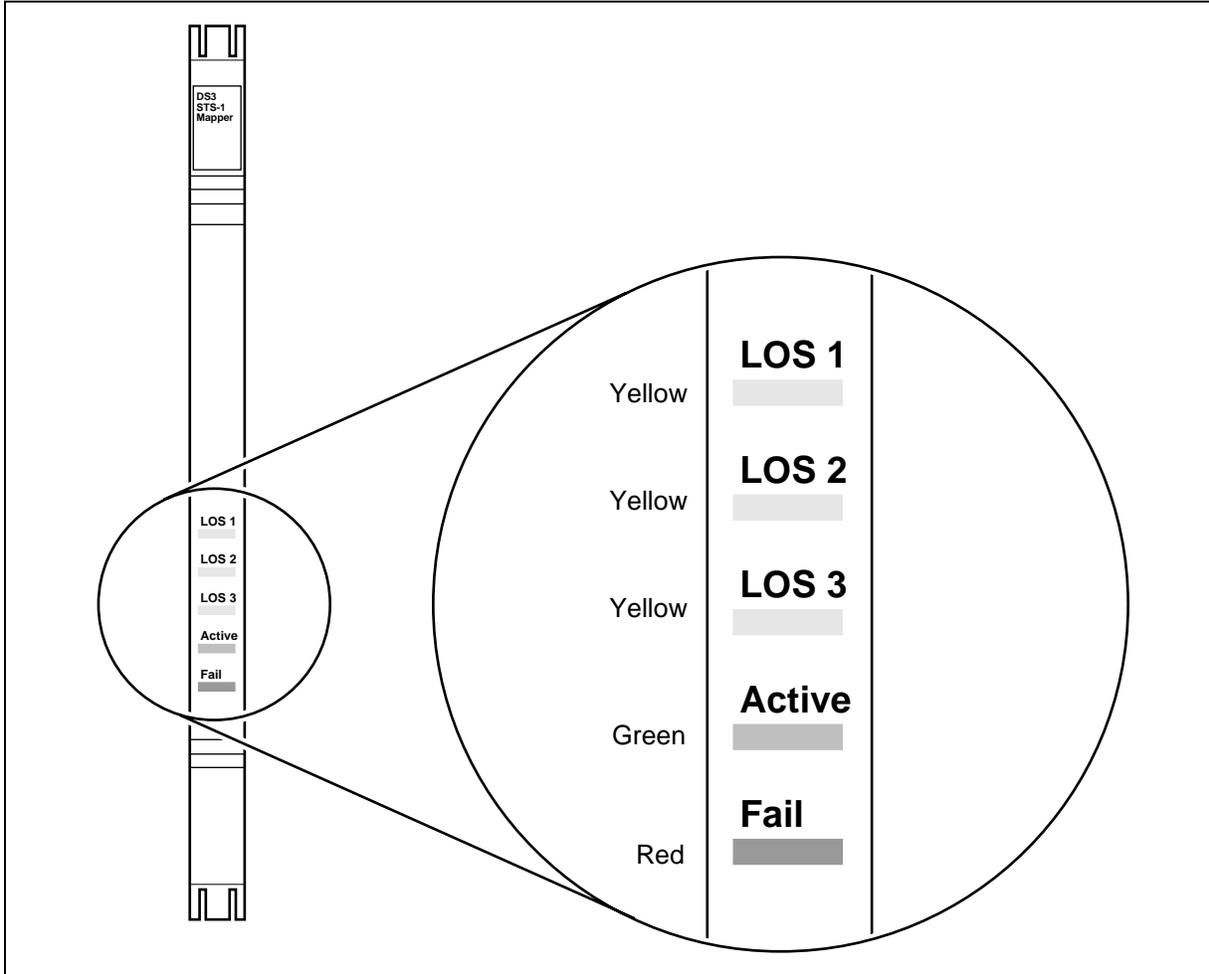


Table 3-7 lists the meanings of the lamps on the DS3 mapper card.

**Table 3-7**  
DS3 mapper card indicators

Indicator	Definition
LOS 1	There is a loss of signal on DS1 #1.
LOS 1	There is a loss of signal on DS1 #2.
LOS 1	There is a loss of signal on DS1 #3.
Active	The mapper is in the active state.
Fail	The mapper is in the failed state.

## Visual indicators on the modules in the copper-distribution shelves

The copper-distribution shelf power converter mounted in the copper-distribution shelf (CDS) has a red fail LED on its faceplate.

Each of the following cards used in the copper-distribution drawers has a red alarm LED on its faceplate that is visible when the drawer is open. The red LED indicates a card failure:

- Epsilon station line card
- manual ringdown 2-wire line card
- Omega 2-wire station line card
- Omega 2-wire office line card
- Omega 4-wire line card
- Omega 6/8-wire line card
- universal voice grade (UVG) station line card
- metallic test access card

*Note:* The metallic test access card has another red LED, located on the surface of the printed circuit board of the card. This LED is lit whenever any one of the cards in the drawer has failed. When this LED is lit, the light can be seen through a lens in the front of the drawer.

- narrowband line-interface card

*Note:* The narrowband line-interface card also has a green active LED on its faceplate.

## External alarm indicators

AccessNode provides relay contacts to control customer installed external alarm indicators. The relay contacts are wire-wrap pins that are located on the wirewrap pin field on the breaker interface panel (BIP).

### External-alarm contacts on the NT4K14 BIP

The wire-wrap pin field is located in the Alarm relay card on the front panel of the NT4K14BA BIP, as shown in Figure 3-11. Note that pins 31 to 42 on the NT4K14BA BIP serve to control external alarm indicators. Table 3-8 lists the functions of these wire-wrap pins.

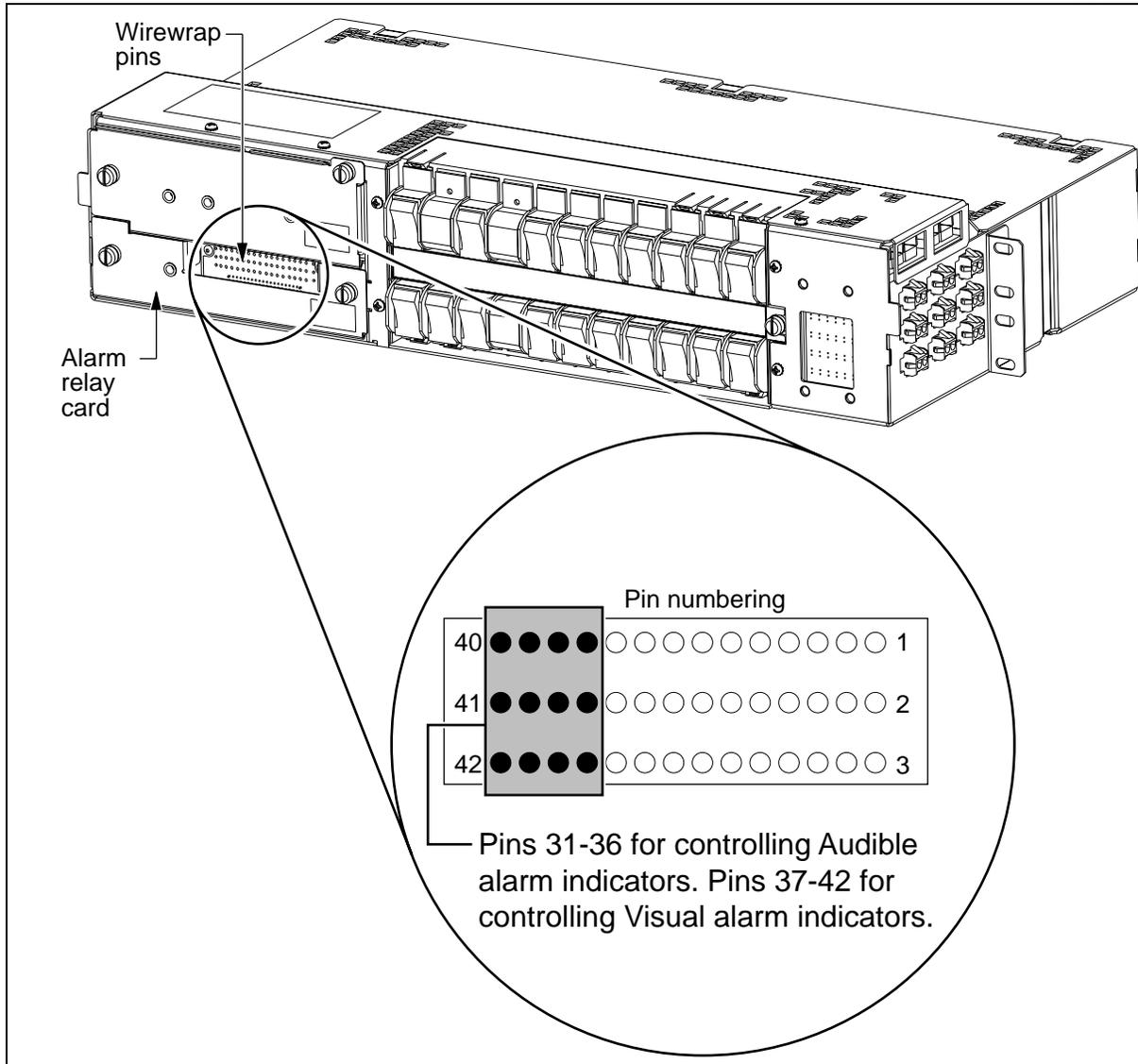
**Table 3-8**  
**Signals on wire-wrap pins 31 to 42 on an NT4K14 BIP**

Pin	Signal	Pin	Signal	Pin	Signal
31	Critical audible	32	Major audible	33	Minor audible
34	Critical audible NO 1	35	Major audible NO 1	36	Minor audible NO 1
37	Critical visual	38	Major visual	39	Minor visual
40	Critical visual NO 1	41	Major visual NO 1	42	Minor visual NO 1

**Note:** NO means relay contacts are open when an alarm is not set.

**Figure 3-11**  
**Wire-wrap pins on the NT4K14 BIP used with the access bandwidth manager shelf**

PC-16513



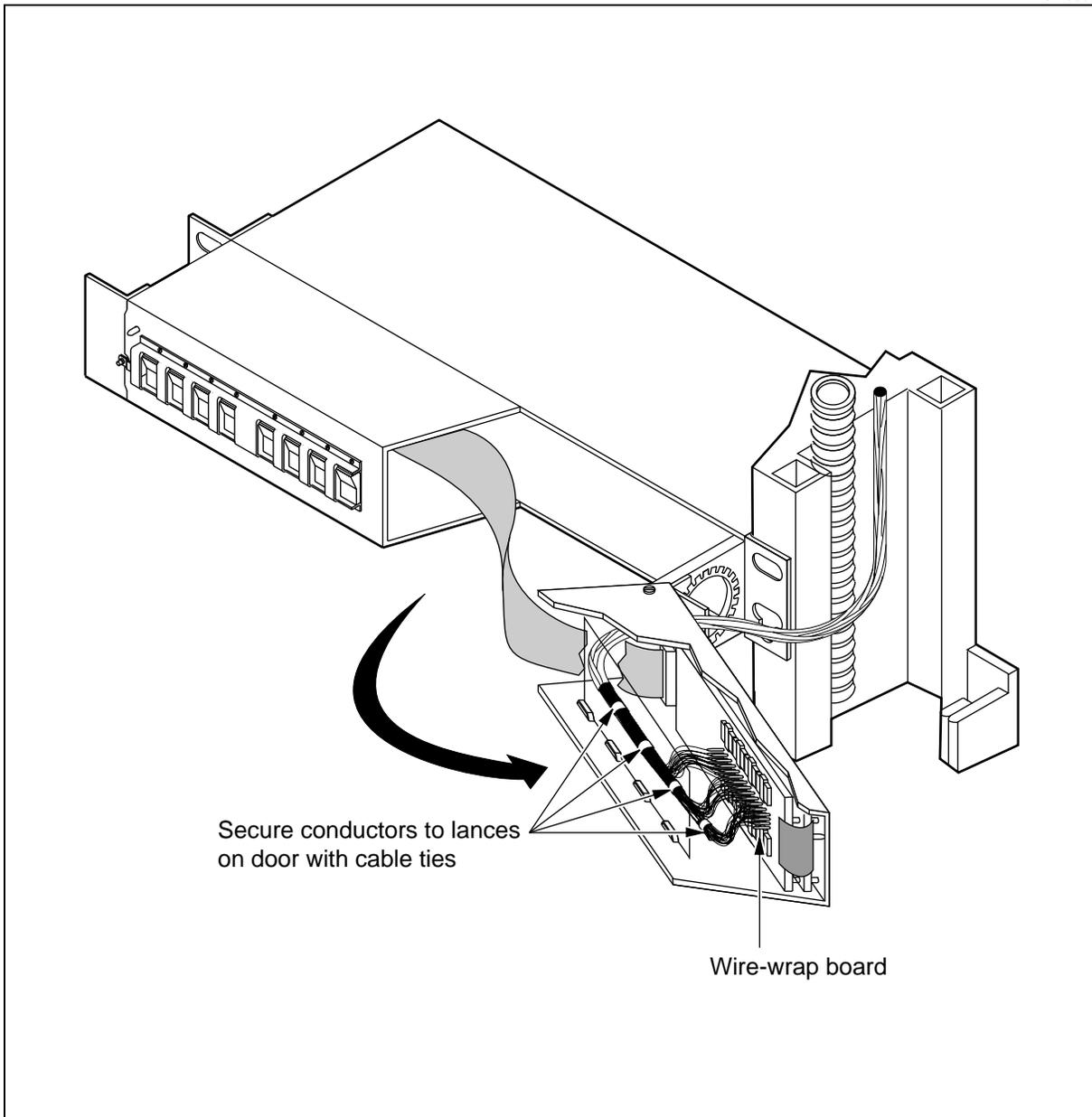
### External-alarm contacts on the NT7E56 BIP

On the NT7E56 BIP, which is used with the transport bandwidth manager shelf, the wire-wrap pins are located on a board that is mounted inside the front cover of the BIP. The right side of the front cover is hinged, and opens to allow access to the wire-wrap board. Figure 3-12 shows the location of the wire-wrap pins.

**Figure 3-12**

**Location of the wire-wrap pins in the NT7E56 BIP, used with the transport bandwidth manager shelf**

PC-10609



3-20 Visual and audible alarm indicators

Figure 3-13 lists the functions of all the wire-wrap pins on the wire-wrap board inside the NT7E56 BIP. The arrangement of pins in the figure is the same as the arrangement that you see after you cover of the BIP, as shown in Figure 3-12.

**Figure 3-13**  
**Signals on the wire-wrap pins in the NT7E56 BIP**

PC-10256

E1 ● Visual Critical NC	E2 ● Visual Critical NC	E3 ● Visual Major NC	E4 ● Visual Major NC	E5 ● Visual Minor NC	E6 ● Visual Minor NC	E7 ● Audible Critical NC	E8 ● Audible Critical NC	E9 ● Audible Major NC	E10 ● Audible Major NC	E11 ● Audible Minor NC	E12 ● Audible Minor NC
E13 ● Visual Critical COM	E14 ● Visual Critical COM	E15 ● Visual Major COM	E16 ● Visual Major COM	E17 ● Visual Minor COM	E18 ● Visual Minor COM	E19 ● Audible Critical COM	E20 ● Audible Critical COM	E21 ● Audible Major COM	E22 ● Audible Major COM	E23 ● Audible Minor COM	E24 ● Audible Minor COM
E25 ● Visual Critical NO	E26 ● Visual Critical NO	E27 ● Visual Major NO	E28 ● Visual Major NO	E29 ● Visual Minor NO	E30 ● Visual Minor NO	E31 ● Audible Critical NO	E32 ● Audible Critical NO	E33 ● Audible Major NO	E34 ● Audible Major NO	E35 ● Audible Minor NO	E36 ● Audible Minor NO
E37 ● Battery Return	E38 ● Battery Return	E39 ● Battery Return	E40 ● Battery Return	E41 ● Remote ACO Note 2	E42 ● Remote ACO Note 2	E43 ● Battery Return	E44 ● Battery Return	E45 ● Battery Return	E46 ● Battery Return	E47 ● Battery Return	E48 ● Battery Return

**Legend:**

ACO = Alarm cutoff

COM = Common connection

NC = Normally closed connection when there is no alarm condition.

NO = Normally open connection when there is no alarm condition.

**Note 1:** Common connections (com) pins are actually shorted together. For example, pins E13 and E14, E15 and E16, E17 and E18, and so on, are physically shorted together.

**Note 2:** When either pin E41 or E42 is momentarily connected to battery return, an ACO of the audible alarm is activated. Audible alarm points can be cut off by momentary application of a ground to either remote ACO input.

---

## Alarm-cutoff feature for audible alarms

The audible alarm indicators are bells, gongs, or buzzers. All audible indicators are optional, and all are external to the AccessNode equipment. For more information on external alarms, see the section titled “External alarm indicators”, beginning on page 3-16.

You can use the alarm-cutoff (ACO) feature to silence external audible alarms. The alarm-cutoff feature cuts off the signals on the wire-wrap pins that control the audible alarms. In contrast, the external visual alarms can not be cut by the ACO pushbutton.

You can cut off the audible alarms in the following ways:

- You can enter a command in the user interface.
- You can press an alarm-cutoff/lamp-test button on the AccessNode. There is an alarm-cutoff/lamp-test button on each type of local craft access panel, and there is also one on the NT7E56 breaker interface panel, which is used with the transport bandwidth manager shelf.

**Note:** If you press one of these buttons when there are no active cuttable alarms, a lamp test occurs. For information about which lamps are tested and how long the tests last, see the sections discussing the local craft access panels and the NT7E56 breaker interface panel in *Configuration and Equipment Description*, 323-3001-100, in this volume.

- You can press an alarm-cutoff/lamp-test button that is remote from the AccessNode. Such a button is optional. If installed, it must be connected to the appropriate pins on the wire-wrap pin field on the breaker interface panel.
  - on the NT4K14 breaker interface panel – pins 27 and 30.
  - on the NT7E56 breaker interface panel – pin E41 and a battery-return pin, or to pin E42 and a battery-return pin. The battery-return pins are E37 to E40 and E43 to E48.

AccessNode keeps track of all alarms that you cut off. If you have cut off an alarm, then for as long as it remains raised, it does not cause the audible alarm indicators to sound. The alarm-cutoff lamp remains lit until each cutoff alarm has been cleared. However, if a new alarm is raised, the new alarm causes the audible alarm indicators to sound. To silence the new alarm, you must cut off alarms once again.

### **System-level ACO**

System-level alarm cutoff (ACO) is in effect if system-level alarm reporting is in effect. System-level alarm reporting is a provisionable option. System-level alarm reporting means that when an alarm occurs on one network element in a system, each network element in the system reports the alarm by way of its user interfaces, its visual alarm indicators, and its external alarm indicators (if any have been equipped). If the alarm being reported is not actually in the network element, the remote-failure indicator lamp on the local craft access panel is illuminated.

If system-level alarm reporting is in effect, then the ACO feature also has system-level functionality. This means that at any network element in the system, you can use any of the available means to cut off any audible alarm, regardless of the origin of the alarm.

### **Remote ACO**

Remote alarm cutoff (ACO) is a function that blocks the flow of parallel-telemetry information from an AccessNode system to an alarm scanner. An alarm scanner is typically located at a maintenance center. The parallel-telemetry outputs from several access systems may be tied together at the input to the alarm scanner. When the alarm scanner receives an alarm indication, it may not be possible to know which system is reporting the alarm. To determine the origin of the alarm, the person at the maintenance terminal in the maintenance center uses remote ACO to cut off the parallel telemetry from each of the paralleled systems, one at a time, until the alarm goes away.

To invoke remote ACO, the person at the maintenance terminal enters a command at that terminal.

The cutoff of parallel telemetry from the AccessNode system to the alarm scanner remains in effect until a new alarm is raised, or until there are no more critical, major, or minor alarms from that system.

---

# Displays and printouts of alarms and logs

---

There are two user interfaces for AccessNode, the network element user interface and the operations controller user interface (OPCUI). You can obtain alarm information using either of these user interfaces, and you can obtain log information in the OPCUI.

## Chapter contents

Use the following table to go directly to the information you require.

Topic	See
Alarm displays in the network element user interface	page 4-2
Alarm displays in the OPC user interface	page 4-6
Log displays and printouts	page 4-11

## Alarm displays in the network element user interface

The network element user interface (NEUI) assumes that you are using a VT100-type character mode terminal. The network-element user interface lets you work with one network element at a time. The network element that you are working with is referred to as the network element in context. When you first log on to the network-element user interface, the network element that is in context is the AccessNode that the terminal is connected to. If you want to work with a different network element, you can do so by entering a command on the command line of the user interface screen.

*Note:* This document explains the information that is available on the screens of the network-element user interface, but does not give instructions on how to access or use those screens. For those instructions, see *Network Element User Interface Description, 323-3001-301*, in *Operations, Administration, and Provisioning, Volume 4A*.

### Alarm summary displayed on every screen

On every screen of the network-element user interface, alarm information is displayed in the Status area, which is the top two lines of the screen. Figure 4-1 shows the Status area of the user-interface screen. The Status area displays a variety of information, including alarm counts for the network element in context and for the system as a whole. A system includes all the AccessNode network elements that serve an application. For examples, see *Configuration and Equipment Description, 323-3001-100*, in this volume.

Whenever a new alarm is raised, the appropriate alarm count is incremented, and the count in the Status area is highlighted by reverse video. The reverse video indicates that you should investigate the new alarm. You can remove the highlighting by entering the **sil** command in the command line. This command works on all the screens in the user interface.

**Figure 4-1**  
**Alarm counts in the Status area of a screen in the network-element user interface**

```

Critical Major minor warning FailProt Lockout ActProt PrfAlrt
Network View 2 4 5 2 * * . . *
1 2 3 1 1 * . . .
DS1 Equip
0 Quit DS1 Equipment Shelf: 1
2 Select Unit: DS1 G1
3 Query Location: ShPos 1
4 State: IS-Traffic
5 ListAlms
6 AlmRpt Status: Active
7 Circuit Packs: DS1BSMpr NT7E04BA Slot 1
8 ChgState DS1IN NTK423AA Slot 30
9 DS1OUT NTK433AA Slot 32
10 DtlProt
11
12
13 Add
14 Delete
15
16 Facility
17 AlmProv
18 Help
NE 2
Time 19:45 >

```

**Alarm information displayed in list form**

In the network-element user interface, the Alarms screen, as shown in Figure 4-2, displays a list of alarms generated by the network element that is currently in context.

**Figure 4-2**  
**Alarms screen in the network-element user interface**

```

Critical Major minor warning FailProt Lockout ActProt PrfAlrt
Network View 1 1 1 . . . . .
1 1 1 1 . . . . .
Alarms
0 Quit Active Alarms
2 Select
3 Subset Alm Class Sh Type Unit Reason Severity
4 Update 7 Fac 1 OC12 G1 Loss of frame C, SA
5 12 Fac 1 DS1 G1 Bipolar violation M, SA
6 AlmRpt
7 NewAlms
8
9 DtlAlms
10 DtlProt
11
12
13
14
15
16
17
18 Help
NE 2
Time 19:45 >

```

4-4 Displays and printouts of alarms and logs

Table 4-1 lists the Alarms screen field display information for each alarm.

**Table 4-1**  
**Alarm field display information**

<b>Alarm</b>	<b>Definition</b>
Alarm report number	Each alarm report number is a unique integer within the network element.
Alarm class	The classes represent general problem groups. The classes are: <ul style="list-style-type: none"><li>• facility</li><li>• equipment</li><li>• environmental</li></ul>
Shelf number	This field is a text string that states what the problem is.
Alarm type	This field identifies what the alarm pertains to.
Unit	This field identifies the unit that the alarm pertains to.
Reason	This field is a text string that states what the problem is.
Severity code	The severity codes are: <ul style="list-style-type: none"><li>• The letter "C" denotes a critical alarm, that is, one that affects (or has the potential to affect) 129 or more subscriber lines.</li><li>• The letter "M" denotes a major alarm, that is, one that affects (or has the potential to affect) 24 or more subscriber lines.</li><li>• The letter "m" denotes a minor alarm. Three types of problems can cause minor alarms. The first type is a service-affecting fault that affects 2 to 23 subscriber lines. The second type is a loss of redundancy on any major circuit pack (such as the processor card or an optical interface circuit pack). The third type is the failure of any circuit pack that is not service-affecting (such as the maintenance interface card).</li><li>• The letter "w" denotes a warning. Warnings are for problems that do not currently affect service, and are not likely to become serious service-affecting problems.</li></ul>
Service code	The service codes are: <ul style="list-style-type: none"><li>• The letters "SA" indicate that the fault is service-affecting.</li><li>• The letters "nsa" indicate that the fault is not service-affecting.</li></ul>

## Detailed alarm information

You can display detailed information about an alarm. The detailed information is displayed on the Detailed Alarm Report screen, which is shown in Figure 4-3.

**Figure 4-3**  
Detailed Alarm Report screen in the network-element user interface

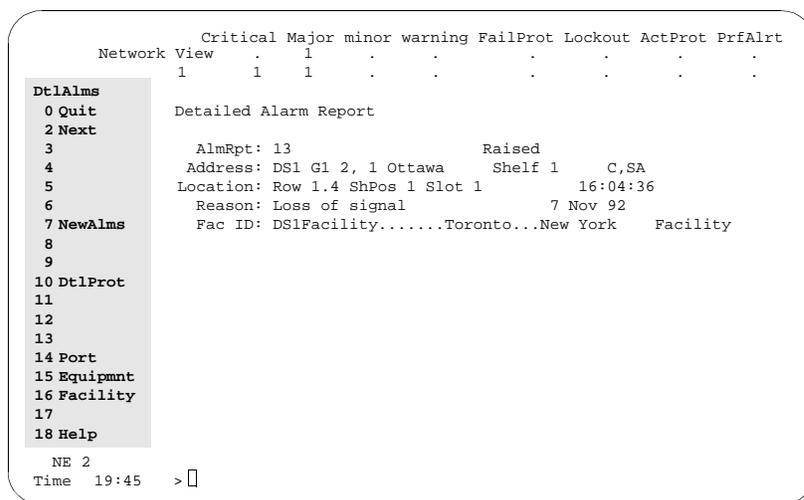


Table 4-2 lists the screen display information for the selected alarm.

**Table 4-2**  
Alarm field display information

Alarm	Definition
Alarm report number	the alarm report number, as on the Alarms screen
Address	the address, including the number, name, object type, and logical address of the network element
Physical location	the physical location of the entity on which the fault exists
Reason	the reason, as on the Alarms screen
Facility ID or Equipment ID	the facility or equipment identification number of the alarm
Trend of the alarm	the trend of the alarm, either Raised or Cleared
Severity of the alarm	the severity of the alarm, as on the Alarms screen
Service cod	the service code of the alarm, as on the Alarms screen
Time and date	the time and date when the event occurred

## Alarm displays in the OPC user interface

The OPC user interface displays information about all the network elements in the system.

For instructions on how to use the screens of the OPC user interface, see *OPC User Interface Description, 323-3001-301*, in *Operations, Administration, and Provisioning, Volume 4A*.

### Alarm summary information on CMT OPC screens

In the character-mode terminal (CMT) OPC user interface, aggregate alarm counts are displayed on the main window for every tool. The aggregate alarm counts are for the network elements (including all OPC alarm counts) in the system. The alarm counts appear at the left side of the status line, which is at the bottom of the window. Figure 4-4 shows the main window for the Event Browser tool, with the status line at the bottom. The alarms are grouped by severity. The labels for the severities are:

- C critical
- M major
- m minor
- w warning

Whenever one of the aggregate alarm counts is incremented, that count is highlighted by reverse video.

**Figure 4-4**  
**Alarm counts in the status line at the bottom of a screen in the CMT OPC user interface**

SC-10308

```

> • Event Browser
Auto-update: [ OFF ]                               Last date at: 16 Sep 17:48:25
25 Events sorted by Time                             [ Update List ]
Showing: OPC logs, all NE logs, alarm, alerts, all sev, and all NES

```

NE#	NE Name	Evt#	Cls	Unit	Reason	Date	Time	Sv
0	OPC	275	Stat	log	COM500 Network Mana	16 Sep	15:53:40	w
0	OPC	274	Usge	log	NAD400 Network Mana	16 Sep	15:53:40	w
0	OPC	273	Cmpl	log	NAD600 Network Mana	16 Sep	13:14:26	w
0	OPC	272	Trbl	log	COM300 Network Mana	16 Sep	13:14:26	w
0	OPC	271	Stat	log	COM500 Network Mana	16 Sep	12:51:53	w
0	OPC	270	Usge	log	NAD400 Network Mana	16 Sep	12:51:53	w
0	OPC	269	Cmpl	log	NAD600 Network Mana	16 Sep	12:51:52	w
0	OPC	268	Trbl	log	COM300 Network Mana	16 Sep	12:51:51	w
0	OPC	267	Cmpl	log	NAD627 Request to r	16 Sep	12:42:37	w
92	CURLY	7978	INFO	log	FAC603 Inter-Ring p	16 Sep	12:42:34	m
92	CURLY	59	Fac	OC12 G1	Inter-ring protecti	16 Sep	12:42:34	-
92	CURLY	59	Fac	OC12 G1	Inter-ring forced s	16 Sep	12:42:34	-
0	OPC	266	Cmpl	log	NAD627 Request to o	16 Sep	12:42:20	w
92	CURLY	7877	INFO	log	FAC603 Inter-Ring P	16 Sep	12:42:18	m
92	CURLY	57	Fac	OC12 G1	Inter-ring protecti	16 Sep	12:42:18	w

```

C 0  M 6  m 9  w 1  FailProt 0  Lckt 0  ActProt 0  PrfAlrt 0  17:48

```

## Alarm information displayed by the Alarm Monitor

In the OPC user interface, you use the Alarm Monitor tool to display or print alarm reports. For information on how to use the tool, see *Network Surveillance Procedures*, 323-3001-510, in *Maintenance*, Volume 5C.

The Alarm Monitor screen displays alarm counts in the banner lines, which are located at the top of the display, and it can also display an alarm list beneath the banner lines. Figure 4-5 shows an Alarm Monitor screen with banner lines and an alarm list.

**Figure 4-5**  
Alarm Monitor screen with banner lines and an alarm list

SC-10275

```

xterm
> Alarm Monitor Options
Critical Major Minor Warning FailProt Lockout ActProt PrfAlrt
Network View . 5 4 6 . . .
Alarms sorted by severity [*] Auto update list
Showing: All Severities, All NEs

  NE#  NE Name  Alm#  Cls  Sh  Type  Unit  Reason  Time  Sev.
*  18 NE18   257  Fac  1  TIC   1 5  TR-08 System 1 loss 16:18:36* M,SA
  22      3  Fac  1  DS1 G3  6  Rx loss of signal 15:53:35* M,SA
  22      1  Fac  1  DS1 G3  5  Rx loss of signal 15:53:34* M,SA
  18 NE18   280  Fac  1  TIC   1 6  TR-08 System 1 Rx f 12:47:05* M,SA
*  18 NE18   222  Fac  1  TIC G2  1 5  TR-08 System 1 Rx f 10:38:00* M,SA
*  18 NE18     3  Fac  1  DS1 G2      Input card missing 03:03:18* M,SA

C 0 M 5 m 4 w 6 FailProt 0 Lckt 0 ActProt 0 PrfAlrt 0 04:48

```

## Banner lines

The banner lines contain network-view alarm counts and the user-view alarm counts. The network view alarm counts are aggregate counts for all the network elements in the system. The network view alarm counts include all OPC alarm counts. The user view alarm counts are aggregate counts for a subset of the network elements in the OPC span of control. The subset is defined either by the user or by a system administrator. Typically, the subset includes only those network elements the user is responsible for monitoring.

The banner lines always show the current state of the system. When the OPC receives notification that a new alarm has been raised, the appropriate alarm count is incremented, and the field is highlighted. The highlighting remains in effect until you enter a command to clear the highlighting.

### **Alarm list**

The alarm list appears below the banner lines. To display an alarm list, you must enter a command. There are separate commands to display lists of new alarms or active alarms.

*Note:* The OPC user interface lets you specify filtering instructions, to restrict the alarms that can be displayed in the list. You can exclude alarms that are not of interest to you. You can also specify the order in which the alarms are to be displayed.

As shown in Figure 4-5, each entry in the alarm list is a one-line summary of an alarm. Table 4-3 lists each entry and a summary of the entries in the alarm list.

For each new alarm, the tool displays a new-alarm symbol at the extreme left of the alarm list, to draw attention to the new alarms. The new-alarm symbol is a plus sign (+). A new alarm is one that has been received since the last time you opened the Alarm Monitor tool.

### **Managing the alarms list**

The Alarm Monitor tool lets you manage the alarms list. The following functionality is available:

- You can specify that only a subset of active alarms should be included in the alarms list. You can filter alarms according to the following criteria:
  - network element
  - severity
  - date and time
- You can sort the alarms by severity, by network element, or by time.
- You can display detailed information about a selected alarm.

Table 4-3 lists each entry and a summary of the entries in the alarm list.

**Table 4-3**  
**Alarm field display information**

<b>Alarm</b>	<b>Definition</b>
Alarm report number	Each alarm report number is a unique integer within the network element.
Network element identifier	Each network element has a number and a name.
Alarm class	The classes represent general problem groups. The following class names are used: <ul style="list-style-type: none"> <li>• facility</li> <li>• equipment</li> <li>• environmental</li> </ul>
Shelf identifier	This field is a text string that identifies the shelf code.
Type of shelf (ABM or TBM)	This field is a text string that identifies the type shelf.
Equipment unit	This field identifies the unit that the alarm pertains to.
Reason	This field is a text string that states what the problem is.
Time and date	The date and time of the alarm update is in the "Last Updated" field.
Severity code	The severity codes are: <ul style="list-style-type: none"> <li>• The letter "C" denotes a critical alarm, that is one that affects (or has the potential to affect) 128 or more subscribers, that is, six or more DS1s.</li> <li>• The letter "M" denotes a major alarm, that is, one that affects (or has the potential to affect) 24 or more customers, that is, one or more DS1s.</li> <li>• The letter "m" denotes a minor alarm. Three types of problems can cause minor alarms. The first type is a service-affecting fault that affects 23 or fewer DS0-based service instances. The second type is a loss of redundancy on any major circuit pack (such as the processor card or an optical interface circuit pack). The third type is the failure of any circuit pack that is not service-affecting (such as the maintenance interface circuit pack).</li> <li>• The letter "w" denotes a warning. Warnings are for problems that do not currently affect service, and are not likely to become serious service-affecting problems.</li> </ul>
Service code	The service codes are: <ul style="list-style-type: none"> <li>• The letters "SA" indicate that the fault is service-affecting.</li> <li>• The letters "nsa" indicate that the fault is not service-affecting.</li> </ul>

**Displaying detailed information about an alarm**

You can display detailed information about an alarm. To display the information, you select the alarm from the alarms list, and then enter the “Details” command. The details are displayed on the Alarm Details dialog, which is superimposed on the Alarm Monitor screen. Figure 4-6 shows an example of the Alarm Details dialog.

**Figure 4-6**  
**Alarm Details dialog**

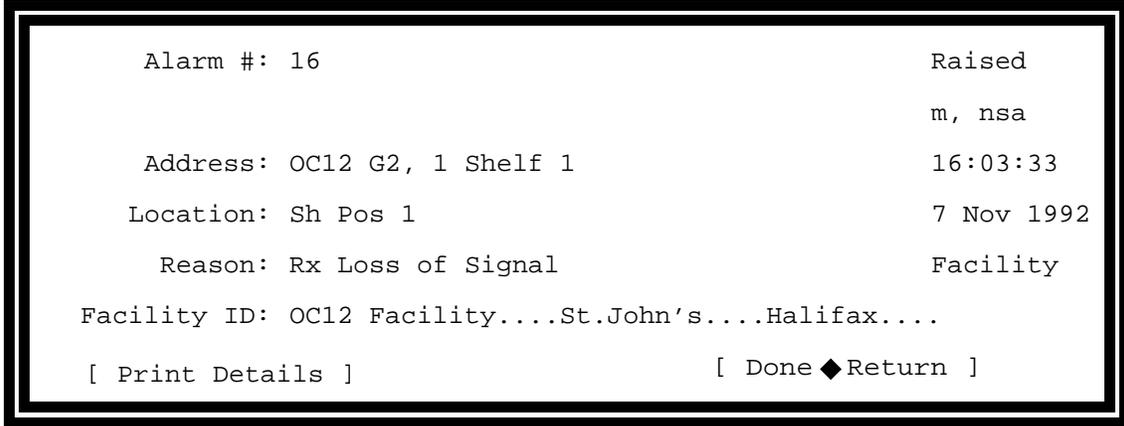


Table 4-4 lists the Alarm Details dialog information for the selected alarm.

**Table 4-4**  
**Alarm field display information**

Alarm	Definition
Alarm report number	the alarm report number, as on the alarms list
Unit	the unit, identifying the equipment or facility involved
Address	the address including a network-element identifier and a shelf identifier (if appropriate)
Physical location	the physical location of the entity on which the fault exists
Reason	the reason, as on the alarms list
Facility ID or Equipment ID	the facility ID (if the alarm is a facility alarm), or the equipment ID (if the alarm is an equipment alarm)
Severity of the alarm	the severity of the alarm, and whether it is service-affecting, as on the alarms list
Time and date	the time and date when the event occurred, as on the alarms list
Alarm class	the alarm class, as on the alarms list

**Printing detailed information about an alarm**

As an alternative to displaying the detailed information for an alarm, you can print the information. To print the information, you select the alarm from the alarms list, and then enter the “Print details” command.

**Log displays and printouts**

In an AccessNode system running the latest software, you can obtain log displays and printouts. The core software includes the log archive feature, which provides for the collection and management of log event records. Using the operations controller user interface (OPCUI), you can sort, view, and print log information based on parameters such as slot, card type, time interval, or log type.



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# Sending alarm information to external systems

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This chapter explains how the AccessNode communicates information to external systems.

## Chapter contents

Use the following table to go directly to the information you require.

Topic	See
AccessNode communications with external systems	page 5-2
Communication with a serial-telemetry system	page 5-3
Communication with a parallel-telemetry system	page 5-5
Communication with operations systems	page 5-11

## AccessNode communications with external systems

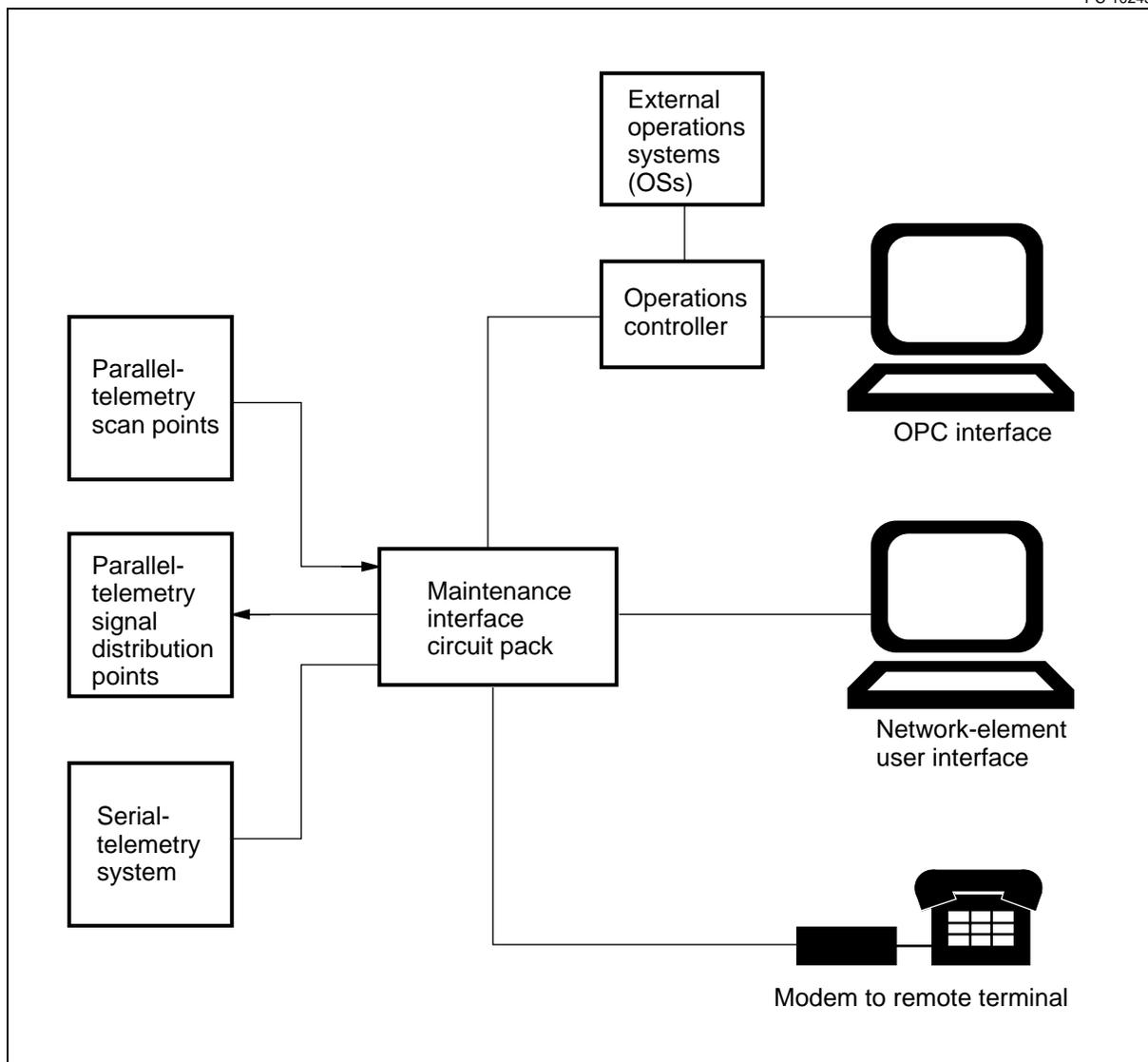
AccessNode can send alarm information to the following external systems:

- serial-telemetry systems
- parallel-telemetry systems
- operations systems (OSs)

Figure 5-1 illustrates the flow of alarm information between AccessNode and external systems.

**Figure 5-1**  
**Flow of alarm information between AccessNode and external systems**

PC-10245



## Communication with a serial-telemetry system

Connection to a serial-telemetry system is by way of the serial-telemetry cable. The cable connects to the side interconnect left circuit pack in the common-equipment shelf, and is labeled Serial Telemetry. The connector is for two RS-422 4-wire serial ports. The serial-telemetry data goes to a piece of external equipment called an E2A Alarm Processing Remote (APR), which is located at a remote monitoring center. Communication between the APR and the AccessNode uses the telemetry byte oriented serial (TBOS) protocol.

### TBOS protocol

The communication between the AccessNode and the alarm processing remote (APR) uses the telemetry byte oriented serial (TBOS) protocol. The protocol specifies that communication should be asynchronous, serial, half-duplex, and at a rate of 2400 baud. The protocol is used for receiving small amounts of alarm surveillance information and for transmitting control messages. All commands and surveillance requests are initiated by the APR.

AccessNode sends alarm information to the APR in the form of TBOS displays. A display is composed of eight bytes, each byte containing eight bits. Each of the 64 bits in a display is referred to as an alarm point.

The communication between the AccessNode and the APR proceeds as follows. The APR sends a scan request to the AccessNode. When AccessNode receives the scan request, it locks the alarm points and sends copies of the displays to the APR. The protocol requires that the AccessNode respond to the scan request within 200 ms.

After the AccessNode has responded, the alarm points remain locked, in anticipation of the second scan request from the APR. When that second request arrives, the AccessNode again must respond to it within 200 ms. If there is an error in the communications (for example, a parity error, a format error, or a response time exceeding 200 ms), the APR initiates another attempt. If three successive attempts fail, the APR declares that the link has failed, and it halts serial telemetry over the link.

## **TBOS displays**

AccessNode uses the following types of TBOS displays:

- monitor displays
- control displays
- remote displays

### **Monitor displays**

Monitor displays report information to the Alarm Processing Remote. In a monitor display, each bit is referred to as an alarm point. Each alarm point is associated with a single indication. The value in each alarm point (1 or 0) indicates one of the following:

- whether or not a given indication is raised
- whether or not a particular object is in a certain state

The maintenance interface card maintains the displays in memory. When it detects an indication, it sets the appropriate alarm points in the monitor displays.

Two things must happen before the maintenance interface card resets an alarm point:

- the indication must clear
- the alarm point must be scanned by the APR.

### **Control displays**

Control displays carry commands from the Alarm Processing Remote to the AccessNode. In a control display, each bit is referred to as a command point. Each command point is mapped to an executable command. The serial-telemetry system sets the command points to indicate which commands the AccessNode should execute.

### **Remote display**

AccessNode has one remote display, the cluster-level display. The cluster-level display reports information from the entire cluster. The cluster is composed of all the network elements in the span of control of the operations controller.

The E2A Alarm Manager software tool in the operations controller collects network-element-level monitor displays from all network elements in the cluster and creates the cluster display. The operations controller distributes the cluster display to all active network elements in the cluster.

### Definitions of the bits in the displays

For the definitions of the bits in the displays used by an AccessNode, see Appendices A, B, and C.

- Appendix A lists the displays used with an access bandwidth manager shelf.
- Appendix B lists the displays used with a transport bandwidth manager shelf.
- Appendix C lists the cluster-level alarm display.

### TBOS Mapping software tool

By using the TBOS Mapping software tool in the operations controller user interface (OPCUI), you can centralize serial-telemetry output for all the network elements served by the operations controller. For information on using the TBOS Mapping software tool, see *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A.

There is no capability to carry remote telemetry (TBOS and E2A) from the RFTs to the central office if you install the operations controller (OPC) in available slots in a the common-equipment shelf in a network element in a separate system. For more information on the possible locations of the operations controller, see *Configuration and Equipment Description*, 323-3001-100, in this volume.

### Communication with a parallel-telemetry system

Examples of parallel-telemetry systems are Surveillance and Control of Transmission Systems (SCOTS) and Telecommunications Alarm Surveillance and Control (TASC).

Connection to a parallel-telemetry system is by way of the parallel-telemetry cable. An alternate connection method is by direct wirewrapping to the pinfield on the BIP. The cable connects to a connector that is located on the side interconnect left circuit pack in the common-equipment shelf, and is labeled Parallel Telemetry.

By way of the parallel-telemetry cable, the AccessNode receives commands from the parallel-telemetry system and sends data to that system. The parallel-telemetry data goes to external equipment called telemetry remote monitoring equipment.

### Incoming parallel-telemetry alarm data

The BIP can receive parallel-telemetry alarm information from external equipment or sensors by way of wire-wrap pins on its wirewrap pin field. E2A parallel telemetry scan points are available on the BIP.

**5-6 Sending alarm information to external systems**

By way of these scan points, AccessNode can be notified of any alarm conditions that are triggered by contact closure between the specified E2A scan point and E2A return. such as high temperatures, flooding, or open safety interconnects on cabinet doors.

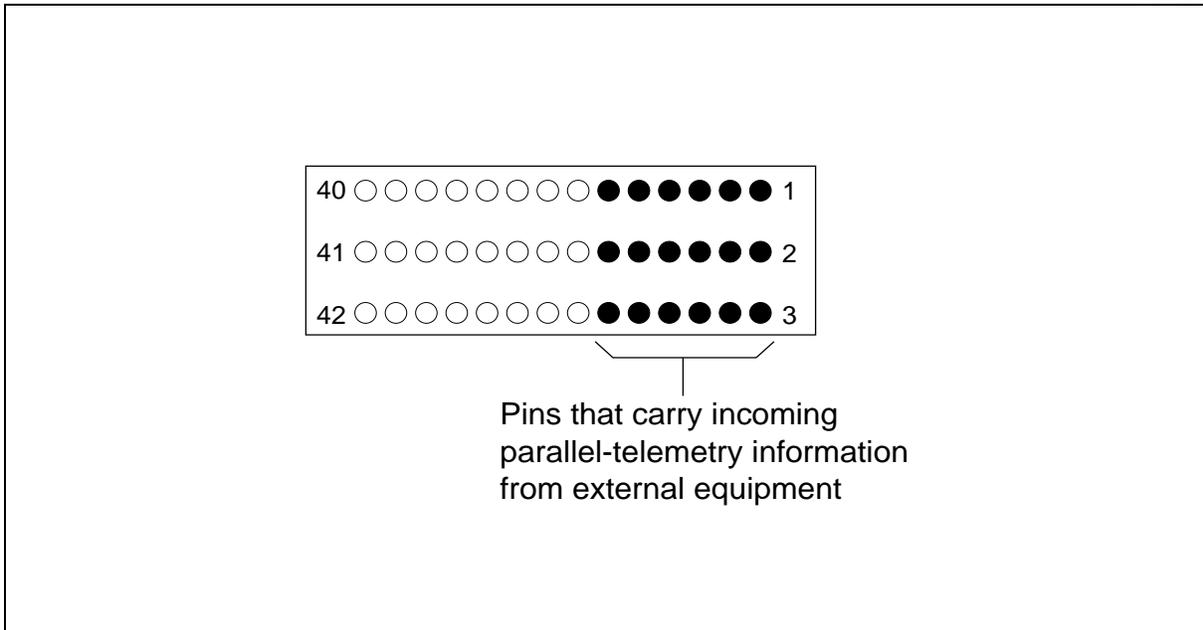
Pins 1 to 18 on an NT4K14BA BIP serve to carry incoming parallel-telemetry information from external equipment. Table 5-1 lists the functions of these wire-wrap pins, and Figure 5-2 shows their positions on the pin field.

**Table 5-1**  
**Incoming parallel-telemetry signals on wirewrap pins 1 to 18 on an NT4K14BA BIP**

Pin	Signal	Pin	Signal	Pin	Signal
1	E2A in 01	2	E2A in return	3	E2A in 02
4	E2A in 03	5	E2A in return	6	E2A in 04
7	E2A in 05	8	E2A in return	9	E2A in 06
10	E2A in 07	11	E2A in return	12	E2A in 08
13	E2A in 09	14	E2A in return	15	E2A in 10
16	E2A in 11	17	E2A in return	18	E2A in return

**Figure 5-2**  
**Wirewrap pins on an NT4K14BA BIP for carrying incoming external alarms**

PC-16514



Each E2A parallel-telemetry scan points (except scan point 03) are customer-provisionable for text and severity. The 03 scan point is dedicated to audible Alarm cutoff (ACO). In some cases (when AccessNode is used in RFT enclosures) the E2A scan points are defaulted to a specific test by the manufacturer

For information on how to set E2A scan points, see *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A.

### **Outgoing parallel-telemetry data**

Parallel-telemetry alarm data goes to the telemetry remote monitoring equipment by way of the parallel-telemetry cable connected to the side interconnect left circuit pack in the common-equipment shelf in the fiber central office terminal (FCOT).

An AccessNode can send 18 information items to the telemetry remote monitoring system by way of parallel telemetry. The 18 information items are controlled by 18 signal-distribution (SD) points, which are relays on the maintenance interface card. The state of each of these relays (open or closed) conveys an information item to the telemetry remote monitoring system.

### **Sending parallel-telemetry information to an alarm scanner**

A telephone company may connect the parallel telemetry outputs from an AccessNode system to an alarm scanner located in a maintenance center. The parallel telemetry from multiple systems may be tied together at the inputs to an alarm scanner.

#### **Remote alarm-cutoff**

Remote alarm cutoff is a function that maintenance personnel can use to determine the origin of an alarm received at the alarm scanner. If the parallel-telemetry signals from multiple systems are connected to the alarm scanner in parallel, it may be impossible to know which of the paralleled systems is reporting a specific alarm.

To determine the origin of the alarm, the person at the maintenance terminal in the maintenance center uses the remote alarm-cutoff command to cut off the parallel telemetry from each of the systems, one at a time, until the alarm goes away.

The cutoff of parallel telemetry from the AccessNode system to the alarm scanner remains in effect until a new alarm is raised, or until there are no more critical, major, or minor alarms from that system.

Table 5-2 on page 5-8 lists the default assignments of the parallel-telemetry signal-distribution points.

**Table 5-2**  
**Default meanings of the parallel-telemetry SD points**

SD point	Meaning
1	System identifier or network-element identifier
2	Critical alarm in the system or in the network element
3	Major alarm in the system or in the network element
4	Minor alarm in the system or in the network element
5	If system-level alarm reporting is in effect, this scan point indicates that an RFT alarm is present in the system. Otherwise, this point is unassigned.
6	Unassigned
7	Unassigned
8	Any OC-12 or OC-3 indication
9	Any DS1 or DS3 indication
10	OC-12/OC-3/DS1/DS3 signal fail
11	OC-12 or OC-3 signal degrade
12	OC-12/OC-3/DS1/DS3 equipment fail
13	OC-12/OC-3/DS1/DS3 protection switch complete
14	Common-equipment fail
15	AC power fail
16	Low battery
17	Unassigned
18	Unassigned
<p><b>Note:</b> The meanings of points one to five vary, depending on whether system-level alarm reporting is in effect. For information on system-level alarm reporting, see page 2-3.</p>	

**E2A Alarm Manager software tool**

By using the E2A Alarm Manager software tool in the OPCUI, you can manage parallel-telemetry output for all the network elements served by the operations controller. For information on using the E2A Alarm Manager software tool, see *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A.

**Note:** If you install the operations controller in available slots in a common-equipment shelf in a network element in a separate system, there is no capability to carry remote telemetry (TBOS and E2A) from the RFTs

to the central office. For more information on the possible locations of the operations controller, see *Configuration and Equipment Description*, 323-3001-100, in this volume.

### **Cross-connecting the parallel and serial-telemetry systems**

You can edit the settings for the parallel-telemetry output points. One use of this editing function is to specify a relationship between an output point and an alarm point in a serial-telemetry display, so that the serial-telemetry alarm point controls the parallel-telemetry output point. You can do this for any one of the parallel-telemetry output points in the range 6 to 18. You can relate any one of these points to any serial-telemetry alarm point. (Parallel-telemetry output points 1 to 5 are fixed.) Each output point can be related to no more than one alarm point.

For instructions on how to edit the settings for the output points, see *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A.

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**Parallel telemetry output points**

An AccessNode has four parallel telemetry output points. The parallel-telemetry output points 15, 16, 17, and 18 are connected to wire-wrap pins 19 to 24 on the breaker interface panel.

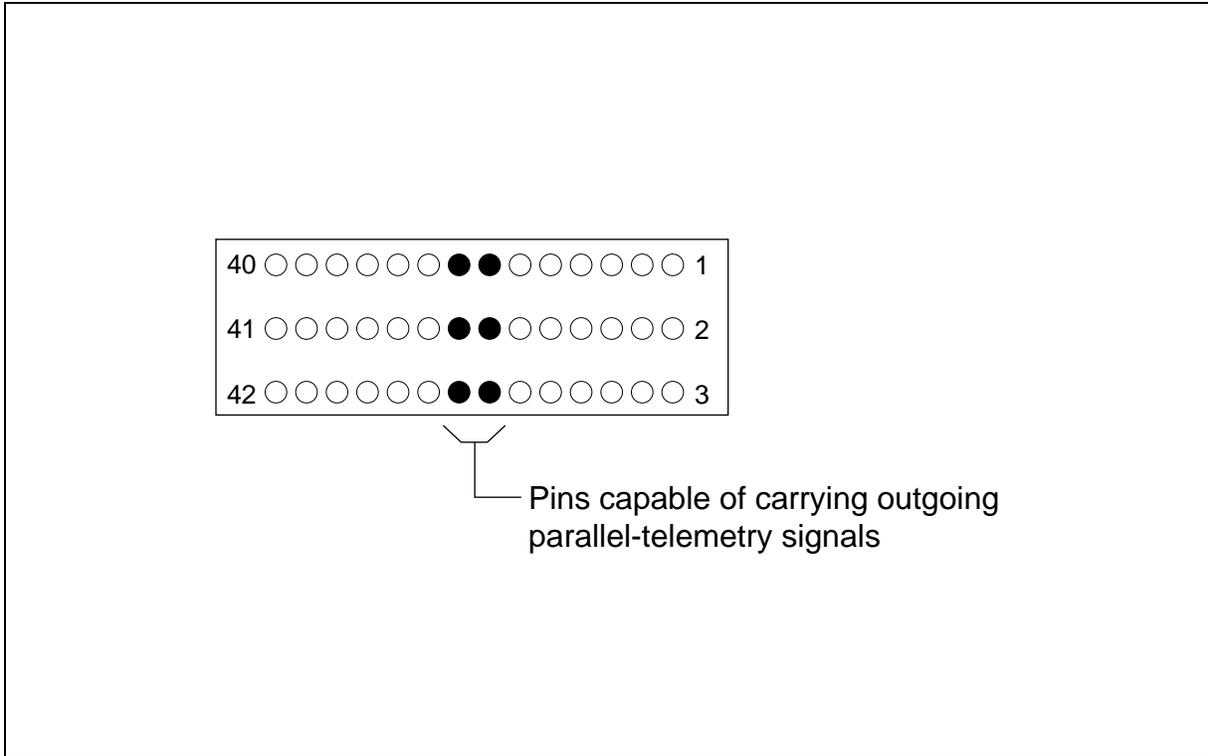
Pins 19 to 24 on an NT4K14BA BIP serve to carry outgoing parallel-telemetry information. Table 5-3 lists the functions of these wire-wrap pins, and Figure 5-3 shows their positions on the wire-wrap pin field.

**Table 5-3**  
**Signals on wirewrap pins 19 to 24 on an NT4K14BA BIP**

Pin	Signal	Pin	Signal	Pin	Signal
19	E2A out 15	20	E2A out return	21	E2A out 16
22	E2A out 17	23	E2A out return	24	E2A out 18

**Figure 5-3**  
**Wirewrap pins on an NT4K14BA BIP carrying outgoing parallel-telemetry signals**

PC-16512



The output points on the wire-wrap pin field can serve to activate various devices. For example, if the parallel telemetry system detects an extraordinary situation such as a power failure at a remote location, the system can send an explicit command to close the relay for one of the output points on the pin field. The closing of that relay could complete a circuit that activates another switch to start a generator to provide backup power.

**Note:** On the NT7E56 breaker interface panel, which is used with the transport bandwidth manager shelf, the wire-wrap pins do not carry outgoing parallel-telemetry signals.

## Communication with operations systems

The OPC is the gateway device by which AccessNode communicates with an operations system (OS). The OPC understands the commands that come from the OS, and responds in a format that the OS can understand, so that communication with AccessNode is transparent for the OS. Because the OPC has access to the alarm data from all the network elements within its span of control, it can supply that data to the OS.

Connection to an operations system is by way of a serial port of the operations controller (OPC). For information on the serial ports to the OPC, see *Configuration and Equipment Description*, 323-3001-100, in this volume.

**Note:** Optional software feature packages are available to support interfaces to various external operations systems.

A transaction language 1 (TL1) interface is used for the interface between the OPC and an external operations system. For information on TL1, see *TL1 Interface Information*, 323-3001-190.

## 5-12 Sending alarm information to external systems

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## Appendix A: TBOS displays, ABM shelf

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This appendix provides the telemetry byte-oriented serial (TBOS) protocol displays used for the access bandwidth manager (ABM) shelf.

### Chapter contents

Use the following table to go directly to the information you require.

Topic	See
Alarm points in monitor display 1: network-element indications	Table 6-1 on page 6-3
Alarm points in monitor display 2 for the ABM shelf: telemetry overview display	Table 6-2 on page 6-6
Alarm points in monitor display 3 for the ABM shelf: equipment	Table 6-3 on page 6-10
Alarm points in monitor display 4 for the ABM shelf: facility	Table 6-4 on page 6-13
Alarm points in monitor display 5 for the ABM shelf: protection	Table 6-5 on page 6-16
Alarm points in monitor display 6 for the ABM shelf: parallel-telemetry scan points and signal-distribution points for the ABM shelf	Table 6-6 on page 6-19
Alarm points in monitor display 7 for the ABM shelf: modules in the copper-distribution drawers	Table 6-7 on page 6-21
Alarm points in monitor display 8 for the ABM shelf: maintenance	Table 6-8 on page 6-24
ABM monitor displays for OC-3 tributaries	Table 6-9 on page 6-25
ABM control display OC-3 tributaries	Table 6-10 on page 6-26
Command points in control display 1 for the ABM shelf	Table 6-11 on page 6-27
Command points in control display 2 for the ABM shelf	Table 6-12 on page 6-30

## **ABM shelf telemetry byte-oriented serial protocol displays**

The following telemetry byte-oriented serial (TBOS) protocol displays are used for the access bandwidth manager (ABM) shelf:

- monitor display 1: network-element indications
- monitor display 2: telemetry overview display
- monitor display 3: equipment
- monitor display 4: facility
- monitor display 5: protection
- monitor display 6: parallel-telemetry scan points and signal-distribution points
- monitor display 7: modules in the copper-distribution drawers
- monitor display 8: maintenance
- control display 1
- control display 2

Tables 6-1 through 6-8 list the definitions of the alarm points in the monitor displays.

Table 6-9 lists the ABM monitor display for OC-3 tributaries.

Table 6-10 lists the ABM control display for OC-3 tributaries.

Tables 6-11 and 6-12 list the definitions of the command points in the control displays.

The meanings of all the alarm points and command points have been predefined, and cannot be changed by the user.

**Table 6-1**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
1	1	1	Network-element alarms: at least one critical alarm (facility category)
2	1	2	Network-element alarms: at least one major alarm (facility category)
3	1	3	Network-element alarms: at least one minor alarm (facility category)
4	1	4	Network-element alarms: at least one warning alarm (facility category)
5	1	5	Network-element alarms: at least one critical alarm (equipment category)
6	1	6	Network-element alarms: at least one major alarm (equipment category)
7	1	7	Network-element alarms: at least one minor alarm (equipment category)
8	1	8	Network-element alarms: at least one warning alarm (equipment category)
9	2	1	Network-element alarms: at least one critical alarm (environmental category)
10	2	2	Network-element alarms: at least one major alarm (environmental category)
11	2	3	Network-element alarms: at least one minor alarm (environmental category)
12	2	4	Network-element alarms: at least one warning alarm (environmental cat.)
13	2	5	Not used
14	2	6	Not used
15	2	7	Not used
16	2	8	Not used
17	3	1	Not used
18	3	2	Not used
19	3	3	Not used
20	3	4	Network-element alerts: at least one OC-12 or OC-3 alert
21	3	5	Not used
22	3	6	Not used
23	3	7	Network-element alerts: at least one STS-12 alert
24	3	8	Not used
—continued—			

**Table 6-1 (continued)**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
25	4	1	Network-element alerts: at least one DS3 alert
26	4	2	Network-element alerts: at least one DS1 alert
27	4	3	Not used
28	4	4	Not used
29	4	5	Not used
30	4	6	Not used
31	4	7	Not used
32	4	8	Not used
33	5	1	Not used
34	5	2	Not used
35	5	3	Not used
36	5	4	Not used
37	5	5	Not used
38	5	6	Not used
39	5	7	Not used
40	5	8	Not used
41	6	1	Network-element protection: at least one OC-12 or OC-3 optical protection fail
42	6	2	Network-element protection: at least one OC-12 or OC-3 optical protection active
43	6	3	Network-element protection: at least one OC-12 or OC-3 optical active lockout
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Network-element protection: at least one DS1 or DS3 metallic protection fail
48	6	8	Network-element protection: at least one DS1 or DS3 metallic protection active
—continued—			

**Table 6-1 (continued)**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
49	7	1	Network-element protection: at least one DS1 or DS3 metallic active lockout
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Not used
58	8	2	Not used
59	8	3	Not used
60	8	4	Not used
61	8	5	Operations-controller-to-network-element (OPC-NE) association is down
62	8	6	Network-element alarms: alarm of any severity is raised
63	8	7	Network-element alarms: alarm of severity critical, major, or minor is raised
64	8	8	Not used
—end—			

**Table 6-2**  
**Alarm points in monitor display 2 for the ABM shelf: telemetry overview display**

Point	Byte	Bit	Description
1	1	1	OC-12 or OC-3 equipment failure
2	1	2	OC-12 or OC-3 signal failure (loss of signal or loss of frame)
3	1	3	OC-12 or OC-3 terminations indicate alarm indication signal (AIS) detected
4	1	4	OC-12 or OC-3 protection switch completed
5	1	5	OC-12 or OC-3 protection switch failed
6	1	6	OC-12 or OC-3 lockout indication
7	1	7	OC-12 or OC-3 performance threshold 1 exceeded
8	1	8	OC-12 or OC-3 performance threshold 2 exceeded
9	2	1	OC-12 or OC-3 protection path failure
10	2	2	DS3 protection path failure
11	2	3	DS1 protection path failure
12	2	4	OC-12 or OC-3 signal degrade
13	2	5	OC-12 or OC-3 terminations indicate far-end receive fail
14	2	6	common-equipment failure
15	2	7	Any OC-12 or OC-3 indication
16	2	8	Any DS1 or DS3 indication
—continued—			

**Table 6-2 (continued)**  
**Alarm points in monitor display 2 for the ABM shelf: telemetry overview display**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
17	3	1	DS3 equipment failure
18	3	2	DS3 metallic facility failure (LOS, LOF, BPV, BER)
19	3	3	DS3 terminations indicate alarm indication signal (AIS) detected
20	3	4	DS3 protection switch completed
21	3	5	DS3 protection switch failed
22	3	6	DS3 lockout indication
23	3	7	DS3 performance threshold 1 exceeded
24	3	8	DS3 performance threshold 2 exceeded
25	4	1	DS1 equipment failure
26	4	2	DS1 metallic facility failure (LOS, LOF, BPV, BER)
27	4	3	DS1 terminations indicate alarm indication signal (AIS) detected
28	4	4	DS1 protection switch completed
29	4	5	DS1 protection switch failed
30	4	6	DS1 lockout indication
31	4	7	DS1 performance threshold 1 exceeded
32	4	8	DS1 performance threshold 2 exceeded
—continued—			

**Table 6-2 (continued)**  
**Alarm points in monitor display 2 for the ABM shelf: telemetry overview display**

Point	Byte	Bit	Description
33	5	1	External input (latch) number 1
34	5	2	External input (latch) number 2
35	5	3	External input (latch) number 3
36	5	4	External input (latch) number 4
37	5	5	External input (latch) number 5
38	5	6	External input (latch) number 6
39	5	7	External input (latch) number 7
40	5	8	External input (latch) number 8
41	6	1	External input (latch) number 9
42	6	2	External input (latch) number 10
43	6	3	External input (latch) number 11
44	6	4	Logical or, of any alarm on any voice module hosted by the ABM configured as an HDT
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 6-2 (continued)**  
**Alarm points in monitor display 2 for the ABM shelf: telemetry overview display**

Point	Byte	Bit	Description
49	7	1	Any high-speed (OC-12 or OC-3) or low-speed (DS1 or DS3) equipment failure
50	7	2	Any high-speed (OC-12 or OC-3) optical failure or low-speed (DS1 or DS3) metallic facility failure
51	7	3	Any alarm indication signal (AIS) detected
52	7	4	Any protection switch completed
53	7	5	Any protection switch failed
54	7	6	Any lockout indication
55	7	7	Any performance threshold 1 exceeded
56	7	8	Any performance threshold 2 exceeded
57	8	1	Network alarms: alarm of critical severity is raised
58	8	2	Network alarms: alarm of major severity is raised
59	8	3	Network alarms: alarm of minor severity is raised
60	8	4	Network alarms: alarm of warning severity is raised
61	8	5	Fan failure detected
62	8	6	Over temperature
63	8	7	Battery fail breaker trip status
64	8	8	Not used
—end—			

**Table 6-3**  
**Alarm points in monitor display 3 for the ABM shelf: equipment**

Point	Byte	Bit	Description
1	1	1	Failure of the DS1 circuit-pack group G1
2	1	2	Failure of the DS1 circuit-pack group G2
3	1	3	Failure of the DS1 circuit-pack group G3
4	1	4	Failure of the DS1 circuit-pack group G4
5	1	5	Failure of the DS1 circuit-pack group G5
6	1	6	Failure of the DS1 circuit-pack group G6
7	1	7	Failure of the DS1 circuit-pack group G7
8	1	8	Failure of the DS1 circuit-pack group G8
9	2	1	Failure of the DS1 protection circuit-pack group
10	2	2	Failure of the DS3 circuit-pack group G1
11	2	3	Failure of the DS3 circuit-pack group G2
12	2	4	Failure of the DS3 circuit-pack group G3
13	2	5	Failure of the DS3 protection circuit-pack group
14	2	6	Not used
15	2	7	Failure of OC-12 or OC-3 circuit-pack group G1
16	2	8	Failure of OC-12 or OC-3 circuit-pack group G2
17	3	1	Circuit-pack failure in slot 1 of the common-equipment shelf
18	3	2	Circuit-pack failure in slot 2 of the common-equipment shelf
19	3	3	Circuit-pack failure in slot 3 of the common-equipment shelf
20	3	4	Circuit-pack failure in slot 4 of the common-equipment shelf
21	3	5	Circuit-pack failure in slot 5 of the common-equipment shelf
22	3	6	Circuit-pack failure in slot 6 of the common-equipment shelf
23	3	7	Circuit-pack failure in slot 7 of the common-equipment shelf
24	3	8	Circuit-pack failure in slot 8 of the common-equipment shelf
—continued—			

**Table 6-3 (continued)**  
**Alarm points in monitor display 3 for the ABM shelf: equipment**

Point	Byte	Bit	Description
25	4	1	Circuit-pack failure in slot 11 of the common-equipment shelf
26	4	2	Circuit-pack failure in slot 12 of the common-equipment shelf
27	4	3	Circuit-pack failure in slot 13 of the common-equipment shelf
28	4	4	Circuit-pack failure in slot 14 of the common-equipment shelf
29	4	5	Circuit-pack failure in slot 15 of the common-equipment shelf
30	4	6	Circuit-pack failure in slot 16 of the common-equipment shelf
31	4	7	Circuit-pack failure in slot 17 of the common-equipment shelf
32	4	8	Circuit-pack failure in slot 18 of the common-equipment shelf
33	5	1	Circuit-pack failure in slot 19 of the common-equipment shelf
34	5	2	Circuit-pack failure in slot 20 of the common-equipment shelf
35	5	3	Circuit-pack failure in slot 21 of the common-equipment shelf
36	5	4	Not used
37	5	5	Not used
38	5	6	Not used
39	5	7	Not used
40	5	8	Not used
41	6	1	Not used
42	6	2	Not used
43	6	3	Not used
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 6-3 (continued)**  
**Alarm points in monitor display 3 for the ABM shelf: equipment**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
49	7	1	Breaker-trip indicator 1 (48V supply CE, CU, or TB CF fail)
50	7	2	Not used
51	7	3	Breaker-trip indicator 3 (failure of 48V supply to copper-distribution shelf)
52	7	4	Not used
53	7	5	Breaker-trip indicator 5 (failure of fuse for 48V talk battery filter power)
54	7	6	Shelf over-temperature: common-equipment shelf
55	7	7	Shelf over-temperature: copper-distribution shelf
56	7	8	Not used
57	8	1	Failure of fan 1
58	8	2	Failure of fan 2
59	8	3	Failure of fan 3
60	8	4	Not used
61	8	5	Not used
62	8	6	Not used
63	8	7	Communication failure (LAPD or control-network loss of signal detected)
64	8	8	Not used
—end—			

**Table 6-4**  
**Alarm points in monitor display 4 for the ABM shelf: facility**

Point	Byte	Bit	Description
1	1	1	Metallic failure, DS1 circuit-pack group G1 (see Note)
2	1	2	Metallic failure, DS1 circuit-pack group G2 (see Note)
3	1	3	Metallic failure, DS1 circuit-pack group G3 (see Note))
4	1	4	Metallic failure, DS1 circuit-pack group G4 (see Note)
5	1	5	Metallic failure, DS1 circuit-pack group G5 (see Note)
6	1	6	Metallic failure, DS1 circuit-pack group G6 (see Note)
7	1	7	Metallic failure, DS1 circuit-pack group G7 (see Note)
8	1	8	Metallic failure, DS1 circuit-pack group G8 (see Note)
9	2	1	Metallic failure, DS3 circuit-pack group G1 (see Note)
10	2	2	Metallic failure, DS3 circuit-pack group G2 (see Note)
11	2	3	Metallic failure, DS3 circuit-pack group G3 (see Note)
<b>Note:</b> Metallic failure means that the DS1 or DS3 terminations indicate one of the following: loss of signal, loss of frame, bipolar violations, or high bit error rate.			
12	2	4	Not used
13	2	5	Loss of signal or loss of frame, OC-12 or OC-3 circuit-pack group G1
14	2	6	Loss of signal or loss of frame, OC-12 or OC-3 circuit-pack group G2
15	2	7	Signal degrade, OC-12 or OC-3 circuit-pack group G1
16	2	8	Signal degrade, OC-12 or OC-3 circuit-pack group G2
17	3	1	Performance threshold 1 exceeded for DS1 circuit-pack group G1
18	3	2	Performance threshold 1 exceeded for DS1 circuit-pack group G2
19	3	3	Performance threshold 1 exceeded for DS1 circuit-pack group G3
20	3	4	Performance threshold 1 exceeded for DS1 circuit-pack group G4
21	3	5	Performance threshold 1 exceeded for DS1 circuit-pack group G5
22	3	6	Performance threshold 1 exceeded for DS1 circuit-pack group G6
23	3	7	Performance threshold 1 exceeded for DS1 circuit-pack group G7
24	3	8	Performance threshold 1 exceeded for DS1 circuit-pack group G8
—continued—			

**Table 6-4 (continued)**  
**Alarm points in monitor display 4 for the ABM shelf: facility**

Point	Byte	Bit	Description
25	4	1	Performance threshold 1 exceeded for DS3 circuit-pack group G1
26	4	2	Performance threshold 1 exceeded for DS3 circuit-pack group G2
27	4	3	Performance threshold 1 exceeded for DS3 circuit-pack group G3
28	4	4	Not used
29	4	5	Performance threshold 1 exceeded for OC-12 or OC-3 circuit-pack group G1
30	4	6	Performance threshold 1 exceeded for OC-12 or OC-3 circuit-pack group G2
31	4	7	Far-end receive fail for OC-12 or OC-3 circuit-pack group G1
32	4	8	Far-end receive fail for OC-12 or OC-3 circuit-pack group G2
33	5	1	Performance threshold 2 exceeded for DS1 circuit-pack group G1
34	5	2	Performance threshold 2 exceeded for DS1 circuit-pack group G2
35	5	3	Performance threshold 2 exceeded for DS1 circuit-pack group G3
36	5	4	Performance threshold 2 exceeded for DS1 circuit-pack group G4
37	5	5	Performance threshold 2 exceeded for DS1 circuit-pack group G5
38	5	6	Performance threshold 2 exceeded for DS1 circuit-pack group G6
39	5	7	Performance threshold 2 exceeded for DS1 circuit-pack group G7
40	5	8	Performance threshold 2 exceeded for DS1 circuit-pack group G8
41	6	1	Performance threshold 2 exceeded for DS3 circuit-pack group G1
42	6	2	Performance threshold 2 exceeded for DS3 circuit-pack group G2
43	6	3	Performance threshold 2 exceeded for DS3 circuit-pack group G3
44	6	4	Not used
45	6	5	Performance threshold 2 exceeded for OC-12 or OC-3 circuit-pack group G1
46	6	6	Performance threshold 2 exceeded for OC-12 or OC-3 circuit-pack group G2
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 6-4 (continued)**  
**Alarm points in monitor display 4 for the ABM shelf: facility**

Point	Byte	Bit	Description
49	7	1	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G1
50	7	2	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G2
51	7	3	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G3
52	7	4	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G4
53	7	5	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G5
54	7	6	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G6
55	7	7	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G7
56	7	8	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G8
57	8	1	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G1
58	8	2	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G2
59	8	3	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G3
60	8	4	Not used
61	8	5	OC-12 or OC-3 termination indicates alarm indication signal (AIS) detected for circuit-pack group G1
62	8	6	OC-12 or OC-3 termination indicates alarm indication signal (AIS) detected for circuit-pack group G2
63	8	7	Not used
64	8	8	Not used
—end—			

**Table 6-5**  
**Alarm points in monitor display 5 for the ABM shelf: protection**

Point	Byte	Bit	Description
1	1	1	DS1 protection-switch failure, DS1 circuit-pack group G1
2	1	2	DS1 protection-switch failure, DS1 circuit-pack group G2
3	1	3	DS1 protection-switch failure, DS1 circuit-pack group G3
4	1	4	DS1 protection-switch failure, DS1 circuit-pack group G4
5	1	5	DS1 protection-switch failure, DS1 circuit-pack group G5
6	1	6	DS1 protection-switch failure, DS1 circuit-pack group G6
7	1	7	DS1 protection-switch failure, DS1 circuit-pack group G7
8	1	8	DS1 protection-switch failure, DS1 circuit-pack group G8
9	2	1	DS3 protection-switch failure, DS3 circuit-pack group G1
10	2	2	DS3 protection-switch failure, DS3 circuit-pack group G2
11	2	3	DS3 protection-switch failure, DS3 circuit-pack group G3
12	2	4	Not used
13	2	5	OC-12 or OC-3 protection-switch failure, circuit-pack group G1
14	2	6	OC-12 or OC-3 protection-switch failure, circuit-pack group G2
15	2	7	OC-12 or OC-3 Tx active status, circuit-pack group G1
16	2	8	OC-12 or OC-3 Rx active status, circuit pack group G1
17	3	1	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G1
18	3	2	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G2
19	3	3	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G3
20	3	4	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G4
21	3	5	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G5
22	3	6	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G6
23	3	7	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G7
24	3	8	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G8
—continued—			

**Table 6-5 (continued)**  
**Alarm points in monitor display 5 for the ABM shelf: protection**

Point	Byte	Bit	Description
25	4	1	DS1 protection lockout (manual or automatic), DS1 protection group
26	4	2	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G1
27	4	3	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G2
28	4	4	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G3
29	4	5	DS3 protection lockout (manual or automatic), DS3 protection group
30	4	6	Not used
31	4	7	OC-12 or OC-3 protection lockout, circuit-pack group G1
32	4	8	OC-12 or OC-3 protection lockout, circuit-pack group G2
33	5	1	DS1 protection switch completed, DS1 circuit-pack group G1
34	5	2	DS1 protection switch completed, DS1 circuit-pack group G2
35	5	3	DS1 protection switch completed, DS1 circuit-pack group G3
36	5	4	DS1 protection switch completed, DS1 circuit-pack group G4
37	5	5	DS1 protection switch completed, DS1 circuit-pack group G5
38	5	6	DS1 protection switch completed, DS1 circuit-pack group G6
39	5	7	DS1 protection switch completed, DS1 circuit-pack group G7
40	5	8	DS1 protection switch completed, DS1 circuit-pack group G8
41	6	1	DS3 protection switch completed, DS3 circuit-pack group G1
42	6	2	DS3 protection switch completed, DS3 circuit-pack group G2
43	6	3	DS3 protection switch completed, DS3 circuit-pack group G3
44	6	4	Not used
45	6	5	OC-12 or OC-3 protection switch completed, circuit-pack group G1
46	6	6	OC-12 or OC-3 protection switch completed, circuit-pack group G2
47	6	7	OC-12 or OC-3 Tx active status, circuit-pack group G1
48	6	8	OC-12 or OC-3 Rx active status, circuit-pack group G1
—continued—			

**Table 6-5 (continued)**  
**Alarm points in monitor display 5 for the ABM shelf: protection**

Point	Byte	Bit	Description
49	7	1	DS1 protection-path failure, DS1 circuit-pack group G1
50	7	2	DS1 protection-path failure, DS1 circuit-pack group G2
51	7	3	DS1 protection-path failure, DS1 circuit-pack group G3
52	7	4	DS1 protection-path failure, DS1 circuit-pack group G4
53	7	5	DS1 protection-path failure, DS1 circuit-pack group G5
54	7	6	DS1 protection-path failure, DS1 circuit-pack group G6
55	7	7	DS1 protection-path failure, DS1 circuit-pack group G7
56	7	8	DS1 protection-path failure, DS1 circuit-pack group G8
57	8	1	DS3 protection-path failure, DS3 circuit-pack group G1
58	8	2	DS3 protection-path failure, DS3 circuit-pack group G2
59	8	3	DS3 protection-path failure, DS3 circuit-pack group G3
60	8	4	Not used
61	8	5	OC-12 or OC-3 protection-path failure, circuit-pack group G1
62	8	6	OC-12 or OC-3 protection-path failure, circuit-pack group G2
63	8	7	Not used
64	8	8	Not used
—end—			

**Table 6-6**  
**Alarm points in monitor display 6 for the ABM shelf: parallel-telemetry scan points and signal-distribution points for the ABM shelf**

Point	Byte	Bit	Description
1	1	1	Signal-distribution point 1 activated
2	1	2	Signal-distribution point 2 activated
3	1	3	Signal-distribution point 3 activated
4	1	4	Signal-distribution point 4 activated
5	1	5	Signal-distribution point 5 activated
6	1	6	Signal-distribution point 6 activated
7	1	7	Signal-distribution point 7 activated
8	1	8	Signal-distribution point 8 activated
9	2	1	Signal-distribution point 9 activated
10	2	2	Signal-distribution point 10 activated
11	2	3	Signal-distribution point 11 activated
12	2	4	Signal-distribution point 12 activated
13	2	5	Signal-distribution point 13 activated
14	2	6	Signal-distribution point 14 activated
15	2	7	Signal-distribution point 15 activated
16	2	8	Signal-distribution point 16 activated
17	3	1	Signal-distribution point 17 activated
18	3	2	Signal-distribution point 18 activated
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	Not used
—continued—			

**Table 6-6 (continued)****Alarm points in monitor display 6 for the ABM shelf: parallel-telemetry scan points and signal-distribution points for the ABM shelf**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
25	4	1	Scan point number 1 (for input from external source) is activated
26	4	2	Scan point number 2 (for input from external source) is activated
27	4	3	Scan point number 3 (for input from external source) is activated
28	4	4	Scan point number 4 (for input from external source) is activated
29	4	5	Scan point number 5 (for input from external source) is activated
30	4	6	Scan point number 6 (for input from external source) is activated
31	4	7	Scan point number 7 (for input from external source) is activated
32	4	8	Scan point number 8 (for input from external source) is activated
33	5	1	Scan point number 9 (for input from external source) is activated
34	5	2	Scan point number 10 (for input from external source) is activated
35	5	3	Scan point number 11 (for input from external source) is activated
36 through 64	5 through 8	4 through end	Not used
—end—			

**Table 6-7**  
**Alarm points in monitor display 7 for the ABM shelf: modules in the copper-distribution drawers**

Point	Byte	Bit	Description
1	1	1	Failure of a common-equipment card in drawer 1 (see Notes 1 and 2)
2	1	2	Failure of a common-equipment card in drawer 2 (see Notes 1 and 2)
3	1	3	Failure of a common-equipment card in drawer 3 (see Notes 1 and 2)
4	1	4	Failure of a common-equipment card in drawer 4 (see Notes 1 and 2)
5	1	5	Failure of a common-equipment card in drawer 5 (see Notes 1 and 2)
6	1	6	Failure of a common-equipment card in drawer 6 (see Notes 1 and 2)
7	1	7	Failure of a common-equipment card in drawer 7 (see Notes 1 and 2)
8	1	8	Failure of a common-equipment card in drawer 8 (see Notes 1 and 2)
9	2	1	Failure of a common-equipment card in drawer 9 (see Notes 1 and 2)
10	2	2	Failure of a common-equipment card in drawer 10 (see Notes 1 and 2)
11	2	3	Failure of a common-equipment card in drawer 11 (see Notes 1 and 2)
12	2	4	Failure of a common-equipment card in drawer 12 (see Notes 1 and 2)
13	2	5	Failure of a common-equipment card in drawer 13 (see Notes 1 and 2)
14	2	6	Failure of a common-equipment card in drawer 14 (see Notes 1 and 2)
<p><b>Note 1:</b> Each copper-distribution drawer contains the following modules that are classified as common-equipment modules: two narrowband line-interface cards, one metallic test access card, and one power filter.</p> <p><b>Note 2:</b> An AccessNode can contain up to 14 copper-distribution drawers. Numbering of the drawers goes from left to right within each shelf. Copper-distribution shelf number one contains drawers one (on the left) and two (on the right). Copper-distribution shelf number two contains drawers three and four, and so on. If the AccessNode is housed in a bay, the copper-distribution shelves are numbered from the top down. If the AccessNode is housed in MBP cabinets, copper-distribution shelf number one is the shelf above the breaker interface panel in the MBP master cabinet, and shelf numbering proceeds upward to the topmost shelf in the master cabinet. If there is an MBP expansion cabinet, the numbering sequence continues for the shelves in that cabinet, from the bottom up. If the AccessNode is housed in a Series 800A outside-plant cabinet, then when the cabinet is viewed from the front, shelves one to five are on the left, numbered from the bottom up, and shelves six and seven are on the right, numbered from the bottom up.</p>			
15	2	7	Not used
16	2	8	Not used
17	3	1	Not used
18	3	2	Not used
19	3	3	Not used
20	3	4	Not used
—continued—			

**Table 6-7 (continued)**  
**Alarm points in monitor display 7 for the ABM shelf: modules in the copper-distribution drawers**

Point	Byte	Bit	Description
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	Not used
25	4	1	Not used
26	4	2	Not used
27	4	3	Not used
28	4	4	Not used
29	4	5	Failure of a line card in drawer 1 (see Note 3)
30	4	6	Failure of a line card in drawer 2 (see Note 3)
31	4	7	Failure of a line card in drawer 3 (see Note 3)
32	4	8	Failure of a line card in drawer 4 (see Note 3)
33	5	1	Failure of a line card in drawer 5 (see Note 3)
34	5	2	Failure of a line card in drawer 6 (see Note 3)
35	5	3	Failure of a line card in drawer 7 (see Note 3)
36	5	4	Failure of a line card in drawer 8 (see Note 3)
37	5	5	Failure of a line card in drawer 9 (see Note 3)
38	5	6	Failure of a line card in drawer 10 (see Note 3)
39	5	7	Failure of a line card in drawer 11 (see Note 3)
40	5	8	Failure of a line card in drawer 12 (see Note 3)
41	6	1	Failure of a line card in drawer 13 (see Note 3)
42	6	2	Failure of a line card in drawer 14 (see Note 3)
<p><b>Note 3:</b> An AccessNode can contain up to 14 copper-distribution drawers. Numbering of the drawers goes from left to right within each shelf. Copper-distribution shelf number one contains drawers one (on the left) and two (on the right). Copper-distribution shelf number two contains drawers three and four, and so on. If the AccessNode is housed in a bay, the copper-distribution shelves are numbered from the top down. If the AccessNode is housed in MBP cabinets, copper-distribution shelf number one is the shelf above the breaker interface panel in the MBP master cabinet, and shelf numbering proceeds upward to the topmost shelf in the master cabinet. If there is an MBP expansion cabinet, the numbering sequence continues for the shelves in that cabinet, from the bottom up. If the AccessNode is housed in a Series 800A outside-plant cabinet, then when the cabinet is viewed from the front, shelves one to five are on the left, numbered from the bottom up, and shelves six and seven are on the right, numbered from the bottom up.</p>			
—continued—			

**Table 6-7 (continued)****Alarm points in monitor display 7 for the ABM shelf: modules in the copper-distribution drawers**

Point	Byte	Bit	Description
43	6	3	Not used
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
49	7	1	Not used
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Power-converter alarm, raised for any copper-distribution-shelf power converter in any copper-distribution shelf
58	8	2	Drawer alarm, raised for any copper-distribution drawer
59	8	3	Line-card alarm, raised for any line card in any copper-distribution drawer
60	8	4	Line-interface card alarm, raised for any line-interface card in any copper-distribution drawer
61	8	5	Metallic-test-access-card alarm, raised for any metallic test access card in any copper-distribution drawer
62	8	6	Not used
63	8	7	Not used
64	8	8	Not used
—end—			

**Monitor display for maintenance**

Monitor display 8 for the access bandwidth manager shelf is a maintenance display. The maintenance display contains a pattern of alternating ones and zeros, as shown in Table 6-8. The Alarm Processing Remote (APR) can test cable integrity by reading this display, which contains known values.

**Table 6-8**  
**Alarm points in monitor display 8 for the ABM shelf: maintenance**

Alarm points	Values								
1 to 8	0	1	0	1	0	1	0	1	
9 to 16	1	0	1	0	1	0	1	0	
17 to 24	0	1	0	1	0	1	0	1	
25 to 32	1	0	1	0	1	0	1	0	
33 to 40	0	1	0	1	0	1	0	1	
41 to 48	1	0	1	0	1	0	1	0	
49 to 56	0	1	0	1	0	1	0	1	
57 to 64	1	0	1	0	1	0	1	0	

Table 6-9 lists the ABM monitor displays for OC-3 tributaries.

**Table 6-9**  
**ABM monitor displays for OC-3 tributaries**

Bit	Function	Specification
01-04	Ofh12	Signal Fail (OC-3 CPG G1S, G2S, G3 and G4)
05-08	Dah12	Detect AIS (OC-3 CPG G1S, G2S, G3 and G4)
09-12	Rfh12	FERF (OC-3 CPG G1S, G2S, G3 and G4)
13-16	Sdh12	Signal degrade (OC-3 CPG G1S, G2S, G3 and G4)
17-20	T1h12	Threshold 1 exceeded (OC-3 CPG G1S, G2S, G3 and G4)
21-24	T2h12	Threshold 2 exceeded (OC-3 CPG G1S, G2S, G3 and G4)
25-28	Swh12	Switch Fail (OC-3 CPG G1S, G2S, G3 and G4)
29-32	Sch12	Switch Complete (OC-3 CPG G1S, G2S, G3 and G4)
33-36	Efh12	Protection Path Fail (OC-3 CPG G1S, G2S, G3 and G4)
37-40	Loh12	Lockout Indication (OC-3 CPG G1S, G2S, G3 and G4)
41-44	Txh12	Circuit Pack Missing (OC-3 CPG G1S, G2S, G3 and G4)
45-48		Empty
49	OCnS5	OC-n Slot 5 Tx Active status
50	OCnS5	OC-n Slot 5 Rx Active status
51	OCnS6	OC-n Slot 7 Tx Active status
52	OCnS6	OC-n Slot 7 Rx Active status
53	OCnS1	OC-n Slot 1 Tx Active status
54	OCnS1	OC-n Slot 1 Rx Active status
55	OCnS3	OC-n Slot 3 Tx Active status
56	OCnS3	OC-n Slot 3 Rx Active status

**Control displays**

A control display carries commands from the Alarm Processing Remote to the AccessNode. In the control display, each bit is referred to as a command point. Each command point is mapped to an executable command. The serial-telemetry system sets the command points to indicate which commands the AccessNode should execute.

Table 6-10 lists the ABM control displays for OC-3 tributaries.

**Table 6-10**  
**ABM control display OC-3 tributaries**

Bit	Function	Specification
24	Cloh3	OC-3 Lockout (OC-3 CPG G1S)
25	Empty	
26	Cloh3	OC-3 Lockout (OC-3 CPG G3)
27	Empty	
28-31	CFsh3	Forced Switch (OC-3 CPG G1S, G2S, G3 and G4)
32-35	CMsh3	Manual Switch (OC-3 CPG G1S, G2S, G3 and G4)

There are two control displays defined for the access bandwidth manager shelf.

- command points in control display 1
- command points in control display 2

Tables 6-11 and Table 6-12 list the definitions of the control points in those control displays.

**Table 6-11**  
**Command points in control display 1 for the ABM shelf**

Point	Byte	Bit	Description
1	1	1	Lockout DS1 circuit-pack group G1
2	1	2	Lockout DS1 circuit-pack group G2
3	1	3	Lockout DS1 circuit-pack group G3
4	1	4	Lockout DS1 circuit-pack group G4
5	1	5	Lockout DS1 circuit-pack group G5
6	1	6	Lockout DS1 circuit-pack group G6
7	1	7	Lockout DS1 circuit-pack group G7
8	1	8	Lockout DS1 circuit-pack group G8
9	2	1	Lockout DS1 protection circuit-pack group
10	2	2	Lockout DS3 circuit-pack group G1
11	2	3	Lockout DS3 circuit-pack group G2
12	2	4	Lockout DS3 circuit-pack group G3
13	2	5	Lockout DS3 protection circuit-pack group
14	2	6	Not used
15	2	7	Lockout OC-12 or OC-3 circuit-pack group G1
16	2	8	Lockout OC-12 or OC-3 circuit-pack group G2
17	3	1	Perform DS1 forced switch, DS1 circuit-pack group G1
18	3	2	Perform DS1 forced switch, DS1 circuit-pack group G2
19	3	3	Perform DS1 forced switch, DS1 circuit-pack group G3
20	3	4	Perform DS1 forced switch, DS1 circuit-pack group G4
21	3	5	Perform DS1 forced switch, DS1 circuit-pack group G5
22	3	6	Perform DS1 forced switch, DS1 circuit-pack group G6
23	3	7	Perform DS1 forced switch, DS1 circuit-pack group G7
24	3	8	Perform DS1 forced switch, DS1 circuit-pack group G8
—continued—			

**Table 6-11 (continued)**  
**Command points in control display 1 for the ABM shelf**

Point	Byte	Bit	Description
25	4	1	Perform DS3 forced switch, DS3 circuit-pack group G1
26	4	2	Perform DS3 forced switch, DS3 circuit-pack group G2
27	4	3	Perform DS3 forced switch, DS3 circuit-pack group G3
28	4	4	Not used
29	4	5	Perform forced switch, OC-12 or OC-3 circuit-pack group G1
30	4	6	Perform forced switch, OC-12 or OC-3 circuit-pack group G2
31	4	7	Not used
32	4	8	Not used
33	5	1	Perform DS1 manual switch, DS1 circuit-pack group G1
34	5	2	Perform DS1 manual switch, DS1 circuit-pack group G2
35	5	3	Perform DS1 manual switch, DS1 circuit-pack group G3
36	5	4	Perform DS1 manual switch, DS1 circuit-pack group G4
37	5	5	Perform DS1 manual switch, DS1 circuit-pack group G5
38	5	6	Perform DS1 manual switch, DS1 circuit-pack group G6
39	5	7	Perform DS1 manual switch, DS1 circuit-pack group G7
40	5	8	Perform DS1 manual switch, DS1 circuit-pack group G8
41	6	1	Perform DS3 manual switch, DS3 circuit-pack group G1
42	6	2	Perform DS3 manual switch, DS3 circuit-pack group G2
43	6	3	Perform DS3 manual switch, DS3 circuit-pack group G3
44	6	4	Not used
45	6	5	Perform manual switch, OC-12 or OC-3 circuit-pack group G1
46	6	6	Perform manual switch, OC-12 or OC-3 circuit-pack group G2
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 6-11 (continued)**  
**Command points in control display 1 for the ABM shelf**

Point	Byte	Bit	Description
49	7	1	Not used
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Run the shelf exerciser
58	8	2	Restart the shelf processor
59	8	3	Perform backup of provisioning data
60	8	4	Not used
61	8	5	Not used
62	8	6	Not used
63	8	7	Not used
64	8	8	Not used
—end—			

**Table 6-12**  
**Command points in control display 2 for the ABM shelf**

Point	Byte	Bit	Description
1	1	1	Operate parallel-telemetry signal-distribution point 1
2	1	2	Operate parallel-telemetry signal-distribution point 2
3	1	3	Operate parallel-telemetry signal-distribution point 3
4	1	4	Operate parallel-telemetry signal-distribution point 4
5	1	5	Operate parallel-telemetry signal-distribution point 5
6	1	6	Operate parallel-telemetry signal-distribution point 6
7	1	7	Operate parallel-telemetry signal-distribution point 7
8	1	8	Operate parallel-telemetry signal-distribution point 8
9	2	1	Operate parallel-telemetry signal-distribution point 9
10	2	2	Operate parallel-telemetry signal-distribution point 10
11	2	3	Operate parallel-telemetry signal-distribution point 11
12	2	4	Operate parallel-telemetry signal-distribution point 12
13	2	5	Operate parallel-telemetry signal-distribution point 13
14	2	6	Operate parallel-telemetry signal-distribution point 14
15	2	7	Operate parallel-telemetry signal-distribution point 15
16	2	8	Operate parallel-telemetry signal-distribution point 16
17	3	1	Operate parallel-telemetry signal-distribution point 17
18	3	2	Operate parallel-telemetry signal-distribution point 18
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24 through 64	3 through 8	8 through end	Not used

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## Appendix B: TBOS displays, TBM shelf

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This appendix provides the telemetry byte-oriented serial (TBOS) protocol displays used for the transport bandwidth manager (TBM) shelf.

### Chapter contents

Use the following table to go directly to the information you require.

Topic	See
Alarm points in monitor display 1: network-element indications	Table 7-1 on page 7-3
Alarm points in monitor display 2 for the TBM shelf: telemetry overview display	Table 7-2 on page 7-6
Alarm points in monitor display 3 for the TBM shelf: equipment	Table 7-3 on page 7-10
Alarm points in monitor display 4 for the TBM shelf: DS1 facility	Table 7-4 on page 7-13
Alarm points in monitor display 5 for the TBM shelf: protection	Table 7-5 on page 7-17
Alarm points in monitor display 6 for the TBM shelf: OC-12 and OC-3 protection / DS3 facility	Table 7-6 on page 7-20
Alarm points in monitor display 7 for the TBM shelf: parallel-telemetry scan points and signal-distribution points	Table 7-7 on page 7-23
Alarm points in monitor display 10 for the TBM shelf: maintenance	Table 7-8 on page 7-25
Command points in control display 1 for the TBM shelf	Table 7-9 on page 7-26
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## TBM shelf telemetry byte-oriented serial protocol displays

The following telemetry byte-oriented serial (TBOS) protocol displays are used for the transport bandwidth manager (TBM) shelf installed in an AccessNode:

- monitor display 1: network-element indications
- monitor display 2: telemetry overview display
- monitor display 3: equipment
- monitor display 4: facility
- monitor display 5: protection
- monitor display 6: OC-12 protection / facility
- monitor display 7: parallel-telemetry scan points and signal-distribution points
- monitor display 10: maintenance
- control display 1
- control display 2

*Note:* Monitor display 8 and monitor display 9 have also been defined for the transport bandwidth manager shelf, but these displays are not included in this document because they are used only when the shelf is installed in an S/DMS TransportNode network element.

Tables 7-1 through 7-7 list the definitions of the alarm points in monitor displays 1 through 7.

Table 7-8 lists the definitions of the alarm points in monitor display 10.

Tables 7-9 and 7-10 list the definitions of the command points in the control displays.

The meanings of all the alarm points and command points have been predefined, and cannot be changed by the user.

**Table 7-1**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
1	1	1	Network-element alarms: at least one critical alarm (facility category)
2	1	2	Network-element alarms: at least one major alarm (facility category)
3	1	3	Network-element alarms: at least one minor alarm (facility category)
4	1	4	Network-element alarms: at least one warning alarm (facility category)
5	1	5	Network-element alarms: at least one critical alarm (equipment category)
6	1	6	Network-element alarms: at least one major alarm (equipment category)
7	1	7	Network-element alarms: at least one minor alarm (equipment category)
8	1	8	Network-element alarms: at least one warning alarm (equipment category)
9	2	1	Network-element alarms: at least one critical alarm (environmental category)
10	2	2	Network-element alarms: at least one major alarm (environmental category)
11	2	3	Network-element alarms: at least one minor alarm (environmental category)
12	2	4	Network-element alarms: at least one warning alarm (environmental cat.)
13	2	5	Not used
14	2	6	Not used
15	2	7	Not used
16	2	8	Not used
17	3	1	Not used
18	3	2	Not used
19	3	3	Not used
20	3	4	Network-element alerts: at least one OC-12 or OC-3 alert
21	3	5	Not used
22	3	6	Not used
23	3	7	Network-element alerts: at least one STS-12 alert
24	3	8	Not used
—continued—			

**Table 7-1 (continued)**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
25	4	1	Network-element alerts: at least one DS3 alert
26	4	2	Network-element alerts: at least one DS1 alert
27	4	3	Not used
28	4	4	Not used
29	4	5	Not used
30	4	6	Not used
31	4	7	Not used
32	4	8	Not used
33	5	1	Not used
34	5	2	Not used
35	5	3	Not used
36	5	4	Not used
37	5	5	Not used
38	5	6	Not used
39	5	7	Not used
40	5	8	Not used
41	6	1	Network-element protection: at least one OC-12 or OC-3 optical protection fail
42	6	2	Network-element protection: at least one OC-12 or OC-3 optical protection active
43	6	3	Network-element protection: at least one OC-12 or OC-3 optical active lockout
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Network-element protection: at least one DS1 or DS3 metallic protection fail
48	6	8	Network-element protection: at least one DS1 or DS3 metallic protection active
—continued—			

**Table 7-1 (continued)**  
**Alarm points in monitor display 1: network-element indications**

Point	Byte	Bit	Description
49	7	1	Network-element protection: at least one DS1 or DS3 metallic active lockout
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Not used
58	8	2	Not used
59	8	3	Not used
60	8	4	Not used
61	8	5	Operations-controller-to-network-element (OPC-NE) association is down
62	8	6	Network-element alarms: alarm of any severity is raised
63	8	7	Network-element alarms: alarm of severity critical, major, or minor is raised
64	8	8	Not used
—end—			

**Table 7-2**  
**Alarm points in monitor display 2 for the TBM shelf: telemetry overview display**

Point	Byte	Bit	Description
1	1	1	OC-12 or OC-3 equipment failure
2	1	2	OC-12 or OC-3 signal failure (loss of signal or loss of frame)
3	1	3	OC-12 or OC-3 terminations indicate alarm indication signal (AIS) detected
4	1	4	OC-12 or OC-3 protection switch completed
5	1	5	OC-12 or OC-3 protection switch failed
6	1	6	OC-12 or OC-3 lockout indication
7	1	7	OC-12 or OC-3 performance threshold 1 exceeded
8	1	8	OC-12 or OC-3 performance threshold 2 exceeded
9	2	1	OC-12 or OC-3 protection path failure
10	2	2	DS3 protection path failure
11	2	3	DS1 protection path failure
12	2	4	OC-12 or OC-3 signal degrade
13	2	5	OC-12 or OC-3 terminations indicate far-end receive fail
14	2	6	Equipment failure
15	2	7	Any OC-12 or OC-3 indication
16	2	8	Any DS1 or DS3 indication
—continued—			

**Table 7-2 (continued)**  
**Alarm points in monitor display 2 for the TBM shelf: telemetry overview display**

Point	Byte	Bit	Description
17	3	1	DS3 equipment failure
18	3	2	DS3 metallic facility failure (LOS, LOF, BPV, BER)
19	3	3	DS3 terminations indicate alarm indication signal (AIS) detected
20	3	4	DS3 protection switch completed
21	3	5	DS3 protection switch failed
22	3	6	DS3 lockout indication
23	3	7	DS3 performance threshold 1 exceeded
24	3	8	DS3 performance threshold 2 exceeded
25	4	1	DS1 equipment failure
26	4	2	DS1 metallic facility failure (LOS, LOF, BPV, BER)
27	4	3	DS1 terminations indicate alarm indication signal (AIS) detected
28	4	4	DS1 protection switch completed
29	4	5	DS1 protection switch failed
30	4	6	DS1 lockout indication
31	4	7	DS1 performance threshold 1 exceeded
32	4	8	DS1 performance threshold 2 exceeded
—continued—			

**Table 7-2 (continued)**  
**Alarm points in monitor display 2 for the TBM shelf: telemetry overview display**

Point	Byte	Bit	Description
33	5	1	External input (latch) number 1
34	5	2	External input (latch) number 2
35	5	3	External input (latch) number 3
36	5	4	External input (latch) number 4
37	5	5	External input (latch) number 5
38	5	6	External input (latch) number 6
39	5	7	External input (latch) number 7
40	5	8	External input (latch) number 8
41	6	1	External input (latch) number 9
42	6	2	External input (latch) number 10
43	6	3	External input (latch) number 11
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 7-2 (continued)**  
**Alarm points in monitor display 2 for the TBM shelf: telemetry overview display**

Point	Byte	Bit	Description
49	7	1	Any high-speed (OC-12 or OC-3) or low-speed (DS1 or DS3) equipment failure
50	7	2	Any high-speed (OC-12 or OC-3) optical failure or low-speed (DS1 or DS3) metallic facility failure
51	7	3	Any alarm indication signal (AIS) detected
52	7	4	Any protection switch completed
53	7	5	Any protection switch failed
54	7	6	Any lockout indication
55	7	7	Any performance threshold 1 exceeded
56	7	8	Any performance threshold 2 exceeded
57	8	1	Network-alarms: alarm of critical severity is raised
58	8	2	Network-alarms: alarm of major severity is raised
59	8	3	Network-alarms: alarm of minor severity is raised
60	8	4	Network-alarms: alarm of warning severity is raised
61	8	5	Fan failure detected
62	8	6	Over temperature
63	8	7	Battery fail breaker trip status
64	8	8	Not used
—end—			

**Table 7-3**  
**Alarm points in monitor display 3 for the TBM shelf: equipment**

Point	Byte	Bit	Description
1	1	1	Failure of the DS1 circuit-pack group G1
2	1	2	Failure of the DS1 circuit-pack group G2
3	1	3	Failure of the DS1 circuit-pack group G3
4	1	4	Failure of the DS1 circuit-pack group G4
5	1	5	Failure of the DS1 circuit-pack group G5
6	1	6	Failure of the DS1 circuit-pack group G6
7	1	7	Failure of the DS1 circuit-pack group G7
8	1	8	Failure of the DS1 circuit-pack group G8
9	2	1	Failure of the DS1 circuit-pack group G9
10	2	2	Failure of the DS1 circuit-pack group G10
11	2	3	Failure of the DS1 circuit-pack group G11
12	2	4	Failure of the DS1 circuit-pack group G12
13	2	5	Failure of the DS1 protection circuit-pack group
14	2	6	Not used
15	2	7	Failure of OC-12 circuit-pack group G1
16	2	8	Failure of OC-12 circuit-pack group G2
17	3	1	Not used
18	3	2	Not used
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	Not used
—continued—			

**Table 7-3 (continued)**  
**Alarm points in monitor display 3 for the TBM shelf: equipment**

Point	Byte	Bit	Description
25	4	1	Failure of the DS3 circuit-pack group G1
26	4	2	Failure of the DS3 circuit-pack group G2
27	4	3	Failure of the DS3 circuit-pack group G3
28	4	4	Failure of the DS3 circuit-pack group G4
29	4	5	Failure of the DS3 protection circuit-pack group
30	4	6	Circuit-pack failure in slot 1 of the common-equipment shelf
31	4	7	Circuit-pack failure in slot 2 of the common-equipment shelf
32	4	8	Circuit-pack failure in slot 3 of the common-equipment shelf
33	5	1	Circuit-pack failure in slot 4 of the common-equipment shelf
34	5	2	Circuit-pack failure in slot 5 of the common-equipment shelf
35	5	3	Circuit-pack failure in slot 6 of the common-equipment shelf
36	5	4	Circuit-pack failure in slot 7 of the common-equipment shelf
37	5	5	Circuit-pack failure in slot 8 of the common-equipment shelf
38	5	6	Circuit-pack failure in slot 11 of the common-equipment shelf
39	5	7	Circuit-pack failure in slot 12 of the common-equipment shelf
40	5	8	Circuit-pack failure in slot 13 of the common-equipment shelf
41	6	1	Circuit-pack failure in slot 14 of the common-equipment shelf
42	6	2	Circuit-pack failure in slot 15 of the common-equipment shelf
43	6	3	Circuit-pack failure in slot 16 of the common-equipment shelf
44	6	4	Circuit-pack failure in slot 17 of the common-equipment shelf
45	6	5	Circuit-pack failure in slot 18 of the common-equipment shelf
46	6	6	Circuit-pack failure in slot 19 of the common-equipment shelf
47	6	7	Circuit-pack failure in slot 20 of the common-equipment shelf
48	6	8	Circuit-pack failure in slot 21 of the common-equipment shelf
—continued—			

**Table 7-3 (continued)**  
**Alarm points in monitor display 3 for the TBM shelf: equipment**

Point	Byte	Bit	Description
49	7	1	Circuit-pack failure in slot 22 of the common-equipment shelf
50	7	2	Circuit-pack failure in slot 23 of the common-equipment shelf
51	7	3	Breaker-trip indicator 1 (48V battery A CE supply fail)
52	7	4	Breaker-trip indicator 2 (48V battery B CE supply fail)
53	7	5	Breaker-trip indicator 3 (power I/O)
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Failure of fan 1
58	8	2	Failure of fan 2
59	8	3	Failure of fan 3
60	8	4	Shelf over-temperature: common-equipment shelf
61	8	5	Shelf over-temperature: cooling unit
62	8	6	Not used
63	8	7	Communication failure (LAPD or control-network loss of signal detected)
64	8	8	Not used
—end—			

**Table 7-4**  
**Alarm points in monitor display 4 for the TBM shelf: DS1 facility**

Point	Byte	Bit	Description
1	1	1	Metallic failure, DS1 circuit-pack group G1 (see Note 1)
2	1	2	Metallic failure, DS1 circuit-pack group G2 (see Note 1)
3	1	3	Metallic failure, DS1 circuit-pack group G3 (see Note 1)
4	1	4	Metallic failure, DS1 circuit-pack group G4 (see Note 1)
5	1	5	Metallic failure, DS1 circuit-pack group G5 (see Note 1)
6	1	6	Metallic failure, DS1 circuit-pack group G6 (see Note 1)
7	1	7	Metallic failure, DS1 circuit-pack group G7 (see Note 1)
8	1	8	Metallic failure, DS1 circuit-pack group G8 (see Note 1)
9	2	1	Metallic failure, DS1 circuit-pack group G9 (see Note 1)
10	2	2	Metallic failure, DS1 circuit-pack group G10 (see Note 1)
11	2	3	Metallic failure, DS1 circuit-pack group G11 (see Note 1)
12	2	4	Metallic failure, DS1 circuit-pack group G12 (see Note 1)
<b>Note:</b> Metallic failure means that the DS1 or DS3 terminations indicate one of the following: loss of signal, loss of frame, bipolar violations, or high bit error rate.			
13	2	5	Not used
14	2	6	Not used
15	2	7	Not used
16	2	8	Not used
—continued—			

**Table 7-4 (continued)**  
**Alarm points in monitor display 4 for the TBM shelf: DS1 facility**

Point	Byte	Bit	Description
17	3	1	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G1
18	3	2	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G2
19	3	3	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G3
20	3	4	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G4
21	3	5	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G5
22	3	6	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G6
23	3	7	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G7
24	3	8	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G8
25	4	1	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G9
26	4	2	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G10
27	4	3	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G11
28	4	4	DS1 terminations indicate alarm indication signal (AIS) detected for DS1 circuit-pack group G12
29	4	5	Not used
30	4	6	Not used
31	4	7	Not used
32	4	8	Not used
—continued—			

**Table 7-4 (continued)**  
**Alarm points in monitor display 4 for the TBM shelf: DS1 facility**

Point	Byte	Bit	Description
33	5	1	Performance threshold 1 exceeded for DS1 circuit-pack group G1
34	5	2	Performance threshold 1 exceeded for DS1 circuit-pack group G2
35	5	3	Performance threshold 1 exceeded for DS1 circuit-pack group G3
36	5	4	Performance threshold 1 exceeded for DS1 circuit-pack group G4
37	5	5	Performance threshold 1 exceeded for DS1 circuit-pack group G5
38	5	6	Performance threshold 1 exceeded for DS1 circuit-pack group G6
39	5	7	Performance threshold 1 exceeded for DS1 circuit-pack group G7
40	5	8	Performance threshold 1 exceeded for DS1 circuit-pack group G8
41	6	1	Performance threshold 1 exceeded for DS1 circuit-pack group G9
42	6	2	Performance threshold 1 exceeded for DS1 circuit-pack group G10
43	6	3	Performance threshold 1 exceeded for DS1 circuit-pack group G11
44	6	4	Performance threshold 1 exceeded for DS1 circuit-pack group G12
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
49	7	1	Performance threshold 1 exceeded for DS1 circuit-pack group G1
50	7	2	Performance threshold 1 exceeded for DS1 circuit-pack group G2
51	7	3	Performance threshold 1 exceeded for DS1 circuit-pack group G3
52	7	4	Performance threshold 1 exceeded for DS1 circuit-pack group G4
53	7	5	Performance threshold 1 exceeded for DS1 circuit-pack group G5
54	7	6	Performance threshold 1 exceeded for DS1 circuit-pack group G6
55	7	7	Performance threshold 1 exceeded for DS1 circuit-pack group G7
56	7	8	Performance threshold 1 exceeded for DS1 circuit-pack group G8
—continued—			

**Table 7-4 (continued)**  
**Alarm points in monitor display 4 for the TBM shelf: DS1 facility**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
57	8	1	Performance threshold 1 exceeded for DS1 circuit-pack group G9
58	8	2	Performance threshold 1 exceeded for DS1 circuit-pack group G10
59	8	3	Performance threshold 1 exceeded for DS1 circuit-pack group G11
60	8	4	Performance threshold 1 exceeded for DS1 circuit-pack group G12
61	8	5	Not used
62	8	6	Not used
63	8	7	Not used
64	8	8	Not used
—end—			

**Table 7-5**  
**Alarm points in monitor display 5 for the TBM shelf: protection**

Point	Byte	Bit	Description
1	1	1	DS1 protection-switch failure, DS1 circuit-pack group G1
2	1	2	DS1 protection-switch failure, DS1 circuit-pack group G2
3	1	3	DS1 protection-switch failure, DS1 circuit-pack group G3
4	1	4	DS1 protection-switch failure, DS1 circuit-pack group G4
5	1	5	DS1 protection-switch failure, DS1 circuit-pack group G5
6	1	6	DS1 protection-switch failure, DS1 circuit-pack group G6
7	1	7	DS1 protection-switch failure, DS1 circuit-pack group G7
8	1	8	DS1 protection-switch failure, DS1 circuit-pack group G8
9	2	1	DS1 protection-switch failure, DS1 circuit-pack group G9
10	2	2	DS1 protection-switch failure, DS1 circuit-pack group G10
11	2	3	DS1 protection-switch failure, DS1 circuit-pack group G11
12	2	4	DS1 protection-switch failure, DS1 circuit-pack group G12
13	2	5	OC-12 or OC-3 protection-switch failure circuit-pack group G1
14	2	6	OC-12 or OC-3 protection-switch failure circuit-pack group G2
15	2	7	Not used
16	2	8	Not used
17	3	1	DS1 protection switch completed, DS1 circuit-pack group G1
18	3	2	DS1 protection switch completed, DS1 circuit-pack group G2
19	3	3	DS1 protection switch completed, DS1 circuit-pack group G3
20	3	4	DS1 protection switch completed, DS1 circuit-pack group G4
21	3	5	DS1 protection switch completed, DS1 circuit-pack group G5
22	3	6	DS1 protection switch completed, DS1 circuit-pack group G6
23	3	7	DS1 protection switch completed, DS1 circuit-pack group G7
24	3	8	DS1 protection switch completed, DS1 circuit-pack group G8
—continued—			

**Table 7-5 (continued)**  
**Alarm points in monitor display 5 for the TBM shelf: protection**

Point	Byte	Bit	Description
25	4	1	DS1 protection switch completed, DS1 circuit-pack group G9
26	4	2	DS1 protection switch completed, DS1 circuit-pack group G10
27	4	3	DS1 protection switch completed, DS1 circuit-pack group G11
28	4	4	DS1 protection switch completed, DS1 circuit-pack group G12
29	4	5	OC-12 or OC-3 protection switch completed, circuit-pack group G1
30	4	6	OC-12 or OC-3 protection switch completed, circuit-pack group G2
31	4	7	Not used
32	4	8	Not used
33	5	1	DS1 protection path failure, DS1 circuit-pack group G1
34	5	2	DS1 protection path failure, DS1 circuit-pack group G2
35	5	3	DS1 protection path failure, DS1 circuit-pack group G3
36	5	4	DS1 protection path failure, DS1 circuit-pack group G4
37	5	5	DS1 protection path failure, DS1 circuit-pack group G5
38	5	6	DS1 protection path failure, DS1 circuit-pack group G6
39	5	7	DS1 protection path failure, DS1 circuit-pack group G7
40	5	8	DS1 protection path failure, DS1 circuit-pack group G8
41	6	1	DS1 protection path failure, DS1 circuit-pack group G9
42	6	2	DS1 protection path failure, DS1 circuit-pack group G10
43	6	3	DS1 protection path failure, DS1 circuit-pack group G11
44	6	4	DS1 protection path failure, DS1 circuit-pack group G12
45	6	5	OC-12 or OC-3 protection path failure, circuit-pack group G1
46	6	6	OC-12 or OC-3 protection path failure, circuit-pack group G2
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 7-5 (continued)**  
**Alarm points in monitor display 5 for the TBM shelf: protection**

Point	Byte	Bit	Description
49	7	1	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G1
50	7	2	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G2
51	7	3	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G3
52	7	4	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G4
53	7	5	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G5
54	7	6	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G6
55	7	7	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G7
56	7	8	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G8
57	8	1	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G9
58	8	2	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G10
59	8	3	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G11
60	8	4	DS1 protection lockout (manual or automatic), DS1 circuit-pack group G12
61	8	5	DS1 protection lockout (manual or automatic), DS1 protection group
62	8	6	OC-12 or OC-3 Tx active status, circuit-pack group G1
63	8	7	OC-12 or OC-3 Rx active status, circuit-pack group G1
64	8	8	Not used
—end—			

**Table 7-6**  
**Alarm points in monitor display 6 for the TBM shelf: OC-12 and OC-3 protection / DS3 facility**

Point	Byte	Bit	Description
1	1	1	Metallic failure, DS3 circuit-pack group G1 (See Note 1)
2	1	2	Metallic failure, DS3 circuit-pack group G2 (See Note 1)
3	1	3	Metallic failure, DS3 circuit-pack group G3 (See Note 1)
4	1	4	Metallic failure, DS3 circuit-pack group G4 (See Note 1)
<b>Note:</b> Metallic failure means that the DS1 or DS3 terminations indicate one of the following: loss of signal, loss of frame, bipolar violations, or high bit error rate.			
5	1	5	OC-12 or OC-3 loss of signal or loss of frame, circuit-pack group G1
6	1	6	OC-12 or OC-3 loss of signal or loss of frame, circuit-pack group G2
7	1	7	Not used
8	1	8	Not used
9	2	1	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G1
10	2	2	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G2
11	2	3	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G3
12	2	4	DS3 terminations indicate alarm indication signal (AIS) detected for DS3 circuit-pack group G4
13	2	5	OC-12 or OC-3 terminations indicate alarm indication signal (AIS) detected, circuit-pack group G1
14	2	6	OC-12 or OC-3 terminations indicate alarm indication signal (AIS) detected, circuit-pack group G2
15	2	7	Not used
16	2	8	Not used
—continued—			

**Table 7-6 (continued)**  
**Alarm points in monitor display 6 for the TBM shelf: OC-12 and OC-3 protection / DS3 facility**

Point	Byte	Bit	Description
17	3	1	Performance threshold 1 exceeded for DS3 circuit-pack group G1
18	3	2	Performance threshold 1 exceeded for DS3 circuit-pack group G2
19	3	3	Performance threshold 1 exceeded for DS3 circuit-pack group G3
20	3	4	Performance threshold 1 exceeded for DS3 circuit-pack group G4
21	3	5	OC-12 or OC-3 performance threshold 1 exceeded, circuit-pack group G1
22	3	6	OC-12 or OC-3 performance threshold 1 exceeded, circuit-pack group G2
23	3	7	Not used
24	3	8	Not used
25	4	1	Performance threshold 2 exceeded for DS3 circuit-pack group G1
26	4	2	Performance threshold 2 exceeded for DS3 circuit-pack group G2
27	4	3	Performance threshold 2 exceeded for DS3 circuit-pack group G3
28	4	4	Performance threshold 2 exceeded for DS3 circuit-pack group G4
29	4	5	OC-12 or OC-3 performance threshold 2 exceeded, circuit-pack group G1
30	4	6	OC-12 or OC-3 performance threshold 2 exceeded, circuit-pack group G2
31	4	7	Not used
32	4	8	Not used
33	5	1	OC-12 or OC-3 far-end receive fail, circuit-pack group G1
34	5	2	OC-12 or OC-3 far-end receive fail, circuit-pack group G2
35	5	3	Not used
36	5	4	Not used
37	5	5	OC-12 or OC-3 signal degrade, circuit-pack group G1
38	5	6	OC-12 or OC-3 signal degrade, circuit-pack group G1
39	5	7	Not used
40	5	8	Not used
—continued—			

**Table 7-6 (continued)**  
**Alarm points in monitor display 6 for the TBM shelf: OC-12 and OC-3 protection / DS3 facility**

Point	Byte	Bit	Description
41	6	1	DS3 protection-switch failure, DS3 circuit-pack group G1
42	6	2	DS3 protection-switch failure, DS3 circuit-pack group G2
43	6	3	DS3 protection-switch failure, DS3 circuit-pack group G3
44	6	4	DS3 protection-switch failure, DS3 circuit-pack group G4
45	6	5	DS3 protection path failure, DS3 circuit-pack group G1
46	6	6	DS3 protection path failure, DS3 circuit-pack group G2
47	6	7	DS3 protection path failure, DS3 circuit-pack group G3
48	6	8	DS3 protection path failure, DS3 circuit-pack group G4
49	7	1	DS3 protection switch completed, DS3 circuit-pack group G1
50	7	2	DS3 protection switch completed, DS3 circuit-pack group G2
51	7	3	DS3 protection switch completed, DS3 circuit-pack group G3
52	7	4	DS3 protection switch completed, DS3 circuit-pack group G4
53	7	5	OC-12 or OC-3 protection lockout, circuit-pack group G1
54	7	6	OC-12 or OC-3 protection lockout, circuit-pack group G2
55	7	7	Not used
56	7	8	Not used
57	8	1	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G1
58	8	2	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G2
59	8	3	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G3
60	8	4	DS3 protection lockout (manual or automatic), DS3 circuit-pack group G4
61	8	5	DS3 protection lockout (manual or automatic), DS3 protection group
62	8	6	OC-12 or OC-3 Tx active status, circuit-pack group G1
63	8	7	OC-12 or OC-3 Rx active status, circuit-pack group G1
64	8	8	Not used
			—end—

**Table 7-7****Alarm points in monitor display 7 for the TBM shelf: parallel-telemetry scan points and signal-distribution points**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
1	1	1	Signal-distribution point 1 activated
2	1	2	Signal-distribution point 2 activated
3	1	3	Signal-distribution point 3 activated
4	1	4	Signal-distribution point 4 activated
5	1	5	Signal-distribution point 5 activated
6	1	6	Signal-distribution point 6 activated
7	1	7	Signal-distribution point 7 activated
8	1	8	Signal-distribution point 8 activated
9	2	1	Signal-distribution point 9 activated
10	2	2	Signal-distribution point 10 activated
11	2	3	Signal-distribution point 11 activated
12	2	4	Signal-distribution point 12 activated
13	2	5	Signal-distribution point 13 activated
14	2	6	Signal-distribution point 14 activated
15	2	7	Signal-distribution point 15 activated
16	2	8	Signal-distribution point 16 activated
17	3	1	Signal-distribution point 17 activated
18	3	2	Signal-distribution point 18 activated
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	Not used
—continued—			

**Table 7-7 (continued)**  
**Alarm points in monitor display 7 for the TBM shelf: parallel-telemetry scan points and signal-distribution points**

Point	Byte	Bit	Description
25	4	1	Scan point number 1 (for input from an external source) is activated.
26	4	2	Scan point number 2 (for input from an external source) is activated.
27	4	3	Scan point number 3 (for input from an external source) is activated.
28	4	4	Scan point number 4 (for input from an external source) is activated.
29	4	5	Scan point number 5 (for input from an external source) is activated.
30	4	6	Scan point number 6 (for input from an external source) is activated.
31	4	7	Scan point number 7 (for input from an external source) is activated.
32	4	8	Scan point number 8 (for input from an external source) is activated.
33	5	1	Scan point number 9 (for input from an external source) is activated.
34	5	2	Scan point number 10 (for input from an external source) is activated.
35	5	3	Scan point number 11 (for input from an external source) is activated.
36 through 64	5 through 8	4 through end	Not used
—end—			

### Monitor display for maintenance

Monitor display 10 for the transport bandwidth manager shelf is a maintenance display. The maintenance display contains a pattern of alternating ones and zeros, as shown in Table 7-8. The Alarm Processing Remote (APR) can test cable integrity by reading this display, which contains known values.

**Table 7-8**  
**Alarm points in monitor display 10 for the TBM shelf: maintenance**

Alarm points	Values								
1 to 8	0	1	0	1	0	1	0	1	
9 to 16	1	0	1	0	1	0	1	0	
17 to 24	0	1	0	1	0	1	0	1	
25 to 32	1	0	1	0	1	0	1	0	
33 to 40	0	1	0	1	0	1	0	1	
41 to 48	1	0	1	0	1	0	1	0	
49 to 56	0	1	0	1	0	1	0	1	
57 to 64	1	0	1	0	1	0	1	0	

### Control displays

A control display carries commands from the Alarm Processing Remote to the AccessNode. In the control display, each bit is referred to as a command point. Each command point is mapped to an executable command. The serial-telemetry system sets the command points to indicate which commands the AccessNode should execute.

There are two control displays defined for the transport bandwidth manager shelf. Tables 7-9 and 7-10 list the definitions of the control points in those control displays.

**Table 7-9**  
**Command points in control display 1 for the TBM shelf**

Point	Byte	Bit	Description
1	1	1	Lockout DS1 circuit-pack group G1
2	1	2	Lockout DS1 circuit-pack group G2
3	1	3	Lockout DS1 circuit-pack group G3
4	1	4	Lockout DS1 circuit-pack group G4
5	1	5	Lockout DS1 circuit-pack group G5
6	1	6	Lockout DS1 circuit-pack group G6
7	1	7	Lockout DS1 circuit-pack group G7
8	1	8	Lockout DS1 circuit-pack group G8
9	2	1	Lockout DS1 circuit-pack group G9
10	2	2	Lockout DS1 circuit-pack group G10
11	2	3	Lockout DS1 circuit-pack group G11
12	2	4	Lockout DS1 circuit-pack group G12
13	2	5	Lockout DS1 protection circuit-pack group
14	2	6	Lockout DS3 circuit-pack group G1
15	2	7	Lockout DS3 circuit-pack group G2
16	2	8	Lockout DS3 circuit-pack group G3
17	3	1	Lockout DS3 protection circuit-pack group
18	3	2	Perform DS1 forced switch, DS1 circuit-pack group G2
19	3	3	Perform DS1 forced switch, DS1 circuit-pack group G3
20	3	4	Perform DS1 forced switch, DS1 circuit-pack group G4
21	3	5	Perform DS1 forced switch, DS1 circuit-pack group G5
22	3	6	Perform DS1 forced switch, DS1 circuit-pack group G6
23	3	7	Perform DS1 forced switch, DS1 circuit-pack group G7
24	3	8	Perform DS1 forced switch, DS1 circuit-pack group G8
—continued—			

**Table 7-9 (continued)**  
**Command points in control display 1 for the TBM shelf**

Point	Byte	Bit	Description
25	4	1	Perform DS1 forced switch, DS1 circuit-pack group G9
26	4	2	Perform DS1 forced switch, DS1 circuit-pack group G10
27	4	3	Perform DS1 forced switch, DS1 circuit-pack group G11
28	4	4	Perform DS1 forced switch, DS1 circuit-pack group G12
29	4	5	Perform DS3 forced switch, DS3 circuit-pack group G1
30	4	6	Perform DS3 forced switch, DS3 circuit-pack group G2
31	4	7	Perform DS3 forced switch, DS3 circuit-pack group G3
32	4	8	Perform DS3 forced switch, DS3 circuit-pack group G4
33	5	1	Perform DS1 manual switch, DS1 circuit-pack group G1
34	5	2	Perform DS1 manual switch, DS1 circuit-pack group G2
35	5	3	Perform DS1 manual switch, DS1 circuit-pack group G3
36	5	4	Perform DS1 manual switch, DS1 circuit-pack group G4
37	5	5	Perform DS1 manual switch, DS1 circuit-pack group G5
38	5	6	Perform DS1 manual switch, DS1 circuit-pack group G6
39	5	7	Perform DS1 manual switch, DS1 circuit-pack group G7
40	5	8	Perform DS1 manual switch, DS1 circuit-pack group G8
41	6	1	Perform DS1 manual switch, DS1 circuit-pack group G9
42	6	2	Perform DS1 manual switch, DS1 circuit-pack group G10
43	6	3	Perform DS1 manual switch, DS1 circuit-pack group G11
44	6	4	Perform DS1 manual switch, DS1 circuit-pack group G12
45	6	5	Perform DS3 manual switch, DS3 circuit-pack group G1
46	6	6	Perform DS3 manual switch, DS3 circuit-pack group G2
47	6	7	Perform DS3 manual switch, DS3 circuit-pack group G3
48	6	8	Perform DS3 manual switch, DS3 circuit-pack group G4
—continued—			

**Table 7-9 (continued)**  
**Command points in control display 1 for the TBM shelf**

Point	Byte	Bit	Description
49	7	1	Not used
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Run the shelf exerciser
58	8	2	Restart the shelf processor
59	8	3	Perform backup of provisioning data
60	8	4	Not used
61	8	5	Not used
62	8	6	Not used
63	8	7	Not used
64	8	8	Not used
—end—			

**Table 7-10**  
**Command points in control display 2 for the TBM shelf**

Point	Byte	Bit	Description
1	1	1	Lockout OC-12 or OC-3 circuit-pack group G1
2	1	2	Lockout OC-12 or OC-3 circuit-pack group G2
3	1	3	Not used
4	1	4	Not used
5	1	5	Not used
6	1	6	Not used
7	1	7	Not used
8	1	8	Not used
9	2	1	Not used
10	2	2	Not used
11	2	3	Not used
12	2	4	Not used
13	2	5	Not used
14	2	6	Not used
15	2	7	Not used
16	2	8	Not used
17	3	1	Perform forced switch, OC-12 or OC-3 circuit-pack group G1
18	3	2	Perform forced switch, OC-12 or OC-3 circuit-pack group G2
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	Not used
—continued—			

**Table 7-10 (continued)**  
**Command points in control display 2 for the TBM shelf**

Point	Byte	Bit	Description
25	4	1	Not used
26	4	2	Not used
27	4	3	Not used
28	4	4	Not used
29	4	5	Not used
30	4	6	Not used
31	4	7	Not used
32	4	8	Not used
33	5	1	Perform manual switch, OC-12 or OC-3 circuit-pack group G1
34	5	2	Perform manual switch, OC-12 or OC-3 circuit-pack group G2
35	5	3	Not used
36	5	4	Not used
37	5	5	Not used
38	5	6	Not used
39	5	7	Not used
40	5	8	Not used
41	6	1	Not used
42	6	2	Not used
43	6	3	Not used
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Operate parallel-telemetry signal-distribution point 1
48	6	8	Operate parallel-telemetry signal-distribution point 2
—continued—			

**Table 7-10 (continued)**  
**Command points in control display 2 for the TBM shelf**

Point	Byte	Bit	Description
49	7	1	Operate parallel-telemetry signal-distribution point 3
50	7	2	Operate parallel-telemetry signal-distribution point 4
51	7	3	Operate parallel-telemetry signal-distribution point 5
52	7	4	Operate parallel-telemetry signal-distribution point 6
53	7	5	Operate parallel-telemetry signal-distribution point 7
54	7	6	Operate parallel-telemetry signal-distribution point 8
55	7	7	Operate parallel-telemetry signal-distribution point 9
56	7	8	Operate parallel-telemetry signal-distribution point 10
57	8	1	Operate parallel-telemetry signal-distribution point 11
58	8	2	Operate parallel-telemetry signal-distribution point 12
59	8	3	Operate parallel-telemetry signal-distribution point 13
60	8	4	Operate parallel-telemetry signal-distribution point 14
61	8	5	Operate parallel-telemetry signal-distribution point 15
62	8	6	Operate parallel-telemetry signal-distribution point 16
63	8	7	Operate parallel-telemetry signal-distribution point 17
64	8	8	Operate parallel-telemetry signal-distribution point 18
—end—			



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## Appendix C: Remote display

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This appendix explains and provides the alarm points for the remote display used in the AccessNode, known as the cluster-level display.

### Chapter contents

Use the following table to go directly to the information you require.

Topic	See
AccessNode cluster-level display	page 8-1
Alarm points in the cluster-level display	Table 8-1 on page 8-2

### AccessNode cluster-level display

AccessNode has one remote display, the cluster-level display. The cluster-level display reports information from the entire cluster. The cluster is composed of all the network elements in the span of control of the operations controller.

The E2A Alarm Manager software tool in the operations controller collects network-element-level monitor displays from all network elements in the cluster and creates the cluster display. The operations controller distributes the cluster display to all active network elements in the cluster.

In the cluster display, a state change indicates that an alarm or status change has occurred in any network element in the span of control. If a second alarm or status change of the same type occurs before the first is cleared, the cluster display does not change, because it already indicates the existence of that alarm or status.

The meanings of all the alarm points and command points have been predefined, and cannot be changed by the user.

Table 8-1 lists the definitions of the alarm points in the cluster-level display.

**Table 8-1**  
**Alarm points in the cluster-level display**

Point	Byte	Bit	Description
1	1	1	Critical alarm in the cluster
2	1	2	Major alarm in the cluster
3	1	3	Minor alarm in the cluster
4	1	4	Warning in the cluster
5	1	5	Cluster display inaccurate
6	1	6	Cluster ID - C/M/m/W alarms
7	1	7	Cluster ID - C/M/m alarms
8	1	8	Not used
9	2	1	Any OC-n indication in the cluster
10	2	2	Any DS <sub>n</sub> indication in the cluster
11	2	3	OC-n or DS <sub>n</sub> signal failure in the cluster
12	2	4	OC-n or DS <sub>n</sub> equipment failure in the cluster
13	2	5	OC-n or DS <sub>n</sub> protection switch completed in the cluster
14	2	6	Not used
15	2	7	Not used
16	2	8	Not used
17	3	1	Common-equipment failure in the cluster
18	3	2	Not used
19	3	3	Not used
20	3	4	Not used
21	3	5	Not used
22	3	6	Not used
23	3	7	Not used
24	3	8	AC power failure in the cluster
—continued—			

**Table 8-1 (continued)**  
**Alarm points in the cluster-level display**

Point	Byte	Bit	Description
25	4	1	Low battery in the cluster
26	4	2	Not used
27	4	3	Not used
28	4	4	Not used
29	4	5	Not used
30	4	6	Not used
31	4	7	Not used
32	4	8	Not used
33	5	1	Not used
34	5	2	Not used
35	5	3	Not used
36	5	4	Environmental subset 1 alarm in the cluster (The value of this alarm point is the result of a logical OR of scan points 36, 37, 38, and 39 in monitor display 2 of every network element in the cluster.)
37	5	5	Environmental subset 2 alarm in the cluster (The value of this alarm point is the result of a logical OR of scan points 40, 41, 42, and 43 in monitor display 2 of every network element in the cluster.)
38	5	6	Not used
39	5	7	Not used
40	5	8	Not used
41	6	1	Not used
42	6	2	Alarm (critical, major, or minor) or warning in a remote network element in the cluster
43	6	3	Alarm (critical, major, or minor) in a remote network element in the cluster
44	6	4	Not used
45	6	5	Not used
46	6	6	Not used
47	6	7	Not used
48	6	8	Not used
—continued—			

**Table 8-1 (continued)**  
**Alarm points in the cluster-level display**

<b>Point</b>	<b>Byte</b>	<b>Bit</b>	<b>Description</b>
49	7	1	Not used
50	7	2	Not used
51	7	3	Not used
52	7	4	Not used
53	7	5	Not used
54	7	6	Not used
55	7	7	Not used
56	7	8	Not used
57	8	1	Not used
58	8	2	Not used
59	8	3	Not used
60	8	4	Not used
61	8	5	Not used
62	8	6	Always set (on)
63	8	7	Always clear (off)
64	8	8	Not used
—end—			

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SONET Products

## **AccessNode**

### Alarms and Surveillance Description

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